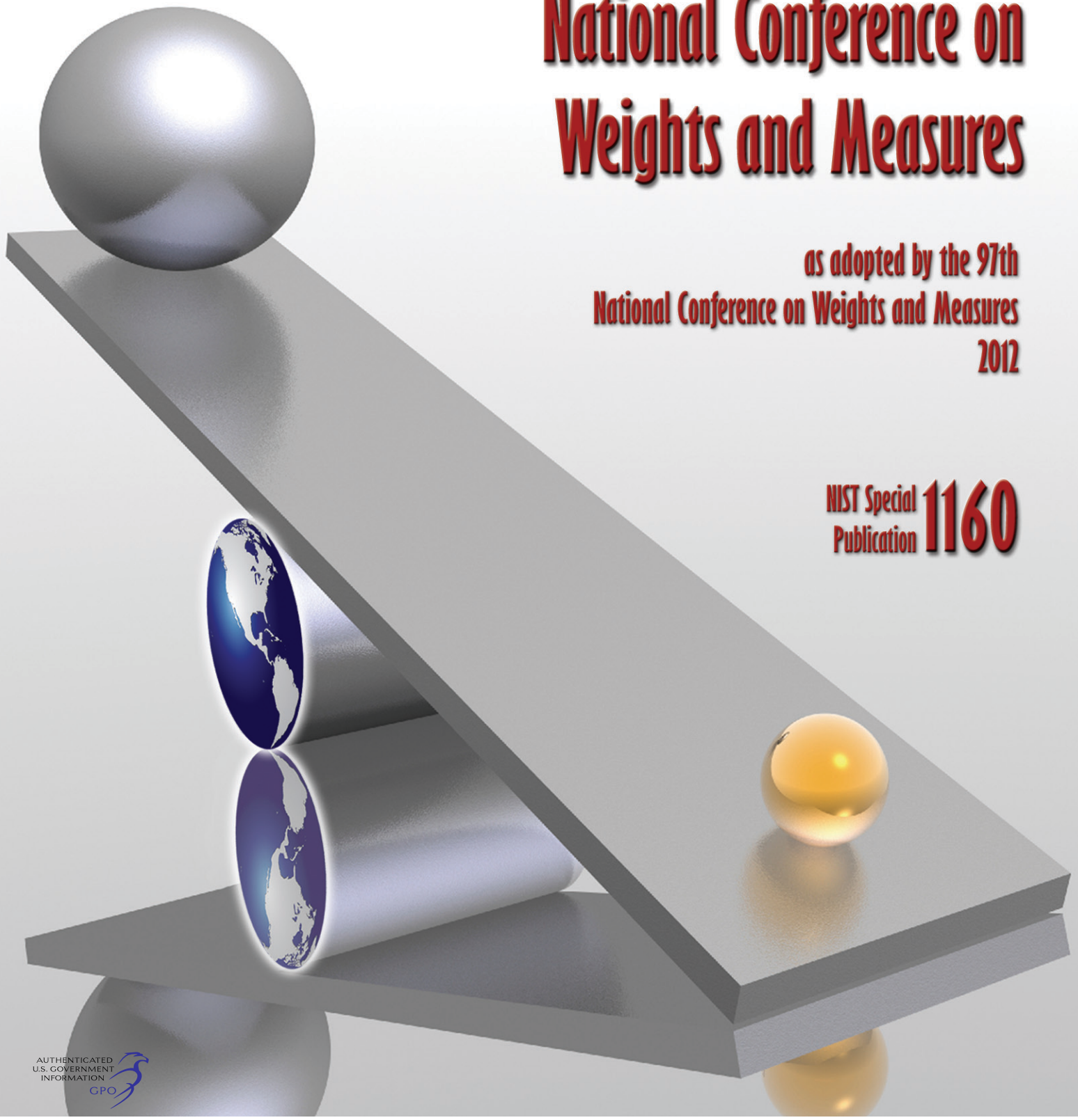
NIST
National Institute of Standards and Technology
U.S. Department of Commerce

Report of the 97th National Conference on Weights and Measures

as adopted by the 97th National Conference on Weights and Measures 2012

NIST Special Publication 1160



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NIST Special Publication 1160

Report of the 97th National Conference on Weights and Measures

Portland, Maine – July 15 through 19, 2012
as adopted by the 97th National Conference on Weights and Measures 2012

Editors:
Tina Butcher
Linda Crown
Richard Harshman
David Sefcik
Lisa Warfield

Carol Hockert, Chief
Office of Weights and Measures
Physical Measurement Laboratory

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May 2013

U.S. Department of Commerce
Cameron F. Kerry, Acting Secretary

National Institute of Standards and Technology
Patrick D. Gallagher, Under Secretary of Commerce for Standards and Technology and Director

The National Conference on Weights and Measures is supported by the National Institute of Standards and Technology and is attended by officials from various states, counties, and cities, as well as representatives from the U.S. Government, other nations, industry, and consumer organizations.

Certain commercial entities, equipment, or materials may be identified in this document in order to describe an experimental procedure or concept adequately. Such identification is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology, nor is it intended to imply that the entities, materials, or equipment are necessarily the best available for the purpose.

Abstract

The 97th Annual Meeting of the National Conference on Weights and Measures (NCWM) was held July 15 -19, 2012, at the Holiday Inn by the Bay, Portland, Maine. The theme of the meeting was "Taking Measure of Our Worth."

Reports by the NCWM Board of Directors, Standing Committees, and Special Purpose Committees constitute the major portion of this publication, along with the addresses delivered by Conference officials and other authorities from government and industry.

Special meetings included those of the Scale Manufacturers Association, Meter Manufacturers Association, Packaging and Labeling Subcommittee, Task Group on Printer Ink and Toner Cartridges, Fuels and Lubricants Subcommittee, and Associate Membership Committee.

Key words: laws and regulations; legal metrology; meters; scales; specifications and tolerances; training; type evaluation; uniform laws; weights and measures.

Note: The policy of the National Institute of Standards and Technology is to use metric units of measurement in all of its publications. In this publication, however, recommendations received by the NCWM technical committees have been printed as they were submitted and, therefore, may contain references to inch-pound units where such units are commonly used in industry practice. Opinions expressed in non-NIST papers are those of the authors and not necessarily those of the National Institute of Standards and Technology. Non-NIST speakers are solely responsible for the content and quality of their material.

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National Conference on Weights and Measures

Annual Report of the 97th NCWM

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Past Chairmen of the Conference

Conference	Year	Location	Chairman
1st	1905	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
2nd	1906	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
3rd	1907	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
4th	1908	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
	1909	Conference Not Held	
5th	1910	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
6th	1911	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
7th	1912	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
8th	1913	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
9th	1914	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
10th	1915	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
11th	1916	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
	1917	Conference Not Held	
	1918	Conference Not Held	
12th	1920	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
13th	1921	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
14th	1922	Washington, D.C.	Dr. S. W. Stratton, Bureau of Standards
15th	1923	Washington, D.C.	Dr. George Burgess, Bureau of Standards
16th	1924	Washington, D.C.	Dr. George Burgess, Bureau of Standards
17th	1925	Washington, D.C.	Dr. George Burgess, Bureau of Standards
18th	1926	Washington, D.C.	Dr. George Burgess, Bureau of Standards
19th	1927	Washington, D.C.	Dr. George Burgess, Bureau of Standards
20th	1928	Washington, D.C.	Dr. George Burgess, Bureau of Standards
21st	1928	Washington, D.C.	Dr. George Burgess, Bureau of Standards
22nd	1929	Washington, D.C.	Dr. George Burgess, Bureau of Standards
23rd	1930	Washington, D.C.	Dr. George Burgess, Bureau of Standards
24th	1931	Washington, D.C.	Dr. George Burgess, Bureau of Standards
	1932	Conference Not Held	
	1933	Conference Not Held	
	1934	Conference Not Held	
25th	1935	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
26th	1936	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
27th	1937	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
28th	1938	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards

Conference	Year	Location	Chairman
29th	1939	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
30th	1940	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
31st	1941	Washington, D.C.	Dr. Lyman Briggs, National Bureau of Standards
	1942	Conference Not Held	
	1943	Conference Not Held	
	1944	Conference Not Held	
	1945	Conference Not Held	
32nd	1946	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
33rd	1947	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
	1948	Conference Not Held	
34th	1949	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
35th	1950	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
36th	1951	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
37th	1952	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
38th	1953	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
39th	1954	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
40th	1955	Washington, D.C.	Dr. E. U. Condon, National Bureau of Standards
41st	1956	Washington, D.C.	Dr. A. V. Astin, National Bureau of Standards
42nd	1957	Washington, D.C.	Dr. A. V. Astin, National Bureau of Standards
43rd	1958	Washington, D.C.	J. P. McBride, MA
44th	1959	Washington, D.C.	C. M. Fuller, CA
45th	1960	Washington, D.C.	H. E. Crawford, FL
46th	1961	Washington, D.C.	R. E. Meek, IN
47th	1962	Washington, D.C.	R. Williams, NY
48th	1963	Washington, D.C.	C. H. Stender, SC
49th	1964	Washington, D.C.	D. M. Turnbull, WA
50th	1965	Washington, D.C.	V. D. Campbell, OH
51st	1966	Denver, CO	J. F. True, KS
52nd	1967	Washington, D.C.	J. E. Bowen, MA
53rd	1968	Washington, D.C.	C. C. Morgan, IN
54th	1969	Washington, D.C.	S. H. Christie, NJ
55th	1970	Salt Lake City, UT	R. W. Searles, OH
56th	1971	Washington, D.C.	M. Jennings, TN
57th	1972	Washington, D.C.	E. H. Black, CA
58th	1973	Minneapolis, MN	G. Johnson, KY
59th	1974	Washington, D.C.	J. Lewis, WA
60th	1975	San Diego, CA	S. Andrews, FL

Conference	Year	Location	Chairman
61st	1976	Washington, D.C.	R. Thompson, MD
62nd	1977	Dallas, TX	E. Prideaux, CO
63rd	1978	Washington, D.C.	J. Lyles, WA
64th	1979	Portland, OR	K. Simila, OR
65th	1980	Washington, D.C.	C. Vincent, TX
66th	1981	St. Louis, MO	E. Stadolnik, MA
67th	1982	Atlanta, GA	E. Heffron, MI
68th	1983	Sacramento, CA	C. Greene, NM
69th	1984	Boston, MA	S. Hindsman, AR
70th	1985	Washington, D.C.	E. Delfino, CA
71st	1986	Albuquerque, NM	G. Mattimoe, HI
72nd	1987	Little Rock, AR	F. Nagele, MI
73rd	1988	Grand Rapids, MI	D. Guensler, CA
74th	1989	Seattle, WA	J. Bartfai, NY
75th	1990	Washington, D.C.	F. Gerk, NM
76th	1991	Philadelphia, PA	N. D. Smith, NC
77th	1992	Nashville, TN	S. Colbrook, IL
78th	1993	Kansas City, MO	A. Nelson, CT
79th	1994	San Diego, CA	T. Geiler, MA
80th	1995	Portland, ME	J. Truex, OH
81st	1996	New Orleans, LA	C. Gardner, NY
82nd	1997	Chicago, IL	B. Bloch, CA
83rd	1998	Portland, OR	S. Malone, NE
84th	1999	Burlington, VT	A. Thompson, AK
85th	2000	Richmond, VA	W. Diggs, VA
86th	2001	Washington, D.C.	L. Straub, MD
87th	2002	Cincinnati, OH	R. Murdock, NC
88th	2003	Sparks, NV	R. Andersen, NY
89th	2004	Pittsburgh, PA	D. Ehrhart, AZ
90th	2005	Orlando, FL	W. Diggs, VA
91st	2006	Chicago, IL	D. Onwiler, NE
92nd	2007	Salt Lake City, UT	M. Cleary, CA
93rd	2008	Burlington, VT	J. Cardin, WI
94th	2009	San Antonio, TX	J. Kane, MT
95th	2010	St. Paul, MN	R. Jennings, TN
96th	2011	Missoula, MT	T. Tyson, KS
97th	2012	Portland, ME	K. Floren, CA

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2011 – 2012 Organizational Chart

NCWM Board of Directors (BOD)			
Office	**Name**	**Affiliation**	**Term Ends**
Chairman	Kurt Floren	Los Angeles County, California	2012
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Active Membership – Northeastern	James Cassidy	City of Cambridge, Massachusetts	2014
At-Large	John Gaccione	Westchester County, New York	2016
At-Large	Stephen Langford	Cardinal Scale Manufacturing, Co.	2013
Associate Membership	Gordon Johnson	Gilbarco, Inc.	2013
Honorary NCWM President	Dr. Patrick D. Gallagher	NIST Director	NA
Executive Secretary	Carol Hockert	NIST, Office of Weights and Measures	NA
Executive Director	Don Onwiler	NCWM Headquarters	NA
Advisory	Gilles Vinet	Measurement Canada	NA
NTEP Administrator	Jim Truex	NCWM Headquarters	NA

National Type Evaluation Program (NTEP)			
Office	**Name**	**Affiliation**	**Term Ends**
Committee Chair	Tim Tyson	Kansas	2012
Member	Kurt Floren	Los Angeles County, California	2012
Member	Stephen Benjamin	North Carolina	2012
Member	Brett Saum	San Luis Obispo County, California	2012
Member	James Cassidy	City of Cambridge, Massachusetts	2014
NTEP Administrator	Jim Truex	NCWM Headquarters	NA

Finance Committee			
Office	**Name**	**Affiliation**	**Term Ends**
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Member	John Gaccione	Westchester County, New York	2014
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Laws and Regulations Committee (L&R)			
Office	**Name**	**Affiliation**	**Term Ends**
Committee Chair	Judy Cardin	Wisconsin	2013
Member	Louis Sakin	Town of Hopkinton, Massachusetts	2012
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Member	Richard Lewis	Georgia	2016
Associate Membership Representative	Rob Underwood	Petroleum Marketers Association of America	2013
Canadian Technical Advisor	Lance Robertson	Measurement Canada	NA
NIST Technical Advisor	David Sefcik	NIST, Office of Weights and Measures	NA
NIST Technical Advisor	Lisa Warfield	NIST, Office of Weights and Measures	NA

Specifications and Tolerances Committee (S&T)			
Office	**Name**	**Affiliation**	**Term Ends**
Committee Chair	Steve Giguere	Maine	2012
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Member	Paul Moyer	Nebraska	2014
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Canadian Technical Advisor	Ted Kingsbury	Measurement Canada	NA
NIST Technical Advisor	Tina Butcher	NIST, Office of Weights and Measures	NA
NIST Technical Advisor	Rick Harshman	NIST, Office of Weights and Measures	NA

Professional Development Committee (PDC)			
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Member	Dale Saunders	Virginia	2014
Member	Cheryl Ayer	New Hampshire	2015
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Safety Liaison	TBD		NA
NIST Technical Advisor	TBD		NA
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Member	Thomas Geiler	Barnstable, Massachusetts	2012
Member	Joe Gomez	New Mexico	2012
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Member	Randy Jennings	Tennessee	2012

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Presiding Officer	James Byers	San Diego County, California	2012
Presiding Officer	Ivan Hankins	Iowa	2012
Presiding Officer	Jack Walsh	Town of Wellesley	2012
Sergeants-at-Arms	Bradford Bachelder	Maine	2012
Sergeants–at-Arms	Conrad Brown	Maine	2012

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Office	Name	Affiliation	Term Ends
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Committee Vice Chair	Christopher Guay	Procter and Gamble, Co.	2012
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Member	Darrell Flocken	Mettler-Toledo, LLC	2013
Member	Michael Gaspers	Farmland Foods, Inc.	2013
Member	Paul A. Lewis, Sr.	Rice Lake Weighing Systems, Inc.	2014
Member	Robert Murnane, Jr.	Seraphin Test Measure, Co.	2014
Member	Steven Grabski	WalmartWal-Mart Stores, Inc.	2015
Member	Christopher Guay	Procter and Gamble, Co.	2015
Member	Thomas McGee	PMP Corporation	2015
Member	Rob Underwood	Petroleum Marketers Association of America	2015
Member	Pete O'Bryan	Foster Farms	2016

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Public Sector Member	Steven Harrington	Minnesota
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Private Sector Member	Curtis Williams	CP Williams Energy Consulting, LLC
Private Sector Member	William Woebkenberg	Mercedes–Benz Research and Development NA

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Public Sector Member (NEWMA)	Frank Greene	Connecticut
Public Sector Member (SWMA)	Bill Tedder	North Carolina
Public Sector Member (WWMA)	Angela Godwin	County of Ventura
Private Sector Member	Krister Hard af Segerstad	IKEA North America Services, LLC
Private Sector Member	Zina Juroch	Pier 1 Imports
Private Sector Member	Pete O'Bryan	Foster Farms
Private Sector Member	Stratt Pinagel	Walmart Stores, Inc.

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Public Sector Member	Fran Elson–Houston	Ohio
Public Sector Member	Ted Kingsbury	Measurement Canada
Public Sector Member	Justin Rae	Measurement Canada
Private Sector Member	Scott Wigginton	United Parcel Service

Task Group on Printer Ink and Toner Cartridges		
Office	**Name**	**Affiliation**
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NIST Technical Advisor	Lisa Warfield	NIST, Office of Weights and Measures
Public Sector Member	Mike Boitano	Amador County
Public Sector Member	Max Gray	Florida
Public Sector Member	Jack Walsh	Town of Wellesley, Massachusetts
Private Sector Member	Matthew Barkley	Hewlett Packard Co.
Private Sector Member	Melody Culton	Brother International
Private Sector Member	Paul Jeran	Hewlett Packard Co.
Private Sector Member	Alfred Menard	Lexmark International
Private Sector Member	Stratt Pinagel	Walmart Stores, Inc.
Private Sector Member	Josh Rosenberg	Information Technology Industry Council

Task Group on Retail Motor Fuel Dispenser Price Posting and Computing Capability		
Office	**Name**	**Affiliation**
Chair	Fran Elson–Houston	Ohio
NIST Technical Advisor	Juana Williams	NIST, Office of Weights and Measures
Public Sector Member	Shelly Miller	Wisconsin
Public Sector Member	Ken Ramsburg	Maryland
Public Sector Member	Dan Reiswig	California
Public Sector Member	Jerry Buendel	Washington State Department of Agriculture
Public Sector Member	Michael Sikula	New York
Private Sector Member	Rex Brown	Petroleum Equipment Institute
Private Sector Member	Gordon Johnson	Gilbarco, Inc.
Private Sector Member	Phil Katselnik	Dresser Wayne
Private Sector Member	Patrick Lewis	KickBack Reward Systems
Private Sector Member	Mike Roach	VeriFone
Private Sector Member	Richard Suiter	Richard Suiter Consulting
Private Sector Member	Rob Underwood	Petroleum Marketers Association of America

NTETC Belt–Conveyor Sector		
Office	**Name**	**Affiliation**
Chair	Bill Ripka	Thermo Fisher Scientific
Technical Advisor	John Barton	NIST, Office of Weights and Measures
NTEP Administrator	Jim Truex	NCWM Headquarters
Public Sector Member	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Ken Jones	California
Private Sector Member	Rafael Jimenez	Association of American Railroads Transportation Technology Center, Inc.
Private Sector Member	Lars Marmsater	Merrick Industries, Inc.
Private Sector Member	Peter Sirrico	Thayer Scale/Hyer Industries
Private Sector Member	Thomas Vormittag	

NTETC Grain Analyzer Sector		
Office	**Name**	**Affiliation**
Chair	Cassie Eigenmann	DICKEY-john Corporation
Co-Technical Advisor	Jack Barber	J B Associates
Co-Technical Advisor	G. Diane Lee	NIST, Office of Weights and Measures
NTEP Administrator	Jim Truex	NCWM Headquarters
Public Sector Member	Randall Burns	Arkansas
Public Sector Member	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Karl Cunningham	Illinois
Public Sector Member	Ivan Hankins	Iowa
Public Sector Member	Thomas Hughes	Missouri
Public Sector Member	Richard Pierce	USDA, GIPSA Technical Services Division
Private Sector Member	Cheryl Tew	North Carolina
Private Sector Member	Jeffrey Adkisson	Grain and Feed Association of Illinois
Private Sector Member	James Bair	North American Miller's Association
Private Sector Member	Rachel Beiswenger	TSI Incorporated
Private Sector Member	Martin Clements	The Steinlite Corporation
Private Sector Member	Andrew Gell	Foss North America
Private Sector Member	Charles Hurburgh, Jr.	Iowa State University
Private Sector Member	Jess McCluer	National Grain and Feed Association
Private Sector Member	Thomas Runyon	Seedburo Equipment Co.

NTETC Measuring Sector		
Office	**Name**	**Affiliation**
Chair	Michael Keilty	Endress + Hauser Flowtec AG, USA
Technical Advisor	Marc Buttler	NIST, Office of Weights and Measures
NTEP Administrator	Jim Truex	NCWM Headquarters
Public Sector Member	Dennis Beattie	Measurement Canada
Public Sector Member	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Jerry Butler	North Carolina
Public Sector Member	Michael Frailer	Maryland
Public Sector Member	James (Steve) Hadder	Florida
Public Sector Member	John Roach	California
Private Sector Member	Steve Bar	Bennett Pump Company
Private Sector Member	William Cooper	Tuthill Transfer Systems
Private Sector Member	Constantine Cotsoradis	Flint Hills Resources
Private Sector Member	Paul Glowacki	Murray Equipment, Inc.
Private Sector Member	Gordon Johnson	Gilbarco, Inc.
Private Sector Member	Dmitri Karimov	Liquid Controls
Private Sector Member	Yefim Katselnik	Dresser Wayne
Private Sector Member	Douglas Long	RDM Industrial Electronics
Private Sector Member	Andrew MacAllister	Daniel Measurement and Control
Private Sector Member	Daniel Maslowski	LTS Sales
Private Sector Member	Wade Mattar	Invensys/Foxboro
Private Sector Member	Richard Miller	FMC Technologies Measurement Solutions, Inc.
Private Sector Member	Andre Noel	Neptune Technology Group, Inc.
Private Sector Member	Henry Oppermann	Weights & Measures Consulting, LLC
Private Sector Member	Johnny Parrish	Brodie International
Private Sector Member	Richard Tucker	RL Tucker Consulting, LLC
Private Sector Member	Kelly White	Itron, Inc.

NTETC Software Sector		
Office	**Name**	**Affiliation**
Chair	James Pettinato	FMC Technologies Measurement Solutions, Inc.
Technical Advisor	Doug Bliss	Mettler–Toledo, LLC
Secretary	Teri Gulke	Liquid Controls, LLC
NTEP Administrator	Jim Truex	NCWM Headquarters
Public Sector Member	Dennis Beattie	Measurement Canada
Public Sector Member	Michael Frailer	Maryland
Public Sector Member	Edward Payne	Maryland
Public Sector Member	Ken Jones	California
Public Sector Member	John Raoch	California
Public Sector Member	Ambler Thompson	NIST, Office of Weights and Measures
Private Sector Member	Mary Abens	Emerson Process Management
Private Sector Member	John Atwood	Tyson Foods
Private Sector Member	Gary Benjamin	NCR Corporation
Private Sector Member	Kevin Detert	Avery Weigh–Tronix
Private Sector Member	Cassie Eigenmann	DICKEY–john Corporation
Private Sector Member	Andre Elle	Endress + Hauser Flowtec AG
Private Sector Member	Thomas Fink	ITW Food Equipment / Hobart
Private Sector Member	Andrew Gell	Foss North America
Private Sector Member	Keith Harper	Gencor Industries, Inc.
Private Sector Member	Tony Herrin	Cardinal Scale Manufacturing Co.
Private Sector Member	Paul A. Lewis, Sr.	Rice Lake Weighing Systems, Inc.
Private Sector Member	Rick Lydon	Sick, Inc.
Private Sector Member	Michael McGhee	Itron, Inc.
Private Sector Member	Richard Miller	FMC Technologies Measurement Solutions, Inc.
Private Sector Member	Adam Oldham	Gilbarco, Inc.
Private Sector Member	Michael Parks	Vulcan Materials Company
Private Sector Member	Mike Roach	VeriFone
Private Sector Member	Robin Sax	CompuWeigh Corporation
Private Sector Member	David Vande Berg	Vande Berg Scales
Private Sector Member	John Wind	Bizerba USA, Inc.

NTETC Weighing Sector		
Office	**Name**	**Affiliation**
Chair	Darrell Flocken	Mettler–Toledo, LLC
Technical Advisor	Rick Harshman	NIST, Office of Weights and Measures
NTEP Administrator	Jim Truex	NCWM Headquarters
Public Sector Member	L. Cary Ainsworth	USDA, GIPSA
Public Sector Member	Luciano Burtini	Measurement Canada
Public Sector Member	Tina Butcher	NIST, Office of Weights and Measures
Public Sector Member	Terry Davis	Kansas
Public Sector Member	Fran Elson–Houston	Ohio
Public Sector Member	Ken Jones	California
Public Sector Member	Jack Kane	Montana
Public Sector Member	Edward Payne	Maryland
Public Sector Member	Byron School	USDA, GIPSA
Public Sector Member	Juana Williams	NIST, Office of Weights and Measures
Private Sector Member	Steven Beitzel	Systems Associates, Inc.
Private Sector Member	Greg Bredahl	Thermo Fisher Scientific
Private Sector Member	Neil Copley	Thurman Scale Co.
Private Sector Member	Mitchell Eyles	Flintec, Inc.
Private Sector Member	Robert Feezor	Scales Consulting and Testing
Private Sector Member	Scott Henry	NCR Corporation
Private Sector Member	Sam Jalahej	Totalcomp, Inc.
Private Sector Member	Rafael Jimenez	Association of American Railroads Transportation Technology Center, Inc.
Private Sector Member	Stephen Langford	Cardinal Scale Manufacturing, Co.
Private Sector Member	Paul A. Lewis, Sr.	Rice Lake Weighing Systems, Inc.
Private Sector Member	L. Edward Luthy	Stock Equipment Company Schenck Process Transport N.A.
Private Sector Member	Nigel Mills	Hobart Corporation
Private Sector Member	Wayne Pugh	OCS Checkweighers, Inc.
Private Sector Member	Louis Straub	Fairbanks Scales, Inc.
Private Sector Member	Jerry Wang	A&D Engineering, Inc.
Private Sector Member	Walter Young	Emery Winslow Scale Company

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President's Address

National Institute of Standards and Technology

Portland, Maine

July 17, 2012

Dr. Willie E. May

Associate Director for Laboratory Programs/Principal Deputy

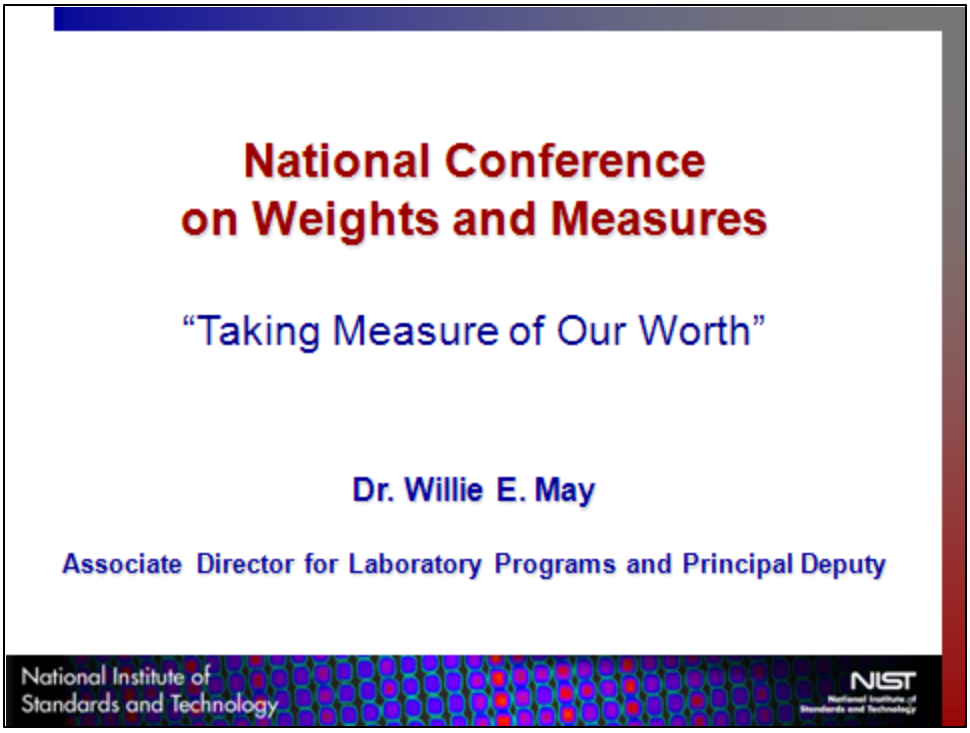
Thank you, Carol and good morning all.

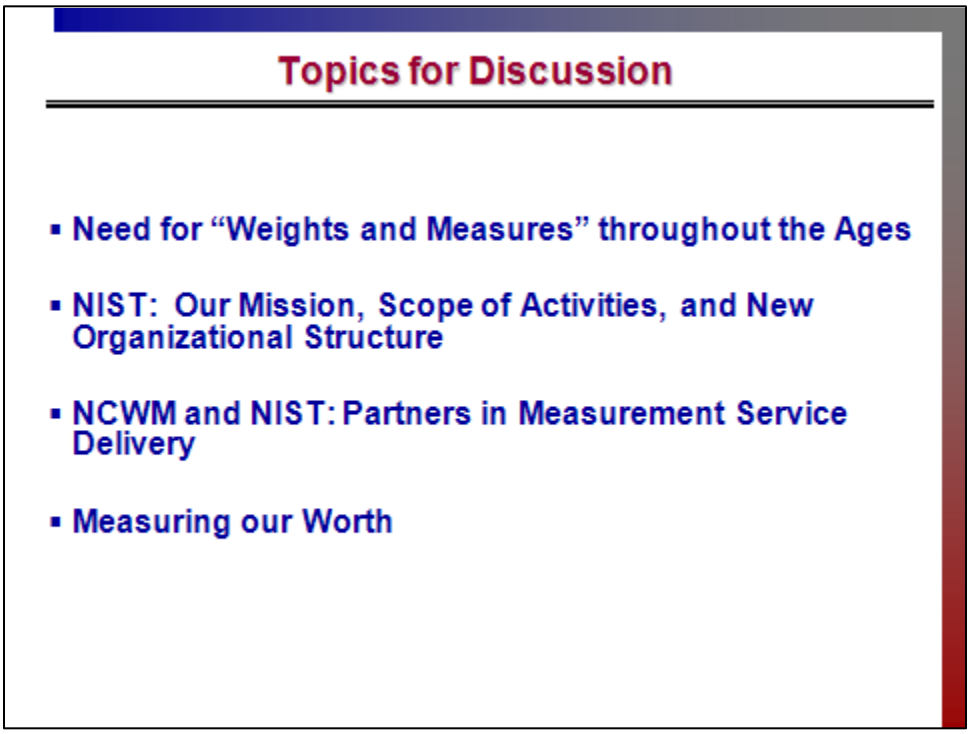
I'd like to thank Commissioner Whitcomb, the State of Maine, and the people of Portland for hosting this wonderful Conference.

I'd also like to thank Chairman Floren and Don Onwiler of the National Conference on Weights and Measures (NCWM) for inviting me to speak this morning on behalf of the National Institute of Standards and Technology (NIST) Director, Pat Gallagher. I'm truly honored to be here.

I am the Associate Director of Laboratory Programs and also serve as Principal Deputy to the NIST Director. Prior to my current position, I served as Founding Director of the NIST Material Measurement Laboratory, Chemical Science and Technology Laboratory, and led the Analytical Chemistry Division. In addition to my duties at NIST, I am also Vice President of the International Committee on Weights and Measures (CIPM), and President-Elect of the CIPM's Consultative Committee on Metrology in Chemistry and Biology. Through both my responsibilities with the CIPM and working at NIST for – well a very long time, I am somewhat familiar with the International Organization of Legal Metrology (OIML) and Legal Metrology, but this is really my first formal interaction with the National Conference on Weights and Measures (NCWM).

Slide presentation follows on next page.


National Conference
on Weights and Measures
"Taking Measure of Our Worth"
Dr. Willie E. May
Associate Director for Laboratory Programs and Principal Deputy
National Institute of
Standards and Technology
NIST


Topics for Discussion
▪ Need for "Weights and Measures" throughout the Ages
▪ NIST: Our Mission, Scope of Activities, and New Organizational Structure
▪ NCWM and NIST: Partners in Measurement Service Delivery
▪ Measuring our Worth

The Need for Metrology: Recognized Through the Ages

Mankind has long recognized the need for measurement science and standards to support construction, manufacturing and trade.

The Need for Metrology: Recognized Through the Ages

The ancient Egyptians were well known for their measurement capabilities

- **Standard unit of length** - the length of Pharaoh's forearm plus the width of his palm
  - **The Cubit**
- **The "Royal Cubit Master"**
  - **Primary standard** in granite
- **Realization of the Cubit: A stick of wood**
  - **Working Standard** / Comparability
- **Re-calibration of cubit stick required on each full moon**
  - **Calibration / Traceability**
  - Severe penalty for non-compliance



Uniformity of length measurement was achieved to a relative accuracy of 0.05% over a distance of 230 meters

In addition to the well known Royal Cubit for length measurement, a host of other accurate measurement standards existed. For example in mass:



Predynastic
Stone mass standard
(5,000 to 7,000 years old)



The Deben,
12g, 27g, 93.3 g
(3,000 to 5,000 years old)

Standards in Medieval Times

"Throughout the realm there shall be the same yard of the same size and it should be of iron"

Assize of Measures, 1196





Magna Carta of 1215

"There shall be standard measures of wine, ale, and corn (the London quarter), throughout the kingdom. There shall also be a standard width of dyed cloth, russett, and haberject, namely two ells within the selvedges. Weights are to be standardised similarly."

U.S. Federal Role in Metrology

The Constitution of the United States



Article 1, Section 8: The Congress shall have the power … *to coin money, regulate the value thereof, and of foreign coin … and fix the standard of weights and measures … (1788)*

"Foreign traders had begun to voice concern that goods might not be assigned a proper quantitative value at American custom-houses and that, as a result, assessed duties might be unfair and uneven from port to port."

John Quincy Adams (1817)

6

International Metrology Infrastructure: The Early Years

International Metrology Infrastructure

20 May 1875

The Meter Convention, an intergovernmental treaty signed by representatives of 17 nations, established an organization structure for member **governments to act in common accord on all matters relating to units of measurement**.

- It established a scientific and permanent International Bureau of Weights and Measures (BIPM) operated under the direction of an International Committee of Weights and Measures (CIPM) controlled by General Conference for Weights and Measures (CGPM).

In subsequent years, National Metrology Institutes were established

1887 PTB (PTR)

"to supervise and direct calibration and to establish metrological standards"

1900 NPL

"for standardising and verifying instruments, for testing materials and for the determination of physical constants"

1901 NIST (NBS)

"for custody of the standards; the comparison of the standards…; the construction … of standards; the testing and calibration of standard measuring apparatus; solution of problems which arise in connection with standards; the determination of physical constants and the properties of materials …"

NIST (NBS) established in 1901

"It is therefore the unanimous opinion of your committee that no more essential aid could be given to

- manufacturing
- commerce
- the makers of scientific apparatus
- the scientific work of Government
- schools, colleges, and universities

than by the establishment of the institution proposed in this bill."


THE EVENING STAR, MONDAY, MARCH 11, 1901

CORRECT MEASURES

LABORATORY TO BE ERECTED

A HANDICAP REMOVED

House Committee on Coinage, Weights and Measures … on the establishment of the National Bureau of Standards (now NIST) May 3, 1900

Organic Act of 1901; Updated in 2008

Functions and activities of the Institute include:

- **custody and dissemination of national standards**
- **determination of physical constants and the properties of materials,**
- **comparison of US national standards with those of other nations**
- **solutions to measurement and standards problems of other government agencies**
- **providing (Innovation) assistance to industry**

8

Needs for Measurement Standards in the U.S.



Article I, Section 8: The Congress shall have the power to…*fix the standard of weights and measures*

National Bureau of Standards established by Congress in 1901

- Eight different "authoritative" values for the gallon
- Electrical industry needed standards
- American instruments sent abroad for calibration
- Consumer products and construction materials uneven in quality and unreliable



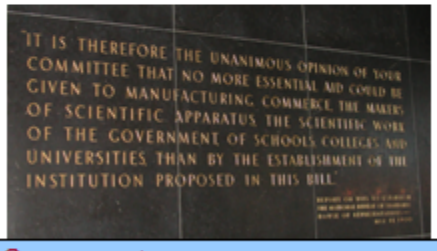
Currently, it is estimated that 80% of global merchandise trade is influenced by testing and other measurement-related requirements of regulations and standards

National Institute of Standards and Technology (NIST)

- Non-regulatory agency within U.S. Department of Commerce
- Founded in 1901 as National Bureau of Standards



Article I, Section 8: The Congress shall have the power to *…coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures*



Unique Mission within the Federal Government **…**
to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life

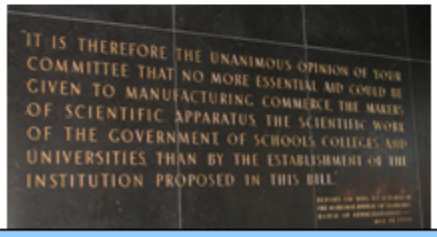
10

National Institute of Standards and Technology (NIST)

- Non-regulatory agency within U.S. Department of Commerce
- Founded in 1901 as National Bureau of Standards



Article I, Section 8: The Congress shall have the power to
...coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures



- **Deep research expertise underpins technological innovation** – e.g., new materials, advanced clinical diagnostics and therapies, advanced communications, etc.
- **Non-regulatory status** enables important role as a convener that facilitates collaboration between industry and government

NIST-at-a-Glance

Major Programs

- NIST Laboratories
- Baldrige Performance Excellence Program
- Hollings Manufacturing Extension Partnership

Major Assets

- ~ 3,000 employees
- ~ 2,800 associates and facilities users
- ~ 1,600 field staff in partner organizations
- ~ 400 NIST staff on ~1,000 national and international standards committees

NIST FY 2012 Congressional Appropriations
$750M



Plus
~ $100 M from other Government Agencies
~ $50 M for other reimbursable services

NIST has two main campuses.....



Gaithersburg, MD

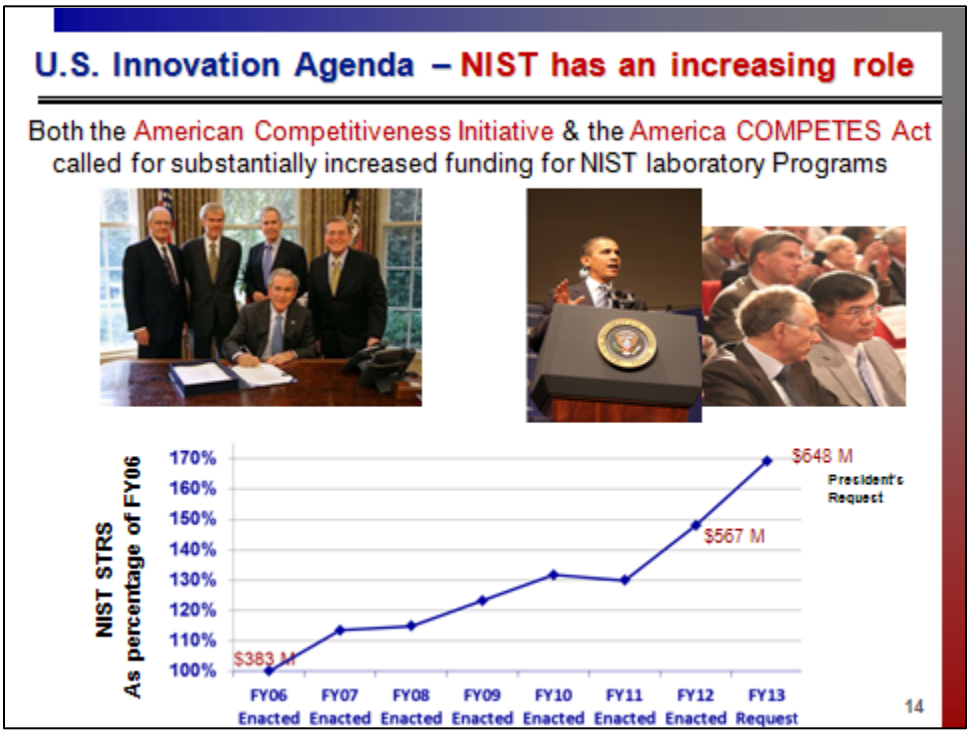


Boulder, CO

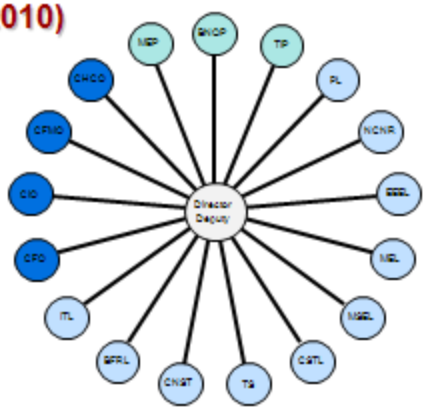
and four joint institutes

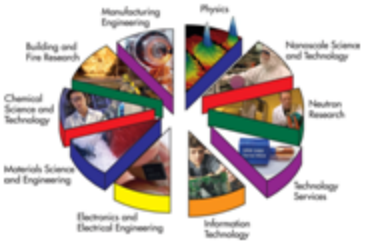
- JILA – *applied physics*
- JQI – *quantum science*
- IBBR – *biotech*
- HML – *marine science*


Since our inception, in addition to maintaining the more traditional National Physical Standards, we have also focused a significant portion of our research and measurement services activities on addressing contemporary societal needs.
2012
NIST Strategic Investment Priorities
• Advanced Manufacturing
• Advanced Materials
• the Environment and Consumer Safety
• Energy
• Bioscience and Health
• Information Technology & Cybersecurity
• Physical Infrastructure
• Forensics & Homeland Security
13


U.S. Innovation Agenda – NIST has an increasing role
Both the American Competitiveness Initiative & the America COMPETES Act called for substantially increased funding for NIST laboratory Programs
NIST STRS
As percentage of FY06
170%
160%
150%
140%
130%
120%
110%
100%
$383 M
$567 M
$648 M
President's Request
FY06 Enacted
FY07 Enacted
FY08 Enacted
FY09 Enacted
FY10 Enacted
FY11 Enacted
FY12 Enacted
FY13 Request
14

NIST (circa 1992 – 2010)





Congressional Appropriations provided as Line Items for various scientific disciplines

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New NIST Organizational Structure

Director
Under Secretary of Commerce for Standards and Technology
Patrick D. Gallagher

Executive Officer for Administration
Management and Organization
Administrative Support

Chief of Staff
Program Coordination
Public and Business Affairs
Congressional and Legislative Affairs
International and Academic Affairs

Associate Director for Laboratory Programs/Principal Deputy
Willie E. May
Standards Coordination Office
Special Programs Office

Associate Director for Innovation and Industry Services
Phillip A. Singerman
Technology Partnerships
Economic Analysis
Grants Management

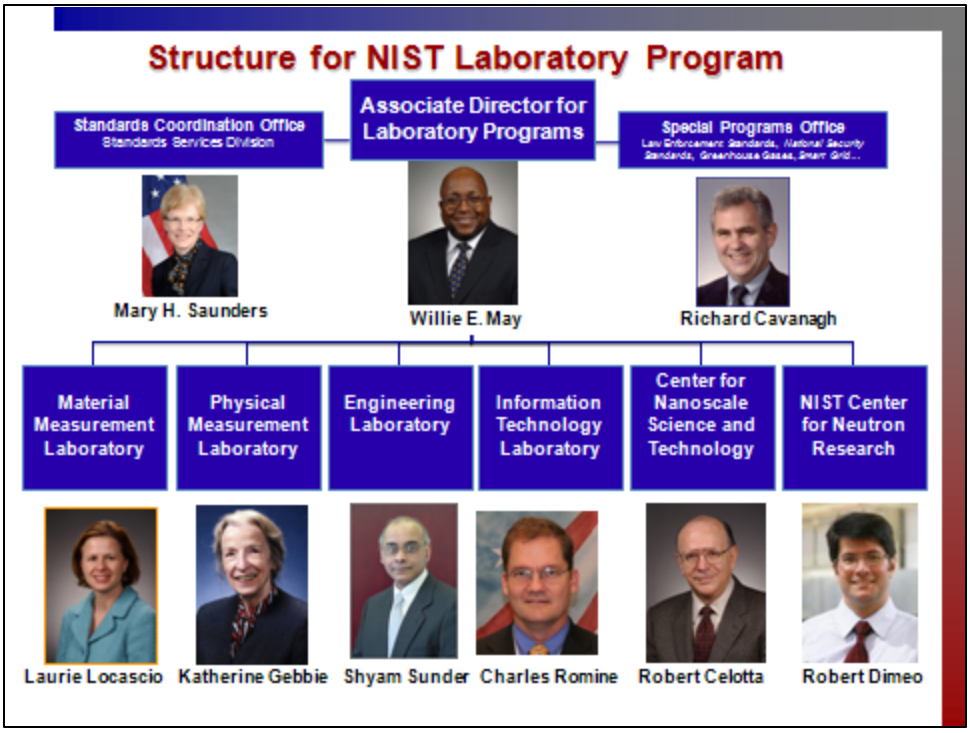
Associate Director for Management Resources
David Robinson
Boulder Site Management
Civil Rights and Diversity
Research Support Services
Strategic Resources

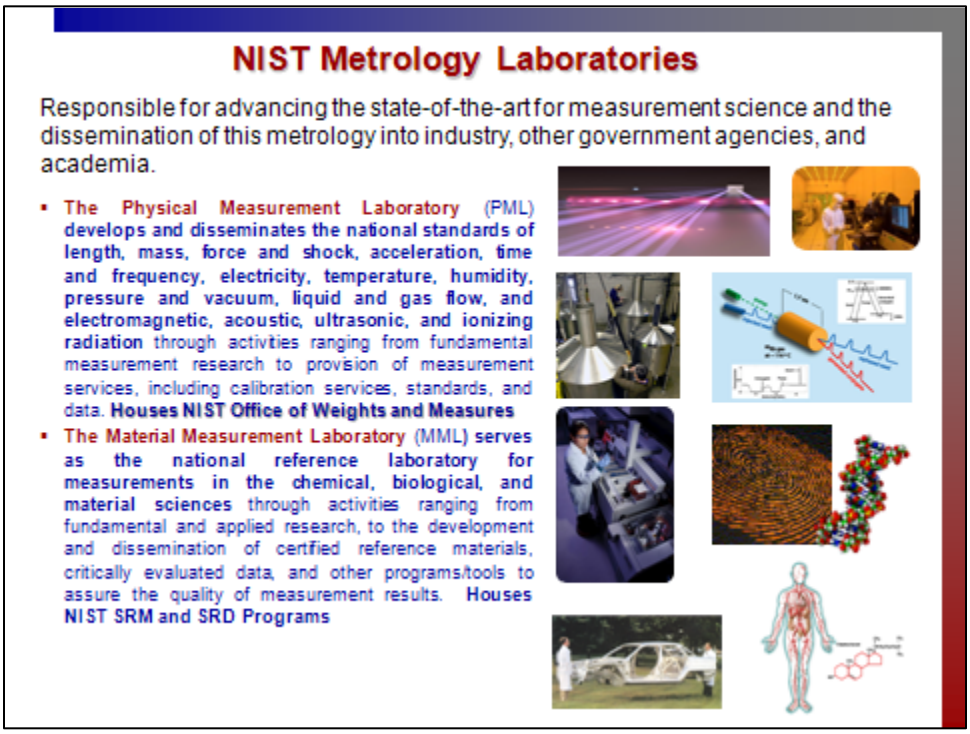
Material Measurement Laboratory
Laurie E. Locascio
Physical Measurement Laboratory
Katharine B. Gebbie
Engineering Laboratory
S. Shyam-Sunder
Information Technology Laboratory
Charles H. Romine
Center for Nanoscale Science and Technology
Robert Celotta
NIST Center for Neutron Research
Robert M. Dimeo

Baldrige Performance Excellence Program
Harry S. Hertz
Hollings Manufacturing Extension Partnership
Roger D. Kilmer
Technology Innovation Program
vacant

Office of Facilities and Property Management
Stella S. Flotes
Office of Financial Resource Management
George E. Jenkins
Office of Workforce Management
Susanne K. Porch
Office of Information Systems Management
Delwin Brockett
Office of Safety, Health and Environment
Richard F. Kayser

16

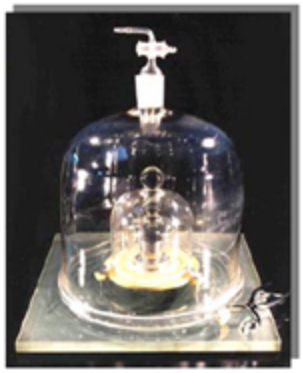

Structure for NIST Laboratory Program
Standards Coordination Office
Standards Services Division
Associate Director for Laboratory Programs
Special Programs Office
Mary H. Saunders
Willie E. May
Richard Cavanagh
Material Measurement Laboratory
Physical Measurement Laboratory
Engineering Laboratory
Information Technology Laboratory
Center for Nanoscale Science and Technology
NIST Center for Neutron Research
Laurie Locascio
Katherine Gebbie
Shyam Sunder
Charles Romine
Robert Celotta
Robert Dimeo


NIST Metrology Laboratories
Responsible for advancing the state-of-the-art for measurement science and the dissemination of this metrology into industry, other government agencies, and academia.
The Physical Measurement Laboratory (PML) develops and disseminates the national standards of length, mass, force and shock, acceleration, time and frequency, electricity, temperature, humidity, pressure and vacuum, liquid and gas flow, and electromagnetic, acoustic, ultrasonic, and ionizing radiation through activities ranging from fundamental measurement research to provision of measurement services, including calibration services, standards, and data. Houses NIST Office of Weights and Measures
The Material Measurement Laboratory (MML) serves as the national reference laboratory for measurements in the chemical, biological, and material sciences through activities ranging from fundamental and applied research, to the development and dissemination of certified reference materials, critically evaluated data, and other programs/tools to assure the quality of measurement results. Houses NIST SRM and SRD Programs

Definition of the kilogram

3rd CGPM, 1901 :

"The kilogram is the unit of mass;
it is equal to the mass of the international prototype of the kilogram."



New York Times
(27 May 2003)

Scientists Struggling to Make the Kilogram Right Again

...The kilogram is getting lighter, scientists say, sowing potential confusion over a range of scientific endeavor...

Electronic Kilogram

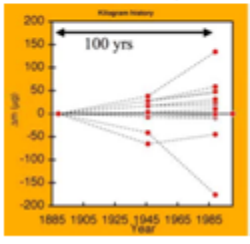
Leading the Way to Replace the World's Last Artifact Standard

Kilogram unit now …
- 120 year-old artifact

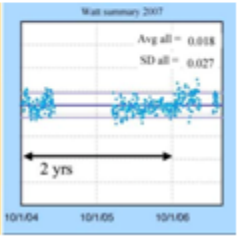
Alternative e-Kilogram
- Mass derived from atomic second, laser meter, Josephson volt, quantum Hall ohm
- **Equivalent to measuring Planck's constant**
- NIST value with 32 ppb uncertainty is best in the world (goal 20 ppb)
- Need confirmation from rest of world



Scatter in IPK copies



e-Kg scatter



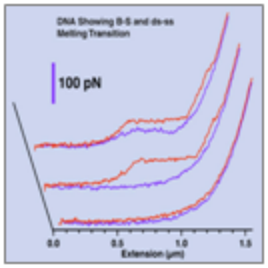
Same vertical scale!

Ultimate Goal
- redefined kg unit in terms of invariant quantum standards

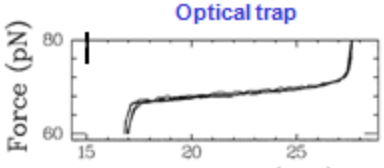
Why?
- Reduced uncertainties of many fundamental constants
- Reduced uncertainties of electrical quantities and the practical realizations become part of the SI
- Invariance in time and space
- The SI becomes more accessible at the highest level of accuracy

DNA as an Intrinsic Force Standard

AFM



Optical trap



65 pN



- DNA can be manufactured to atomic precision anywhere in the world.
- The force required to induce DNA transition is used as a biophysics "standard" – but firm metrological basis does not exist
- NIST is working to measure the DNA transition force with traceable metrology using approaches based on both optical and AFM techniques.



Electronic kilogram project

Mass is the only SI unit still defined by a physical artifact

- NIST and other national labs are working to redefine in terms of natural phenomena
- Watt balance—compares precise measure of voltage and resistance with force and velocity
- Int. Gen. Com Weights and Measures has recommended redefinition
- Could improve some electrical measurements 50 fold



NIST Technology Laboratories

Responsible for sector-specific programs in technology and technology infrastructure

- **The Engineering Laboratory** (EL) **promotes the development and dissemination of advanced manufacturing and construction technologies, guidelines and services to the U.S. manufacturing and construction industries** through activities, including measurement science research, development of performance metrics, tools and methodologies for engineering applications, and supporting standards and codes development.
- The EL has specific responsibilities in
  - fire prevention and control;
  - national earthquake hazards reduction;
  - national windstorm impact reduction;
  - national construction safety.
- **The Information Technology Laboratory** (ITL) **develops and disseminates standards, measurements, and testing for interoperability, security, usability, and reliability of information systems,** including cybersecurity standards and guidelines for Federal agencies and U.S. industry, supporting these and measurement science at NIST through fundamental and applied research in computer science, mathematics and statistics.



Healthcare reform is a major issue throughout the world

- The rising cost of healthcare and increased prevalence of chronic diseases is having a devastating affect of economic security and quality of life in all parts of the world.
- Major efforts are underway to reform healthcare and reduce spending through increased efficiency and quality, focusing on prevention of disease and creating a healthier population.

It is a stated goal of the Obama Administration to improve the quality of U.S. health care while lowering its cost by computerizing all Americans' medical records. … "this will cut waste, eliminate red tape, and reduce the need to repeat expensive medical tests …. it will save lives by reducing the deadly but preventable medical errors that pervade our health care system".

- **Need interoperable health IT network** that is **correct, complete, secure, usable, and testable**
- **Measurements that are comparable over space and time are key to achieving these goals.**

Healthcare: Lack of Standards has Economic and Quality-of-Life Implications

U.S. Spends ~ $2.5 trillion on Health Care Annually of which 10-15% is associated with measurements

- **~ 70% of health care decisions are based on results from clinical laboratory measurements**
  - *Yet, standards exist for only 10% of the 700 routinely performed clinical laboratory tests*
- **60 million CT tests performed annually to measure changes in lesions are limited by ability to discern only large changes in size/metabolism**
  - *This is a direct consequence to lack of standards to monitor equipment performance*
- **Costs of repeat measurements amounts to 1.5 B US$ per year in Germany according to the German Health Report of 1998 (www.gbe-bund.de)**

Measurement Bias also Affects Quality of Life and leads to

- **Incorrect diagnosis and treatment**
- **Impairment of patient well-being**

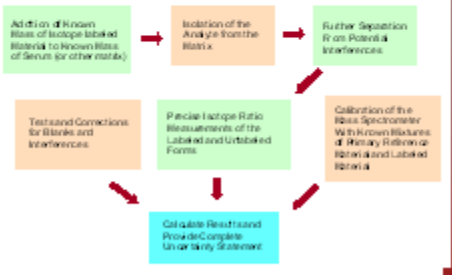
NIST has maintained Standards for 13+ Health Status Markers for 25+ years

Reference Systems are Currently in Place for Many Well-Defined Markers that are:

- **Relatively small well-defined molecular or elemental species**
- **Typically, can be determined using isotope-dilution GC or ICP ID/MS-based methodologies**

Marker	Disease State
Calcium	Cancer, Blood Clotting
Chloride	Kidney Function
Cholesterol	Heart Disease
Creatinine	Kidney Function
Glucose	Diabetes
Lithium	Antipsychotic Treatment
Magnesium	Heart Disease
Potassium	Electrolyte Balance
Sodium	Electrolyte Balance
Triglycerides	Heart Disease
Urea	Kidney Function
Uric Acid	Gout
Vitamins	Nutrition Status

Isotope Dilution/Mass Spectrometry-based Definitive Methods





Glucose

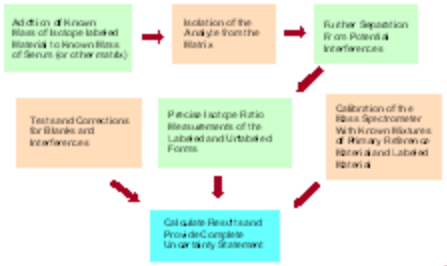
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Isotope Dilution/Mass Spectrometry-based Definitive Methods




Glucose

The New York Times

"Quest Acknowledges Errors in Vitamin D Tests"



"The nation's largest medical laboratory company provided possibly erroneous results to thousands of people who had their vitamin D levels tested in the last two years, the company has acknowledged." "When the Quest tests have been inaccurate, the reading has typically been too high, although not in all cases."

By ANDREW POLLACK, NY Times, JANUARY 7, 2009

NIST SRM 972 - Vitamin D in Human Serum



- Vitamin D deficiency has long been associated with osteoporosis and an increased risk of bone fractures; has recently been linked to increased risk of other common diseases.
- Clinical labs perform hundreds of thousands of tests for vitamin D each year, and recent studies have shown that different labs often provide different results for the same samples.
- MML scientists have developed SRM 972, "Vitamin D in Human Serum," to provide a foundation for increased accuracy for vitamin D measurements
- SRM 972, issued 9 Jun 2009, contains four serum samples with NIST assigned values for three vitamin D metabolites; 25(OH)D2, 25(OH)D3, and 3-epi-25(OH)D3

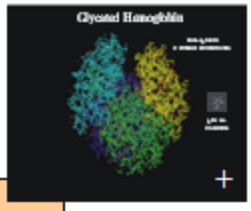
>1300 units sold over past 21 months

Major purchasers: Quest Diagnostics (666); Perkin Elmer (97); Kaiser Permanente (12); Vanderbilt University (11); CDC (9); Waters Instruments (9)

Laboratory Medicine: NIST Program Expansion Plans

Reference systems for markers that typically exhibit:

- High molecular mass (>20,000 daltons)
- Heterogeneity, low concentration, instability of analyte form
- Cannot all be determined using GC- ID/MS or ICP/MS-based methodologies
- Such as the following:



Protein Analysis

- Single Blood Protein Biomarkers
  - Troponin-I — *Myocardial Infarction*
  - C-Reactive Protein — *Risk of Heart Attack*
  - PSA — *Prostate Cancer*
  - Albumin — *Kidney Function*

Genetic Testing

- Single Gene Mutations
  - Genetics Directed Therapy
    - Her2-Nu — *Breast cancer*
    - CYP2C9 and VKORC1 — *Warfarin Dosage*
    - Kras — *Colon Cancer*
  - Diagnostics
    - DNA Triplet Repeat — *Fragile X*
    - CAG Repeats — *Huntington's Disease*
- Genome Sequencing to support Direct to Consumer Genetic Testing

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Cardiac Troponin I

- Cardiac Troponin I is a heart muscle protein that is observed in the bloodstream after myocardial damage
- *Measurement Challenges*:
  - Low levels of detection needed: 0.1 - 20 ng/mL
  - Heterogeneity of troponin forms (phosphorylation, complexation with other troponin subunits, degradation in serum)

- EKGs often do not show evidence of heart damage
- Damage to heart tissue is accompanied by a rise in blood levels of certain proteins
  - CK-MB — not specific to heart tissue
  - Troponin I — specific to heart tissue
- Immunoassay-based methods are used to measure blood troponin levels
- Results among various immunoassays vary by more than 20-fold on **same** blood sample

Assay Manufacturer	Conc. ng/mL	# Labs
A	19.9	115
B	6.7	489
C	0.85	27

From G. S. Bodor, Denver Health and Hospitals -- personal communication 1997

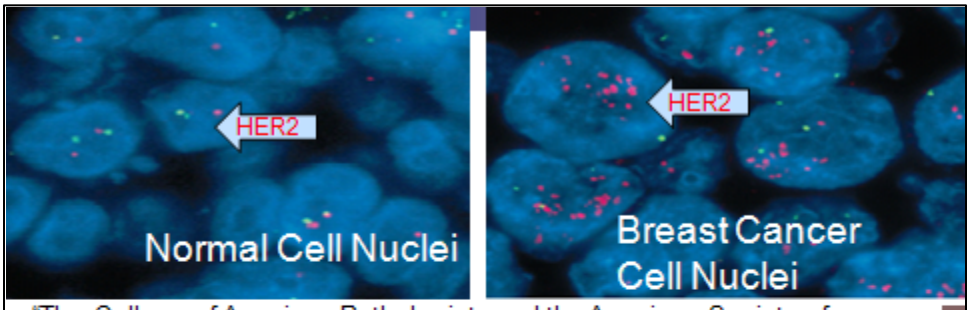
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Prostate Specific Antigen (PSA)

- >37,000 deaths annually in U.S. from prostate cancer
- Blood tests for PSA are used to screen for the likelihood of prostate cancer
- PSA is a heterogeneous protein that occurs both free and complexed
- Immunoassays are the approach favored for routine measurement of PSA
- Wide variability among the results from immunoassays (see below)
- High incidence of false positives and false negatives

# of Labs	- Low -	- Med.-	-High-	-Mean-	- S.D. -	%RSD	95% Confidence Range
2672	10.8	19.4	34.5	19.67	2.14	10.9	15.39-23.95
2653	7.2	9.8	18	9.92	1.11	11.2	7.70-12.14
2689	5.3	7.3	12.8	7.36	0.79	10.7	5.78-8.94
2509	2.1	3	4.7	3.03	0.33	10.8	2.37-3.69
2504	0.6	0.7	1.5	0.73	0.11	14.5	0.51-0.95
2591	0.1	0.2	0.8	0.24	0.1	40.2	0.04-0.44

From: http://www.cooleyville.com/cancer/capsava.htm



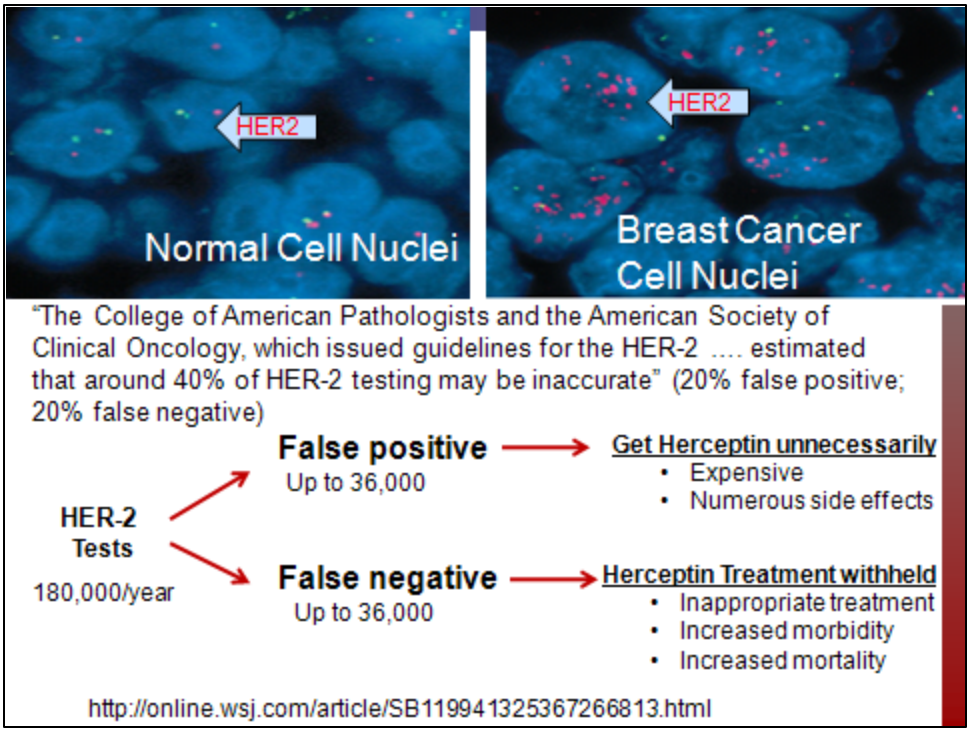
"The College of American Pathologists and the American Society of Clinical Oncology, which issued guidelines for the HER-2 .... estimated that around 40% of HER-2 testing may be inaccurate" (20% false positive; 20% false negative)

HER-2 Tests
180,000/year

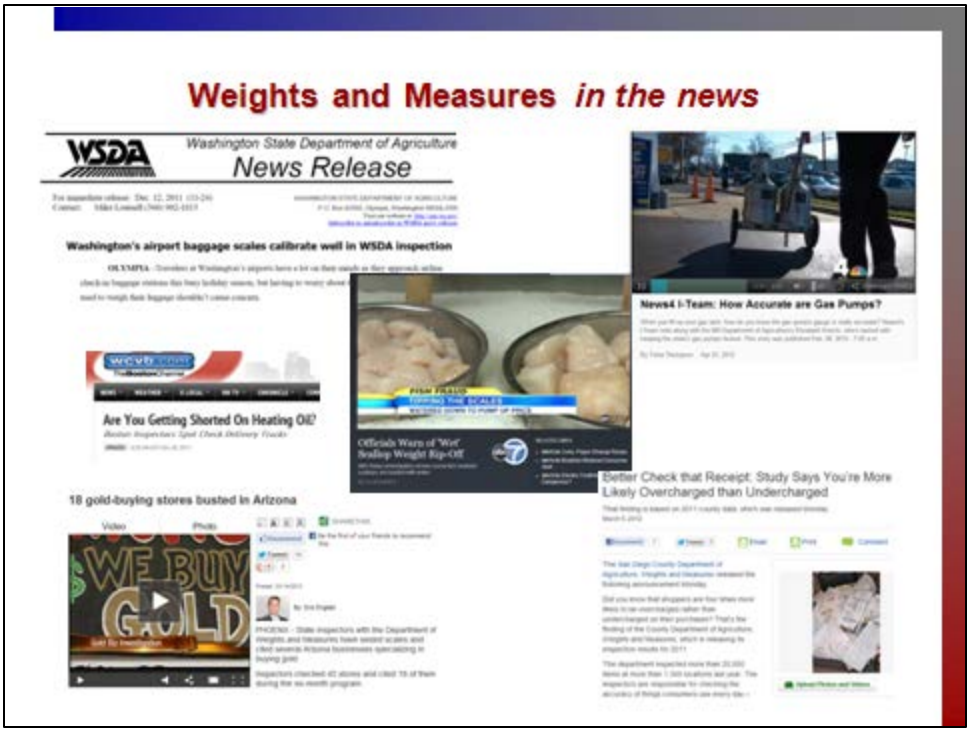
False positive → Get Herceptin unnecessarily
Up to 36,000
- Expensive
- Numerous side effects

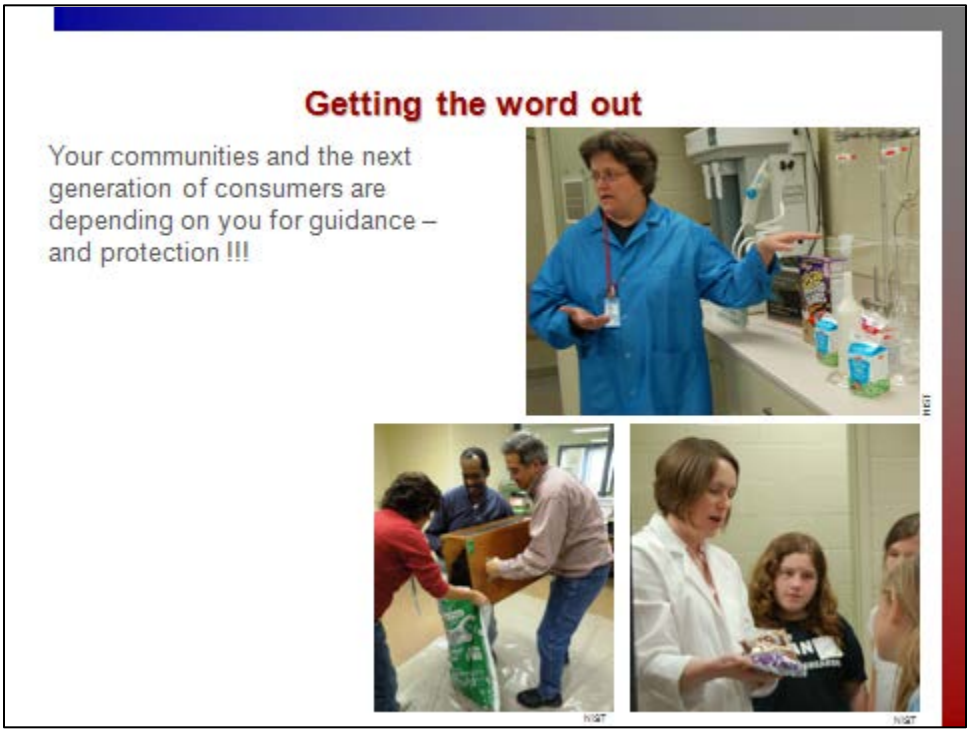
False negative → Herceptin Treatment withheld
Up to 36,000
- Inappropriate treatment
- Increased morbidity
- Increased mortality

http://online.wsj.com/article/SB119941325367266813.html


HER2
Normal Cell Nuclei
HER2
Breast Cancer Cell Nuclei
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Lack of recognition is a good thing!
The weights and measures system in the U.S. works so well that its accuracy is taken for granted.
GAS
It's not always pleasant, but it's fair -- Thanks to your efforts.


Weights and Measures in the news
Washington State Department of Agriculture
News Release
Washington's airport baggage scales calibrate well in WSDA inspection
News4 I-Team: How Accurate are Gas Pumps?
Are You Getting Shorted On Heating Oil?
Officials Warn of 'Wet' Scallop Weight Rip-Off
Better Check that Receipt: Study Says You're More Likely Overcharged than Undercharged
18 gold-buying stores busted in Arizona
Video
Photo
WE BUY GOLD


Getting the word out
Your communities and the next generation of consumers are depending on you for guidance – and protection !!!

… and We're Here to Help !!!

NIST is ramping up its training efforts

- $.5M toward new training programs
- 20 new regional instructors to train 3,000 inspectors nationwide
- New hands-on and online courses, webinars for those who need training on a tight budget



A challenge to you

The foundation of all knowledge is accurate data.

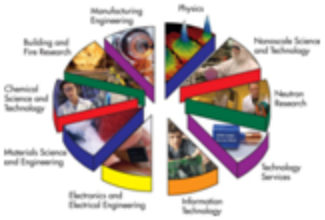
- NIST and NCWM need your help to collect performance and impact data.
- We need you to be our boots on the ground.
- Let's work together to define a methodology for data collection.
- With the right data, we can do the analysis needed to truly PROVE the WORTH of your efforts to our communities and economy.



NIST: A Premier Scientific Institution

World-leading measurement science and standards program

- 3 Nobel Laureates since 1997
- MacArthur Fellowship winner in 2003
- National Medal of Science winners in 1998, 2008
- 60 National Academy Members (8 current)
- ~120 National Society Fellows and recipients of ~ 60 National/International Awards per year



A.V. Astin, Director of NBS (1951 – 1969)

The National Bureau of Standards, Physics Today, June, 1953

"The **Bureau staff believes** first of all in **the importance of scientific research** as a means of intellectual and spiritual advancement, as the foundation of our technological economy and high standard of living, and as the bulwark of our national security." "...a substantial portion of the program.. should be devoted to fundamental or nonprogrammatic research. ... **on ideas of their own choosing**.."

"...the **development and maintenance of the standards** ...**provides the first and primary reason for the Bureau's existence**. ...This standards work must ... keep abreast of the expansion of the frontiers of science...."



Thanks for Your Attention

Willie E. May
Associate Director for Laboratory Programs & Principal Deputy
National Institute of Standards and Technology
100 Bureau Drive
Gaithersburg, Maryland 20899-1000

(301) 975-2300
wem@nist.gov



Questions and Comments?



Chairman's Address

National Conference on Weights and Measures

Portland, Maine

July 17, 2012

Kurt E. Floren

Commissioner, Los Angeles County Department of Agriculture

Los Angeles, California

Good morning. First, let me welcome you to the 97th Annual Meeting of the National Conference on Weights and Measures (NCWM). I thank you for the honor of serving as Chairman of NCWM over this past year.

Secondly, let me confess at the outset that I have failed to accomplish anything close to what I had hoped and intended to do in the course of my chairmanship. This year, I had the sincere pleasure of traveling around the country, attending regional meetings and observing the great work of so many dedicated Weights and Measures officials, Associate Members, and interested parties from around the states. At each, I found myself doing something of an apology tour, expressing frustration and regret at the lack of progress in producing final work products in keeping with my theme for the year, "Taking Measure of Our Worth."

As I know I am not alone, this has been an indescribably challenging year, scrambling to retain support and funding for the very important work that we all do in a horrific economic environment. As I commented in my last newsletter article, I am so very proud of what we do. I highlighted the mottos that appear on the NCWM Website: "Creating Confidence – Ensuring Equity"; "Giving A Voice To All"; "The Standard for Fairness in the Marketplace."

I have always been astounded at the array of topics and issues dealt with in the work of the Conference. The agendas with which we are dealing this week are no exception, from railway track scale and retail motor fuel dispenser issues to polyethylene products, hydrogen fuel, and, of all things, animal bedding. It really is astounding – and sobering. What weights and measures regulatory and standards issues touch upon also touch virtually every consumer in this country and beyond every single day. That makes what we strive to do of tremendous worth and importance, not just in our governmental, manufacturing, and marketing worlds, but to every citizen in every community.

NCWM has accomplished a great deal over recent years. There is a temptation, as Chairman, to focus on and highlight what has been occurring in the last 12 months. But, it is important to consider things from a long-term perspective, in reverse and in moving forward. Looking back, to the credit of so many of you and of the great leadership provided by our past Chairs and Board members, NCWM has undertaken many major operational reorganizations and service delivery improvements, making it a much stronger and more effective organization:

- Just four years ago, NCWM assumed full management of its operations, including membership, arrangement and conduct of our meetings, hiring of an outstanding Executive Director, and establishment of a permanent home office, achieving fiscal soundness, stability, and organizational effectiveness not before enjoyed.
- Enactment of the Verified Conformity Assessment Program (VCAP) has accomplished great steps toward ensuring that load cell and, soon, other device manufacturing processes of those holding certificates of conformance result in uniformity and consistency in production, lending assurance and verification to quality and production-meets-type requirements.
- We have implemented the On-Line Position Forum, providing a great means to expand and enhance opportunities for members to actively participate in the development of standards, whether or not able to physically attend our meetings. The Forum is receiving increased attention and utilization, and enhancements continue to be identified to make it more user-friendly and functional.

- The National Certification Program has been launched, with the work of the Professional Development Committee, our contractor and old friend Ross Andersen, and the many subject matter experts from among our members and their staffs teaming to continue development of exams to cover the broad spectrum of weights and measures disciplines. These certifications will serve to demonstrate and document the knowledge and competence of inspectors and ensure uniformity of skills and abilities in our system.
- Strategic Planning has been fully incorporated, not in the form of a dusty document turning yellow on a shelf, but a living document that is continually assessed, updated, and employed, with clear goals and strategies to enhance NCWM as a national and international resource, to provide ongoing and improved training opportunities for members, to improve the National Type Evaluation Program, and to secure the financial stability of the Conference.

The list goes on. And so does the work in continuing to build upon these achievements and derive ever-increasing returns from them. These represent the visions of many among us and, particularly, the endeavors of preceding NCWM Chairs and Boards of Directors who deserve great admiration for that forward vision. All of this and more has been done while fulfilling our core work in developing the standards and procedures that fill our handbooks and provide the assurance of equity in the marketplace, to which NCWM is dedicated.

All that I have mentioned are works in progress. None are complete, but, rather, are incredibly valuable undertakings that will and must continue to develop to produce their full potential in benefits for us all. This brings me back to my confession of not having fulfilled all that was my vision under our year's theme, "Taking Measure of Our Worth."

Back home in California, to say that things have been "challenging" would be a gross understatement. We, like so many states, have been dealing with continually declining resources and endless streams of threats to our programs. Our State Department of Food and Agriculture, within which resides our State Weights and Measures agency, Division of Measurement Standards, lost over $33 million in general fund support – 35 % of its budget – over the last year and a half. Program reductions have been widespread, not the least of which was utter decimation of all general fund support to Division of Measurement Standards, excepting only minimal funding of its metrology laboratory, upon which local jurisdictions rely for standards calibrations. In May, even that was significantly reduced due to continuing State revenue shortfalls.

To add to this, multiple legislative bills seeking to exempt certain industry sectors from all weights and measures regulatory oversight had to be addressed, as did the impending sunset of a statute authorizing County Sealers to charge device registration fees, the core support mechanism for local device inspection programs. As Agricultural Commissioner/Sealer of our state's largest jurisdiction and Vice-President of our statewide organization of Commissioners/Sealers, the call to action for self-preservation did severely frustrate advancements in formulating National Weights and Measures support strategies that I had envisioned in my role as your Chairman.

However, crisis often stimulates ingenuity, and I want to share some positive outcomes of these intense struggles. In addressing these fiscal challenges, representatives of industries affected by many threatened programs were brought together, teaming with regulators to examine program activities and identify least destructive approaches to reductions. Mutual objectives and concerns were considered and discussions of program values were undertaken in developing strategies to deal with funding issues. In every case, reliable, detailed data proved critical in reaching agreement in ranking program priorities and making sound decisions.

In the case of our device registration fee legislation, we benefited from a decades-long practice of our State Division of Measurement Standards in collecting and compiling statewide device inspection testing, compliance, and expenditure data. Each County Sealer reports monthly inspection results for 29 specific categories of devices, recording pass/fail rates and hours expended for each. Year-end financial reports collected from all jurisdictions enable extrapolation of actual program costs. In negotiating with industry groups and legislators over recent months, this detailed information provided convincing evidence of the need for these regulatory activities and the actual costs of delivering the valuable consumer and competitor protection services. In negotiating with one industry sector originally seeking an outright exemption from all inspections and from registration fee requirements, the data we were able to produce served to demonstrate the value of regulatory inspections to them in securing fair competition and, in the end, solicited not only agreement on a fee structure, but a "support" position from them on the bill. As a final result, our device registration bill, even in these times of extreme economic pressure, is moving forward with revenue increases exceeding $2 million toward enhancements of local Weights and Measures activities.

As to the State Weights and Measures funding dilemma, this same data served to convince legislators of the importance of State oversight, coordination, and training in support of local jurisdictions and facilitated development of State administrative fees that County Sealers, under newly-established statutory and regulation authorities, are now collecting through our device registration billings and remitting to the State Division of Measurement Standards to sustain its device program work.

Finally, other innovative ideas have been implemented, including securing monies in the form of *cy pres* awards in settlements of civil prosecutions brought jointly by the County and State Weights and Measures agencies against chronic violators. Those funds have been utilized to sustain package inspection and price verification programs at the State level, effectively causing non-compliant entities to carry the costs.

What this exhausting year in my state has produced is a dress rehearsal for what, I believe, must be pursued on a national basis. True teamwork among jurisdictions – State and County – and engagement of industry members, sharing and cooperating in data gathering and presenting a unified picture of the worth of Weights and Measures programs, is proving invaluable in producing innovative funding mechanisms very different from those of the past. We cannot keep doing things as we have always done them.

So, my year as Chairman draws to a close. Has progress been disappointing in taking the measure of our worth nationally? Yes. Is there a declaration of defeat? No. Efforts must continue. I remain committed to continuing the effort and hope we can team together to accomplish far more than any of us can do individually. Like so many major NCWM endeavors, work is ongoing. Full results are not yet realized. But, there is great promise in what can be achieved. I thank you for the honor you have given me this year, and hope that, through teamwork, we can accomplish for years to come much more than what could be done in a single challenging year.

Again, I thank you, sincerely.

Chairman Elect's Address

National Conference on Weights and Measures

Portland, Maine

July 17, 2012

Stephen Benjamin

North Carolina Department of Agriculture and Consumer Services

Thank you Kurt, good morning everyone and thank you for being here. It is a privilege and honor to have been selected to serve as your Chairman for the coming year. I will be brief as I am about all that stands between you and your trip home.

First of all, I would like to thank all of those that have served on our committees, subcommittees, sectors and task groups this past year, both at the Conference and regional levels. It is your time and dedication to the issues that come before us that make the National Conference on Weights and Measures (NCWM) successful. I would also like to thank my staff for the effort they must put in while I'm fulfilling my duties, first as Chairman-elect and now as Chairman of NCWM. Finally, I would like to thank my family for being supportive of this opportunity.

Speaking of family, we recently went on a family vacation to the Shenandoah Valley area of Virginia, about a five-hour drive from our home. As usual, after about 30 minutes on the road, my six-year old daughter asked the question, "Are we there yet daddy?" Being a patient and loving father, I took a deep breath and went with my second response, "Not yet sweetheart."

This scene was repeated a number of times during the drive, but I also had time to think, well aware that I had to deliver this speech just a few weeks later. Certainly at lot has gone on over the years in the NCWM, but I asked myself, "Are we there yet?" In considering this, I don't know if there is a final destination for our organization, but there have definitely been milestones on the journey forward. Some of these milestones have been significant to this organization, such as the transition of NTEP management from NIST, OWM to the Conference, and more recently the transition from Management Solutions to our own Executive Director and staff. Many other milestones are in the form of proposals that come before us, some of them involving a great deal of time and sometimes spirited discussion.

You've all heard the cliché, "it's not about the destination, but the journey." As an organization we have a goal, "That equity may prevail," that is the journey we are on. We proceed along this path as new technologies are developed for devices, new fuels are introduced, and new products are marketed and even old products in new packaging. In short, the world of weights and measures is constantly changing, and we must move forward to address these needs through our proposal process.

We have worked these past few years on moving the NCWM forward as an organization as well. How can we do better in promoting what we do and improve at how we do it? At the risk of sounding like a broken record, I think the biggest step recently was the management change we made in 2007. This action provided us a dedicated staff focused on the business of the Conference. It also allowed for funds to pursue projects such as website improvements, online applications and registrations, web posting of training material, and the online position forum. We continued on this path forward as we implemented the Verified Conformity Assessment Program (VCAP), the Professional Certification Program, and the formation of the Packaging and Labeling Subcommittee, which held their first face-to-face meeting this past Sunday.

With this in mind, my theme this coming year is "On the Path to Tomorrow." I encourage the continued development of projects such as the "tool kit" for weights and measures programs that will put facts, contacts, and materials to support their programs at their fingertips. The Professional Certification Program and VCAP continue to grow and reach more people. The Board of Directors continues to look at ways to increase services to the members in order to make membership meaningful. The key to moving forward is simply your involvement. Many of you may equate involvement with serving on an NCWM standing committee, but I say even participating at a

regional level or on a task group or even replying to a question on a list server is a step on the path. We are working together and sharing our knowledge to move forward.

To this end I make the following appointments for the coming year:

- Laws and Regulations Committee:

  Louis Sakin, Towns of Hopkinton/Northbridge, Massachusetts, five year term

- Specifications and Tolerances Committee:

  Edward Seidler, Town of Framingham, Massachusetts, five year term

- Professional Development Committee:

  Stacy Carlsen, Marin County , California five year term

- Nominating Committee:

  Committee Chair, Kurt Floren, Los Angeles County, California

  Judy Cardin, Wisconsin

  Thomas Geiler, Barnstable Regulatory Services, Massachusetts

  Joe Gomez, New Mexico

  Maxwell Gray, Florida

  Randy Jennings, Tennessee

  Tim Tyson, Kansas

- Credentials Committee:

  To be announced later.

- Presiding Officers:

  Jack Walsh, Town of Wellesley, Massachusetts

  John Albert, Missouri

  SWMA, to be decided.

  WWMA, to be decided.

- Parliamentarian:

  Lou Straub, Fairbanks Scales, Inc.

- Chaplain:

  Stephen Langford, Cardinal Scale Manufacturing Co.

- Sergeants-at-Arms:

  I will be working with our members from Kentucky to designate Sergeants-at-Arms for our 2013 Annual Meeting.

I look forward to seeing you all in Charleston, South Carolina, for the Interim Meeting in January and have a safe trip home.

Thank you.



Pictured: Kurt Floren, NCWM Chairman; Tom Geiler, Award Recipient; and Willie E. May. NIST.

Special Recognitions

NCWM Lifetime Achievement Award Recipient

Tom Geiler

Only one NCWM Lifetime Achievement Award may be given each year. The 2012 recipient is Tom Geiler, Director of the Regulatory Services Department of Barnstable, Massachusetts.

Tom began his career as a meat cutter. He must have excelled, because he went on as a meat department manager for 15 years. During this same time, he was also a reserve police officer for his community; a position he would hold for 35 years. In 1974, he took the experience he gained in law enforcement and retail, and applied it to a new line of work as weights and measures sealer. Thirty-eight years later, he still holds that position as well as a few other duties.

In those 38 years, Tom has attended 35 consecutive NCWM Annual Meetings. He has served the Education, Administration, and Consumer Affairs Committee, the Subcommittee on Members Expenses, the Task Force on Planning for the 21st Century, the Laws and Regulations Committee, the Privatization Work Group, the Budget Review Committee, the United States/Canada Mutual Recognition Work Group, the Strategic Planning Subcommittee, the Legislative Liaison Committee, the Finance Committee, and many years on the Nominating Committee. He served twice as a NCWM Vice Chairman, two terms on the Executive Committee, and a term on the NTEP Board of Governors. He was the NCWM Chairman in 1994 and Chairman of the NTEP Board of Governors in 1995. In 2001, he returned to the Board of Directors where he served as Treasurer through 2006. Most recently, he has served as Credentials Committee Coordinator. He worked very hard to establish a National Train the Trainer Program when he served on the Education, Administration, and Consumer Affairs Committee and worked closely with the Office of Weights and Measures to obtain the funding necessary to accomplish this. His tenure on the Privatization Work Group opened the eyes of legislators to the pitfalls of privatizing Weights and Measures.

This man has been a leader at all levels of weights and measures enforcement, never seeking personal reward but always demonstrating concern for consensus and integrity in his arguments to advance the philosophy of Equity in the Marketplace. His service records to his state and regional associations are equally impressive. In addition to those associations, he is also affiliated with the International Society of Weighing and Measuring, International Society of Antique Scale Collectors, New England Parking Officials, Massachusetts Parking Officials Association, Massachusetts Licensing Officials Association, and if that isn't enough, he has probably attended more Western Weights and Measures Association meetings than anyone who lives in the western region. NCWM proudly recognizes Tom Geiler with the 2012, NCWM Lifetime Achievement Award.

Distinguished Service Award Recipient

Charles Carroll



Pictured: Kurt Floren, NCWM Chairman, congratulates Charles Carroll for his distinguished service.

Charlie is a native of Chelsea, Massachusetts, and currently resides in Wakefield. He is a graduate of Boston College High and attended the University of Massachusetts Boston and Harvard School of Government. In his long history of weights and measures service, he was Deputy Sealer of Weights and Measures in Chelsea from 1959 to 1971. He was Inspector of Standards for the Massachusetts Division of Standards from 1971 to 1973. He was then appointed to Supervisor until 1983 when he was appointed Assistant Director. In 2008, he was again promoted with an appointment to his current position as Director of the Division of Measurement Standards. He is in his 53rd year of service in weights and measures. During this time, he has maintained membership and active participation in the Eastern and Western Massachusetts Weights and Measures Associations, the state Weights and Measures Association, the Northeastern Weights and Measures Association, and the National Conference on Weights and Measures. He rounds out his interests as an avid fan of Boston professional sports, and he enjoys bowling and golf.

Charlie attended his first NCWM Annual Meeting in 1982, and this year marks his 31st consecutive year of attendance. During those years, Charlie has served twice as NCWM Vice-Chairman. He served four years on the Resolutions Committee, chairing that committee two of those years. He served five years on the Specifications and Tolerances Committee, chairing that committee for two years. In 1992, Charlie participated in a Canada/United States meeting to explore opportunities in legal metrology to reduce trade barriers between our countries. From 1996 to 1998, Charlie served on the NCWM Executive Committee and the NTEP Board of Governors. After NCWM incorporation, Charlie served on the Board of Directors and NTEP Committee from 1999 to 2000 and again from 2005 to 2009. He served on the Nominating Committee in 2011 and 2012. Charlie also served on the state committee that developed the certification criteria and text questions for state certification.

What isn't recognized in his list of services is Charlie's consummate quiet gentleman's approach to every situation: filled with the wisdom of his years of experience and his friendly smile. He has calmly served as a leader to NCWM through difficult and exciting times of transition and growth. All of the qualities recognized here have also been recognized by his colleagues at the regional and state levels where he was the recipient of the Northeastern association's 1985 Man of the Year Award and the Massachusetts Weights and Measures Lifetime Achievement Award in 2005.

Distinguished Service Award Recipient

Tina Butcher



Pictured: Kurt Floren, NCWM Chairman and NIST, Office of Weights and Measures' Tina Butcher.

Tina Butcher, Group Leader for the Legal Metrology Devices at the National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM) began her public service in the Pest Management Program at the Maryland Department of Agriculture. The pest management experience must have prepared her well for her illustrious career in weights and measures. In 1983, she was transferred to Maryland's Weights and Measures Program where she spent five years as a field inspector.

In 1987, she moved to NIST, OWM. With that move, Tina quickly became involved in many NCWM activities. Among her list of contributions, she was technical advisor to the Task Force on Energy Allocation in 1988 and 1989; the Multiple Dimensions Measuring Devices Work Group in the early 1990s; the Task Force on Safety from 1989 to 1991; the Executive Committee in 1991; the Liaison Committee in 1993 and 1994; the Handbook 44 Reorganization Work Group from 1999 to 2001; and the Automatic Temperature Compensation Steering Committee in 2008 and 2009. Her technical advisor service to NCWM standing committees include the Specifications and Tolerances Committee from 1993 to 1998 and again from 2008 forward, and the Professional Development Committee in 2007 and 2008. Tina is well-known for her contributions over many years to the National Type Evaluation Program. She has been technical advisor to many NTEP groups including the Measuring Sector from 1988 to 1995 and from 2008 to 2011; the Weighing Sector from 1992 to 1997, the Grain Moisture Meter Sector from 1992 to 1995, the Belt-Conveyor Scale Sector in 1997, the NTEP Committee from 1999 to 2001; the Laws and Regulations Committee regarding the model NTEP regulation from 1999 to 2002; the United States/Canada Mutual Recognition Work Group from 1994 to 2000; and the NTEP Long-Term Business Plan Work Group from 1998 to 2000. Tina was the NTEP Manager from 1994 to 2000 prior to transfer of its administration to NCWM. In addition to all of these contributions to NCWM, Tina has made significant contributions at NIST with developmental assignments in the Malcolm Baldridge National Quality Award Program and in the NIST Director's Office in 2002 and 2003. She was the recipient of the U.S. Department of Commerce Bronze Medal in 2003.

Through all of this continuing service, Tina has made significant and lasting contributions to codes throughout Handbook 44 and was integral in the creation of code sections such as the Mass Flow Meter Code. She is widely regarded for her superior technical writing skills and her calm manner that leads to input from others toward sound decision making. She has also earned the respect of NCWM members for her ability to inject important technical and historic information while avoiding personal dictation in the decisions. Tina's long-term service to NCWM and the weights and measures community is truly remarkable. Tina's personal time is devoted to her family and other activities including the Altar Guild and teaching children's classes at her church. She is Co-Director of her church's Junior Daughters of the King Chapter and enjoys volunteering in her daughter, Holly's, various sports and school activities.

Distinguished Service Award Recipient

Ronald Hayes

Ron Hayes, Missouri Weights and Measures Director, received his education in computer science and mathematics from Missouri University of Science and Technology. In 1976, Ron went to work for the Missouri Department of Agriculture. In his early years, he was a grain moisture meter inspector and assisted the department in developing that new program. He taught laboratory techniques in his role as a laboratory assistant, and he performed petroleum tests as an assistant metrologist. In 1982, Ron was promoted to Fuel Quality Program Administrator and Laboratory Manager. In 2008, he was again promoted to his current position as Director of the Division of Weights, Measures and Consumer Protection.



Pictured: Kurt Floren, NCWM Chairman, presents award to Ron Hayes.

Ron attended his first NCWM Annual Meeting in 1984, and this is his 23rd year of attendance. Ron's experience managing the Petroleum Laboratory formed the foundation of much of his service to NCWM in his early years. He has been a member of the Southern Weights and Measures Association and the Central Weights and Measures Association after it was formed in 1985. He has been a member of the NCWM Fuels and Lubricants Subcommittee since 1992. He has chaired that subcommittee since 2006. Ron chaired the Motor Fuel Regulation Working Group from 1993 to 1995. He has also served as a member of the Premium Diesel Work Group and the Automotive Lubricants Work Group. Ron served as a Presiding Officer of our Annual Meetings in 2003, 2004, and 2005. In addition to his current responsibilities as chair of the Fuels and Lubricants Subcommittee, Ron is an officer on the NCWM Board of Directors.

Much of Ron's work over these many years has been in concert with standards development within ASTM International as a member of the ASTM D02 Committee on Petroleum Products and serving on many subcommittees under it. NCWM and ASTM have much in common and Ron has greatly assisted both organizations to maximize each other's resources toward common goals. An employee of his once described Ron as "wicked smart." We can all agree with the spirit of that compliment, and we are grateful that he has applied his talents to our benefit.

Distinguished Service Award Recipient

Chris Guay

Chris Guay is a Regulatory Fellow at Procter and Gamble Company. He resides in Mason, Ohio, and has many hobbies including hiking, backpacking, photography, painting, and electric trains. He graduated Magna Cum Laude with a Chemical Engineering Bachelor of Science degree from the University of Illinois in 1982 and received his MBA in Management from the University of Cincinnati in 1990. Chris has been a regular attendee and supporter of the Ohio, Central, Northeastern, Southern, and Western Weights and Measures Associations as well as many other trade associations affiliated with Procter and Gamble product lines.

Chris attended his first NCWM Annual Meeting in 1990, and this year is his 21st year of attendance. His official service began in 1993 on the Associate Membership Committee. He served that committee from 1993 to 1995, 1997 to 2001, 2004 to 2005, and 2007 to present with his current term to expire in 2015. During those years, he was Vice-Chairman of the Associate Membership Committee in 1993, 2007, 2011, and 2012, and chaired the committee in 1994 and 2008. Chris chaired a special task group under the Associate Membership Committee from 1993 to 1995 that developed recommendations to increase the involvement of industry membership in the NCWM structure, including appointments to standing committees. Sometimes you get what you ask for, and Chris was appointed to the Administrative and Public Affairs Committee from 1996 to 1998. This was followed immediately with a five-year term on the Laws and Regulations Committee from 1999 to 2003. In 1998, Chris participated in an important planning meeting as NCWM was transitioning into a nonprofit corporation that needed administrative support. He served on the Nominating Committee in 2001 and 2002. He served a five-year term on the Board of Directors from 2004 to 2008. Today, in addition to his service to the Associate Membership Committee, Chris is Chairman of the new Packaging and Labeling Subcommittee. This subcommittee was his brainchild to assist the Laws and Regulations Committee and NCWM to effectively address critical issues in the consumer packaging industry.

We have come to cherish Chris' ability to speak softly, intelligently, and directly; never one to sugar coat a situation. In Chris' home state of Ohio, he recognized the value that county officials could bring to the regional and national scene, and he worked directly with them to show them the way at a time when NCWM had a need for the additional expertise and leadership. Chris was mentored in his early years by one of our most cherished industry members, Bill Braun, who pushed us all to be organization oriented, not issue oriented. Chris is just that person as represented by his words, his service, and his actions. For this reason, he was awarded the Bill Braun Award by the Central Weights and Measures Association in 2008.



Pictured: Kurt Floren congratulates Chris Guay, recipient of the Distinguished Service Award.

2012 Contributions Award Recipient

Tim Tyson



Pictured: Tim Tyson receives the 2012 Contributions Award from Kurt Floren.

The Contributions Award was presented to Tim Tyson, Director of the Kansas Department of Agriculture, Weights and Measures Division.

Tim obtained his Bachelor of Science degree in Animal Science from Kansas State University. He also holds a Bachelor of Science degree in Computer Science from Friends University in Wichita. Prior to his employment with the Kansas Department of Agriculture, Tim spent 14 years at the management level in food manufacturing facilities and three years in software development in the insurance industry. In 2006, Tim was named Director of Weights and Measures for the State of Kansas. He is also Director of the Department's Feed and Seed Division and Grain Warehouse Licensing. In addition to their day jobs, Tim and his wife, Karyn, operate a ranch, and he enjoys hunting.

In a very short time, Tim was recognized for his leadership abilities in the weights and measures community. He was Chairman of the Central Weights and Measures Association in 2008. He joined the NCWM Board of Directors in 2008 as an at-large director. He was elected as Chairman-Elect for 2010 and NCWM Chairman of the Board in 2011. This year, Tim chaired the Nominating Committee, and he is completing his service to the Board of Directors this week as the NTEP Committee Chair.

Tim is thought of as the "quiet man from Kansas." He is a man of few words, but when he speaks it is direct, on point, and spoken with authority and confidence. He is highly regarded for his ability to listen, analyze, and provide leadership with wisdom. His regional association, the Central Weights and Measures Association (CWMA) has noted his significant efforts and leadership in the areas of commodity labeling and moisture allowance standards. In the past year, he has been innovative in his approach to demonstrate the impact and importance of weights and measures regulatory oversight for the citizens in Kansas.

Attendance Recognition

5th Year Attendees

John Albert	Missouri Department of Agriculture
Chris Bradley	Seraphin Test Measure
James Brown	Petroleum Equipment Institute
James Byers	San Diego County, California Weights and Measures
Chuck Corr	Archer Daniels Midland Company
John Eichberger	National Association of Convenience Stores
Ivan Hankins	Iowa Department of Agriculture
Krister Hard af Segerstad	IKEA
Fran Elson-Houston	Ohio Department of Agriculture
Zina Juroch	Pier 1 Imports
Dmitri Karimov	Liquid Controls
James McGetrick	BP Products
Kristin Moore	Renewable Fuels Association
Julie Quinn	Minnesota Department of Commerce

Rob Underwood	Petroleum Marketers Association of America
Craig VAnBuren	Michigan Department of Agriculture and Rural Development
Tim White	Michigan Department of Agriculture and Rural Development

10th Year Attendees

Cary Ainsworth	USDA, GIPSA
Jerry Buendel	Washington State Department of Agriculture
Judy Cardin	Wisconsin Department of Agriculture, Trade and Consumer Protection
Rafael Jimenez	Association of American Railroad Transportation Technology Center
Thomas McGee	PMP Corporation

15th Year Attendees

Charles Ehrlich	NIST Office of Weights and Measures
Kurt Floren	Los Angeles County California Weights and Measures
Alan Johnston	Measurement Canada
Robert Murnane	Seraphin Test Measure
Bill Ripka	Thermo Fisher Scientific

20th Year Attendees

Norman Brucker	Precision Measurement Standards, Inc.
Michael Keilty	Endress + Hauser Flowtec AG USA
Don Onwiler	NCWM

25th Year Attendees

Louis Straub	Fairbanks Scales
Richard Suiter	Richard Suiter Consulting

35th Year Attendees

Thomas Geiler	Town of Barnstable, Massachusetts Weights and Measures

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Report of the Board of Directors (BOD)

Mr. Kurt Floren, Chairman
Los Angeles County, California

100 INTRODUCTION

The Board of Directors (BOD/Board) submits its Final Report for consideration of the 97th National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the BOD during its Interim Meeting in New Orleans, Louisiana, January 22 - 25, 2012. The Board conducted Open Hearings for the items in Table A during the Annual Meeting held July 22 - 26, 2012, in Portland, Maine. 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 report are identified in Table B. The first three digits 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 board 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; **(I) Informational Item:** the item is under consideration by the BOD but not proposed for Voting; **(V) Voting Item:** the board is making recommendations requiring a vote by the active members of NCWM; **(W) Withdrawn Item:** the item has been removed from consideration by the BOD. Table C provides the Summary of Voting Results for each Voting Item.

During the Annual Meeting, some Voting Items are considered individually, others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Board has assembled as a single Voting Item during their deliberation after the Open Hearings 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 Board will entertain any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

The BOD may change the status designation of agenda items (Developing, Informational, Voting, and Withdrawn) up until the report is adopted, except that items which are marked Developing, Informational or Withdrawn cannot be changed to Voting Status. Any change from the Interim Report 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 BOD. 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 that may have been part of the Board's consideration will appear as appendix items.

All sessions are open to registered attendees of the conference. If the board must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed provided that (1) NCWM Chairman or, in his 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 desk. If at all 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

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Activity Reports ..... 110 Series
Strategic Planning, Policies, and Bylaws ..... 120 Series
Financials ..... 130 Series
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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
CTT	Conformity to Type	OIML	International Organization of Legal Metrology
CWMA	Central Weights and Measures Association	OWM	Office of Weights and Measures
L&R	Laws and Regulations Committee	PDC	Professional Development Committee
NCWM	National Conference on Weights and Measures	VCAP	Verified Conformity Assessment Program
NIST	National Institute of Standards and Technology	WWMA	Western Weights and Measures Association
NTEP	National Type Evaluation Program		

Table C
Summary of Voting Results

Reference Key Number	*House of Senate Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
120-5	Voice Vote of Business Items				Adopted
To Accept the Report	Voice Vote				Adopted

Details of All Items
(In order by Reference Key)

110 ACTIVITY REPORTS

110-1 I Membership and Meeting Attendance

Membership levels track closely with the economy as shown in the yearly comparison below. The Board is confident that the trend will reverse as it historically does when the economy improves. There was some improvement in state government membership as a result of outreach. Those efforts will continue. As the Professional Certification Program grows, NCWM expects to see an increase in memberships to take advantage of the waived exam fees.

The attendance in January 2012 for the Interim Meeting in New Orleans was exceptional. That meeting had a robust agenda including many new proposals on an array of issues. Attendance also improved for the 97th Annual Meeting, in Portland, Maine, in July. Feedback has been very good for the technical sessions that have been added to the Sunday afternoon sessions. These sessions benefit the standards development process, and add value for stakeholders who attend.
The following is a comparison of NCWM membership levels for the past six years.

Table D NCWM Membership Report						
	June 2012	**June 2011**	**June 2010**	**June 2009**	**June 2008**	**June 2007**
Associate	842	813	814	822	848	863
Foreign Associate	58	62	53	53	56	53
Federal Gov't	11	11	12	10	9	9
NIST	16	11	12	10	9	9
State Gov't	589	567	565	696	831	825
Local Gov't	487	495	524	558	554	565
Foreign Gov't	14	14	12	24	22	31
Retired	195	202	196	196	232	221
Total	**2,212**	**2,180**	**2,188**	**2,373**	**2,567**	**2,581**

110-2 I NCWM Newsletter and Website

The Board continuously considers ways to monitor and improve the content of the newsletter and website. Members are encouraged to bring ideas and articles forward for inclusion in newsletters. Of particular interest are articles that would be pertinent to field inspectors and the service industry.

At the 2012 Annual Meeting, the BOD approved a number of pending enhancements to the website. Some of these new features include:

- Create a mobile-friendly National Type Evaluation Program (NTEP) database search;
- Create a mobile-friendly membership directory;
- Add the option of instant PDF download for NCWM Publication 14 sales; and
- Add the ability to apply online for NTEP certification.

A request was received to populate all of the safety articles from past newsletters into one location on the website for easier access. This request will be implemented. Compliments were offered to NCWM and to NIST for posting links to pertinent news pieces related to weights and measures on the NCWM Facebook, LinkedIn, and Twitter accounts and the NIST Directors e-mail listserv.

Comments and suggestions for improvements to the newsletter and website should be directed to NCWM at (402) 434-4880 or info@ncwm.net.

Online Position Forum:
Activity increased somewhat in the second year for the Online Position Forum, but it remains light. The board believes that participation will increase in time as members become more comfortable with it and as committee agenda items generate interest. Improvements were made following the first experience in 2011 so that comments are more easily viewed.

The Online Position Forum is not a voting system. It is simply a method to present positions, opinions, and supporting documents. All active, associate, and advisory members have the opportunity to login, view committee

agenda items, enter positions and comments, and upload supporting .pdf documents for each agenda item of standing committees or the Board.

The options for each agenda item are:

- Support;
- Support with Comments;
- Oppose with Comments;
- Neutral; or
- Neutral with Comments.

Staff will notify members when the forum is ready for them to enter their comments each spring. The comment period will end on May 31. On June 1 members will be able to view positions, comments, and supporting documents by others. This will help them prepare for the deliberations and voting at the Annual Meeting in July by having a better idea of positions others may have.

Social Networking:
NCWM has accounts with LinkedIn, Facebook, and Twitter to improve our outreach. By opening these accounts, NCWM is now more visible in Internet search engines and will be more identifiable to tech-savvy stakeholders. Users will find links to weights and measures related news stories, and they will be kept informed throughout the Interim and Annual Meetings of special announcements including any changes in schedules. This has been very helpful for meeting attendees who carry hand-held devices. In the past year, staff has posted many news articles of interest to the weights and measures community on the social networks, generating increased interest and following.

Professional Certification Program:
Professional certification exams can be purchased through the online shopping cart at www.ncwm.net/examinations. Exams are free for members and $75 per exam for non-members. By logging in as a member, the price will be adjusted to $0 in the shopping cart. As orders are received, NCWM sends an e-mail to the customer providing the credentials to log into the test site to take the online exam. An applicant who does not pass the exam in the first attempt may log in at a later date and have one retake. After that, it will be necessary to reapply. Certification is now available in three areas, including:

- Retail Motor Fuel Dispensing Systems;
- Package Checking Basic; and
- Small Capacity Weighing Systems Class III.

See the report of the Professional Development Committee for information regarding additional exams under development.

110-3 I Meetings Update

Interim Meetings:

- January 27 - 30, 2013 Francis Marion Hotel, Charleston, South Carolina
- January 19 - 22, 2014 Hotel Albuquerque, Albuquerque, New Mexico
- January 2015 Hotel to be determined in Tampa, Florida

Annual Meetings:

- July 14 - 18, 2013 Seelbach Hilton Louisville, Louisville, Kentucky
- July 2014 The Westin, Detroit, Michigan
- July 2015 TBD

NCWM strives to plan meetings in locations that offer comfortable rooms and a variety of entertainment and dining options close by. The following is a brief description of future planned events.

The 2013 Interim Meeting will be at the Francis Marion Hotel in historic downtown Charleston, South Carolina. It is truly a beautiful hotel situated perfectly for attendees to get the full Charleston experience. The 2013 Annual Meeting will be held at the Seelbach Hilton in Louisville, Kentucky. The hotel was built in 1905 and is listed on the National Register of Historic Places. Attendees can simply walk out the door to experience Fourth Street Live where there are plenty of restaurants and entertainment.

The board has selected Tampa, Florida, for the 2015 Interim Meeting. A final decision will be made on the hotel for that event at the fall 2012 BOD meeting.

100th NCWM Annual Meeting:
The board hopes to make the 2015 Annual Meeting a very special event and one that you won't want to miss. In addition to addressing the business of the organization, NCWM will be celebrating its 100th Annual Meeting 110 years after our first meeting in 1905. A small work group is developing plans for the 100th NCWM Annual Meeting in 2015. The group will consider locations and special events to commemorate and bring excitement to the occasion. Suggestions may be forwarded to Ms. Luanne Groenjes, NCWM Office Manager, at (402) 434-4880 or luanne.groenjes@ncwm.net.

110-4 I Participation in International Standard Setting

Conformity to Type
International Organization of Legal Metrology (OIML) is considering development of a Conformity to Type (CTT) program. An OIML Seminar on CTT was held in June 2011 in Utrecht, The Netherlands. NCWM was invited to share its experience with the NTEP Conformity Assessment Program and in particular, the Verified Conformity Assessment Program (VCAP). The presentation was given by Mr. Don Onwiler, NCWM Executive Director. NCWM is hopeful that the VCAP Audit Reports can also satisfy the needs of the OIML CTT at a significant savings to certificate holders. Mr. Darrell Flocken, Mettler-Toledo, LLC, also presented with perspectives from the manufacturing industry. Dr. Charles Ehrlich, National Institute of Standards Technology (NIST), Office of Weights and Measures (OWM), was in attendance and participated in the discussions. A subcommittee has been formed that will describe the United States and European programs.

Mutual Acceptance Arrangement (MAA)
Mr. Jim Truex, NTEP Administrator, attended the Committee on Participant Review in Germany in 2011. Resolutions were developed at that meeting for the amendment of B10, the certificate system under the MAA. The spirit of the resolutions was to allow utilizing authorities to voluntarily accept manufacturer test data under the MAA. A draft amendment is being developed for vote in early 2012. *See the NTEP Committee Final Meeting Report for more detail.*

Dr. Ehrlich, NIST, OWM, gave a report of OIML activities. An updated report is included in the 2012 NCWM Annual Report as an appendix to the report of the Board of Directors (see Appendix A).

120 STRATEGIC PLANNING, POLICIES, AND BYLAWS

120-1 I Strategic Planning

The Board reviewed the strategic plan at the January 2012 Interim Meeting and identified opportunities to update it. Several strategies have been successfully completed, and several new strategies were introduced new strategies. Members are asked to provide input before the January meeting on the five current goals in the strategic plan and any other goals that they believe should be included.

Five primary goals are contained in the strategic plan.

1. Enhance NCWM as a national and international resource for measurement standards development.
2. Promote uniform training for individuals involved in weights and measures.
3. Continue to improve NTEP.
4. Expand the role of NCWM as a resource for state and local weights and measures programs.
5. Preserve the financial stability of NCWM.

The strategic plan in its entirety may be viewed in the Members Only area at www.ncwm.net/content/strategic-plan.

NCWM as a National and International Resource:
A strategy under this goal was to implement the Online Position Forum. The forum was completed in 2011 and the strategy will now be to make improvements to the program and promote increased use of it by our membership. Several ideas will be implemented to generate interest. Additionally, guidance will be developed to assist committees in how to preview and use comments in a consistent manner.

Promote Uniform Training:
The Professional Certification Program is a top priority under this goal. In 2011, the Board contracted the services of Mr. Ross Andersen to serve as Certification Exam Coordinator working with the PDC. The Board believes this arrangement will greatly assist the PDC in developing a full line of certification exams.

Some states are expressing interest in using the Professional Certification Program as a prerequisite to registering service agents. It is unknown at this time whether the difficulty of the exams will be appropriate to test an individual's expertise without undue delay in becoming state-registered. The delay can be costly for service agencies because they need employees who are recognized by the state to work independently with the privileges of being registered. To address these questions, NCWM has contacted state directors to generate a list of service agents from various states to voluntarily take the Retail Motor Fuel Dispenser Exam.

Continue to Support NTEP:
A strategy of high priority under this goal is to maintain viable support for NTEP laboratories. Mr. Truex, NTEP Administrator, monitors the number of full-time equivalents associated with the authorized laboratories and tracks evaluation time and backlog statistics to ensure that NTEP evaluations can be completed in a timely manner. He reports these statistics quarterly to the NTEP Committee and BOD.

NCWM has a contingency plan in place to ensure evaluation services are maintained for NTEP applicants in the event that insufficient services were available under the current authorized laboratory system. Another strategy toward this goal is the continued development of the Verified Conformity Assessment Program which has already successfully addressed load cells. *See the NTEP Committee Final Report for more details.*

Expand the Role of NCWM as a Resource to Officials:
Of high importance under this goal is NCWM's ability to gather and compile data that will demonstrate the impact of regulatory programs. Efforts in this regard have been difficult or impossible because of differences in how jurisdictions acquire and maintain device, inspection, and compliance data. The board is discussing methods of studying data that would not require massive changes in jurisdictional practices.

Many programs are experiencing severe budget cuts that are diminishing their effectiveness. NCWM plans to develop a "toolkit" with the support of the Associate Membership Committee that can be used by program administrators to generate support for their programs. This toolkit will contain materials including data supporting a regulatory presence, industry contacts that can be called upon to explain the necessity of a regulatory presence to ensure a level playing field for businesses and consumer protection, and a short video production.

Preserve Financial Stability:
This goal was originally to "ensure" financial stability. Financial reports of the past several years indicate that NCWM is financially stable barring any surprises. However, NCWM must recognize that it does not have sufficient reserves at this time to fully implement the NTEP contingency plan that was developed to ensure continued evaluation services if the authorized state laboratories fell victim to budget cuts. The board will study NCWM's needs and establish a target for reserves for NTEP and other potential exposures. When that target is achieved, NCWM will be in a position to identify ways to improve services and/or reduce fees in support of its membership.

120-2 I Regional Support

Shopping Cart Service for Regional Websites:
NCWM hosts all four regional websites. In 2010, the Western Weights and Measures Association (WWMA) asked NCWM to create a shopping cart on their site for online meeting registrations. WWMA reported to NCWM Board of Directors that the online meeting registrations worked very well for them. It provides a means for WWMA members to pay dues and meeting registrations with credit cards. The transaction is processed through the NCWM PayPal™ account, and NCWM transfers the funds to the region's bank account, less credit card fees of about 3.5 %. Two additional regions, the Central Weights and Measures Association (CWMA) and the Southern Weights and Measures Association (SWMA) have requested online membership and meeting registration through their websites. This programming will be completed in time for 2012 meeting registrations. Cost will vary according to the complexity of the project, but ranges from around $1,200 to $1,500.

Meeting Documents on Regional Websites:
In the fall of 2011, NCWM made efforts to be the clearinghouse for all new proposals being submitted to the regional associations. NCWM established a requirement that all proposals shall be submitted electronically to simplify report writing for regional committees. A suggestion from a member prompted NCWM to post all new proposals on the regional websites. This addition was very well received, and NCWM hopes to receive additional suggestions to improve services for members and regional associations.

Beginning in the fall 2012, just one template will be sent to each regional committee containing both the carryover items and the new proposals designated to the respective region. Furthermore, each new item will be identically numbered and titled at each region. This will not only streamline documentation for regions, but will also simplify the process for implementing regional reports into NCWM Publication 15. Staff expects that these improvements will enable them to make NCWM Publication 15 available at an earlier date this fall.

120-3 I Standing Committees

Committee Orientation:
In 2010, NCWM began conducting Committee Orientation for committee chairs and new committee members. It is held at NIST, OWM in Gaithersburg, Maryland, to facilitate participation of all NIST Technical Advisors. The program presented by NCWM Chairman and Executive Director includes a half-day session for committee chairs followed by a full day for the new committee members. The focus is on leadership, administrative processes, roles and responsibilities, and review of *NCWM Committee Member Handbook*. Additionally, the committee chairs and NIST Technical Advisors review agenda items for the new members so that they are prepared in advance for the technical discussions and Open Hearings. Because the response to the first meeting in 2010 was so positive, the orientation is an annual event.

Task Groups and Subcommittees:
Task groups and subcommittees are created via appointment by the NCWM Chairman. A task group is given a specific charge, and it reports to the appropriate NCWM standing committee. A task group will disband at the completion of its assignment. A subcommittee is charged with ongoing responsibilities in support of a standing committee in a specific field of expertise.

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

The board expresses great appreciation to the volunteers who serve on these important task groups and subcommittees in support of the work of this organization.

- **Task Group on Printer Ink and Toner Cartridges:**

  The group reports to the Laws and Regulations (L&R) Committee and is addressing method of sale and net quantity labeling requirements. For more information, contact:

  Chair
  Ms. Judy Cardin
  Wisconsin Department of Agriculture, Trade and Consumer Protection
  P.O. Box 8911
  Madison, WI 53708-08911
  Phone: (608) 224-4945
  Fax: (608) 224-4939
  E-mail: judy.cardin@datcp.state.wi.us

- **Fuels and Lubricants Subcommittee:**

  This group reports to the L&R Committee. For more information, contact:

  Chair
  Mr. Ronald Hayes
  Missouri Department of Agriculture
  1616 Missouri Blvd
  P.O. Box 630
  Jefferson City, MO 65102
  Phone: (573) 751-4316
  Fax: (573) 751-0281
  E-mail: ron.hayes@mda.mo.gov

- **Packaging and Labeling Subcommittee:**

  The group reports to the L&R Committee. For more information, contact:

  Chair
  Mr. Christopher Guay
  Procter and Gamble, Co.
  One Procter and Gamble Plaza
  Cincinnati, OH 45202
  Phone: (513) 983-0530
  Fax: (513) 983-8984
  E-mail: guay.cb@pg.com

120-4 I NCWM Publications 15 and 16

NCWM Publications 15 and 16 are documents that provide the agendas and reports for NCWM Interim and Annual Meetings. Though they are NCWM publications, NIST, OWM has supported NCWM by preparing and publishing the documents. NIST, OWM has less staff dedicated to publications than in the past. That, combined with the cumbersome process they are subjected to when publishing documents, has prompted NCWM to assume this responsibility. As of the fall of 2011, NCWM assumed responsibility for NCWM Publications 15 and 16. As a result, NIST, OWM staff will be able to devote more resources to training development and other publications such as NCWM Annual Report, NIST Handbooks 44, 130 and 133, National Type Evaluation Technical Committee Sector Reports, etc.

This change in responsibilities does affect flow of information and documents through the fall season in preparation for regional meetings and submitting reports at their completion. The 2012 NCWM Publication 15 represented NCWM's first product under this new initiative. The processes to reach this final product have been examined and refined based on experience and input from regional and national committee members, NIST, OWM staff, and the members.

There were less shifting of responsibilities in the development of NCWM Publication 16. The committees retained responsibility for developing the final reports for NCWM Publication 16. Once completed, they submit those reports to NCWM for inclusion in NCWM Publication 16. The shift of responsibility to NCWM in producing NCWM Publication 16 proved highly successful, resulting in publication and posting of the 2012 NCWM Publication 16 before April 2012 and enabling the access of the On-Line Position Forum for comment/position input by members a full month earlier than that occurring in the prior year.

120-5 V NCWM Bylaws Administrative Updates

(This item was adopted.)

Source:
NCWM Board of Directors (2012)
Purpose:
Update bylaws to reflect new management procedures, shifting responsibilities, and changes to policy.
Item Under Consideration:
Amend various sections throughout NCWM bylaws as follows:

Article IV - Membership Fees and Records
Section 2 - Membership Records
The ~~**Board of Directors shall designate an individual or organization to be responsible for membership, including collection of membership fees and maintenance of membership records.**~~ **corporation shall collect membership fees and maintain membership records.**

Article V - Use of the Insignia
The insignia of the Corporation ~~**may be used or displayed only by members of the Corporation with express written approval from the Board of Directors.**~~ **is trademarked. Use or display of the insignia by members is allowed except that the Corporation may prohibit any use that is deemed by the Corporation to be inappropriate.**

Article VI - Directors

Section 4 - Insurance and Indemnification of Directors
A. Insurance and Indemnification of Directors
The ~~**Board of Directors**~~ **Corporation** is authorized to purchase insurance, including but not limited to, general liability insurance, errors and omissions insurance, and directors and officers liability insurance, together with any other insurance deemed by the Board to be reasonable, in such sums and for such premiums as the ~~**Board**~~ **Corporation** determines are appropriate.

Article VII - Duties of the Directors and Appointive Officials

Section 1 - Chairman
The Corporation Chairman ~~**has the role of Chief Executive Officer of the Corporation and, as such,**~~ has ~~**the**~~ broad authority ~~**customarily associated with that role,**~~ including, but not limited to, the authority to make policy decisions on behalf of the Corporation and take such actions as are necessary to put these decisions into effect. The Chairman is the principal presiding officer at the meetings of the Corporation and of the Board of Directors, makes appointments to the several standing and special purpose committees, and appoints other Corporation officials to serve during his or her term of office.
~~**All contracts or other obligations requiring Corporation funding must be signed by the Chairman or his or her designee.**~~

Section 5 - Treasurer
The Treasurer ensures the integrity of the fiscal affairs of the Corporation and serves on the Board of Directors of the Corporation. The Treasurer performs other duties as assigned by the Chairman.
~~**The Treasurer may appoint, with approval of the Board, an assistant to assist the Treasurer in the discharge of his or her duties.**~~

Article IX - Committees

Section 1 - Special Purpose Committees
The Special Purpose Committees consist of the following:

A. Nominating Committee
The Nominating Committee (referenced in Article VI, Section 3) shall be appointed annually by the Chairman and shall consist of the most recent active Past Chairman of the Corporation as Committee Chairman and six active members, to include at least one member representing each of the four regions. The nominating committee shall make recommendations to the Corporation for nominations for the Board of Directors. The nominating committee shall give due weight and consideration to the recommendation of the Associate Membership Committee regarding the Associate Director nomination.

~~**B. Resolutions Committee**~~
~~**The Resolutions Committee shall be appointed by the Chairman and shall consist of three members appointed for 3-year staggered terms.**~~

~~**C**~~**B. Finance Committee**
The Finance Committee shall be comprised of the **Chairman-Elect, Nominated Chairman-Elect,** Treasurer, ~~**and the two At-Large Directors**~~ **Director representing the Associate Membership Committee, and the Executive Director**. Each member's term on the Finance Committee shall coincide with the member's term ~~**as Director**~~ **of office**.

Section 3 - National Type Evaluation Program (NTEP) Committee
The NTEP Committee is comprised of five members: the Immediate Past Chairman, the Chairman and the Chair-Elect of the Conference and two regional Directors from the Board of Directors. The NTEP Committee must include at least one member from each of the four regions. ~~**(amendment passed July, 2001)**~~ **The NTEP Administrator shall serve in an advisory role to the NTEP Committee.**

The NTEP Committee ~~**fixes**~~ **may develop recommendations to the Board of Directors for NTEP fees including, but not limited to application fees to obtain a NTEP Certificate of Conformance and** the annual maintenance fee for retaining a ~~**National Type Evaluation Program**~~ **NTEP** Certificate of Conformance. The NTEP Committee is responsible for the operation of the NTEP program with respect to its fiscal management, providing guidance related to the activities of the program and establishing policy and procedures.

Through the Chairman of the NTEP Committee, members are appointed from the Advisory, Active, and Associate Members to the Technical Committees of the National Type Evaluation Program. The Associate members represent the interest of manufacturers, retail sales organizations, and users of commercial devices. The Active members represent the interest of government officials and the consumer. These committees make technical, policy, and procedural recommendations to the NTEP Committee for implementation.

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

A. Board of Directors

The Board of Directors is the governing body of the Corporation and is authorized to make all decisions relating thereto, including but not limited to the following:

1. conducts the business of the National Conference on Weights and Measures, Inc., as a Corporation, which at a minimum includes (a) overseeing the preparation and filing of the biennial report and fee with the Nebraska Secretary of State in compliance with Neb. Rev. Stat. Section 21-301.
2. reviews and approves the budget;
3. selects the place and dates, ~~**and also fixes the registration fee**~~ for each meeting of the Corporation;
4. fixes **all fees including but not limited to meeting registrations, fees associated with NTEP administration, publications, and** the annual membership fee; ~~**and**~~
5. advises the responsible individual or organization, as designated by the Chairman, with respect to the programs for the meetings of the Corporation and its committees, and makes recommendations to the Corporation, the Corporation officers, and the committee chairmen**; and**.
6. **reviews an annual audit report prepared by an external auditor whose services are retained by the corporation to assess the accuracy of the financial statements, the accounting principles used, and evaluate overall financial statement presentation.**

The Board of Directors, in the interval between meetings of the Corporation:

1. authorizes meetings of Corporation committees in accordance with the provisions of Article VIII, Section 3;
2. authorizes expenditures that are not in the budget; and
3. acts for the Corporation in all routine or emergency situations that may arise.

Special meetings of the Board may be held at the discretion of the Chairman, and may take place in any manner technologically possible, including, but not limited to, telephone conference calls and electronic mail. A quorum shall consist of seven members of the Board. Voting may be cast in any manner prescribed by the Chairman. All questions before the Board of Directors will be decided whenever practical, by voice vote or by ballot, and will be decided on the basis of the majority of votes cast.

The Board serves as a policy and coordinating body in matters of national and international significance which may include such areas as metrication; the interaction with organizations such as the International Organization of Legal Metrology (OIML), American National Standards Institute (ANSI), International Organization for Standardization (ISO), ~~**American Society for Testing and Materials (ASTM)**~~ **ASTM International**, National Conference of Standards Laboratories (NCSL), and such internal matters as may be required, ~~**including, for example, the Retiree Organization**~~.

The Chairman, on behalf of the Board, annually presents a report on Corporation activities.

~~**F. Resolutions Committee**~~

~~**Each year at the Annual Meeting of the Corporation, the Resolutions Committee presents for Corporation action such resolutions as it has been directed by the Corporation to prepare, and such additional resolutions as are deemed appropriate by the Committee.**~~

~~**G**~~**F. Finance Committee**

The Finance Committee ~~**may appoint an external auditor to audit the books of the Corporation and, if an auditor is appointed, will evaluate the recommendations of the auditor and recommend an action thereon to the Board.**~~ **provides review and preliminary approval of the draft budget before it is presented to the Board of Directors for final approval.**

Background/Discussion:

In 2010, the bylaws were amended after thorough legal review to reflect NCWM as a Nebraska corporation and to provide additional liability protections. In 2011, the bylaws were amended following a parliamentarian review of voting procedures.

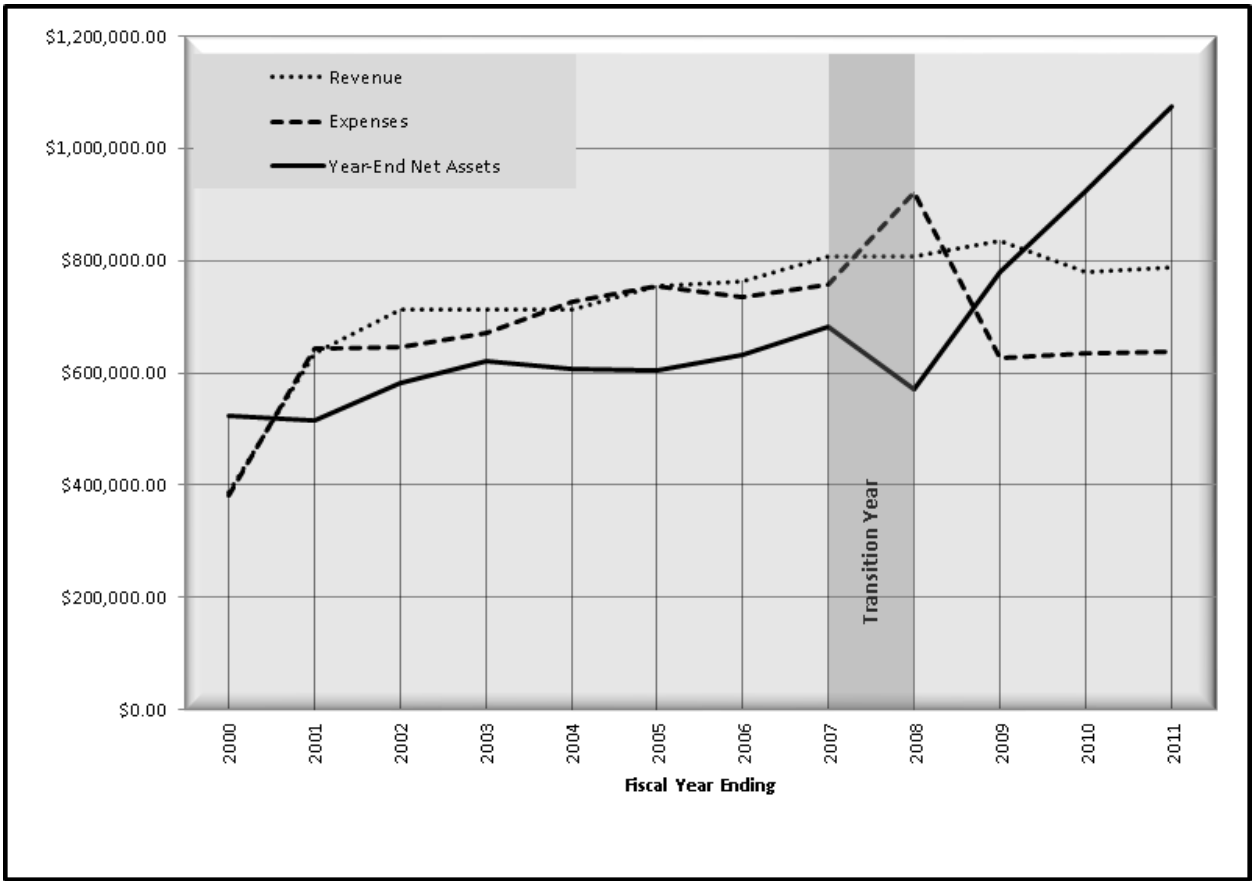
This year, NCWM conducted an administrative review of the bylaws to determine if amendments are needed to reflect new management procedures, shifting of responsibilities, and changes in policy. Based on that review, the board is presenting the above excerpts of NCWM bylaws with proposed amendments.

130 FINANCIALS

130-1 I Financial Report

NCWM operates on a fiscal year of October 1 through September 30. Budgets are set to be conservative on projected revenues and realistic on anticipated expenses.

Below is a graphic view of the past 11 fiscal years based on year-end audit reports. The spike in expenses in 2008 reflects the cost of the management transition. The management company was still under contract that year while NCWM hired employees, procured office space, furniture, computers, etc. The graph shows significant savings in the following years of 2009 - 2011 even though NCWM has invested significantly in new initiatives during that time. Those initiatives include NCWM and regional website development, the Online Position Forum, the Professional Certification Program, and other improvements to services.



The following is the balance sheet as of June 30, 2012 in comparison with the same time the previous year.

ASSETS	June 30, 2012	June 30 2011
Current Assets	$	$
Checking/Savings		
Associate Member Fund	20,601.39	18,451.85
Certificates of Deposit	1,126,348.07	954,265.98
Checking	34,796.11	−24,857.69
Savings	129,601.52	208,118.33
Total Checking/Savings	$ 1,311,347.09	$ 1,155,978.47
Accounts Receivable	2,905.00	960.00
Other Current Assets	38,808.22	51,589.87
Other Assets	7,352.30	8,617.67
TOTAL ASSETS	**$ 1,360,412.61**	**$ 1,217,146.01**
LIABILITIES & EQUITY		
Liabilities	$	
Current Liabilities	21,499.43	10,891.87
Total Liabilities	$ 21.499.43	10,891.87
Equity		
Unrestricted Net Assets	1,095,648.60	931,421.51
Net Income	243,264.58	274,832.63
Total Equity	$ 1,338,913.18	1,206,254.14
TOTAL LIABILITIES & EQUITY	**$ 1,360,412.61**	**$ 1,217,146.01**

Mr. Kurt Floren, Los Angeles County, California | Chairman
Mr. Stephen Benjamin, North Carolina | Chairman-Elect
Mr. Tim Tyson, Kansas | NTEP Committee Chair
Mr. Mark Coyne, City of Brockton, Massachusetts | Treasurer
Mr. Brett Saum, San Luis Obispo County, California | Active Membership - Western
Mr. Ronald Hayes, Missouri | Active Membership - Central
Mr. Terence McBride, Memphis, Tennessee | Active Membership - Southern
Mr. James Cassidy, City of Cambridge, Massachusetts | Active Membership - Northeastern
Mr. John Gaccione, Westchester County, New York | At-Large
Mr. Stephen Langford, Cardinal Scale Manufacturing, Co. | At-Large
Mr. Gordon Johnson, Gilbarco, Inc. | Associate Membership

Ms. Carol Hockert, NIST, OWM | Executive Secretary
Mr. Don Onwiler, NCWM Headquarters | Executive Director
Mr. Gilles Vinet, Measurement Canada | Board of Directors Advisor
Mr. Jim Truex, NCWM Headquarters | NTEP Administrator

Board of Directors

Appendix A

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

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

INTRODUCTION

The NIST, OWM is responsible for coordinating U.S. 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 by fax at (301) 975-8091 or charles.ehrlich@nist.gov.

Note: OIML publications are available 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
B	Basic Publication	MAA	Mutual Acceptance Agreement
BIML	International Bureau of Legal Metrology	MTL	Manufacturers' Testing Laboratory
BIPM	International Bureau of Weights and Measures	NIST	National Institute of Standards and Technology
CD	Committee Draft[1]	NTEP	National Type Evaluation Program
CIML	International Committee of Legal Metrology	OIML	International Organization of Legal Metrology
CTT	Conformity to Type	OWM	Office of Weights and Measures
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[3]	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 draft at the stage of development within a technical committee or subcommittee; 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 or subcommittee concerned and sent to BIML for approval by CIML

[3] WD: 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 (TC) and Technical Subcommittees (SC) of specific interest to members of National Conference on Weights and Measures (NCWM). Schedules of future activities of the Secretariats, the U.S. National Work Groups (USNWG), and the International Work Groups (IWG) of the committees and subcommittees are also included.

TC 3/SC 5 Conformity Assessment (United States)

The subcommittee held a meeting in Paris, France, in October 2010 to discuss the revision of the Basic Publications (B) 3, *Certificate System* and B 10, *Mutual Acceptance Arrangement* (MAA). The International Committee of Legal Metrology (CIML) Preliminary Ballots on B 3 and B 10 closed in July 2011 without any negative votes, and a final CIML vote was held at the CIML Meeting in Prague, Czech Republic, in October 2011. Both B 3 and B 10 passed the CIML vote. International comments on a new document entitled *The Role of Measurement Uncertainty in Conformity Assessment Decisions in Legal Metrology* have been received and are being used by the Secretariat to develop the 2 Committee Draft (CD). Please see the MAA section in the National Type Evaluation Program (NTEP) Committee Report of this publication for more details on the activities of TC 3/SC 5. For more information on the activities of this subcommittee, please contact Dr. Charles Ehrlich at (301) 975-4834 or charles.ehrlich@nist.gov.

TC 5/SC 1 Environmental Conditions (Netherlands)

The Secretariat distributed the 1 CD revision of Document (D) 11, *General Requirements for Electronic Measuring Instruments*, in February 2011. This is a very important document in the OIML system and is used by all of the OIML TCs as a general reference for technical and testing requirements on all measuring instruments. The United States submitted comments on the 1 CD in May 2011. The United States also participated in a meeting of TC 5/SC 1 to discuss the D 11 document and international comments on the 1 CD in Utrecht, The Netherlands, in June 2011. Highlights of the discussions in Utrecht 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 ("E 3") for a non-mains local source of electrical power supply. The OIML Expert Report E 5, Overview of the Present Status of the Standards Referred to in OIML D 11 General Requirements for Electronic Measuring Instruments was recently published and updates all of the IEC references for testing requirements in D 11. The 2 CD of D 11 was received in January 2012 and comments were returned to the Secretariat in March 2012. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov, if you would like further information on this project.

TC 5/SC 2 Software (Germany and BIML)

The OIML D 31, *General Requirements for Software-controlled Measuring Instruments,* has been published and will serve as guidance for software requirements in International Recommendations by OIML TCs. The United States participated in the technical work on this document and submitted votes and comments on several drafts of the document. A new project on software verification was approved by CIML, and the United States is waiting for the first draft of this document. Please contact Dr. Ambler Thompson at (301) 975-2333 or ambler@nist.gov if you would like to discuss OIML software efforts.

TC 6 Prepackaged Products (South Africa)

A project to develop an OIML International Quantity Mark (IQ Mark) is still ongoing. The IQ Mark is intended to eliminate the need for redundant inspections for compliance with legal metrology requirements for labeling and net contents. Receiving countries want imported packages to meet all of their legal metrology requirements, and packers in exporting countries want to ensure prepackages will not be rejected or require additional inspections after arriving in the destination country. The initial proposal for the program would require that participating

packagers meet specific requirements in order to participate in a program for quantity control and labeling of prepackaged goods. The United States is participating in a work group that is developing guidelines on acceptable manufacturing practices that would be used in the IQ Mark's accreditation programs. The United States believes the effort to manage and certify quality control systems will add unnecessary extra costs to all participating suppliers. Though there is significant opposition to the IQ Mark effort from several countries (including the United States, Denmark, Switzerland, and Canada), TC 6 continues to move forward with this project under the premise that such a voluntary system would be of value to developing countries. The United States voted "no" on the 2 CD of the IQ Mark document in May 2010 and received the 3 CD from the Secretariat in August 2011. The United States voted "no" on this draft as well. The Secretariat has indicated that if roughly half of the P-members of TC 6 continue to oppose this project, the Secretariat will recommend to CIML to stop the project.

NIST is assisting TC 6 in two other important projects: (1) a revision of OIML Recommendation (R) 87, *Quantity of Product in Prepackages* (the OIML equivalent to NIST Handbook 133, *Checking the Net Contents of Packaged Goods*), and (2) a revision OIML R 79, *Labeling Requirements for Prepackaged Products*.

NIST hosted a meeting of TC 6 in Gaithersburg, Maryland, September 26 - 30, 2011. Please contact Mr. Ken Butcher at (301) 975-4859 or kbutcher@nist.gov, if you would like more information about the work of this subcommittee or to participate in any of these projects.

TC 8 Measurement of Quantities of Fluids (Japan)

In October 2011, CIML reassigned responsibility of TC 8 from Switzerland to Japan. Additionally, CIML has approved projects to revise the following two TC 8 documents: (1) R 63, *Petroleum Measurement Tables* (1994), and (2) R 119, *Pipe Provers for Testing of Measuring Systems for Liquids Other Than Water* (1996). Both of these documents are important for other OIML recommendations involving liquid measurement. 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 1 Static Volume and Mass Measurement (Germany)

The United States now chairs an IWG that is drafting new sections of 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. OIML R 80-2, *Road and Rail Tankers, Test Methods*, is being developed. 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 3 Dynamic Volume and Mass Measurement for Liquids Other Than Water (United States and Germany)

Subcommittee work is continuing on the development of OIML R 117 2, *Dynamic Measuring Systems for Liquids Other Than Water, Part 2, Test Methods*, and R 117-3, *Test Report Format*. The first CD of R 117-2 was distributed in March 2011. While the 1 CD of R 117-2 generated over 400 international comments that will all need to be resolved, there was excellent acceptance of the methodology and concepts used in the complex new recommendation. A meeting of the IWG for the development of R 117 was held in Braunschweig, Germany, in November 2011 to resolve international comments on the 1 CD and to work to develop new annexes for measuring systems for foaming potable liquids for pipelines and for aircraft refueling. The IWG for the development of R 117 also continues to hold international webinars to accelerate the work on this high priority document. The 2 CD of R 117-2 will be distributed later in 2012, and the full TC 8/SC 3 subcommittee will hold a meeting in November 2012. If you have any questions or would like to participate in the next phases of this project, please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov.

TC 8/SC 5 Water Meters (United Kingdom)

OIML, International Standardization Organization (ISO), and the European Committee for Standardization are working together to harmonize requirements for water meters using OIML R 49, *Water Meters Intended for the Metering of Cold Potable Water and Hot Water Parts 1, 2, and 3,* as the base document. The Joint Working Group of these three organizations distributed the 2 CD of the harmonized document in May 2011 with international

comments returned in August 2011. NIST hosted a joint meeting of the three organizations in Gaithersburg, Maryland, in November 2011, and the 3 CD of the harmonized document was distributed in June of 2012. The American Water Works Association Committee on Water Meters is assisting in these efforts. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov, if you would like copies of documents or to participate in this project.

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

The Secretariat for R 81, *Dynamic Measuring Devices and Systems for Cryogenic Liquids,* is working to complete project one to update: (1) electronic tests in accordance with the latest edition of OIML D 11 (2004) and/or the latest IEC and ISO standards; (2) technical requirements to include new developments in hydrogen measurements; and (3) current recommendations for density equations. OIML R 81 (1998) will be reformatted into two distinct parts in the format that is recommended for recently developed OIML recommendations. The Secretariat will ask members of TC 8/SC 6 and the USNWG to review and formally comment on the first draft of revised R 81, *Part 1: Metrological and Technical Requirements* and *Part 2: Metrological Controls and Performance Tests* in 2012. To obtain more information or to participate in this project, please contact Ms. Juana Williams at (301) 975-3989 or juana.williams@nist.gov.

TC 8/SC 7 Gas Metering (Netherlands)

The Secretariat distributed the preliminary Draft Recommendation (DR) of OIML R 137-1 and R 137-2, *Gas Meters; Part 1: Metrological and Technical Requirements, and Part 2: Metrological Controls and Performance Tests* in May 2011. Extensive U.S. comments on both the 1 CD and the 2 CD were developed in cooperation with the measurement committees of the American Gas Association. The OIML R 137 document is especially important to the United States interests because the American National Standards Institute (ANSI) B 109 committee on gas measurement is using R 137 to create a new performance-based standard for gas meters in the United States. Meetings of the work group that is developing this new standard ANSI B 109.zero (109.0) were held in Savannah, Georgia, in February 2011; in Fort Worth, Texas, in September 2011; and in Seattle, Washington, in January 2012. R 137 was approved by direct CIML online approval in March 2012 and was published in May 2012. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov, if you would like to participate in these efforts of if you would like to obtain a copy of any of these gas measurement documents.

TC 9 Instruments for Measuring Mass (United States)

The CIML approved a new work item to revise OIML R 60:2000, *Metrological Regulation for Load Cells*. This revision is planned to cover everything from the basic principles of R 60 (e.g., tolerances and accuracy classes) to exploring the addition of new requirements. The United States distributed a first working draft revision of R 60, incorporating a major re-formatting of the document. USNWG members and TC 9 members were requested to return comments on R 60 by March 2011. A meeting was held September 19 - 20, 2011, in Braunschweig, Germany, to discuss the intended scope of R 60 that will be incorporated into a 1 CD of R 60, which is expected to be distributed later in 2012. For more information on these efforts, please contact Mr. John Barton at (301) 975-4002 or john.barton@nist.gov.

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

R 134 1, *Automatic Instruments for Weighing Road Vehicles in Motion and Measuring Axle Loads* has been approved by the CIML and published. The United States' comments concerning terminology and document scope were incorporated in the document. The test report format of this document, R 134 2, has also been published. The U.S. Federal Highway Administration is sponsoring a project wherein it is anticipated that both OIML R 134 and an American Society of Testing Materials standard will be used to help develop a new code in NIST Handbook 44, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices,* applicable to in-motion weighing systems for the pre-screening of road vehicles. A USNWG met in July 2011 to kick off this project. To receive a copy of the OIML documents or to obtain more information on this work, please contact Mr. Richard Harshman at (301) 975-8107 or richard.harshman@nist.gov.

The DR of OIML R 106, *Part 1 Automatic Rail Weighbridges*, was approved by a direct CIML online vote in April 2011. The 4 CD of R 106-2 was approved by a TC 9/SC 2 vote in April 2011, and has been submitted to the International Bureau of Legal Metrology (BIML) as a DR. The DR of R 106-2 was submitted to the CIML as a Preliminary Ballot with a deadline of May 22, 2012. To receive copies of these documents or to obtain more information on the work of this subcommittee, please contact Mr. John Barton at (301) 975-4002 or john.barton@nist.gov.

The Secretariat is in the process of revising OIML R 50, *Continuous Totalizing Automatic Weighing Instruments (Belt Weighers)*. The United States returned comments on the 3 CD of this R in July 2010 and participated in a meeting on R 50 in Teddington, United Kingdom, in April 2011. In September 2011, a 4 CD was circulated to members of TC 9/SC 2 for review and comment. The United States believes that durability testing requirements agreed to in a formal vote by "P" members in April 2009, which were subsequently incorporated into the 3 CD, have been watered down in the 4 CD. Responses were due to be submitted to the Secretariat by March 30, 2012. For more information on this effort, please contact Mr. John Barton at (301) 975-4002 or john.barton@nist.gov.

TC 17/SC 1 Humidity (China and United States)

The Co-Secretariats are working with a small IWG to revise OIML R 59, *Moisture Meters for Cereal Grains and Oilseeds*. All drafts have been distributed to the USNWG, which for the most part is a subset of the National Type Evaluation Technical Committee Grain Analyzer Sector. A preliminary 6 CD was developed based on international comments received on the 5 CD, and a meeting of TC 17/SC 1 was held in Orlando, Florida, to address those comments. Per discussions during that meeting, Germany submitted suggestions for additional software requirements that will be included in the 6 CD that is anticipated to be distributed in late 2012. Please contact Ms. G. Diane Lee at (301) 975-4405 or diane.lee@nist.gov if you would like to participate in this IWG.

TC 17/SC 8 Quality Analysis of Agricultural Products (Australia)

This subcommittee was formed to study the issues and write a working draft document *Measuring Instruments for Protein Determination in Grains*. Australia is the Secretariat. At a TC 17/SC 8 meeting hosted by NIST, the subcommittee discussed comments concerning the maximum permissible errors and harmonization of the TC 17/SC 8 R for protein with the TC 17/SC 1 R for moisture. International comments on the 2 CD were received and compiled. These comments were discussed at a meeting of TC 17/SC 8 in Orlando, Florida. The Secretariat is developing the 3 CD based on discussion at the Orlando, Florida, meeting. The 3 CD is expected to be distributed in late 2012. Please contact Ms. G. Diane Lee at (301) 975-4405 or diane.lee@nist.gov, if you would like to participate in this IWG.

OIML Mutual Acceptance Arrangement (MAA)

The report on the OIML MAA can be found in the NTEP section of this document. For further information on the MAA and its implementation, please contact Dr. Charles Ehrlich at (301) 975-4834 or e-mail charles.ehrlich@nist.gov.

II. REPORT ON THE 46TH CIML MEETING IN PRAGUE, CZECH REPUBLIC, IN OCTOBER 2011

Mr. Mason, CIML member from the United Kingdom, assumed his responsibilities as the newly-elected President of the CIML for a six-year term taking over for Mr. Johnston, CIML member from Canada.

Mr. Patoray, who has been serving as BIML Director since January 2011, provided several reports on financial and administrative matters at BIML, including improvements that have been implemented since his arrival at BIML.

Mr. Kool, BIML Assistant Director for the last five years, had his contract renewed for another five years.

It was agreed that the funds in the special account of the BIML Translation Center may be used, as necessary, for translation and interpretation activities that are not currently part of the normal operation of the Bureau, in particular:

- the translation of documents (with particular priority to translating from English to French to reduce the backlog of Publications into French);
- interpretation on an experimental basis at Conferences and Committee Meetings;
- converting existing documents of interest to the work of the Organization (minutes and resolutions of past Conferences and Committee Meetings and other relevant documents) into a suitable electronic format.

Zimbabwe and Georgia were welcomed as new OIML Corresponding Members.

A new Memorandum of Understanding with IEC was approved, and the Bureau was instructed to draw up a joint work program with the IEC and report on the progress at the 47th CIML Meeting.

The prospective establishment of a liaison with the Consumer Policy Committee of ISO was discussed. The Bureau was instructed to identify possible liaison activities, to encourage such activities at the TC and SC level, and to report on the progress at the 47th CIML Meeting.

The ongoing collaboration at all levels between OIML and the International Bureau of Weights and Measures (BIPM) was discussed. CIML requested its President and the BIML Director to intensify the cooperation with the BIPM in operational activities and to pursue further discussions and studies with BIPM concerning a possible collocation.

CIML approved the following Recommendation:

- OIML R 35-2, *Material Measures of Length for General Use - Part 2: Test methods*.

CIML instructed the BIML to submit the following DR to direct CIML online approval after they have passed the appropriate subcommittee vote and then received sufficient support in the preliminary ballot:

- Draft Revision of OIML R 126, *Evidential Breath Analyzers*;
- Draft Revision of OIML R 137, (Parts 1 and 2) *Gas Meters*.

CIML reassigned the responsibility for the Secretariat of TC 8 *Measurement of Quantities of Fluids* to Japan.

CIML approved the following Draft BPs:

- Revision of *OIML B 3 OIML Basic Certificate System for OIML Type Evaluation of Measuring Instruments*;
- Revision of OIML B 10-1 and OIML B 10-2 (combined into a single document B 10) *Framework for a Mutual Acceptance Arrangement on OIML Type Evaluations*.

CIML, noting the report of TC 3/SC 5 on the issue of the acceptance of manufacturers' test results within a Declaration of Mutual Confidence (DoMC) under the MAA, and recalling its Resolution number 20 at the 43rd CIML Meeting, decided that Issuing Participants may request the registration of Manufacturers' Testing Laboratories (MTLs) under a DoMC provided that the conditions agreed by TC 3/SC 5 and laid down in a respective amendment to, or revision of, OIML B 10 are met, and that after this amendment to, or revision of, OIML B 10, MAA Type Evaluation Reports that contain test results from MTLs may be accepted by participants on a voluntary basis.

CIML approved as a new work item for OIML TC 3/SC 5:

- the amendment to, or the revision of, OIML B 10 *Framework for a MAA on OIML Type Evaluations* to include appropriate conditions for the registration of MTLs under a DoMC.

However, CIML also decided that the registration of MTLs under a DoMC remains excluded from the scope of the MAA, until this amendment to, or revision of, OIML B 10 is approved.

CIML, noting the written report of the seminar on Conformity to Type (CTT) held in Utrecht, the Netherlands, on June 20 – 30, 2011, and noting the oral report and presentation by the CIML Member for New Zealand, Mr. O'Brien, on the outcome of the follow-up CTT Seminar held in Prague, Czech Republic, on October 10, 2011, approved the establishment of a new subcommittee of TC 3, to be titled *Conformity to Type*, which shall undertake as a work item the development of a guidance document on the *Scope for Pre-market Surveillance Activities Focused on the Conformity Assessment of Measuring Instruments to Give Assurance that Manufactured (or Production) Instruments Meet Their Approved Type*. The responsibility for the Secretariat of the new subcommittee was assigned jointly to New Zealand and BIML.

The new subcommittee was invited to take into account:

- the information provided at the seminars held in June and October 2011; and
- the current programs in the United States and the European Union and any best practices identified elsewhere.

CIML approved, subject to re-titling the proposed "Working Groups" as "Project Groups" and other necessary editorial changes, the revision of:

- OIML B 6-1 *Directives for OIML Technical Work. Part 1: Structures and Procedures for the Development of OIML Publications*; and
- OIML B 6-2 *Directives for OIML Technical Work. Part 2: Guide to the Drafting and Presentation of OIML Publications*.

BIML was instructed to produce a guidance document for B 6-1 and B 6-2 no later than December 1, 2011, setting out the arrangements for implementation and to introduce the new arrangements from January 1, 2012, in an orderly way. An *ad-hoc* work group was established, chaired by the CIML Second Vice-President, to consider improvements to OIML B 6-1 and OIML B 6-2, suggested by CIML members in the light of the experience of operating the new procedures, and instructed the *ad-hoc* work group to present proposals for the amendment of OIML B 6-1 and OIML B 6-2 for consideration at its 47th Meeting.

CIML, noting the development of the 3rd edition of the *International Vocabulary of Metrology* (VIM) - *Basic and General Concepts and Associated Terms* by the Joint Committee for Guides in Metrology of which OIML is a Member Organization, noting the publication of the 3rd edition of the VIM as an OIML Vocabulary (OIML V 2-200:2010), recalling the requirements for the drafting and presentation of terms and definitions in OIML Recommendations and Documents as laid down in Annex B of OIML B 6-2:1993, and in particular paragraph B.1.2 *Avoidance of Duplications and Contradictions*, and considering the imminent completion of the revision of the International Vocabulary of Legal Metrology (VIML) by OIML TC 1, resolved:

a) that new, and revisions of existing, OIML Recommendations and Documents should apply the terminology and definitions of the VIM and the VIML without amendment;
b) that terms and definitions from international vocabularies from other fields (for instance statistics) may be adapted when the concept that they pertain to in legal metrology is different and that such conceptual differences should be explained in a note; and
c) that when, in OIML Publications other than Recommendations and Documents, terms and definitions are used that differ from those in the VIM and the VIML, these differences should be indicated in notes, as appropriate.

BIML was further instructed to monitor the correct implementation of this resolution at all stages of the preparation of OIML publications.

CIML encouraged all its members and relevant TCs, in particular TC 2, TC 9, TC 9/SC 3 and TC 11, to actively participate in the discussion and provide comments to the *ad-hoc* OIML Work Group "New SI" before February 24, 2012, in particular on the impact that the proposed new SI unit redefinitions might have on legal metrology matters.

CIML, taking into consideration that:

- the net revenue from the paid subscriptions for the OIML Bulletin is relatively small;
- the OIML Bulletin is still an indispensable means of communication to the members and other interested parties; and
- the OIML Bulletin should be circulated to as wide an audience as possible,

concluded that:

- the OIML Bulletin should be rendered free of charge;
- electronic versions of all issues of the OIML Bulletin should be available for download on the OIML web site without restriction;
- printed copies of the OIML Bulletin should be provided only to OIML member states and corresponding members; and
- requested that the 14th Conference consider this opinion in the budget for the 2013 to 2016 budget period.

The committee decided to award Professor Dr. Lev Issaev, its former member for the Russian Federation, the title of Member of Honor in recognition of his work for OIML over a period of more than 30 years.

III. FUTURE OIML MEETINGS

The 14th OIML Conference and 47th CIML Meeting will be held in Bucharest, Romania, October 1 - 5, 2012.

IV. REGIONAL LEGAL METROLOGY ORGANIZATIONS

Meeting of the Inter-American Metrology System (SIM) General Assembly and the SIM Legal Metrology Work Group (LMWG)

The 2010 SIM General Assembly (GA) was held in Miami, Florida, on November 2. The GA was originally scheduled to be held in St. Lucia but needed to instead be held in Miami because of Hurricane Tomas. Mr. Dajes, INDECOPI Peru, was presented by the Organization of American States as the sole candidate for the SIM Presidency. Mr. Senna at mjsenna@inmetro.gov.br, of INMETRO in Brazil serves as the Chairman of the SIM LMWG. The organization is working to build capacity in legal metrology for SIM member countries. Please contact Mr. Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov for more information.

Asia-Pacific Legal Metrology Forum (APLMF)

The 18th Meeting of APLMF was held September 5 - 8, 2011, in Busan, South Korea. The People's Republic of China holds the Presidency and Secretariat of APLMF. Mr. Changcheng, APLMF President and Vice Minister of AQSIQ, chaired the meeting. APLMF activities are facilitated through its seven work groups. The most active is the work group on Training Coordination chaired by Australia.

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. There were no training courses given by APLMF in 2011. The APLMF Secretariat spent a considerable amount of time, with the assistance of the United States, developing a proposal to obtain support from the Asia-Pacific Economic Cooperation (APEC) - Trade and Investment Liberalization and Facilitation funding in order to support the delivery of the training which was agreed upon at the 17th APLMF meeting (see below). Changes in APEC priorities are making it more difficult to achieve funding. While feedback from the previously-held training courses has been positive, it is becoming clear that in order to continue to receive funding for the training, APLMF needs to do a more thorough job of assessing and documenting the impact of the training courses on the economies that receive the training.

The Secretariat reported that APLMF has been successful in obtaining APEC funding to deliver two training programs in 2012. The first training activity, a three-day seminar entitled *Improving the Custody Transfer of Liquid*

Fuel in the Asia-Pacific Region was held March 6 – 8, 2012, in Singapore. Mr. Ralph Richter of NIST served as the facilitator for this successful seminar. The second training activity, a *Train-the-Trainer* course on the verification of in-line (pipeline) turbine and positive displacement metering systems used for hydrocarbon products in the bulk fuel supply chain, will be held in the second half of 2012 in Thailand.

APLMF members also considered and approved an initiation of self-funded training activities. In 2012, there will be such training in rice moisture measurement given by Japan.

The United States was represented at the meeting in Busan by Dr. Charles Ehrlich, who serves as Chairman of the APLMF work group on Mutual Recognition Arrangements and by Mr. Ralph Richter. Dr. Ehrlich gave an extensive report and update on the OIML MAA. Mr. Richter prepared and presented the U.S. Country Report. The 2012 APLMF meeting is scheduled to be held in November 2012 in the Philippines.

Associate Membership Committee (AMC)
Agenda and Draft Meeting Minutes

Robert Murnane, Chair
Associate Membership Committee

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III. Financial Condition
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  (b) Professional Development Committee Report
  (c) Laws and Regulations Committee Report
V. AMC Fund Disbursement Requests
VI. Filling Vacant Positions
VII. Old Business
VIII. New Business
IX. Adjournment

AMC Draft Meeting Minutes

July 17, 2012
Portland, Maine

Call to Order

Chairman Robert Murnane called the meeting to order at 5:00 p.m.

Meeting Minutes

A copy of the January 2012 meeting minutes was distributed. These minutes were reviewed and a motion was made by Steven Grabski and seconded by Chris Guay to approve the minutes as written. With no further discussion, the minutes were approved.

Financial Condition

A copy of the financial report was distributed. Chairman Murnane reviewed the deposit/disbursements and reported a current balance of $20,691.39 as of July 1, 2012. A motion was made and seconded to accept the Financial Report. With no other discussion, the Financial Report was accepted.

Board of Directors Report

Gordon Johnson, the Associate Membership Representative on the NCWM Board of Directors (BOD) gave a report concerning BOD activities. A few of the items are repeated below.

- The BOD voted on updating the policy on recording of meetings, new policy no verbatim recording of meetings.
- The Treasurer's Report indicated NCWM is in very good financial condition.
- The NCWM is looking at a new Web provider; the BOD received cost estimates for the change over to the new provider.

Gordon mentioned that additional information on the activities of the BOD can be found in the final conference report.

Additional information on the BOD's topics can be found in its report to be published in the *Report of the 97th National Conference on Weights and Measures*.

Professional Development Committee (PDC) Report

Steven Grabski, the Associate Membership Representative on the PDC, gave a report about the Committee's activities. The key items were:

- Two new training modules will be released in the coming weeks.
- The Committee is planning to work with the regional associations on the idea of having one registration test for service personnel that is accepted by all states. It was reported that New Hampshire and Arkansas are moving forward with requiring registered service persons to take and pass the appropriate modules.

Laws and Regulations (L&R) Committee Report

Rob Underwood, the Associate Membership Representative on the L&R Committee reported that the hot topic in this committee is the requirements around selling blended gasolines.

AMC Fund Disbursement Report

Chairman Murnane reported that no new funds requests have been received, and that $2,500 was distributed to each of the four regional associations to support their training projects.

Filling Vacant Positions

Chairman Murnane reported that David Calix has agreed to assume the position of Secretary/Treasurer beginning at the conclusion of this meeting. The Committee was asked to approve David for the position and did so with a unanimous vote. With no additional positions to fill; Chairman Murnane reminded the members that the AMC position on the NCWM Board of Directors expires at the conclusion of the 2013 Annual Meeting. Nominations for this position must be submitted to the AMC Chairman before the conclusion of the AMC meeting held in conjunction with the NCWM 2013 Interim Meeting.

Old Business

None to report.

New Business

1. The members present discussed the role of the AMC and voiced a desire for the AMC to play a more active role within the NCWM. These discussions led to several ideas.

    a. Adam Bolain suggested that we could provide training or awareness seminars at industry type tradeshows with the idea of reaching out to the smaller industry groups that are impacted by the work of the NCWM. It was mentioned that this effort would be good for the smaller industries as well as providing possible increase in NCWM membership. This led to the next item.

    b. All AMC members will receive an e-mail asking for information related to training issues. The information could include a list of possible topics for presentation sessions at the NCWM meeting or other related conferences; a list of other conferences or associations that are possible candidates for an AMC sponsored training class; and individuals that are willing to conduct training at the regional weights and measures associations. This e-mail will be sent out to all members in August.

    c. Paul Lewis suggested supporting the NCWM 100th meeting in July 2015. Gordon Johnson was going to inform the BOD of the AMC interest in supporting this special meeting with the idea that the Board could have some ideas on how we can help. Gordon will report on the discussion at our January meeting.

2. Bob Murnane revisited the idea of the AMC developing a toolbox of presentations and information directed at supporting a state weights and measures program. The contents of the toolbox would be available to state and local weights and measure programs for use in supporting or growing their program. Bob suggested the idea of forming a subgroup of AMC members to further develop the idea. Possible subgroup members are Henry Oppermann, Steven Grabski, Richard Suiter, and Chris Guay. Bob will discuss this with the individuals and report on any activity during our January meeting.

Adjournment

With no further new business Chairman Murnane adjourned the meeting at 6:05 p.m.

Respectfully submitted by,
Darrell Flocken,
Secretary, AMC

Individuals in Attendance

Sam Bell – PMAA/Echols Oil Company
Gary Benjamin – NCR Corporation
Gorden Blain – InterteK
Adam Bolain – HJ Heinz
Tim Broemmer – Avery-Weigh-Tronix
David Calix – NCR Corporation
Darrell Flocken – Mettler Toledo
Larry Goodbar – Yamato Corp.
Steven Grabski – Walmart
Chris Guay – Procter & Gamble
Gordon Johnson – Gilbarco, Inc.
Stephen Langford – Cardinal Scale Manufacturing Co
Paul Lewis – Rice Lake Weighing Systems
Bob Murnane – Seraphin Test Measures
Pete O'Bryan – Foster Foods
Henry Oppermann – W&M Consulting
Frank Rusk – Coti-Global Inc.
Louis Straub – Fairbanks Scales
Rob Upright – Vishay Transducers
Rob Underwood – PMAA
Don Onwiler – NCWM
Zina Vuroch – Pier 1 Imports

Report of the Laws and Regulations (L&R) Committee

Judy Cardin, Chairperson
Wisconsin

200 INTRODUCTION

The L&R Committee (hereinafter referred to as the "Committee") submits its Final Report for consideration of the 97th National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during its Interim Meeting in New Orleans, Louisiana, January 22 - 25, 2012. The report addresses the following items in Table A during the Annual Meeting held July 22 - 26, 2012, in Portland, Maine. 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 report 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*, 2012 edition, and NIST Handbook 133, *Checking the Net Contents of Packaged Goods*, 2011 edition. The first three digits 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; **(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. Table C provides the Summary of Voting Results for each Voting Item.

During the Annual Meeting, 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 entertain any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

Committees may change the status designation of agenda items (Developing, Informational, Voting, and Withdrawn) up until the report is adopted, except that items which are marked Developing, Informational or Withdrawn cannot be changed to Voting Status. Any change from the Interim Report or from what appeared 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 **<u>underlining</u>** 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 will appear as appendix items.

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 provided that (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 at all possible, the posting will be done at least a day prior to the planned closed session.

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

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Weights and Measures Law (UWML) ..... 221 Series
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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
API	American Petroleum Institute	NEWMA	Northeastern Weights & Measures Association
ASTM	American Society for Testing and Materials International	NIST	National Institute of Standards and Technology
BOV	Bag on Valve	NPA	National Pasta Association
CFR	Code of Federal Regulations	NTEP	National Type Evaluation Program
CNG	Compressed Natural Gas	OEM	Original Equipment Manufacturer
CRC	Coordinating Research Council	OMB	Office of Management and Budget
CWMA	Central Weights & Measures Assn.	ORVR	On-board Refueling Vapor System
D	Density	OWM	NIST Office of Weights and Measures
EPA	Environmental Protection Agency	PALS	Packaging and Labeling Subcommittee
EVSE	Electric Vehicle Supply Equipment	PDP	Principal Display Panel
FALS	Fuels and Lubricants Subcommittee	PEV	Plug-in Electric Vehicle
FDA	Food and Drug Association	PUC	Public Utility Commission
FPLA	Fair Packaging and Labeling Act	RFA	Renewable Fuels Association
FSS	Fuel Specifications Subcommittee	RMFD	Retail Motor Fuel Dispenser
FTC	Federal Trade Commission	§	Section Symbol
GUM	Guide to the Expression of Uncertainty in Measurement	S&T	Specifications and Tolerances
HB 130	NIST Handbook 130, Uniform Laws and Regulations in the areas of Legal Metrology and Engine Fuel Quality	SAE	Society of Automotive Engineers
HB 133	NIST Handbook 133, Checking the Net Content of Packaged Goods	SWMA	Southern Weights & Measures Association
HDPE	High Density Polyethylene	TG	Task Group
IEC	International Electrotechnical Commission	UPLR	Uniform Packaging and Labeling Regulation
ISO	International Organization for Standardization	UPR	Unit Pricing Regulation
L&R	Laws and Regulations	U.S. EPA	U.S. Environmental Protection Agency
LLPDE	Linear Low Density Polyethylene	USNHWG	U.S. National Hydrogen Work Group
LMDPE	Linear Medium Density Polyethylene	USNWG	U.S. National Work Group
MLWG	Moisture Loss Work Group	UWML	Uniform Weights and Measures Law
NAA	National Aerosol Association	VIM	International Vocabulary of Metrology
NARUC	National Association of Regulatory Utility Commissioners	W&M	Weights and Measures
NBB	National Biodiesel Board	WG	Work Group
NCWM	National Conference on Weights & Measures	WWMA	Western Weights and Measures Association

Table C
Summary of Voting Results

Reference Key Number	*House of Senate Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
Consent Calendar 231-3, 232-1, 232-2, 232-3, 232-7, 237-6, 237-7, 237-9, 237-10, 260-4	34	0	42	0	Adopted
232-4	33	0	42	0	Adopted
237-1	30	3	31	6	Adopted
237-3	30	1	29	3	Adopted
237-4	34	0	39	0	Adopted
260-2	25	7	39	5	Returned to the Committee

Details of All Items
(In order by Reference Key)

210 NIST HANDBOOK 130 – GENERAL

210-1 W Clarification of Terminology

(This item was withdrawn.)

Source:
Mr. Steve Malone (2012)

Purpose: Clarify that weights and measures programs only provide the consumer the ability to make price and quantity comparisons, not the ability to make quality comparisons.

Item Under Consideration:

Amend NIST Handbook 130, Uniform Weights and Measures Law as follows:

Section 12. Powers and Duties of the Director

(n) prescribe, by regulation, the appropriate term or unit of weight or measure to be used, whenever the director determines that an existing practice of declaring the quantity of a commodity or setting charges for a service by weight, measure, numerical count, time, or combination thereof, does not facilitate ~~**value**~~ **quantity** comparisons by consumers, or offers an opportunity for consumer confusion; (Amended 1991, **20XX**)

Amend NIST Handbook 130, Uniform Packaging and Labeling Regulation as follows:

Amend NIST Handbook 130, Uniform Packaging and Labeling Regulation as follows:

Section 13. Retail Sale Price Representations

13.1. "Cents off" Representations.

(c) No "cents off" promotion shall be made available in any circumstances where it is known or there is reason to know that it will be used as an instrumentality for deception or for frustration of value price comparison; e.g., where the retailer charges a price that does not fully pass on to the consumers the represented price reduction or where the retailer fails to display the regular price in the display area of the "cents off" marked product.

13.2. Introductory Offers.

(d) No introductory offer with a "cents off" representation shall be made available in any circumstance where it is known or there is reason to know that it will be used as an instrumentality for deception or for frustration of ~~**value**~~ **price** comparison; e.g., where the retailer charges a price that does not fully pass on to consumers the represented price reduction.

Amend NIST Handbook 130, Uniform Unit Pricing Regulation as follows:

1. Background (Paragraphs 4 and 5)

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

The NCWM also considered several comments on this item from members of the U.S. Metric Association. Most of these comments suggested that the Unit Pricing Regulation (UPR) be amended to require unit pricing in metric units and permit inch-pound unit pricing to be provided voluntarily. When it developed the proposed revisions, NCWM included guidelines for both inch-pound and metric unit pricing and believes this is the correct approach to implementing metric revisions in the regulation. NCWM would like to make it clear that the UPR applies only when stores voluntarily provide unit pricing information. Its purpose is to provide a standard that retailers must follow to ensure that consumers will have pricing information that helps them make ~~**value**~~ **price** comparisons. The decision to provide unit price information in metric or inch-pound units rests with retailers who will respond to consumer preference. NCWM believes that consumer preference will be the deciding factor as to when and how quickly metric unit pricing is used in the marketplace. Therefore, NCWM does not support amendments to include mandatory provisions in the UPR as these provisions would take the decision to go to metric unit pricing out of the hands of consumers and retailers. Finally, NCWM does not want to include any requirement that may discourage retailers from voluntarily providing unit price information.

(Amended 1997, **20XX**)

Amend NIST Handbook 130, NCWM Policy, Interpretations, and Guidelines, Section 2 as follows:

2.2.7. Aerosol Packaged Products

3. Since the labeling of aerosol packaged products by volume cannot be compared with the labeling of such products in terms of net weight, labeling in terms of volume and weight inhibits ~~**value**~~ **quantity** comparisons and causes consumer confusion with respect to the quantity of product the consumer is buying and can be a form of deceptive labeling.

2.3.15. Bulk Sales

3. Present methods of sale and advertising are often misleading.

   Suggestions were made that advertising on a "wrapped weight" basis would properly inform the consumer. However, it was pointed out that a typical purchaser does not know what "wrapped weight" is (i.e., gross weight). Moreover, selling packaged goods on a gross weight basis is illegal; it thwarts ~~**value**~~ **quantity** comparison with other products sold by net weight.

2.6.1. Retail Gas Sales and Metric Price Computations in General

The National Institute of Standards and Technology published equivalent rounded values for metric equivalents of inch-pound units should be used. They are:

3.785 411 784 liters = 1 gallon
0.264 172 052 4 gallon = 1 liter

A "Rule of Reason" should apply to the corrected value so that the value used is consistent with the quantity of the transaction. The converted value should never have fewer than four significant digits

and should have at least the same number of significant digits as the number of significant digits in the quantity of product being converted. For example, if a 1000 gal delivery were to be converted to liters the value would be 3785 liters; for 10 000 gal, 37 854 L; for 100 gal, 378.5 L.

In the case of expressing a unit price equivalent for consumer ~~**value**~~ **price and quantity** comparisons in retail gasoline sales, the following formula should be used: (advertised, posted, or computing device unit price per liter) x 3.785 = (equivalent unit price per gallon, rounded to the nearest $^1/_{10}$ cent.)

2.6.14.2. Declaration of Net Quantity of Contents. – The following information is required to appear on the lower 30 % of the principal display panel of all packages:

Count

The package must include a count declaration (e.g., 1 Chamois) unless the statement of identity clearly expresses the fact that only one unit is contained in the package. A package containing two or more units shall bear a statement in terms of count (e.g., 2 Chamois).
Area

- Chamois packages must have area declarations in both inch-pound and metric units.

Metric

- For areas that measure less than 1 m^2, the area shall be stated in square decimeters and decimal fractions of a square decimeter or in square centimeters and decimal fractions of a square centimeter;

- For areas that measure 1 m^2 or more, the area shall be stated in square meters and decimal fractions to not more than three places.

To facilitate ~~**value**~~ **quantity** comparison and simplify the measurement process, chamois should be measured in one quarter square foot (2.322 57 decimeter) increments. Dimensions should be rounded down to avoid overstating the area.

2.6.15.2. Declaration of Net Quantity of Contents. – The following information must appear on the lower 30 % of the principal display panel of all packages:

- Count

The package must include a count declaration (e.g., 1 sponge) unless the statement of identity clearly expresses the fact that only one unit is contained in the package. A package containing two or more units shall bear a statement in terms of count (e.g., 2 sponges).

- Dimensions

The package must include the dimensions of the sponges in inches and centimeters.

To facilitate ~~**value**~~ **quantity** comparison and simplify the measurement process, sponges should be measured in ½ in (1 cm) increments. Dimensions should be rounded down to avoid overstating the size of a sponge.

Background/Discussion:
The terminology "value comparison" implies that the requirements in NIST Handbook 130 encompass more than price and quantity, they also include the quality. This is not the intent of the requirements or the role for weights and measures officials. In today's litigious world our rules and regulations need to be as clear and concise as possible so that it is not implied that the weights and measure official is providing a quality measurement.

This proposal makes terminology throughout the model laws and regulations consistent with the terminology used in the model Weights and Measures Law and the preamble of the Method of Sale Regulation, as follows:

Uniform Weights and Measures Law, Section 17. Method of Sale

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

Uniform Regulation for the Method of Sale of Commodities, Preamble

The purpose of this regulations is to require accurate and adequate information about commodities so that purchasers can make price and quantity comparisons.

At the 2011 Central Weights and Measures Association Interim Meeting, an industry representative commented that this was an interesting proposal but may create more questions. A state regulator asked the definition of value, to which the submitter replied, "its worth." A state regulator expressed concern because the term "value comparison" is included in his state statute. Another regulator suggested that an alternative to this proposal is to define "value comparison" rather than change the references in the handbook. The Committee determined that "value" is an accepted term in the weights and measures community, and the CWMA recommendation was to Withdraw the item.

At the 2011 Western Weights and Measures Association (WWMA) Annual Meeting, the Committee reviewed the Fair Packaging and Labeling Act (FPLA) and found that the term "value" is used (see below). The Committee firmly believes that language within NIST Handbook 130 needs to be consistent with FPLA and congressional intent. The WWMA, therefore, recommends the item be Withdrawn.

Fair Packaging and Labeling Act (FPLA)

TITLE 15 - COMMERCE AND TRADE

CHAPTER 39 - FAIR PACKAGING AND LABELING PROGRAM

§1451. Congressional Delegation of Policy.

Informed consumers are essential to the fair and efficient functioning of a free market economy. Packages and their labels should enable consumers to obtain accurate information as to the quantity of the contents and should facilitate **value comparisons** (emphasis added). Therefore, it is hereby declared to be the policy of the Congress to assist consumers and manufacturers in reaching these goals in the marketing of consumer goods.

At the 2011 Northeastern Weights and Measures Association (NEWMA) Interim Meeting, there were no comments. The NEWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2011 Southern Weights and Measures Association Annual, the NIST Technical Advisor noted that a change in the language could cause a conflict with some state statutes who the adopt weights and measures law. It was also noted that FPLA consistently uses the term "value comparison." The Committee believes the item has merit and warrants further discussion. The SWMA forwarded the item to NCWM, recommending it as an Informational Item.

At the 2012 Interim Meeting, comments were made that language should remain consistent with language in the FPLA. The history between W&M documents and FPLA should remain intact to allow for traceability back to originating statute. The NCWM 2012 L&R Committee recommends that this item be Withdrawn in its entirety.

221 NIST HANDBOOK 130 – UNIFORM WEIGHTS AND MEASURES LAW

221-1 D Section 1. Definitions

Source:
National Institute of Standards and Technology, Office of Weights and Measures (OWM) (2012)

Purpose:
The 1993 version of the *International Vocabulary of Metrology* (VIM) was updated in 2008 to reflect changes in international agreement about several of the key definitions it contains, in order to better align the definitions with the philosophy of the *Guide to the Expression of Uncertainty in Measurement* (GUM). The current definitions of five entries in the Uniform Weights and Measures Law (UWML) were taken from the 1993 version of the VIM, and do not reflect the changes introduced in the 2008 version of the VIM. The changes proposed below are to update those five entries so that they reflect current international agreement on terminology. Two new definitions that are related to the other five definitions are also being proposed to be added. By incorporating these seven definitions, the UWML will be brought into agreement with current international agreement on these metrology-related definitions. Specific explanations for each of the proposed additions, revisions, and deletions to the definitions are provided below under Background/Discussion.

Item Under Consideration:
Amend NIST Handbook 130, Uniform Weights and Measures Law as follows:

1.14. Calibration. – **An** ~~**A set of operations which establishes,**~~ **operation that,** under specified conditions, ~~**the**~~**in a first step, establishes a relation** ~~**relationship**~~ between **the quantity** values ~~**indicated by a measuring instrument or measuring system, or values represented by a material measure, and the corresponding known values of a measurand**~~ **with measurement uncertainties provided by measurement standards and corresponding indications with associated measurement uncertainties and, in a second step, uses this information to establish a relation for obtaining a measurement result from an indication.**

(Added 2005, **Amended 20XX**)

1.15. Metrological Traceability. – The property of ~~**the**~~ **a measurement** result ~~**of a measurement or the value of a standard**~~ whereby **the result** ~~**it**~~ can be related to ~~**stated**~~ **a** reference~~**s, usually national or international standards,**~~ through **a documented** ~~**an**~~ unbroken chain of ~~**comparisons all having stated uncertainties.**~~ **calibrations, each contributing to the measurement uncertainty.**

(Added 2005, **Amended 20XX**)

1.16. Measurement Uncertainty. – A **non-negative** parameter ~~**associated with the result of a measurement that characterizes**~~ **characterizing** the dispersion of the **quantity** values ~~**that could reasonably be**~~ **being** attributed to **a measurand**~~**, the measurance.**~~ **based on the information used.**

(Added 2005, **Amended 20XX**)

1.19. Standard, Reference Measurement. – A **measurement** standard~~**, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived.**~~ **designated for the calibration of other measurement standards for quantities of a given kind in a given organization or at a given location.** The term "reference **measurement** standards" **usually** means the physical standards of the state that serve as the legal reference from which all other standards for weights and measures within that state are derived.

(Added 2005, **Amended 20XX**)

1.20. Standard, Working Measurement. – A **measurement** standard that is~~ **usually calibrated against a reference standard, and is**~~ used routinely to calibrate or ~~**check material measures, measuring instruments or reference materials.**~~ **verify measuring instruments or measuring systems.** The term "working **measurement** standards" means the physical standards that are traceable to the reference standards

through ~~**comparisons**~~ **calibrations or verifications**, using acceptable laboratory procedures, and used in the enforcement of weights and measures laws and regulations.

(Added 2005, **Amended 20XX**)

1.21. Metrological Traceability Chain. – Sequence of measurement standards and calibrations that is used to relate a measurement result to a reference.

(Added 20XX)

1.22. Metrological Traceability to a Measurement Unit. – Metrological traceability where the reference is the definition of a measurement unit through its practical realization.

(Added 20XX)

Background/Discussion:
Harmonization of NCWM terminology with internationally accepted terminology helps promote global acceptance of U.S. products abroad. Proposed modifications could interfere with commonly used NCWM terminology/ concepts, but the presenter of this proposal believes that is not the case here.

1.14. Calibration. – An ~~**set of operations which establishes, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system, or values represented by a material measure, and the corresponding known values of a measurand.**~~ **operation that, under specified conditions, in a first step, establishes a relation between the quantity values with measurement uncertainties provided by measurement standards and corresponding indications with associated measurement uncertainties and, in a second step, uses this information to establish a relation for obtaining a measurement result from an indication.**

NOTE 1: A calibration may be expressed by a statement, calibration function, calibration diagram, calibration curve, or calibration table. In some cases, it may consist of an additive or multiplicative correction of the indication with associated measurement uncertainty.

NOTE 2: Calibration should not be confused with adjustment of a measuring system, often mistakenly called "self-calibration", nor with verification of calibration.

NOTE 3: Often, the first step alone in the above definition is perceived as being calibration.

(Added 2005, **Amended 20XX**)

1.15. Metrological Traceability. – The ~~**property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties.**~~ **property of a measurement result whereby the result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty.**

NOTE 1: For this definition, a "reference" can be a definition of a measurement unit through its practical realization, or a measurement procedure including the measurement unit for a non-ordinal quantity, or a measurement standard.

NOTE 2: Metrological traceability requires an established calibration hierarchy.

NOTE 3: Specification of the reference must include the time at which this reference was used in establishing the calibration hierarchy, along with any other relevant metrological information about the reference, such as when the first calibration in the calibration hierarchy was performed.

NOTE 4: For measurements with more than one input quantity in the measurement model, each of the input quantity values should itself be metrologically traceable and the calibration hierarchy involved may form a branched structure or a network. The effort involved in establishing metrological traceability for

each input quantity value should be commensurate with its relative contribution to the measurement result.

NOTE 5: Metrological traceability of a measurement result does not ensure that the measurement uncertainty is adequate for a given purpose or that there is an absence of mistakes.

NOTE 6: A comparison between two measurement standards may be viewed as a calibration if the comparison is used to check and, if necessary, correct the quantity value and measurement uncertainty attributed to one of the measurement standards.

NOTE 7: The ILAC considers the elements for confirming metrological traceability to be an unbroken metrological traceability chain to an international measurement standard or a national measurement standard, a documented measurement uncertainty, a documented measurement procedure, accredited technical competence, metrological traceability to the SI, and calibration intervals (see ILAC P 10:2002).

NOTE 8: The abbreviated term "traceability" is sometimes used to mean "metrological traceability" as well as other concepts, such as "sample traceability" or "document traceability" or "instrument traceability" or "material traceability", where the history ("trace") of an item is meant. Therefore, the full term of "metrological traceability" is preferred if there is any risk of confusion.

(Added 2005, **Amended 20XX**)

1.16. Measurement Uncertainty. – A ~~**parameter associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measurance.**~~ **non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used.**

NOTE 1: Measurement uncertainty includes components arising from systematic effects, such as components associated with corrections and the assigned quantity values of measurement standards, as well as the definitional uncertainty. Sometimes estimated systematic effects are not corrected for but, instead, associated measurement uncertainty components are incorporated.

NOTE 2: The parameter may be, for example, a standard deviation called standard measurement uncertainty (or a specified multiple of it), or the half-width of an interval, having a stated coverage probability.

NOTE 3: Measurement uncertainty comprises, in general, many components. Some of these may be evaluated by Type A evaluation of measurement uncertainty from the statistical distribution of the quantity values from series of measurements and can be characterized by standard deviations. The other components, which may be evaluated by Type B evaluation of measurement uncertainty, can also be characterized by standard deviations, evaluated from probability density functions based on experience or other information.

NOTE 4: In general, for a given set of information, it is understood that the measurement uncertainty is associated with a stated quantity value attributed to the measurand. A modification of this value results in a modification of the associated uncertainty.

(Added 2005, **Amended 20XX**)

1.19. Standard, Reference Measurement. – A ~~**standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived.**~~ **measurement standard designated for the calibration of other measurement standards for quantities of a given kind in a given organization or at a given location.** The term "reference standards" means the physical standards of the state that serve as the legal reference from which all other standards for weights and measures within that state are derived.

(Added 2005, **Amended 20XX**)

1.20. Standard, Working Measurement. – A ~~**standard that is usually calibrated against a reference standard, and is used routinely to calibrate or check material measures, measuring instruments or reference materials.**~~ **measurement standard that is used routinely to calibrate or verify measuring instruments or measuring systems.** The term "working standards" means the physical standards that are traceable to the reference standards through comparisons, using acceptable laboratory procedures, and used in the enforcement of weights and measures laws and regulations.

NOTE 1: A working measurement standard is usually calibrated with respect to a reference measurement standard.

NOTE 2: In relation to verification, the terms "check standard" or "control standard" are also sometimes used.

(Added 2005, **Amended 20XX**)

1.21. Metrological Traceability Chain. – Sequence of measurement standards and calibrations that is used to relate a measurement result to a reference.

NOTE 1: A metrological traceability chain is defined through a calibration hierarchy.

NOTE 2: A metrological traceability chain is used to establish metrological traceability of a measurement result.

NOTE 3: A comparison between two measurement standards may be viewed as a calibration if the comparison is used to check and, if necessary, correct the quantity value and measurement uncertainty attributed to one of the measurement standards.

(Added 20XX)

1.22. Metrological Traceability to a Measurement Unit. – Metrological traceability where the reference is the definition of a measurement unit through its practical realization.

NOTE 1: The expression "traceability to the SI" means "metrological traceability to a measurement unit of the International System of Units".

(Added 20XX)

At the 2011 CWMA Interim Meeting, four state regulators commented that they do not support this proposal and asked why the international vocabulary could not align with NCWM. A state regulator asked that NIST, OWM provide examples of problems caused by the lack of alignment with these two publications. The CWMA recommends this item be Withdrawn.

At the 2011 WWMA Annual Meeting, a county official supported the efforts to harmonize the relationship with international counterparts and believes this item should be supported on those grounds. The WWMA supports the idea of the proposal but would like to have staff review this item before proceeding. The WWMA's recommendation is to make this an Information Item.

At the 2011 NEWMA Interim Meeting, the Committee recommended the item as a Developing Item. The NEWMA believes that uniformity of definitions in the international marketplace will result in less confusion.

At the 2011 SWMA Annual, no comments were heard. The SWMA would like to provide members more time for internal review and recommend the item be forwarded to NCWM as an Informational Item.

At the 2012 Interim, the submitter explained that the proposal allows for alignment with the international definitions. There is concern that the international language does not conform to existing language in HB 130. The language appears to be too complicated and could cause misinterpretation. The Committee is recommending that this language be returned to the submitter for formatting, and language review. They would like the submitter to share the document at the 2012 CWMA and NEWMA Annual meetings. The 2012 L&R Committee recommended

this item be considered as a Developing Item. At the 2012 NEWMA Annual Meeting, NEWMA supported this item and recommended that it be further developed.

At the 2012 CWMA Annual Meeting, a NIST Technical Advisor submitted modified definitions and provided additional background information.

Background of each definition (May 2012)

1.14. Calibration. – Justification to amend the definition:

This revision updates the current definition by clarifying that a calibration not only involves comparing indications of measuring instruments with corresponding values (and uncertainties) of measurement standards, but also involves using these comparisons in an "inverse" manner, in order to be able to assign a measured value and measurement uncertainty to an item being measured by the measuring instrument, based on the indication of the measuring instrument. By updating this definition, UWML will recognize that calibration involves a two-step process.

1.15. Metrological Traceability. – Justification to amend the definition:

This revision will update the current definition in four significant ways. First, in the 2008 VIM, "measurement result" means a value and an uncertainty (not just a value, as it meant in the 1993 VIM), so that traceability now applies to both the value and the uncertainty. Second, it is recognized that any acceptable "reference" can be used, and it doesn't have to be a national or international standard. Third, the unbroken chain has to be documented, which wasn't specified in the 1993 definition. And fourth, the chain is a chain of calibrations, and not just comparisons. This is to recognize that a comparison alone is not sufficient for traceability, since a comparison does not result in values being transferred along the chain (as a calibration does). Also, the term "Metrological" is added in front of "Traceability" in order to distinguish this type of traceability from other types (e.g., document traceability). By updating this definition, the UWML will be consistent with international practice, such as used in documents from the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) that pertain to accreditation requirements for (state) metrology laboratories (e.g., ISO/IEC 17025).

1.16. Measurement Uncertainty. – Justification to amend the definition:

This revision updates the current definition by first clarifying that a measurement uncertainty cannot be negative, and also by removing "that could reasonably be attributed," which some people found to be confusing. The term "Measurement" was added in order to distinguish this type of uncertainty from other types. The advantage to updating this definition is that the revisions will bring it into agreement with the 2008 VIM definition.

1.19. Standard, Reference Measurement. – Justification to amend the definition:

This revision will update the current definition in two ways. First, it would no longer be required that a reference measurement standard be of the highest quality available (for example, it could be lower in a metrological traceability chain). Second, it is specified that a reference measurement standard is intended to be used for calibration of other measurement standards (as opposed to being used to make routine measurements). The term "Measurement" was added to the term in order to distinguish this type of reference standard from other types. Updating this definition will reflect current international agreement about reference measurement standards that is consistent with the 2008 VIM.

1.20. Standard, Working Measurement. – Justification to amend the definition:

This revision will update the current definition in two ways. First, a working standard would no longer be required to be directly calibrated by a reference standard (it could, for example, be calibrated by another working standard). Also, this revision will clarify that a working standard can be used for both calibration and

verification. The word "Measurement" was added in order to distinguish this type of standard from other types of working standards. By updating this definition, the UWML will reflect current international agreement about working measurement standards that is consistent with the 2008 VIM.

1.21. Metrological Traceability Chain. – Justification to add the following definition to the UWML:

This is a new definition for that is intended to support the revision to the definition of "metrological traceability" by explaining what is meant in the definition by "chain." By adding this definition, the UWML will reflect current international agreement on traceability that is consistent with ISO and IEC documents that pertain to accreditation requirements for (state) metrology laboratories.

1.22. Metrological Traceability to a Measurement Unit. – Justification to add the following definition to the UWML:

This is a new definition that is intended to support the revision to the definition of "metrological traceability" by explaining what is meant by the expression "traceability to the SI". For example, "(metrological) traceability to the SI" means metrological traceability to the definition of the measurement unit "kilogram" (kg) through the practical realization of the kg at NIST, obtained by calibration of a NIST mass artifact, having a mass of about 1 kg, against the international kilogram in Paris. By adding this definition to the UWML, it will reflect current international agreement on traceability that is consistent with ISO and IEC documents that pertain to accreditation requirements for (state) metrology laboratories.

The CWMA requested that the submitter of the proposal provide a presentation at the 2012 NCWM Annual Meeting that will brief the Conference on the changes and effects to each definition to help provide clarity.

At the 2012 NCWM Annual Meeting, Dr. Charles Ehrlich provided an update as to the purpose of this item. Dr. Ehrlich informed the Committee that he will provide a presentation at the 2013 NCWM Interim Meeting that will give further explanation for each definition. The L&R Committee recommended that the modified definitions provided at the CWMA Annual Meeting be considered. The L&R Committee agreed to modify the language submitted by Dr. Charles Ehrlich and that language is reflected under the Item Under Consideration.

231 NIST HANDBOOK 130 – UNIFORM PACKAGING AND LABELING REGULATION (UPLR)

231-1 I Sections 6.12. Supplementary Quantity Declarations and 6.14. Qualification of Declaration Prohibited

Source:
Central Weights and Measures Association (CWMA)

Purpose:
Provide clearer language to help guide industry and state officials when federal agencies are inconsistent in their interpretations, and this proposal provides better guidance.

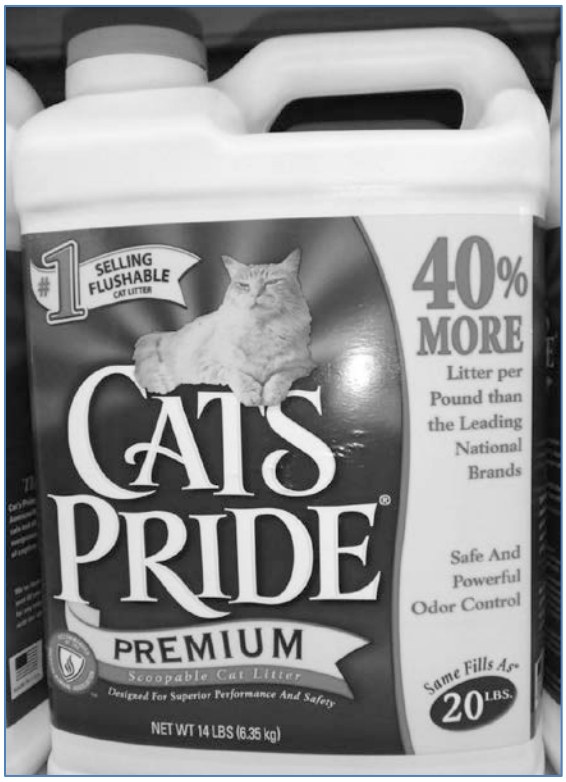
Item Under Consideration:

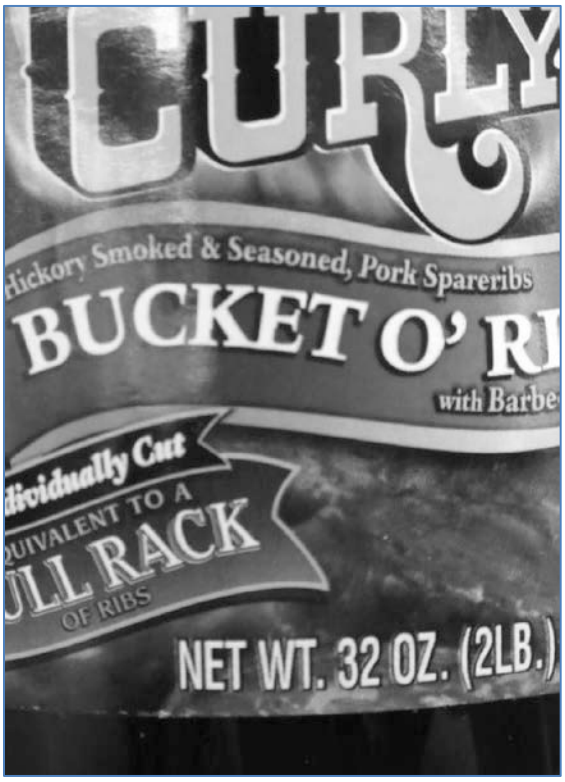
6.12. Supplementary Quantity Declarations. – The required quantity declaration may be supplemented by one or more declarations of weight, measure, or count, such declaration appearing other than on a principal display panel. Such supplemental statement of quantity of contents shall not include any term qualifying a unit of weight, measure, or count that tends to exaggerate the amount of commodity contained in the package (e.g., "giant" quart, "larger" liter, "full" gallon, "when packed," "minimum," **"equivalent," "lasts the same as,"** or words of similar import).

6.14. Qualification of Declaration Prohibited. – In no case shall any declaration of quantity be qualified by the addition of the words "when packed," "minimum," or "not less than," **"equivalent," or "lasts the same as,"** or any words of similar import (e.g., "approximately"), nor shall any unit of weight, measure, or count be qualified by any term (e.g., "jumbo," "giant," "full," or the like) that tends to exaggerate the amount of commodity.
(Amended 1998 and **20XX**)

Background/Discussion:
Manufacturers are using the terms "equivalent" or "lasts the same as" to qualify net weight statements. Clearer language is needed to provide consumers with better information. Industries and state officials need better guidance for product labeling. Currently, the Federal Trade Commission (FTC) does not consider the terms "equivalent," or "lasts the same as" exaggerated or misleading.

At the 2010 CWMA Interim Meeting, a state regulator presented an example of a label (refer to Appendix A in the *Report of the 96th NCWM* [SP 1125, 2011) that was perceived as mislabeled. It was agreed that no conflicting information regarding the net weight statement should be in the lower one-third of the principal display panel (PDP). The CWMA forwarded this item to NCWM, recommending it move forward as a Voting Item.









At the 2011 NCWM Interim Meeting, it was reported that this language was lifted straight out of the Fair Packaging and Labeling Act (FPLA), and if modified, states could run into problems with their investigations. A NIST Technical Advisor stated that language "lasts the same as" or "equivalent" is in the marketplace, which may be misleading to consumers. The Committee was reminded that the lower 30 % of the principal display panel should be free of supplementary quantity declarations as specified in the UPLR, in Section 6.12. Supplementary Quantity Declarations.

The NIST Technical Advisor remarked that the section was amended in 1998 to include the term "approximately" (which is not included in the Federal Regulations) as a prohibited term. There has been no indication that the differences between the UPLR and Federal Regulations are being challenged. It was also recommended that FTC be notified that this is an issue before the Conference. The Committee recommends that the item under consideration be an Informational Item.

At the 2011 NEWMA Annual Meeting, there was a recommendation to obtain additional data from the submitter of the proposal along with clarification from the Federal Trade Commission on their letter dated November 4, 2010. No additional comments were heard on this item. The NEWMA L&R Committee recommended that this item be Informational.

At the 2011 CWMA Annual Meeting, the submitter of the proposal commented that the terms "last the same as" and "equivalent to" are not quantity statements and should not be in the net quantity of the principle display panel area. The CWMA L&R Committee finds that this will be helpful for enforcement issues and recommended that this item be Informational.

At the 2011 NCWM National Meeting, there were no comments heard on this item. The Committee received a letter from Clorox, stating the term "lasts the same as" is being removed from their packaging. The Committee would like to receive additional input from the fall 2011 regional meetings on this item.

At the 2011 CWMA Interim Meeting, several state regulators voiced support of the item and want clear cut guidelines for enforcement. Additionally, regulators would like to see the FTC follow suit in federal law. One state

regulator recommended that the item be referred to the Package and Labeling Subcommittee (PALS). The CWMA supports this item and recommends moving it forward as a Voting Item with no language changes.

At the 2011 WWMA Annual Meeting, there were no comments. The WWMA concurs with the FTC findings that the terms are not misleading. The added terms are deemed a quality statement rather than a quantity statement. WWMA recommended that the item be Withdrawn.

At the 2011 NEWMA Interim Meeting, no comments were made and the Committee maintained a neutral position. NEWMA recommended that the item remain as an Informational Item.

At the 2011 SWMA Annual Meeting, there were no comments heard from the floor. The SWMA L&R Committee supports the proposal as written and recommends the item move forward as a Voting Item.

At the 2012 NCWM Interim Meeting, an industry representative commented that exaggerated and misleading terms need to be addressed. He contends that in the marketplace it is becoming commonplace to see supplemental information appearing on the front of the principal display panel (PDP). Mr. Guay, PALS Chair, is recommending the PALS Committee develops this item to provide additional guidance. The 2012 L&R Committee is recommending that this item be Informational and assigned to PALS for further development.

At the 2012 NEWMA and the CWMA Annual Meetings, both regions supported the development of this item through the PALS. At the CWMA Meeting, Mr. Guay remarked that the PALS has just been formed and have not had an opportunity to meet. However, during the 2012 NCWM Annual Meeting, he provided an update in which he stated this item had been reviewed by the Subcommittee. PALS is planning to provide the NCWM L&R Committee with governing principles regarding claims on packages, and to develop a series of recommendations regarding best practices for these types of label statements.

Additional letters, presentations and data may have been part of the Committee's consideration. Please refer to refer to Appendix A in the *Report of the 96th Annual NCWM Conferen*ce [SP1125, 2011] to review supporting documentation.

231-2 I Section 10.3. Aerosols and Similar Pressurized Containers

Source:
Commonwealth of Massachusetts Division of Standards (2012)

Purpose:
To allow the quantity statement in terms of weight for packages utilizing the Bag on Valve (BOV) technology, where the propellant is not expelled when the valve is activated. NIST HB 130, Uniform Packaging and Labeling Regulations, Section 10.3. Aerosols and Similar Pressurized Containers require aerosols and similar pressurized containers that expel the propellant along with the product to disclose the net quantity in terms of weight.

Item Under Consideration:

10.3. Aerosols and Similar Pressurized Containers. – The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed.

10.3.1. Products labeled non Aerosols in Similar Pressurized Containers (bag on valve [BOV] does not expel propellant with product). – The declaration of quantity shall disclose the net quantity of the commodity in terms of fluid measure.

Background/Discussion:
There are a number of products currently in the marketplace bearing quantity statements in terms of fluid measure that utilize the BOV technology. Value comparison of these products which are non-aerosol by definition because the propellant is not dispensed with the product is not possible, as the products using the BOV technology cannot be

compared with the traditional aerosol packaged product because the propellant is included in the net weight and is dispensed with the product. In the example below, two similar products are pictured; however, the one on the right is labeled by net weight and the one on the left is labeled by liquid measure.



BOV technology is environmentally friendlier because the propellant is not dispensed with the product. Products utilizing the BOV technology only expel the product as the product is contained in a bag which is surrounded by the propellant inside the container. In April 2011, NIST, OWM received a letter supporting labeling of certain products such as the "Pure Citrus" product pictured above by liquid measure.

At the 2011 CWMA Interim Meeting, the CWMA agreed that the proposal did not include a specific recommendation for the language for the amendment to NIST Handbook 130, Uniform Packaging and Labeling Regulations, Section 10.3., Aerosols and Similar Pressurized Containers and recommended that the item be returned to the submitter for Development.

At the 2011 WWMA Annual Meeting, a comment from industry stated there are currently products in the marketplace that are similar but delivered in a different fashion. This should be looked at to account for new technology in the marketplace. Ms. Lisa Warfield, the NIST Technical Advisor read from the 2011 *NEWMA Annual Report* that recommends that the words "non-aerosol" be printed on the label so that inspectors know to test by fluid measure. The Committee believes there may be some confusion to the different unit pricing units but that consumers will be able to determine that there is new technology to expel the product. BOV technology currently exists in the marketplace and a proper method of sale is needed. The WWMA Committee recommends forwarding this item to NCWM as a Voting Item with the language modifications reflected below:

10.3. Aerosols and Similar Pressurized Containers. – The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed.

10.3.1. Products labeled non Aerosols in Similar Pressurized Containers (bag on valve [BOV] does not expel propellant with product). – The declaration of quantity shall disclose the net quantity of the commodity in terms of fluid measure.

After the recommendation, additional comments were accepted. A county official was troubled with the wording "non-aerosol" and thought the intent of the proposal was to allow people to comparison shop between aerosols and non-aerosols. A county official stated the product could be measured by the liquid. A retired NIST, OWM employee questioned how it was measured. A county official wanted to know whether the entire product was expelled when empty. A county official stated that this was not ready for status as a Voting Item. The WWMA L&R Committee met briefly and decided to change the recommendation to a Developing Item.

At the 2011 NEWMA Interim Meeting, it was stated that testing for content could be problematic and that marking on the package should be net weight of product only, not including propellant which is not part of product. The Committee believes there is better comparison of net contents of product being sold if words "NON-AEROSOL PRODUCT" are added to product label. The recommendation is to move the item to a Voting Item with the following revision to add to the container language "A NON-AEROSOL" product.

At the 2011 SWMA Annual Meeting, concern was expressed by an industry weights and measures consultant over an acceptable test procedure that would be used if volume was permitted. The NIST Technical Advisor noted that no specific language has been proposed and that UPLR Section 6.4., Terms: Weight, Measures, Volume, or Count declares that "any net content statement that does not permit price and quantity comparison is forbidden." It was further noted that NIST Handbook 130, Section 10.3. Aerosols and Similar Pressurized Containers apply to aerosols and similar pressurized containers. One manufacturer has provided input to this proposal. The National Aerosol Association (NAA) has been contacted for input into this proposal. Preliminary comment by NAA is that BOV technology or versions of it has been around since the 1990s. The NAA board member believes BOV technology is considered an aerosol, basing his opinion on a California Air Resources Board Regulation. The SWMA Committee requested that specific language be developed for this item and a complete response from the NAA. They also noted that test procedures will need to be discussed if a volume statement is to be considered. SWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2012 NCWM Interim Meeting, the NCWM L&R Committee reviewed several letters from different manufacturers that utilize the BOV technology in which they recommended the appropriate method of sale for BOV style packaging to be volume. Concern was expressed that consumers would not be able to make value comparisons if similar items had different units of measure.

A presentation provided by Mr. Paul Van Slyke with Lock Lord Bissell & Liddell LLP/Blue Magic, Inc., indicated they believe that BOV does not fall under the aerosol guidelines. The reasoning is that a BOV container does not expel propellant with the product and, therefore, it inherently has less net weight. They believe that consumers do not have sufficient information to know differences between aerosols and BOV products. Mr. Van Slyke recommended two solutions amending the UPLR language as follows:

> **10.3. Aerosols and Similar Pressurized Containers.** – The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed**, provided however that containers that separate propellant from the expelled product so that propellant is not expelled (such as containers using bag-on-valve technology) may be labeled either with weight or volume of the quantity of the commodity that will be expelled.**

or

> **10.3. Aerosols and Similar Pressurized Containers.** – The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed.
>
> **10.3.1. Containers that separate propellant from the expelled product so that the propellant is not expelled (such as containers using bag-on-valve technology) shall be prominently labeled NON-AEROSOL. The declaration of quantity shall disclose the net quantity of the commodity in terms of fluid measure.**

Mr. Doug Raymond, National Aerosol Association (NAA) gave a presentation in which he reported his association's position is that a container using BOV technology is an aerosol and its net quantity needs to be declared in terms of net weight. He remarked that bag on valve technology (BOV) has been around for twenty plus years and is not new to the marketplace. Various products are packaged using the bag on valve (BOV) technology (e.g., sunscreen, wound washes, shaving cream, and car products). Different aerosol forms use liquid gas, compressed gases and in barrier forms using Sepro, bladder, and BOV. Mr. Raymond also stated that BOV and non-BOV products are designed to expel their products equally. He also claimed that classifying a BOV container as a non-aerosol is misleading and a safety concern since this product is pressurized.

A county regulator agreed that BOV containers should be labeled and tested by net weight. He remarked that test procedures need to be clarified for BOV containers. For example, should the bag be removed from the canister to recover the product?

Concern was also expressed that consumers would be confused if they encountered similar products with different unit pricing and if the products contents are labeled differently. The BOV proposal that was represented during the 2012 NCWM Interim Meeting was based upon the views of the room air fresheners industry only.

The Committee would like to have a better understanding of the variety and type of products in the marketplace and what is under current development. Clarification is needed for the term "similar products" (i.e., what products meet this classification as defined in NIST Handbook 130, UPLR, Section 10.3. Aerosols and Similar Pressurized Containers). The Committee is also requesting from NIST, OWM clarification on the definition of aerosol and a review for any updates to NIST Handbook 130, Interpretations and Guidelines, Section 2.2.7. Aerosol Packaged Products. The Committee made this an Informational Item.

At the 2012 NEWMA Annual Meeting, it was discussed that there is a conflict with the declaration of content labels in the marketplace between aerosols and bag on valve (BOV) products.

At the 2012 CWMA Annual Meeting, a NIST Technical Advisor stated that the FDA compliance department is reviewing their regulations to see if there is a conflict. NIST has been in contact with the National Aerosol Association, and they will have a representative at the 2012 NCWM Annual Meeting.

At the 2012 NCWM Annual Meeting, Mr. Douglas Raymond, representing the National Aerosol Association, reported that the association is currently working with marketers, companies, and other trade associations, and NAA will provide an update on their position on this item at the 2013 NCWM Interim Meeting. The Committee received and reviewed five letters on this matter.

Additional letters, presentations and data may have been part of the Committee's consideration. To review the supporting documentation, please refer to Appendix B in the *Report of the 96th Annual NCWM Conference* (SP1125, 2011) and Appendix A in this document for additional content.

231-3 V Section 10.11. Statements of Cubic Measure in Compressed Form

(This item was adopted.)

Source:
American Wood Fibers (2012)

Purpose:
Disallow pre-compression volume statements on packages of compressed animal bedding.

Item Under Consideration:
Amend NIST Handbook 130, Packaging and Labeling Regulation, Section 10.11. Statements of Cubic Measures in Compressed Form. Delete Section 10.11. in its entirety:

Delete Section 10.11. in its entirety:

> ~~**10.11. Statements of Cubic Measure in Compressed Form. When the content declaration on a commodity sold in compressed form is stated in terms of cubic measure, an additional statement may indicate the amount of material from which the final product was compressed. The amount in such statement shall not exceed the actual amount of material that can be recovered.**~~
>
> ~~**(Added 1993)**~~

Background/Discussion:
Pre-compression volume statements for compressed animal bedding do not provide consumers with information with which to make fair comparisons of similar products, and may be considered deceptive, since the pre-compressed volume cannot be verified and the usable recovered volume is smaller than the pre-compressed volume.

There is no way for inspectors to field test the pre-compression statement. Pre-compression statements are not in keeping with NIST Handbook 130, Package and Labeling Regulation, 6.14. Qualification of Declaration Prohibited that states, "In no case shall any declaration of quantity be qualified by the addition of the words 'when packed'."

At the 2011 SWMA Annual Meeting, an industry representative stated that declaring a pre-compressed volume is potentially deceptive, and that consumers and inspectors cannot verify. The SWMA L&R Committee believes if pre-compressed volume cannot be verified it should not be stated on packages. SWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2012 NCWM Interim Meeting, the Committee reviewed the entire submitted proposal which included modifications to Method of Sale Regulation, Section 2.23. Animal Bedding (refer to Item 232-3). The Committee agreed to move this item forward for a Voting Item.

At the 2012 NEWMA Annual Meeting, no comments were received on this item. The NEWMA recommends this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 CWMA Annual Meeting, a state regulator remarked that allowing a third declaration of pre-compressed volume confuses the consumer and a pre-compressed volume statement is not relevant to the usable volume.

At the 2012 NCWM Annual Meeting, a county regulator commented that having a pre-compressed statement is meaningless and supports a proposal to prohibit a declaration of pre-compressed volume statement on animal bedding.

232 NIST HANDBOOK 130 – UNIFORM REGULATION FOR THE METHOD OF SALE

232-1 V Section 2.13.4. Declaration of Weight

(This item was adopted.)

Source: Western Weights and Measures Association (2010)

Purpose:
Update HB 130, Section 2.13.4. Declaration of Weight to provide new density values for heavier density plastics that is currently in the marketplace.

Item under Consideration:
Amend NIST Handbook 130, Method of Sale Regulation, Section 2.13.4. Declaration of Weight as follows:

2.13.4. Declaration of Weight. – The labeled statement of weight for polyethylene sheeting and film products under Section 2.13.1.1. Sheeting and Film, and 2.13.3.1. Bags shall be equal to or greater than the weight calculated by using the formula below. The final value shall be calculated to four digits, and declared to three digits, dropping the final digit as calculated (for example, if the calculated value is 2.078 lb, then the declared net weight shall be 2.07 lb).

For SI dimensions:

$M = T \times A \times D/1000$, where:

M = net mass in kilograms

T = nominal thickness in centimeters

A = nominal length in centimeters times nominal width [NOTE 6, page 122] in centimeters

D = **minimum** density in grams per cubic centimeter as ~~**determined**~~ **defined** by ASTM Standard D1505 ~~**10**~~, "Standard Test Method for Density of Plastics by the Density-Gradient Technique" (2010 or latest issue) **and ASTM Standard D883, "Standard Terminology Relating to Plastics" (2011 or latest issue).**

For the purpose of this regulation, the minimum density **for linear low density (D) polyethylene plastics (LLDPE)** shall be 0.92 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for linear medium density (D) polyethylene plastics (LMDPE) shall be 0.93 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for ~~linear~~ high density (D) polyethylene plastics (HDPE) shall be 0.94 g/cm^3 (when D is not known).

For inch-pound dimensions:

W = T × A × 0.03613 × D, where:

W = net weight in pounds;

T = nominal thickness in inches;

A = nominal length in inches times nominal width [NOTE 6, page 123] in inches;

D = minimum density in grams per cubic centimeter as ~~**determined**~~ **defined** by ASTM Standard D1505 ~~**68**~~, Standard **Test** Method ~~**of Tes**~~t for Density of Plastics by the Density Gradient Technique (**2010** or latest issue); **and ASTM Standard D883, "Standard Terminology Relating to Plastics" (2011 or latest issue)**; ~~**and**~~

0.03613 the factor for converting g/cm^3 to lb/in^3

For the purpose of this regulation, the minimum density **for linear low density (D) polyethylene plastics (LLDPE)** shall be 0.92 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for linear medium density (D) polyethylene plastics (LMDPE) shall be 0.93 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for ~~linear~~ high density (D) polyethylene plastics (HDPE) shall be 0.94 g/cm^3 (when D is not known).

(Added 1977) (Amended 1980, 1982, 1987, 1989, 1990, ~~**and**~~ 1993**, and 20XX**)

NOTE 6: *The nominal width for bags in this calculation is twice the labeled width.*

Background/Discussion:
It was stated at the 2009 WWMA Annual Meeting that manufacturers and distributors of polyethylene bags are using the calculated target weight identified in NIST Handbook 130, Uniform Regulation for the Method of Sale, Section 2.13.4. Declaration of Weights, to understate the net quantity of their labels. The polyethylene industry recognizes a density value of 0.92 g/cm³ for linear low density polyethylene (LLDP) products. When 0.92 g/cm³ is used to calculate the target net weight of high density polyethylene (HDPE), the product may make the target net weight. However, when the appropriate density value of 0.95 g/cm³ is used to test HDPE, the product often fails to meet the calculated target net weight. Further testing reveals than one or more of the labeled width, thickness, or count statements are inaccurate. It appears that some manufacturers are aware that weights and measures officials are restricted to testing HDPE product using the 0.92 g/cm³ value, because the actual density value is not stated on the product label. Existing procedural guidelines do not address HDPE materials. When testing at manufacturing

locations, weights and measures officials are able to obtain information regarding the density of the product directly from the manufacturer. However, at distributor locations density information is not available and officials must test using the 0.92 g/cm³ value designated in NIST Handbooks 130 and 133 to verify the weight of the product. When the product has no net weight statement on the package, 0.92 g/cm³ is the only factor that the inspector may use to calculate the target net weight.

Initial proposal submitted in 2009:
Amend NIST Handbook 130, Method of Sale Regulation, Section 2.13.4. as follows:

2.13.4. Declaration of Weight. – The labeled statement of weight for polyethylene sheeting and film products under Sections 2.13.1.1. Sheeting and Film, and 2.13.3.1. Bags, shall be equal to or greater than the weight calculated by using the formula below. The final value shall be calculated to four digits, and declared to three digits, dropping the final digit as calculated (for example, if the calculated value is 2.078 lb, then the declared net weight shall be 2.07 lb).

For SI dimensions:

$M = T \times A \times D/1000$, where:

M = net mass in kilograms

T = nominal thickness in centimeters

A = nominal length in centimeters times nominal width [***NOTE 6***, page 122] in centimeters

D = density in grams per cubic centimeter as determined by ASTM Standard D1505 68, Standard Method of Test for Density of Plastics by the Density Gradient Technique (or latest issue)

For the purpose of this regulation, **when D is not labeled on the package,** ~~**known,**~~ the minimum density **(D) used to calculate the target net weight for linear low density polyethylene products (LLPD) and products other than high density (HDPE)** shall be 0.92 g/cm³ ~~**(when D is not known).**~~ **For products labeled High Density (HDPE) or similar wording, which does not specify the minimum density (D) on the package label, the minimum density (D) used to calculate the target net weight shall be 0.95 g/cm³.**

For inch-pound dimensions:

$W = T \times A \times 0.03613 \times D$, where:

W = net weight in pounds;

T = nominal thickness in inches;

A = nominal length in inches times nominal width [***NOTE 6***, page 122] in inches;

D = density in grams per cubic centimeter as determined by ASTM Standard D1505 68, Standard Method of Test for Density of Plastics by the Density Gradient Technique (or latest issue); and 0.03613 is a factor for converting g/cm³ to lb/in³.

~~**For the purpose of this regulation, the minimum density shall be 0.92 g/cm³.**~~
(Added 1977) (Amended 1980, 1982, 1987, 1989, 1990, ~~**and**~~ 1993**, and 201X**)

NOTE 6: *The nominal width for bags in this calculation is twice the labeled width.*

The 2009 WWMA Annual Meeting, the Committee supported the following with changes as presented below. WWMA forwarded the item as amended to NCWM, recommending it be a Voting Item:

2.13.4. Declaration of Weight. – The labeled statement …

~~**For the purpose of this regulation, the minimum density shall be 0.92 g/cm³ (when D is not known).**~~
~~**For the purpose of this regulation, the minimum density shall be 0.92 g/cm³.**~~

Amend NIST Handbook 130, Section 2.13.4. Declaration of Weight as follows:

For the purpose of this regulation, **when D is not known,** the minimum density **(D) used to calculate the target net weight for linear low polyethylene products (LLDP) and products other than high density (HDPE)** shall be 0.92 g/cm³ ~~**(when D is not known)**~~**. For products labeled "High Density," HDPE, or similar wording, the minimum density (D) used to calculate the target net weight shall be 0.95 g/cm³.**

The 2009 NEWMA Interim Meeting, the Committee forwarded the item to NCWM, with the recommendation that it be a Developing Item.

At the 2010 NCWM Interim Meeting, the Committee heard support for changing the density factor from 0.92 g/cm³ to 0.95 g/cm³ on this item. A county commissioner (California) indicated that the information provided by the WWMA was data extracted from Internet searches. Manufacturers are complaining that under current practice they cannot compete fairly. Mr. Jackelen urged the Committee to reject this proposal. Mr. Jackelen stated that 0.92 g/cm³ density currently works for manufacturers and changing it to 0.95 g/cm³ will cause undue cost and waste. Most manufacturers do not make high density (HD) bags, but are producing blends. According to Mr. Jackelen, another reason to reject the proposal is if the 0.95 g/cm³ bag is punctured, it continues to tear.

A state official commented that if you use the term HD, then you are bound by the 0.95 g/cm³. If you use the length × width × thickness × density to determine the net weight, then the density value needs to be added on the package labeling. A state official said that manufacturers should consider disclosing the density factor on every product as part of the labeling. It was voiced that if there are questions about an absolute 0.95 g/cm³ density, then there should be an alternative. Another state official commented that the 0.95 g/cm³ will be factored in only when the density is not known. The Committee received letters that were reviewed on this item. The Committee recommended moving the item under consideration forward as a Voting Item.

At the 2010 NEWMA Annual Meeting, there was concern that there appears to be a lack of data on this item. It was not reviewed by all regions, nor was it presented to industry to seek comments. The NEWMA L&R Committee felt that this item was not an emergency and wanted the opportunity to review comments received from all the regions and industry.

At the 2010 CWMA Annual Meeting, the CWMA heard no comments on this item and recommends moving it forward as a Voting Item.

At the 2010 NCWM Annual Meeting, the Committee heard from Mr. Jackelen who opposed this item and requested that it be Withdrawn. Mr. Jackelen believes this proposal will have a detrimental effect because can liners are made of natural gas and oil and the cost of these two items are increasing. Currently, the 0.92 g/cm³ is an established practice in industry and the marketplace, and is used to set the bottom weight. Changing this density will cause confusion. Mr. Jackelen clarified that high density (HD) does not mean it is a better density. There are other linear bags that have higher quality than HD. As far as sustainability, if 0.95 g/cm³ is the established requirement it will cause an additional 12 million pounds of trash to be generated.

An official countered that the intent of this proposal is to provide the inspectors with information. There is fraud in the marketplace on these types of items and additional information is warranted. A director recommends that a minor amendment be done to the item under consideration, and insert "for products labeled HD when the D is not on the package label use 0.95 g/cm³." Also, use a similar statement "if the packer or manufacturer does not disclose the density then use 0.95 g/cm³." The director pointed out that it is not the role of the Conference to address quality issues, but to have a level playing field for inspectors to test a product. Another official remarked that companies need to identify their product on the container, and inspectors will use what density is disclosed.

The Committee received one letter asking for the withdrawal of this item, and California submitted material safety data sheets from several companies. The Committee considered comments received and agreed that more work was needed so the item was changed to an Informational status.

At the 2010 CWMA Interim Meeting, there were no comments heard on this item. The CWMA recommends that this item remain an Informational Item.

At the 2010 WWMA Annual Meeting, a state official commented that 10 companies have filed complaints concerning products being mislabeled, where the density was unknown. A state official submitted new language to replace a portion of language within the item under consideration. Two county officials spoke in support of the amended item, which would assist weights and measures officials in the field. A county official submitted a letter of support. The WWMA recommends that the amended language move forward as a Voting Item as amended with the SI dimensions included.

Amend NIST Handbook 130, Section 2.13.4. Declaration of Weight as follows:

For the purpose of this regulation, **when D is not labeled on the package,** ~~**known,**~~ the minimum density **(D) used to calculate the target net weight for linear low density polyethylene products (LLPD) and products other than high density (HDPE)** shall be 0.92 g/cm^3 ~~**(when D is not known).**~~ **For products labeled High Density (HDPE) or similar wording, which does not specify the minimum density (D) on the package label, the minimum density (D) used to calculate the target net weight shall be 0.95 g/cm³.**

At the 2010 SWMA Annual Meeting, there were no comments heard on this item. The SWMA would like to seek additional comments from industry, other than material safety data sheets. The SWMA recommends that the item move forward as an Informational item.

At the 2010 NEWMA Interim Meeting held in Norwich, Connecticut, they noted that this proposal is confusing and that additional work needs to be done to clarify the impact of the proposed changes on manufacturers and consumers. The NEWMA recommends this move forward as a Developing item.

At the 2011 NCWM Interim Meeting, Mr. Jackelen restated that this item, as written, will have a detrimental effect on the industry due to the high cost of plastics. Mr. Jackelen further explained that high density plastics are of higher quality, but are of a thinner gauge which subjects it to tearing. A state regulator stated that the WWMA recommended a change to the language for specifying that only when the density is not known or not labeled then the 0.95 g/cm³ would apply.

The Committee agreed that adding a requirement, which gives the manufacturer the option of providing the actual density of the plastic provides flexibility for industry and will assist weights and measures officials to ensure the accuracy of quantity declarations. The Committee recommends the revised language under consideration from the WWMA move forward as a Voting Item.

At the 2011 NEWMA and the CWMA Annual Meetings, there were no comments heard on this item. Both associations recommended this item be a Voting Item.

At the 2011 NCWM Annual Meeting, it was noted that there is a corresponding test procedure proposal on the agenda under Item 260-2. Mr. Jackelen stated that if such a proposal passes it would have a detrimental effect on the plastics industry. This product is currently being made from oil and gas, both of which prices have skyrocketed. By adopting the 0.95 g/cm³ density, an additional 12 million pounds of plastics would be added into the marketplace and ultimately landfills at current productions rates. Current industry practice is 0.92 g/cm³ for high density polyethylene. Introducing a change will only confuse the marketplace. A director spoke in support of this proposal saying it will give weights and measures officials a tool to check non-consumer packages. It was emphasized that "D" could be stated on the product, but, if not, officials need a density factor in order to conduct inspections. This director also reminded everyone that this issue is about accuracy and not quality. Another director expressed concern with the term "when D is not known." Currently 0.92 g/cm³ is the lower density rating, when "D" is not known, the proposed language will allow industry to use densities lower than 0.92 g/cm³. A letter from industry was

received stating that 0.95 g/cm³ may not represent the density of HDPW currently in the marketplace. Industry indicated that 0.948 g/cm³ is a more accurate factor. The Committee believes that additional data from industry needs to be received on the density factors before proceeding with this item. The Committee returned this item back to Informational status.

At the 2011 CWMA and NEWMA Interim Meetings, both associations recommended keeping this item as an Informational Item based on testimony at the 2011 NCWM Annual Meeting.

At the 2011 WWMA Annual Meeting, Mr. Jackelen commented that he does not support this proposal. A state official commented that the formula for testing polyethylene is used to minimize destructive testing being performed, also serving to speed up the inspection process. A county official recommends that a subsection (E) "Density" be added to NIST Handbook 130, Method of Sale Regulation, Sections 2.13.1.1. Sheeting and Film and 2.13.3.1. Bags add a subsection (f) "Density." This will require manufacturers to place the density on the labeling.

The WWMA L&R Committee reviewed the ASTM definitions for high density, low density, and medium density. It was agreed that the use of the ASTM defined density would clarify the proposal. The WWMA L&R Committee took the existing language out of NIST Handbook 130 (2011) and edited as shown below. The WWMA recommends moving the item forward as a Vote as amended below:

2.13.4. Declaration of Weight. – The labeled statement of weight for polyethylene sheeting and film products under Section 2.13.1.1. Sheeting and Film, and 2.13.3.1. Bags, shall be equal to or greater than the weight calculated by using the formula below. The final value shall be calculated to four digits, and declared to three digits, dropping the final digit as calculated (for example, if the calculated value is 2.078 lb, then the declared net weight shall be 2.07 lb).

For SI dimensions:

$M = T \times A \times D/1000$, where:

M = net mass in kilograms

T = nominal thickness in centimeters

A = nominal length in centimeters times nominal width [***NOTE 6***, page 123] in centimeters

D = density in grams per cubic centimeter as ~~**determined**~~ **defined** by ASTM Standard ~~**D1505-68, Standard Method of Test for Density of Plastics by the Density-Gradient Technique**~~ **D883 (2011), Standard Terminology Relating to Plastics** (or latest issue)

For the purpose of this regulation, the minimum density **for linear low density polyethylene plastics, (LLDPE)** shall be 0.92 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for linear medium density polyethylene plastics, (LMDPE) shall be 0.93 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for linear high density polyethylene plastics, (HDPE) shall be 0.94 g/cm^3 (when D is not known).

For inch-pound dimensions:

$W = T \times A \times 0.03613 \times D$, where:

W = net weight in pounds

T = nominal thickness in inches;

A = nominal length in inches times nominal width [*NOTE 6*, page 123] in inches

D = density in grams per cubic centimeter as ~~**determined**~~ **defined** by ASTM Standard ~~**D1505-68, Standard Method of Test for Density of Plastics by the Density Gradient Technique**~~ **D883 (2011), Standard Terminology Relating to Plastics** (or latest issue); and 0.03613 is a factor for converting g/cm^3 to lb/in^3

For the purpose of this regulation, the minimum density **for linear low density polyethylene plastics, (LLDPE)** shall be 0.92 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for linear medium density polyethylene plastics, (LMDPE) shall be 0.93 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for linear high density polyethylene plastics, (HDPE) shall be 0.94 g/cm^3 (when D is not known).

(Added 1977) (Amended 1980, 1982, 1987, 1989, 1990, ~~**and**~~ 1993**, and 20XX**)

NOTE 6: *The nominal width for bags in this calculation is twice the labeled width.*

At the 2011 SWMA Annual Meeting, no comments were heard. The SWMA supported the item as written pending clarification of high density. SWMA recommended the item move forward as a Voting Item.

At the 2012 NCWM Interim Meeting, the Committee reviewed OWM Publication 15 (2012) Item Under Consideration:

NIST Handbook 130, Method of Sale Regulation, Section 2.13.4.:

2.13.4. Declaration of Weight. – The labeled statement of weight for polyethylene sheeting and film products under Sections 2.13.1.1. Sheeting and Film and 2.13.3.1. Bags, shall be equal to or greater than the weight calculated by using the formula below. The final value shall be calculated to four digits, and declared to three digits, dropping the final digit as calculated (for example, if the calculated value is 2.078 lb, then the declared net weight shall be 2.07 lb).

For SI dimensions:

M = T × A × D/1000, where:

M = net mass in kilograms

T = nominal thickness in centimeters

A = nominal length in centimeters times nominal width [*NOTE 6*, page 122] in centimeters

D = density in grams per cubic centimeter as determined by ASTM Standard D1505 ~~**-68**~~, Standard Method of Test for Density of Plastics by the Density Gradient Technique (**2010** or latest issue)

For the purpose of this regulation, **when D is not known,** the minimum density **(D) used to calculate the target net weight for linear low polyethylene products (LLPD) and products other than high density (HDPE)** shall be 0.92 g/cm^3 ~~**(when D is not known)**~~.

For products labeled High Density (HDPE) or similar wording, the minimum density (D) used to calculate the target net weight shall be 0.95 g/cm^3.

For inch-pound dimensions:

$W = T \times A \times 0.03613 \times D$, where:

W = net weight in pounds;

T = nominal thickness in inches;

A = nominal length in inches times nominal width [***NOTE 6***, page 123] in inches;

D = density in grams per cubic centimeter as determined by ASTM Standard D1505 ~~68~~, Standard Method of Test for Density of Plastics by the Density Gradient Technique (**2010** or latest issue); and 0.03613 is a factor for converting g/cm^3 to lb/in^3.

~~**For the purpose of this regulation, the minimum density shall be 0.92 g/cm^3.**~~
(Added 1977) (Amended 1980, 1982, 1987, 1989, 1990, ~~**and**~~ 1993**, and 20XX**)

NOTE 6: *The nominal width for bags in this calculation is twice the labeled width.*

Mike Jackelen commented that the information he previously submitted letters to the Committee is still valid. He stated that if this item is passed it will have a detrimental effect on industry. Can liners are made from oil and gas which have drastically increased in price. Mr. Jackelen also spoke in regards to the 2011 WWMA language, and that the medium density is not being manufactured or used in the marketplace

An official urged that the Committee move the language from the 2011 WWMA forward as a Voting Item. The 2012 L&R Committee designated this item as a Voting Item using language received from the 2011 WWMA along with editorial privileges to add reference to ASTM D1505 and ASTM D883.

At the 2012 NEWMA Annual Meeting NEWMA received a comment on whether a 0.093 g/cm^3 density resolves the issue. It was discussed that this allows the density to meet an ASTM standard. The NEWMA recommended that this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 CWMA Annual Meeting, the CWMA recommended this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 NCWM Annual Meeting, Mr. Jackelen with Berry Plastics opposed this item for several reasons; various blends that are made from natural resources; oil and gas, a 0.92 g/cm^3 density sets the bottom limit, sustainability in creating waste and consumer confusion. Mr. Jackelen has submitted letters regarding his objections to the Committee, which are on record in the *Report of the 96th NCWM* (SP 1125, 2011). Several state and county regulators support this item since the formula for testing polyethylene is used to minimize destructive testing being performed; also, serving to speed up the inspection process.

After discussing the comments from the 2012 NCWM Annual Meeting Open Hearings and the proposed changes, the Committee agreed to modify the language in its interim report to that shown in this final report in the Item Under Consideration. This will provide densities that are representative of the actual densities use by manufacturers to improve the usability of the weight calculations. The Committee made two editorial changes to the item to align with the ASTM standard: 1) replace the term “products” with “plastics”; and 2) remove the word “linear” from the definition of high density polyethylene.

Additional letters, presentations and data may have been part of the Committee’s consideration. Please refer to Appendix I, *Report of the 95th NCWM* (SP 1115, 2010) and Appendix B in the *Report of the 96th NCWM* (SP 1125, 2011) for additional content.

232-2 V Section 2.19. Kerosene

(This item was adopted.)

Source:
Kansas Department of Agriculture (2012)

Purpose:
Establish a method of retail sale for bulk Kerosene.

Item Under Consideration:
Amend NIST Handbook 130, Method of Sale Regulation as follows:

2.19. Kerosene. – All kerosene kept, offered, exposed for sale, or sold shall be identified as such and will include, with the word kerosene, an indication of its compliance with the standard specification adopted by ASTM International (ASTM) in Specification number D3699 (2008 or latest revision).

Example: 1K Kerosene; Kerosene - 2K.

(Added 1983)

2.19.1. Retail Sale from Bulk. – All kerosene kept, offered, or exposed for sale and sold from bulk at retail shall be in terms of the gallon or liter.

(Added 2012)

Background/Discussion:
No method of sale regulation exists for kerosene except for labeling. Some individuals want to sell kerosene by weight which would frustrate price and quantity comparison. This proposal would better define the method of sale.

At the 2011 CWMA Interim Meeting, there were several comments from state regulators expressing concerns such as the lack of recognition of the metric unit, bulk sales, and reference temperatures for prepackaged containers and whether this is prohibitive of selling by weight. Kerosene is a dwindling market and the cost of a meter could be prohibitive. The preponderance of comments received indicates this item needs more development. THE CWMA did not forward the item to NCWM and recommended that the item be returned to submitter for development.

At the 2011 WWMA Annual Meeting, a comment was made that the metric equivalent needs to be stated. The WWMA forwarded this item to NCWM, recommending it as a Voting Item as it appears below.

2.19. Kerosene. – All kerosene kept, offered, exposed for sale, or sold shall be identified as such and will include, with the word kerosene, an indication of its compliance with the standard specification adopted by ASTM International (ASTM) in Specification number D3699 (1982 or latest revision).

Example:
1K Kerosene; Kerosene - 2K.

(Added 1983)

2.19.1. All kerosene kept, offered, or exposed for sale and sold at retail shall be in terms of the gallon (as defined as 231 in^3 at 60 °F [15.6 °C]).

At the 2011 NEWMA Interim Meeting, it was stated that sale of kerosene is by liquid measure rather than weight when dispensed from bulk. Method of sale should be consistent with other such liquid methods of sale (i.e., diesel and gasoline [including ethanol and biofuel] products). The NEWMA recommends making this a Developing Item.

At the 2011 SWMA Annual Meeting, no comments were heard and the SWMA recommends this as a Voting Item.

At the 2012 Interim Meeting, the submitter clarified that this is to define a method of sale for retail bulk kerosene. The Committee reviewed all language changes submitted by the regions. The 2012 L&R Committee made minor editorial corrections and is recommending that it move forward as a Voting Item.

At the 2012 NEWMA Annual Meeting, the NEWMA recommends this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 CWMA Annual Meeting, a representative stated that kerosene is a liquid and must be sold by volume. A state representative remarked there are small retailers that are selling by weight, and it would be an unnecessary hardship for them to purchase equipment to sell by volume. Three state representatives rose to oppose this item during the open hearings. THE CWMA recommends this item be considered as a Voting Item at the 2012 NCWM Annual Meeting.

At the 2012 NCWM Annual Meeting no comments were received on this item.

232-3 V Section 2.23. Animal Bedding

(This item was adopted.)

Source:
American Wood Fibers (2012)

Purpose:
Disallow pre-compression volume statements on packages of compressed animal bedding.

Item Under Consideration:
Amend NIST Handbook 130, Uniform Regulation for Method of Sale, Section 2.23. Animal Bedding as follows:

2.23. Animal Bedding. – Packaged animal bedding of all kinds, except for baled straw, shall be sold by volume, that is, by the cubic meter, liter, or milliliter and by the cubic yard, cubic foot, or cubic inch. If the commodity is packaged in a compressed state, the quantity declaration shall include both the quantity in the compressed state and the usable quantity that can be recovered. **Compressed animal bedding packages shall not include pre-compression volume statements.**

Example:
250 mL expands to 500 mL (500 in^3 expands to 1000 in^3).

(Added 1990, **Amended 2012**)

2.23.1. Exemption – Non-Consumer Packages Sold to Laboratory Animal Research Industry. – Packaged animal bedding consisting of granular corncobs and other dry (8 % or less moisture), pelleted, and/or non-compressible bedding materials that are sold to commercial (non-retail) end users in the laboratory animal research industry (government, medical, university, preclinical, pharmaceutical, research, biotech, and research institutions) may be sold on the basis of weight.

(Added 2010)

Background/Discussion:

1. Pre-compression volume statements for compressed animal bedding do not provide consumers with information with which to make fair comparisons of similar products, and may be considered deceptive, since the pre-compressed volume cannot be verified and the usable recovered volume is smaller than the pre-compressed volume.
2. There is no way for inspectors to field test the pre-compression statement.
3. Pre-compression statements are not in keeping with Package and Labeling Regulation, Section 6.14. Qualification of Declaration Prohibited which states, "In no case shall any declaration of quantity be qualified by the addition of the words 'when packed,'…."

At the 2011 SWMA Annual Meeting an industry representative stated that declaring a pre-compressed volume is potentially deceptive, and that consumers and inspectors cannot verify it. The SWMA L&R Committee agreed that pre-compressed volume should not be stated on packages if it cannot be verified. SWMA forwarded the item to NCWM with the recommendation that it be considered as a Voting Item.

At the 2012 NCWM Interim Meeting, the Committee reviewed the submitted proposal, which included removal of the UPLR, Section 10.11. Statement of Cubic Measure in Compressed Form (refer to Item 231-3, Section 10.11. Statements of Cubic Measures in Compressed Form). The 2012 L&R Committee designated this item as a Voting Item with minor editorial revisions.

At the 2012 NEWMA Annual Meeting there were no comments heard on this item. NEWMA recommends this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 CWMA Annual Meeting, it was remarked that required quantity statements are compressed and useable volume. Allowing a third declaration of pre-compressed volume only confuses the consumers and is not relevant to the usable volume. The CWMA recommends this item to be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 NCWM Annual Meeting a county director spoke in support of this item. There were no comments received in opposition of this item.

The Committee agreed that pre-compressed volume should not be stated on packages if it cannot be verified. SWMA forwarded the item to NCWM with the recommendation that it be considered as a Voting Item.

232-4 V Section 2.33. Vehicle Motor Oil

(This item was adopted.)

Source:
Central Weights and Measures Association (2011)

Purpose:
Provide a method of sale regulation for vehicle motor oil that would correspond with the NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation and require detailed invoicing requirements.

Item Under Consideration:
Provide specific language for Labeling of Vehicle Motor Oil in NIST Handbook 130, Method of Sale Regulation as follows:

2.33. Oil.

2.33.1. Labeling of Vehicle Engine (Motor) Oil. – Vehicle engine (motor) oil shall be labeled.

2.33.1.1. Viscosity. – The label on ~~a~~ any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank, and ~~the~~ any invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank, shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300, "Engine Oil Viscosity Classification."

2.33.1.2. Intended Use. – The label on any vehicle engine (motor) oil container shall contain a statement of its intended use in accordance with the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than 'Energy Conserving')."

2.33.1.3. Brand. – The label on any vehicle engine (motor) oil container and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil

dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle engine (motor) oil.

2.33.1.4. Engine Service Category. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the engine service category, or categories, met in letters not less than 3.18 mm ($^{1}/_{8}$ in) in height, as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than 'Energy Conserving')" or API Publication 1509, "Engine Oil Licensing and Certification System."

2.33.1.4.1. Inactive or Obsolete Service Categories. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with SAE J183, Appendix A, whenever the vehicle engine (motor) oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than 'Energy Conserving')."

2.33.1.4.~~2~~5. Tank Trucks or Rail Cars. – Tank trucks, rail cars, ~~or~~ and other types of delivery trucks that are used to deliver vehicle engine (motor) oil are not required to display the SAE viscosity grade and service category or categories as long as the bill of lading or other documentation provides that information.

All references to invoice or receipt will be enforceable effective on July 1, 2013.

(Added 2012)

Background/Discussion:
At the 2010 CWMA Interim Meeting, a state regulator stated that oil changing facilities are affecting revenues from legitimate businesses by masquerading as branded facilities, while selling lower-quality oil. The consumer believes they are receiving the advertised brand of oil. At least one branded oil company has investigated certain questionable installers, filed lawsuits, and have successfully closed those suits with installers in the area of trademark infringement and deceptive trade practices. To assist in mitigating these unlawful trade practices and to protect consumers against fraudulent activity, it is recommended that invoice be established. A state regulator questioned if businesses were using the same hose for hydraulic and motor oil, or if the hose would be flushed prior to using it for a different product. He remarked that there would be a contamination factor. The CWMA recommends that the item under consideration move forward to NCWM L&R Committee for consideration.

At the 2011 NCWM Interim Meeting, it was pointed out that if Item 237-6, NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation, Section 3.13.1. Labeling of Vehicle Motor Oil was adopted by the Conference it would require a corresponding method of sale. It was also noted that this method of sale is important to consumers and stakeholders because not all of the states adopt the Engine Fuels and Lubricants Regulation. The Committee recommends this item move forward as a Voting Item.

2.33. Oil.

2.33.1. Labeling of Vehicle Motor Oil.

2.33.1.1. Viscosity. – The label on a vehicle motor oil container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300.

2.33.1.2. Intended Use. – The label on a vehicle motor oil container shall contain a statement of its intended use in accordance with the latest version of SAE J183.

2.33.1.3. Brand – The label on a vehicle motor oil container and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle motor oil.

2.33.1.4. Engine Service Category. – The label on a vehicle motor oil container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank shall contain the engine service category, or categories, met in letters not less than 3.18 mm ($\frac{1}{8}$ in) in height, as defined by the latest version of SAE J183 or API Publication 1509, "Engine Oil Licensing and Certification System."

2.33.1.4.1. Inactive or Obsolete Service Categories. – The label on a vehicle motor oil container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with SAE J183, Appendix A, whenever the vehicle motor oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183.

2.33.1.4.2. Tank Trucks or Rail Cars. – Tank trucks, rail cars, or other types of delivery trucks that are used to deliver vehicle motor oil are not required to display the SAE viscosity grade and service category or categories as long as the bill of lading or other documentation provides that information.

(Added 201X)

At the 2011 NEWMA Annual Meeting, membership reviewed the proposal under the background/discussion, and it was noted that the title to the SAE and API standard would be noted. It was also noted to change the word "motor" to "engine." A representative from API did not object to these changes. The NEWMA recommended that this item move forward as a Voting Item.

At the 2011 CWMA Annual Meeting there was support from API and a state representative. The CWMA L&R Committee recommended that this item move forward as a Voting Item.

At the 2011 NCWM Annual Meeting, the Committee was asked whether it is appropriate for Section 2.33.1.3. Brand to be included in this proposal. American Petroleum Institute (API) and some state regulators agree that this section is important for traceability purposes. The API representative stated that bulk oils are the weak link in the property chain. API does have a licensing program for engine oil, but without knowing the brand name, it would be hard to determine compliance with any specifications. A state representative expressed concern with the cost and training for testing the "brand." There is concern that some car manufacturers will void a warranty unless a specific brand is used. The FALS Chairperson supports this proposal so that producers can guarantee their product and enforce mislabeling. The FALS group believes this item has unanimous support. The Committee noted that the SAE and API standards technical title would be editorially placed in the proposal. The Committee was also asked to consider changing the term "motor" to "engine," but after a discussion with the Fuels and Lubricants Subcommittee Chair, it was recommended to keep the term "motor." The Committee added the words "or receipt" after the word "invoice" throughout this proposal. The Committee also believes that time needs to be granted for the implementation of this regulation so the words, "All references to invoice or receipt will be enforceable effective on July 1, 2012," were added to the proposal. The FALS and L&R Committee received a letter from the Independent Lubricant Manufacturers Association (ILMA) in support of this and a corresponding proposal Item 237-4 (refer to Appendix B.) During the voting session, a state regulator agreed that brand helps with traceability, but he believes the labeling requirement should be limited to specification. Several states stated they would support this item only if Section 2.33.1.3. Brand was removed from the proposal. On a split vote, the item was returned to the Committee.

At the 2011 CWMA Interim Meeting and the 2011 WWMA Annual Meeting, Mr. Ferrick, gave a presentation outlining why brands must be addressed. Not all oil is the same; brands differ. Mr. Ferrick made it clear that this language was not being introduced to require states to test brands, but to allow API to address the chain of custody issues and effectively monitor bulk products. One state regulator supports moving this item forward as a Voting Item and stated that branding is not new as it is mentioned throughout NIST Handbook 130. Additionally, under the model law for Engine Fuels and Automotive Lubricants Inspection, it is unlawful to misrepresent brand in addition to other items. Further, in the Uniform Engine Fuels and Automotive Lubricants Regulation, Section 3.14.1. Labeling related to automatic transmission fluid requires "the brand name" on each container. The CWMA believed there was overwhelming evidence for the use of "brand" in NIST Handbook 130 and recommends moving this item forward as a Voting Item.

At the 2011 WWMA Annual Meeting, a presentation by Mr. Ferrick, served to clarify the issue of branding. API offered their assistance to the states regarding the testing of branding. There was concern regarding the bulk containers and comingling of product, state budgetary issues and the outlook of the future of API assistance, and enforcement of branding. A county official questioned the enforcement capability of API and suggested that language be developed that stipulates that API will enforce violations. There was support from the Western Petroleum Marketers Association and a state regulator. The WWMA recommends moving the item forward as a Voting Item with an editorial change to the effective date statement to read, "All references to invoice or receipts will be enforceable effective on July 1, 2013."

At the 2011 NEWMA Interim Meeting, questions were raised regarding "off brand" selling where brand is thought to be present. Mr. Ferrick commented that API can test at a particular facility if it is API licensed. NEWMA recommends moving this to a Voting Item.

At the 2011 SWMA Annual Meeting, Mr. Ferrick, gave a presentation in support of this item and stated the API also supports Item 237-6. API routinely samples product in the marketplace to ensure it meets their standards. API has to know the brand when testing in order to act on enforcement to protect consumers. Mr. Ferrick recommended a July 2013 implementation date if adopted. A NIST Technical Advisor stated that in the Engine Fuels and Automotive Fuels Regulation, Section 3.14. Automatic Transmission Fluid it requires brand to be stated on the label, and within Section 6. Product Registration requires that the brand be stated for "engine fuel designed for special use." A retired official noted that in NIST Handbook 44 effective dates for non-retroactive requirements are always the first of the year. Information from the floor supported that brands and quality are linked. The SWMA recommends placing the item as a Voting Item with a July 2013 implementation date.

At the 2012 NCWM Interim Meeting, the FALS Chairperson remarked that FALS fully supported this item. Mr. Ferrick, recommended that this item move forward as a Voting Item with an enforcement date of July 2013 with reference to invoice and receipt requirements. Mr. Ferrick is to provide guidance at all the regional meetings on the process to have brand tested in the event of a complaint. The L&R Committee recommends that a modification be made to the enforcement date to read July 2013 related to invoice and receipt requirements, and move this forward as a Voting item.

At the 2012 NEWMA Annual Meeting, Mr. Ferrick presented a review of this item to the members and indicated his support for this item. NEWMA recommends this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 CWMA Annual Meeting, Mr. Ferrick gave a presentation, "Consumers Deserve to Know What Oil They're Buying." API clarified that they are a standard setting body for motor oil specifications and that automobile manufacturers are prohibited from requiring the use of their own "brand" of motor oil. A state director requested regional consensus on this item. The CWMA recommends this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 NCWM Annual Meeting, Mr. Ferrick gave a presentation on "Does Brand Matter for Motor Oil." The Committee received 33 letters in support and one letter of opposition for this item. During open hearings there were numerous state and county regulators and industry that supported this item. There was opposition from Jim O'Leary representing AOCA, who recommends that several amendments be done to this item. Areas of concern are Sections 2.33.1. Labeling of Vehicle Motor Oil, 2.33.1.3. Brand, and 2.33.1.4.1. Inactive or Obsolete Service Categories.

AOCA has submitted a letter to the Committee with details. A state regulator remarked that these products are labeled "motor oil" in the marketplace and are we in conflict in using the term "engine oil"? Ron Hayes, FALS Chair clarified that within the engine fuels regulations that motor oil also is defined as engine oil.

After discussing the comments from the 2012 NCWM Annual Meeting open hearings and the proposed changes, the NCWM L&R Committee agreed to modify the language in its Interim Report to that shown in this Final Report in the Item Under Consideration. The NCWM L&R Committee made an editorial change the term "vehicle motor oil" to "vehicle engine (motor) oil" throughout the item and made minor editorial changes.

Additional letters, presentations and data may have been part of the Committee's consideration. To view the supporting documentation for this item, please refer to Appendix B in this report for additional content.

232-5 D Section 2.XX. Retail Sale of Electricity/Vehicle

Source:
National Institute of Standards and Technology, Office of Weights and Measures (2012)

Purpose:
Create a Developing Item to engage the weights and measures community in creating a method of sale to support uniformity in retail sales of electricity as vehicle fuel.

Item Under Consideration:
Proposal to be developed.

Background/Discussion:
Significant work is needed to gather and incorporate all available input from stakeholders including device manufacturers, public utility commissions, weights and measures officials, smart grid experts, and all others that are in a position to contribute to the development of a method of sale for electricity as vehicle fuel. Thus, it is recommended that this item be taken up as a Developing Item to encourage input from stakeholders and experts in the development of proposed definitions, method of sale requirements, retail equipment price posting and labeling requirements, and any other elements needed to advance the item for adoption.

While a specific proposal for consideration has yet to be developed, some preliminary examples and points to consider are offered below:

2.XX.1. Definitions.

(a) Electric Vehicle or Hybrid-Electric Vehicle. – A vehicle that employs electrical energy as a primary or secondary mode of propulsion.

(b) Plug-in Electric Vehicle (PEV). – An electric vehicle that has onboard electrical energy storage designed to be charged via a physical connection to an external source of electrical energy.

(c) Electricity as Vehicle Fuel. – Electrical energy transferred to and/or stored onboard an electric vehicle primarily for the purpose of propulsion.

(d) Electric Vehicle Supply Equipment (EVSE). – A device or system used to transfer electrical energy to an electric vehicle, either as charge transferred via physical or wireless connection, by loading a fully charged battery, or by other means.

2.XX.2. Method of Retail Sale and Supply Equipment Labeling. – Preliminary review suggests that the method of sale should be based on metered quantities to facilitate value comparison by consumers. The units should be specified for all electrical energy kept, offered, or exposed for sale and sold at retail as vehicle fuel, such as electrical energy units in terms of kilowatt hours (kWh) and/or in the metric equivalent unit for electrical energy joules (J)

2.XX.3. Retail Service Equipment Labeling. – The unit price on the basis of the method of sale will be important to consumers as a basis for a value comparison regardless of whether the electrical energy is delivered through a slow plug-in charging device, a fast charging device, or by battery replacement.

2.XX.4. Presentation of Price (Street Signs and Advertisements). – The unit price according to method of sale will be important to clearly represent on street signs and advertisements when a consumer must make a value comparison before pulling their vehicle into a station to purchase electrical energy.

Although many plug-in electric vehicle (PEVs) are primarily charged in homes and at work, it is projected that will have a growing need for public PEV charging stations in order to address public expectations and allow for successful adoption of PEV technology by the public. Several states have observed emergence of PEVs and made inquiries regarding direction of NCWM toward a method of sale for electricity as a vehicle fuel. One resource for locating charging stations online at https://na.chargepoint.com/charge_point identifies nearly 1100 charging stations already deployed across the United States. Use of electric vehicles and hybrid-electric vehicles is increasing. Adoption of electric vehicles is being driven by a number of factors, including high traditional fuel prices, auto industry investment in PEV technology, government investment and subsidies, national fuel economy standards, and state and national zero-emission vehicle and greenhouse gas standards.

A single, consistent method of sale is needed to pave the way for accurate measurement and representation of quantities sold and to facilitate value comparison by consumers. The method of sale is a crucial element that must be in place before the suitability of measurement methods and device technologies can be assessed. A measurement that is accurate, consistent, and understandable will promote consumer confidence and will provide consumers with a fundamental tool to perform value comparisons and protect themselves from confusion and fraud. An electrical energy-based method of sale would accomplish this.

Other methods of publicly offering electrical energy for sale as vehicle fuel have appeared in the absence of a nationally standardized method of sale. These include time-based charges, subscriber access, and gratis (free of charge) access. The coexistence of multiple methods of sale for the same commodity frustrates consumers' efforts to make informed value comparisons.

The actual value to a motorist of the electrical energy that is received during charging is in terms of the distance that they are able to travel. The increase in the distance they can travel after receiving a charge is dependent on the amount of electrical energy that was delivered during the charging event. The amount of charge that a vehicle receives during a charging event cannot be determined solely by measuring the time that it was connected to a charging system. The rate per time that charge is delivered will depend on many factors that cannot be controlled including, but not limited to, the starting charge level, the design of the vehicle battery, the type of charging equipment, and other environmental variables. For these reasons, a time based method of sale will not form a sound basis for a consistent value comparison and an electrical energy based method of sale is strongly recommended.

The current equipment for vehicle charging that is available in the marketplace today represents a very wide range of charging speeds, further emphasizing the need for a single method of sale. Level 1 equipment charges vehicles with 110 VAC and can take 8 hours to 12 hours to fully charge a vehicle. In contrast, a fast DC type of Electric Vehicle Supply Equipment (EVSE) is capable of charging a vehicle from 20 % to 80 % of full charge in 10 minutes, closely approximating the time of a traditional liquid (e.g., gasoline) vehicle fueling cycle. Consumers place a high value on their time, and so it is reasonable to expect that the unit price for electrical energy from a device that is capable of very fast charging will be higher. This can also be anticipated because the equipment capable of faster charging represents a higher capital investment. Since stations may offer multiple options for charging speed, a uniform language for describing the type of charging equipment available at any provider should be developed so that this important aspect of consumer value can be presented consistently in conjunction with the unit price to aid in the value comparison.

Vehicle charging using types of EVSE that offer slower charging rates is often offered in conjunction with other paid services (e.g., parking, valet parking, routine vehicle maintenance). In these cases, the unit price for electrical energy offered should be presented separately from any price for the other paid service(s) to allow for a value comparison with the cost of electrical energy offered by other providers.

For reference, a typical PEV can hold a charge of 24 kWh in onboard storage, with some vehicles capable of holding as high as 75 kWh. The average price of electrical energy in the United States is $0.075 per kWh and the average price for residential electrical energy is $0.089 per kWh. Presuming that the price for electrical energy as a vehicle fuel might range from $0.10 per kWh to $0.50 per kWh (perhaps depending on the speed of the ESVE charger), then the cost to the consumer to fill a vehicle might range from $2.40 to as high as $37.50.

An additional issue that needs to be explored and developed is that of "battery exchanges." Equipment already exists that allows consumers to swap a depleted storage device for a fully charged onboard storage device (i.e., battery). In this case, the amount of charge present in the fully charged device should to be communicated to the consumer consistent with the method of sale to enable a value comparison between this method and plug-in ESVE charging. The issue of whether and how to credit a consumer for the amount of charge that exists in the battery that is to be removed should be considered as this item develops.

There are currently as many as eight manufacturers of EVSE that would benefit from clear direction on method of sale and device standards.

The National Association of Regulatory Utility Commissioners (NARUC) and other local Public Utility Commissions (PUC) interests have identified PEV use, and particularly public re-charging use cases, as having potentially significant impact on public utility efficiency, infrastructure needs, and pricing structures. Collaboration with these organizations in the development of national legal metrology standards for electrical energy sold as vehicle fuel would offer an opportunity for the creation and implementation of standards that take into consideration the missions of both NARUC and NCWM.

There is a likelihood that stations owned and operated by public utilities will coexist with privately owned charging stations. There may be regulatory issues in some jurisdictions that effect price regulation and competitiveness between these two types of stations. This is another reason that NARUC and PUC input is critically needed on development of a method of sale.

In *Comments of the Division of Ratepayer Advocates to the California PUC* (see Section II.A. www.dra.ca.gov/NR/rdonlyres/B2E02349-740A-4EA8-A4D0-69ED3C0D6623/0/R0908009DRAComments_A1b.pdf), the question has also been raised as to whether PUCs may require residential customers to install a separate electric sub-meter for PEV charging. If this occurs, it is most likely that consumers would be invoiced for charging their vehicles at home in the same kWh units that are used for their primary billing. If the method of sale at public charging stations matches the units that are billed for charging the same vehicle at the residence, this will further facilitate the value comparison by consumers.

In some states, electrical energy sub-metering already falls under the jurisdiction of state and local weights and measures authorities. These jurisdictions must now use established standards other than NIST Handbook 44 and NIST Handbook 130. National standards for the sale of electrical energy in NIST Handbook 44 and NIST Handbook 130 would promote greater uniformity on sub-metering applications.

At the 2011 CWMA Interim Meeting, an official suggested referencing FTC for labeling on alternative fuels. The CWMA recommends returning the item to the submitter for development and recommends the item as a Developing Item.

At the 2011 WWMA Annual Meeting, a state regulator commented that such vehicles already exist and there is no need for this matter to be addressed by NCWM. The Committee acknowledges that new technology is currently in the marketplace and encourages NCWM to develop a method of sale for electricity as a vehicle fuel. This was recommended as a Developing Item.

At the 2011 NEWMA Interim Meeting, an official questioned how consumers will be charged, how the effort will be monitored, and whether this would be considered a regulated utility. NEWMA forwarded the item to NCWM recommending it as a Developing Item.

At the 2011 SWMA Annual Meeting, a state regulator asked for clarification regarding the definition of an electric or hybrid electric vehicle. A NIST Technical Advisor noted that there is an absence of a clearly defined method of sale. Inquiries regarding the correct method of sale have increased as growth in charging stations have grown. The Technical Advisor asked that this item be made Developing because much information needs to be gathered. A couple state officials responded that only their utility companies can sell electricity. It was recognized that public utilities need to be an integral part of the process. A state official questioned whether a measuring device for electricity exists today and whether it was National Type Evaluation Program (NTEP) approved. There was also a question to whether a test measure can be traceable and certifiable to a standard. A state regulator expressed support for this item. SWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2012 NCWM Interim Meeting concern with the definitions for primary and secondary and that it only deals with vehicle fuel. At this time there is no item for consideration and the language under the area "background/discussion" areas are to be considered. The NIST Technical Advisor remarked that OWM is currently gathering data and information from many resources. Eventually a work group will be formed to further develop this item. The NCWM L&R Committee is recommending that this item remain a Developing Item.

At the 2012 NEWMA Annual Meeting, a remark was made that devices are not utility electric meters but are subsidiary meters that fall under weights and measures jurisdiction. A stakeholder remarked that businesses are installing these sub-meters and support the development of this item. NEWMA supports this as a Developing Item.

At the 2012 CWMA Annual Meeting, a state official remarked that this is not a public utility and owners of these charging units make free market sales. States need to be concerned that this is a rapidly growing area and no standard currently exist. A state regulator remarked that there are quick and slow charging stations and recommends that consumers be charged on what the vehicle is capable of receiving and know what the device is capable of delivering. The CWMA supports this as a Developing Item.

At the 2012 NCWM Annual Meeting, the NIST Technical Advisor remarked that a NIST work group has been formed to develop this item, and there are two meetings schedule over the next several months. A draft proposal code has been developed and is worded heavily following the California standard. Two regulatory officials rose to express urgency in developing this proposal.

Mr. Marc Buttler, NIST, OWM, at (301) 975-4615 or marc.buttler@nist.gov will be the NIST Technical Advisor, if you are interested in assisting with the development of this item. Ms. Juana Williams, NIST, OWM, will be the Chair for the Electric Vehicle Supply Equipment Workgroup (EVSE) and can be reached at (301) 975-3989 or juana.williams@nist.gov.

232-6 I Packaged Printer Ink and Toner Cartridges

Source:
Southern Weights and Measures Association (SWMA) (2010)

Purpose:
This proposal is to clarify the labeling requirements for industry, consumers and weights and measures officials.

Item Under Consideration:

2.XX. Printer Ink and Toner Cartridges Labeling.

2.XX.1 Definitions.

2.XX.1.1. Printer Ink Cartridges. – Any cartridge or module that contains ink or a similar substance in liquid form employed in the printing and/or copying of documents, papers, pictures, etc., that is used in a printing device and designed to be replaced when no longer able to supply its contents in printing and/or copying.

2.XX.1.2. Toner Cartridges. – Any cartridge or module that contains toner, powder, or similar non-liquid substance employed in the copying or printing of documents, papers, pictures, etc. that is used in a printing and/or copying device and designed to be replaced when no longer able to supply its contents in printing and/or copying.

2.XX.2. Method of Sale and Labeling.

2.XX.2.1. Method of Sale, Printer Ink Cartridges. – All printer ink cartridges kept, offered, or exposed for sale or sold shall be sold in terms of the count of such cartridges and the fluid volume of ink in each cartridge, stated in terms of milliliters or fluid ounces.

2.XX.2.2. Method of Sale, Toner Cartridges. – All toner cartridges kept, offered, or exposed for sale or sold shall be sold in terms of the count of such cartridges, and the net weight of toner substance.

(Added 201X)

Background/Discussion:
Over the past several years, there has been a change in the marketplace on inkjet and toner cartridges net content statements. Currently, there is little uniformity in the marketplace on this item, and the Committee is seeing some labels with a net content or with only a page yield count (e.g., prints 1000 pages). The NIST, OWM pointed out that according to guidelines printed in NIST Handbook 130, Weights and Measures Law, Section 19 "information required on packages," these products are required to have the net contents of the ink (and toner) labeled, but manufacturers have resisted, claiming an exemption under the FPLA. The purpose of this proposal is to specifically clarify the requirements for industry, consumers, and weights and measures officials.

At the 2009 SWMA Annual Meeting, a Lexmark representative commented that they do not believe that a net content statement should be required, and that a page yield is sufficient. He read the main points of a letter from Lexmark to Mr. Max Gray, Director, Florida Agriculture and Consumer Services, dated March 17, 2009. The main points within the letter were: 1) the ink associated with a cartridge is a small fraction of the total cost of the print cartridge mechanism; 2) a page yield can provide a meaningful comparison to a consumer, if all manufacturers employ the same estimating assumptions and techniques; and 3) the International Organization for Standardization (ISO) studied this issue for years and has rejected reliance on ink volume or quantity; instead ISO has developed a yield, estimating and claiming methodology that permits cartridges to be compared using a consistent yardstick. Unlike ink volume measurements, page yield measurements provide a consumer with a reliable way to compare the amount of printing that can be expected. Lexmark also stated that ink is expressly exempt from labeling as provided by the FPLA 16 CFR 503.2(a).

An industry representative believes this issue does need to be discussed and reviewed further. However, many officials believe that consumers should know what they are getting. If it is determined that page count is the quantity statement, then the page print standard should be reviewed and have tighter standards. Mr. Gray felt that more data is needed from manufacturers on this issue. SWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2010 Interim Meeting, Mr. Matthew Barkley, Hewlett Packard Co., commented that the FPLA creates an exemption for ink, which extends to toner and ink cartridges. A declaration of weight and volume are not the best way for consumers to make value comparisons. Customers benefit from page count/yield. Mr. Barkley urged that this issue be Withdrawn. If this issue is to proceed, it should be Informational to allow for a review of the FPLA exemption. He suggested that page yield is widely accepted and has repeatability measures.

Mr. Paul Jeran, Hewlett Packard Co., submitted a white paper (refer to Appendix C in the *Report of the 96th NCWM* [SP 1125, 2011]) from the Information Technology Industry Council (ITI). This white paper included manufacturers from Epson, Hewlett Packard, Kodak, and Lexmark. Mr. Jeran explained that his background is with ink and toner measurement. For the same volume of ink, two different systems of the same model cartridge from two different vendors can print a different number of pages. In order to determine the page yield, they are using the ISO/IEC methodology. ISO is currently working on a photo yield standard.

A state official expressed concerns with page yield being the standard page print for quantity. There is variation based on the type of cartridge, printer, and font and if graphics/photos are being printed. There is also a concern with what ink cartridge re-fillers are doing. A Florida official reviewed the current practice of re-fillers, and they are listing on the labels the amount of ink. There are many manufactured packages in the marketplace, so value comparison to original equipment manufacturer (OEM) is critical. This is an expensive commodity and clarifications of the requirements are needed. A state official recommended that this item not be Withdrawn, but made Informational so additional information can be researched on this item. It is firmly believed that there needs to be a consistency with the declaration statement on these types of items. A consumer stated that he believes the net content needs to be stated with voluntary supplemental information for page yield. Some voiced their opinion that consumers need to know page yield in order to make a value comparison. The NIST Technical Advisor stated that under the FTC regulations ink and toner cartridges were not part of the CFR. NIST met with the FTC on February 26, 2010, to request clarification of the exemption. According to the Committee, there needs to be a test procedure for verification of net content developed for ink and toner cartridges. The 2010 L&R Committee designated this item be made an Informational Item until they can receive clarification from the FTC, review ISO standards, and determine what re-fillers' current practices are.

At the 2010 NEWMA and the CWMA Annual Meetings, both Associations received a presentation from Mr. Stephen Pociask, American Consumer Institute, regarding a lack of consumer information when purchasing computer printers and cartridges. Both Associations expressed that there are still many unanswered questions and would like to hear from manufacturers of ink and toner cartridges. Both associations recommended that the item remain as an Informational Item.

At the 2010 Annual Meeting, Mr. Pociask presented a 2007 study done by his organization with funding by a telemarketing research company. An official expressed concern that the study presented was not clear and asked if page count based on certain fill levels or declaring the weight on the cartridge itself. Mr. Pociask responded that currently Quality Logic uses the ISO standards. He also concluded that net weight is easy to enforce. Mr. Pociask stressed that his focus is to provide information that give consumers useful information in purchasing printers and the life cost of the printer, including printer ink cost.

Another official stated that the study was interesting, but would like to hear from manufacturers. There are several issues; cartridges are only for specific printers, when comparing price per page you suggest that price is static, and ink cartridge re-fillers need to be addressed.

Mr. Joshua Rosenberg, IT Industry Council (ITI), agreed that providing consumers with information is meaningful, however, relevant to the consumer is the number of pages that can print. The ISO standards are a good tool, but will lead to customer confusion. Mr. Rosenberg expressed that much more discussion is necessary on this issue.

At the 2010 Annual Meeting, the Board of Directors established the Printer Ink and Toner Cartridges Task Group to review and obtain additional information from all stakeholders. Ms. Vicky L. Dempsey, Chief Inspector, Montgomery County, Ohio, was appointed as Chair and Ms. Lisa Warfield was designated as the NIST Technical Advisor.

At the 2010 CWMA Interim Meeting, Ms. Dempsey, Chair of the Printer Ink and Toner Cartridge Task Group, announced her resignation to the association. Ms. Dempsey gave a briefing on this issue, in particular whether this particular form of ink is included in the exemption of the FPLA. It was indicated that FDA believes this exemption only applies to ink in pens, not in printer cartridges. Regulators commented that "yield' is more important for cost comparison for consumers; however, other regulators felt that "yield" is not a weights and measures issue. Another concern was that the ISO yields are based upon approximations. Discussion also included whether regulators would have to purchase printers in order to verify yield. It was generally agreed that this is a very complicated matter, and the method of sale needs to be measurable. A regulator stated he had spoken with a manufacturer and questioned how the packages are filled. The response indicated that packages are filled by volume. The CWMA Committee supported the efforts of the Printer Ink and Toner Cartridge Task Group to gather more information for development of this proposal. THE CWMA recommended that the item remain as an Informational Item.

At the 2010 WWMA Annual Meeting and the 2010 NEWMA Interim Meeting, it was announced that NCWM is seeking a chairperson for the Printer Ink and Toner Cartridge Task Group. The CWMA and WWMA are recommending that this item move forward as an Informational Item.

At the 2010 SWMA Annual Meeting, it was announced that a chair is needed for the Printer Ink and Toner Cartridge Task Group. The SWMA Committee does not endorse the formation of the Printer Ink and Toner Cartridge Task Group to resolve this issue. Only within the past couple years have manufacturers changed their declaration statement to read "yield." Allowing the declaration by yield will open the door for other commodities to change their labeling (e.g., loads of laundry). The SWMA Committee recommends that these commodities be sold by volume and weight; however, they are not opposed to yield being a supplementary statement. This will allow for inspectors to verify the net contents, and also provide information for consumers to make value comparisons. The SWMA Committee would like to seek additional information from industry and ink re-fillers. The SWMA recommended the item under consideration move forward as a Voting Item.

At the 2011 NCWM Interim Meeting, the Printer Ink and Toner Cartridge Task Group held its first work session chaired by Ms. Maureen Henzler, Kansas Department of Agriculture. There was discussion on the current forms and types of printer ink. Industry also explained that they are able to deliver less ink with a better print quality. As a result, they refrain from using the net content statement but believe that a page yield is more useful information for a consumer in making comparisons. Industry was informed that yield is not acceptable, and they cannot use words like "approximate" and "estimated." It was agreed that yield could be a supplementary statement on the package. The 2011 L&R Committee designated this item as an Informational Item.

The Printer Ink and Toner Cartridge Task Group requested additional information from industry with regard to:

1. How does the ISO standard work and how does this standard fit into the weights and measures test procedure?

2. How is print darkness measured?

3. Why have manufacturers removed the net weight declaration from packages and replaced it with a page yield?

4. When changing formulas, is the toner receptacle resubmitted back through the ISO standards to validate the page print accuracy?

At the 2011 NEWMA Annual Meeting there were no comments heard on this item. The Committee Chair reminded members that the Printer Ink and Toner Cartridge Task Group will be meeting on the Sunday prior to the start of the NCWM Annual Meeting, and that industry will be giving a presentation. NEWMA recommended that this item move forward as an Informational Item.

At the 2011 CWMA Annual Meeting, there were several comments heard on this item. Concern was expressed that ink cartridges used to have quantity on the label, but now, in the marketplace, only yield is used for labeling. A state director expressed concern that ink re-fillers are not being addressed under this proposal. The CWMA recommended that this item move forward as an Informational Item.

During the 2011 Annual Meeting of the NCWM, the Printer Ink and Toner Cartridge Task Group met (Sunday, July 17, 2011). This task group was attended by several members of state, county, and city weights and measures officials as well as members of industry. Mr. Josh Rosenberg, Information Technology Industry Council (ITI), and other members of the printer industry gave a presentation outlining their viewpoints using yield as the method of sale for their products. The printer industry representatives were asked questions regarding the amount of product each cartridge held and all agreed their respective companies were aware of the net contents of each container. A stakeholder stated that packages must have the weight, measure, or count – no other type of labeling is acceptable. Industry was also informed that "yield" is not an acceptable means of labeling for any product. The Printer Ink and Toner Cartridge Task Group will meet again at the NCWM 2012 Interim. The printer industry was asked to consolidate their presentation to only address the labeling issue of their products and address the task group with this

information. Also, the Printer Ink and Toner Cartridge Task Group plans to make a proposal to the NCWM L&R Committee for a method of sale for packaged printer inks and toner cartridges.

During the open hearings at the 2011 NCWM Annual Meeting, Mr. Rosenberg, with ITI (also representing Lexmark, HP, Kodak, Epson and Brother), entered their Sunday presentation for the record (refer to Appendix C in the *Report of the 96th NCWM* [SP 1125, 2011]). Mr. Rosenberg remarked that a label by volume or weight does not meet the objectives of their organization or consumers' preference. Mr. Rosenberg believes that yield is the best way to enable consumers to make informed purchase decisions. He further believes there is a way to provide information through yield data and the ability to apply the ISO standard for yield. Mr. Rosenberg stated they will be in attendance at the upcoming regional meetings to address any issues or concerns. A stakeholder noted that he does not believe the ISO yield standard is acceptable, due to the default system of each manufacturer's printer being different. He also pointed out that NCWM is not a performance based evaluation agency, and encourages the Printer Ink and Toner Cartridge Task Group to develop an item based on the use of weight or volume as the unit of measure. The L&R Committee would like to see additional work from the Printer Ink and Toner Cartridge Task Group.

At the 2011 NEWMA Interim Meeting, no comments were recorded, and it was recommended the item remain Informational.

At the 2011 SWMA Annual Meeting, no comments were recorded. The SWMA supports the item as written and recommends it as a Voting Item.

At the 2012 NCWM Interim Meeting, Ms. Henzler informed the Committee that the task group did not have a recommendation on a method of sale for either the ink or toner. They did suggest minor editorial changes to add the word "copying" after the word "printing" or vice versa, throughout the definitions.

Several members of the ink and toner industry recommended that this item be withdrawn and they have reflected this in letters written to the Committee since this item first appeared. They remarked that having the current proposal will confuse and mislead consumers. They believe that consumers are not concerned with the net quantity of ink they are getting, but how many pages they can print. They agreed that the definitions do need additional work. It was also remarked that there are other ink technologies out in the marketplace such as, wax sticks and oils. Currently wax sticks/crayons are sold by count.

A contractor commented that the Method of Sale Regulation states the items must be sold on the basis of weight, measures, or count. The regulation should be the starting point with the possibility of adding supplementary information.

The Committee believes test procedures need to be developed to test these commodities. In addition, destructive testing of these products can be costly. The Committee wants to look at the possibility that both toner and ink be sold by weight. Ms. Cardin, Committee Chair, will request that the NCWM Board of Directors appoint a new work group to develop test procedures and to disband the current Printer Ink and Toner Cartridge Task Group.

At the 2012 NEWMA Annual Meeting, the NCWM Chair indicated that there was an impasse on this item. The Task Group is not planning to meet at this time to resolve the issues. The Committee recommends that this be an Informational Item.

At the 2012 CWMA Annual Meeting, Ms. Judy Cardin, Task Group Chair, gave an overview of the history of this item and provided an update. The Task Group has been formed to focus on test procedures for weight statements on ink and toner cartridges. An industry representative remarked he was supportive of the Task Group's efforts and that an acceptable method of sale will be reached. He also recommended that the Conference get further participation from industry and stakeholders by sending out letters. The Committee recommends that this item be Informational. Additional submissions in Appendix C of this report have been part of the L&R Committees consideration.

At the 2012 NCWM Annual Meeting the new Printer Ink and Toner Gravimetric Package Testing Task Group met to discuss a test method that would require industry to label cartridges with a tare (packaged materials) weight. Matthew Barkley, Hewlett Packard, commented that any item under consideration should weigh benefits and competitive disadvantages. He also expressed concern that some proposals may create significant financial hardships for manufacturers and that these costs may be pass on to the consumers. The Task Group, Chaired by Ms. Cardin (judy.cardin@wi.gov), will continue its work on gravimetric test methods for printer ink and toner cartridges and will report its work at the 2013 NCWM Interim Meeting. The Committee is placing a Developing Item 260-5 on the agenda to report the work of the Printer Ink and Toner Gravimetric Package Testing WG. The L&R Committee will not develop Item 232-6 further until it hears the result of the new Task Group.

Anyone interested in participating in the Printer Ink and Toner Cartridge Gravimetric Package Testing Task Group should contact Ms. Cardin, Wisconsin Weights and Measures, at judy.cardin@wisconsin.gov or Ms. Lisa Warfield, NIST Technical Advisor at lisa.warfield@nist.gov. The 2012 L&R Committee designated this item as an Informational Item.

Additional letters, presentations and data may have been part of the Committee's consideration. To review supporting documents, please refer to Appendix C, *Report of the 96th NCWM* (SP 1125, 2011) and Appendix C in this report to review additional documents.

232-7 V Section 2.32.1. Definition of Hydrogen Fuel (H)

(This item was adopted.)

Source:
Southern Weights and Measures (SWMA)

Purpose:
Amend NIST Handbook 130, Regulation for the Method of Sale, Section 2.32.1. Definitions for Hydrogen Fuel.

Item Under Consideration:

2.32. Retail Sales of Hydrogen Fuel (H).

2.32.1. Definitions for Hydrogen Fuel. – A fuel composed of ~~**the chemical**~~ **molecular** hydrogen intended for consumption in **a surface vehicle or electricity production device with** an internal combustion engine or fuel cell.

(Amended 2012)

(Added 2010)

Background/Discussion:
At the 2011 SWMA Annual Meeting, the NIST Technical Advisor to the U.S. National Work Group for the Development of Hydrogen Measurement Standards (USNHWG) requested a new proposal move forward to modify the definition of hydrogen fuel to recognize the latest updates to that term by the vehicle fuel community. The USNHWG is proposing this modification s to avoid confusion and maintain consistency between the definitions of hydrogen fuel under NCWM consideration in L&R Agenda Item 237-10, a proposal for adding the term to the NCWM Handbook 130, Engine and Fuels Automotive Lubricants Regulation and the term currently found in NCWM Handbook 130, Method of Sale and the Engine Fuels Regulation.

The SWMA L&R Committee supports the work of USNHWG and recommended this item be moved forward as a Voting Item with the recommendations noted above.

At the 2012 NCWM Interim, the NIST Technical Advisor to the USNHWG reported that this language had been approved by the USNHWG and encouraged the Committee to move the proposal forward as a Voting Item. The Committee agreed to add a new item to its agenda to update the current NIST Handbook 130 definition and recommended this proposal as a Voting Item.

At the 2012 NEWMA and the CWMA Annual Meetings both associations supported this item and recommended adoption by the NCWM.

At the 2012 NCWM Annual Meeting, there were no comments received on this item.

237 NIST HANDBOOK 130 – UNIFORM ENGINE FUELS AND AUTOMOTIVE LUBRICANTS REGULATION

237-1 V Section 2.1.2. Gasoline-Oxygenated Blends

(This item was adopted.)

Source:
Central Weights and Measures Association (2011)

Purpose:
Modify the language in Section 2.1.2. Gasoline-Oxygenate Blends and 2.1.3. Gasoline-Ethanol Blends to be aligned with the Environmental Protection Agency's (EPA's) language in the March 2009 Growth Energy Waiver request.

Item Under Consideration:
Amend the NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation as follows:

Section 2. Standard Fuel Specifications

2.1. Gasoline and Gasoline-Oxygenate Blends.

2.1.1. Gasoline and Gasoline-Oxygenate Blends (as defined in this regulation). – Shall meet the most recent version of ASTM D4814 "Standard Specification for Automotive Spark-Ignition Engine Fuel" except for the permissible offsets for ethanol blends as provided in Section 2.1.~~3~~**2**. Gasoline-Ethanol Blends.

(Added 2009)

~~**2.1.2. Gasoline-Oxygenate Blends. Shall contain no more than 10 volume percent ethanol. For other oxygenates, blends shall contain no more than 2.0 mass percent oxygen except fuels containing aliphatic ethers and/or alcohols (excluding methanol) shall contain no more than 2.7 mass percent oxygen.**~~

~~**(Added 2009)**~~

2.1.~~3~~2. Gasoline-Ethanol Blends. – When gasoline is blended with ~~**1 to 10 volume percent**~~ ethanol, the ethanol shall meet the ~~**requirements**~~ **most recent version** of ASTM D4806 **"Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel"** and the blend shall meet **the most recent version of** ASTM D4814 with the following permissible exceptions:

(a) The maximum vapor pressure shall not exceed the ASTM D4814 limits by more than ~~**1.0 psi for**~~:

(1) **1.0 psi for blends containing** ~~**Only**~~ 9 to 10 volume percent ethanol ~~**blends**~~ from June 1 through September 15.

(2) **1.0 psi for** ~~**All**~~ blends **containing** ~~**of**~~ 1 **or more** ~~**to 10**~~ volume percent ethanol **for volatility classes A, B, C, D** from September 16 through May 31.

(3) 0.5 psi for blends containing 1 or more volume percent ethanol for volatility Class E from September 16 through May 31.

The vapor pressure exceptions in subsections 2.1.2. Gasoline-Ethanol Blends will remain in effect until May 1, 2016, or until ASTM incorporates changes to the vapor pressure maximums for ethanol blends, whichever occurs earlier.

~~**(b) Until May 1, 2012, or until ASTM D4814 incorporates changes to the 50 volume percent evaporated point to account for the volatility effects of up to 10 volume percent ethanol, whichever occurs earlier, the distillation minimum temperature at the 50 volume percent evaporated point shall not be less than 66 °C (150 °F) (see Notes 1and 2).**~~

~~**(c) Until May 1, 2012, or until ASTM D4814 incorporates changes to the vapor lock protection minimum temperature for Classes 1 - 5 to account for the volatility effects of up to 10 volume percent ethanol, whichever occurs earlier, the minimum temperature for a Vapor-Liquid Ratio of 20 for the applicable vapor lock protection class for gasoline-ethanol blends shall be as follows (see Notes 1 and 2):**~~

~~**(1) Class 1 shall be 54 °C (129 °F)**~~

~~**(2) Class 2 shall be 50. °C (122 °F)**~~

~~**(3) Class 3 shall be 47 °C (116 °F)**~~

~~**(4) Class 4 shall be 41.5 °C (107 °F)**~~

~~**(5) Class 5 shall be 39 °C (102 °F)**~~

~~**(6) Class 6 shall be 35 °C (95 °F)**~~

~~**All gasoline and gasoline-ethanol blends sold in Area V (as shown in ASTM D4814 Appendix Fig. X1.2) shall meet the vapor lock protection minimum temperatures in ASTM D4814.**~~

~~**NOTE 1: The value for the 50 volume percent evaporated point noted in Section 2.1.3.(b) and the values for Classes 1, 2, and 3 for the minimum temperature for a Vapor-Liquid Ratio of 20 in Section 2.1.3.(c) are now aligned and identical to those that are being published in ASTM D4814-09b and apply equally to gasoline and gasoline-ethanol blends. In future editions of NIST Handbook 130, Section 2.1.3.(b) will be removed editorially and the reference to Classes 1, 2, and 3 in Section 2.1.3.(c) will be removed editorially. In addition, existing Sections 2.1.3. through 2.1.7. of NIST Handbook 130 will be renumbered.**~~

~~**NOTE 2: The temperature values (e.g., 54 °C, 50. °C, 41.5 °C) are presented in the format prescribed in ASTM E29 "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications."**~~

(Added 2009) **(Amended 2012)**

Discussion/Background:
The EPA will make a ruling on the March 2009 Growth Energy Waiver. When the ruling is announced, the above regulation will need to be extended to cover E15 gasoline blends. The Renewable Fuels Association (RFA) is proposing a broader approach to recognizing the authorized proportion of ethanol. RFA recommends the following language:

2.1.2. Gasoline-Oxygenate Blends. – Shall contain no more than **the maximum proportion of ethanol authorized by U.S. Environmental Protection Agency (EPA) under Section 211 of the Clean Air Act.**

10 volume percent ethanol. For other oxygenates, blends shall contain no more than 2.0 mass percent oxygen except fuels containing aliphatic ethers and/or alcohols (excluding methanol) shall contain no more than 2.7 mass percent oxygen.

(Added 2009) **(Amended 20XX)**

At the 2010 CWMA Interim Meeting an update was given on the current consideration by EPA to allow higher ethanol blends in conventional vehicles. The Fuel and Automotive Lubricants Subcommittee (PALS) Chair stated that the FALS may be meeting to discuss this issue at the NCWM Interim Meeting 2011. The CWMA L&R Committee received two letters on this issue (refer to Appendix F in the *Report of the 96th NCWM* [SP 1125, 2011]). The CWMA recommends that this item be forwarded to the FALS for further work.

At the 2010 WWMA Meeting an industry representative expressed concern on what this action will have on car warranties and potential liability issues. A representative stated that he opposed this item until an official ruling is made by the EPA. The WWMA recommends that this item be made a Developing Item.

At the 2010 SWMA Annual Meeting and the 2010 NEWMA Interim Meeting, there were no comments heard on this item. The Conference would like to see a recommendation from the FALS. Both associations are recommending that these items go to the FALS for further development.

At the 2011 NCWM Interim Meeting, Mr. Ron Hayes, Chair for FALS reported that FALS held a conference call on January 14, 2011, and also met at the NCWM to review the FALS items. The FALS Chair reported that a consensus could not be reached on this item.

An industry representative expressed concern with legal and liability challenges if the current proposal is passed. A representative from the renewable fuels industry recommended moving the item forward for adoption as written, because it recognizes EPA as the authority on setting requirements for ethanol and will not restrict ethanol use. An energy representative also noted the proposal collaboratively has gone through all the regions with no opposition and moving this forward as a vote is to recognize what EPA has decided, and their authority not to restrict ethanol content. A representative from API commented that passing the proposal is premature and the NCWM should delay action until revisions to ASTM D4814 can be completed. He also noted that the EPA decision was based on the durability of emissions related equipment and vehicle emissions, and does not preempt rules that are based on grounds other than emissions; ASTM will need to determine the vehicle drivability characteristics of the fuel before amending the D4814 performance standard. It was suggested that the goal of the model engine fuel regulation is to ensure vehicle performance, so adopting the ASTM standard is appropriate. An automotive representative expressed support for waiting on the revisions for ASTM D4814. The 2011 L&R Committee designated this item as an Informational Item to allow FALS to study it further.

Section 2. Standard Fuel Specifications

2.1.2. Gasoline-Oxygenate Blends. – Shall contain no more than **the maximum proportion of 10 volume percent** ethanol **authorized by the U.S. Environmental Protection Agency (EPA) under Section 11 of the Clean Air Act**. **For other oxygenates, blends shall contain no more than 2.0 mass percent oxygen except fuels containing aliphatic ethers and/or alcohols (excluding methanol) shall contain no more than 2.7 mass percent oxygen.**

(Added 2009) **(Amended 20XX)**

At the 2011 NEWMA Annual Meeting, a consultant remarked that proposed labeling is currently with the Office of Management and Budget (OMB), and they are working with the Federal Trade Commission (FTC) to agree on a final requirement. The NEWMA recommended this item move forward as an Informational Item.

At the 2011 CWMA Annual Meeting, a letter was received recommending that the CWMA not give consideration to the proposal until ASTM D4814, Standard Specification for Automotive Spark-Ignition Engine Fuel is completed. The CWMA recommended that this item move forward as an Informational Item.

At the 2011 NCWM Annual Meeting, the FALS met to modify Section 2.1. Gasoline and Gasoline-Oxygenate Blends. FALS is waiting to see how E15 is incorporated into ASTM D4814, Standard Specification for Automotive Spark-Ignition Engine Fuel. ASTM is currently waiting for performance data from the Coordinating Research Council (CRC) study. A Tennessee state official recommends that the model regulation only refer to the ASTM D4814 specification for gasoline-oxygenate blends. There was additional discussion regarding the vapor pressure exceptions provided in the model law regulation. It was also mentioned that the Environmental Protection Agency (EPA) may eventually discontinue the 1.0 psi allowance for E10 blends. The Committee supports the item under consideration and would like to receive additional input from the Regional meetings.

At the 2011 CWMA Interim Meeting, Mr. Hayes, FALS Chair, stated they met and amended a proposal that blends must meet most recent version of ASTM D4814 standards. Mr. Hayes also stated E15 does not have a one-pound waiver. An energy industry representative explained that it took ASTM five years to modify the volatility limits for ethanol blended fuels. The industry representative noted 45 out of 50 states give winter one-pound relief, and if this ceases refinery costs will increase and supply will decrease. Furthermore, EPA may remove the summer one-pound relief in 2016. If this happens, where will the butane go? It took 12 years for drivability index to be developed; therefore, this will take some time. A state regulator questioned the need for a one pound relief suggesting one-half pound relief for winter fuels. Producers may manufacture fuel that exceeds ASTM specifications and will add ethanol to take advantage of the full one pound allowed. The energy company representative countered that 95 % of the gasoline in the states has ethanol and relief has been allowed with no report of problems. An ethanol company representative supports this proposal. The CWMA recommends moving the item forward as a Voting Item.

At the 2011 WWMA Annual Meeting, a FALS representative supported moving the item forward as a Voting Item. The WWMA supports the work of FALS and feels the item is ready to be considered a Voting Item.

At the 2011 NEWMA Interim Meeting no comments were heard. NEWMA recommended that the item remain as an Informational Item.

At the 2011 SWMA Annual Meeting, an industry representative expressed support for the item with two exceptions: 1) keeping the 1.0 psi waiver in 2.1.3.(a); and 2) that 2.1.3.(a)(2) be modified by changing 10 % ethanol to 15 % ethanol. It was noted that ASTM needs to take action to recognize the effect of ethanol on gasoline vapor pressure. Removal of the waiver by NCWM would result in an estimated 2.5 volume percent of the available gasoline pool in order to comply with more stringent ASTM specification limits. The Committee believes that this item will harmonize NIST Handbook 130 with ASTM D4814, while allowing ASTM time to make necessary changes. The SWMA supported the following item with the following two exceptions and recommends this as a Voting Item.

1. Keep the 1.0 psi waiver in 2.1.3.(a); and
2. 2.1.2.(a)(2) is modified by changing 10 volume percent ethanol to 15 volume percent ethanol.

At the 2012 NCWM Interim Meeting, the FALS met in a Sunday work session. Mr. Ron Hayes, FALS Chair, commented that one goal since the inception of the Fuels and Lubricants Subcommittee (formerly known as the Petroleum Subcommittee) is to reference ASTM standards whenever possible without exceptions. Mr. Hayes reviewed a presentation submitted by Mr. Jennings, Tennessee, which supported the recommended FALS changes as published into OWM Publication 15 (2012), that requires gasoline and gasoline oxygenates blends meeting ASTM D4814 without exceptions. A petroleum marketer remarked that the waiver should remain for 1.0 psi until additional data is submitted to ASTM.

Mr. Hayes agrees that data should come from ASTM or CRC. Mr. Bob Reynolds, Renewable Fuels Association, recommended that a review of the title of Section 2.1.1. “Gasoline and Gasoline-Oxygenated Blends” be made since this section refers to “ethanol”. Mr. Reynolds also commented that decisions should be delayed on vapor pressure until ASTM or EPA can address this issue. A comment was made to table the psi changes and recommend this item move forward as a vote. An informal vote was taken from those in attendance and FALS is recommending this item move forward as a Vote with a modification to keep the waiver. During open hearings, the FALS Chair provided a recommendation that FALS had approved during their Sunday work session, but expressed that some members withdrew their support of the new language once they saw the actual language in print.

Several industry representatives supported this item as modified by the FALS, citing that there are no studies or data to support removal of the waiver. In addition, the waiver has been in place for over twenty years and cannot be arbitrarily removed; therefore, the waiver should remain. Conversely, another commenter expressed there is no data that supports the 1.0 psi waiver for winter grade gasoline especially for gasoline blends with the new lower T-V/L20 lower limits. Additionally, 1.0 psi is not needed for winter fuels as the vapor pressure increase to gasoline due to ethanol is only 0.5 psi. A letter was reviewed that stated the 1.0 psi waiver should be removed and recommended this item as documented. Additional comments were made by industry and regulators that Class E fuels should have a cap of 15.5 lbs.

The Committee recognizes that FALS will continue to modify this language as additional data is received. The Committee believes that this item is needed for E15, if not, states will handle them individually. The 2012 L&R Committee recommends that the language move forward as Voting Item.

At the 2012 NEWMA Annual Meeting, the L&R Committee received revised language from FALS. Two stakeholders stated they support the new language from FALS. The NEWMA L&R Committee was advised that FALS continues to work on this item and will present its final position at the NCWM Annual Meeting.

At the 2012 CWMA Annual Meeting, Mr. Hayes, FALS Chair, presented revised language. There was substantial agreement on this language but a final consensus was not reached. The Committee continues to support the FALS and looks forward to reviewing a consensus document.

At the 2012 NCWM Annual Meeting, Mr. Prentiss Searles opposed this item as written and submitted revised language for the Committee to consider. Mr. Searles would like to align NIST Handbook 130 with ASTM. Mr. Searles also stated that the proposal put forward by FALS was a placeholder and consensus was not reached. In addition, industry is opposed to such language presented by FALS. Fifteen industry/stakeholder representatives, five state regulators spoke in favor of the language submitted by Mr. Searles. Several states supported the proposal as provided in NCWM Publication 16. One state regulator stated they could support the later enforcement date as proposed by API if the oil companies were truly sincere in moving towards aligning states with ASTM standards without any exceptions including other volatility exemptions and distillation temperatures.

For both NCWM Publication 16 and the alternative language the 10 % ethanol cap is removed, thus allowing blends up to 15 % ethanol.

For non-summer fuels, this alternative language retains the 1 psi waiver (with the exception of Class E fuel which has a 0.5 psi waiver) that currently exists within NIST Handbook 130 for 1 % to 10 % ethanol. This also expands the same vapor pressure waiver for all blends including blends up to 15 % ethanol, and provides a sunset date of May 1, 2016, at which point there will be no exceptions to ASTM standards. For non-summer fuels, the NCWM Publication 16 language would have eliminated the 1 psi waiver for fuel with the publication of NIST Handbook 130 (2013).

The Committee recommends the language submitted by API be considered for adoption.

During the voting session, a state regulator voiced concern that the Committee is asking for a Vote on new language that did not have proper time for review or discussion at the regional association meetings. The Committee Chair remarked that language changes occur often as a result of open hearing testimony and this language, when proposed during testimony, was widely supported as a reasonable compromise to allow the proposal to move forward.

After discussing the comments from the 2012 NCWM Annual Meeting Open Hearings and the proposed changes, the Committee agreed to modify the language in its Interim Report to that shown in this Final Report in the Item Under Consideration.

Additional letters, presentations and data may have been part of the Committee's consideration. To review supporting documents, please refer to Appendix F, *Report of the 96th NCWM* (SP 1125, 2011) and Appendix D in this report to review additional documents.

237-2 I Section 2.1.5. Minimum Motor Octane Number

Source:
BP Global Fuels Technology – West Coast (2011)

Purpose:
Remove Section 2.1.5. Minimum Motor Octane Number since it is considered obsolete.

Item Under Consideration:

Amend the NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation, Section 2.1.5. Minimum Motor Octane Number as follows

~~**2.1.5. Minimum Motor Octane Number. The minimum motor octane number shall not be less than 82 for gasoline with an AKI of 87 or greater;**~~

Background/Discussion: In the early 1990s, the Table titled "Automotive Spark-Ignition Engine Fuel Antiknock Indexes in Current Practice" was removed from the body of ASTM D4814 and placed into an Appendix in ASTM D4814. This Appendix is non-mandatory information and is not part of the specification. It is inappropriate for NIST Handbook 130 to continue with the 82 motor octane number minimum for the following reasons: 1) 82 motor octane number minimum is not an ASTM D4814 specification; 2) FTC regulates octane posting and has no motor octane number minimum; 3) neither the Kinder Morgan Pipeline nor the Olympic Pipeline requires a minimum motor octane number specification; and 4) the Colonial Pipeline has no motor octane number minimum for either Reformulated Blendstock for Oxygenate Blending (RBOB) or Conventional Blendstock for Oxygenate Blending (CBOB).

Recent data shows a low motor octane number is actually preferable for the current fleet of vehicles. Motor and Research octane numbers are equally important to the performance of the motor vehicle engine. A minimum motor octane number requirement offers no more protection to the consumer than the road octane number that is the average of the Motor and Research octane numbers.

At the 2010 SWMA and WWMA Annual Meetings and the 2010 CWMA and NEWMA Interim Meetings, all four associations forwarded the item to NCWM, recommending it as an Informational Item. The SWMA, CWMA, and NEWMA recommended that the item to be developed by FALS.

At the 2011 NCWM Interim Meeting, the FALS Chair reported that the Subcommittee recommended that this item be Informational to allow more time for data to be reviewed. Historical data exists and the Coordinating Research Council (CRC) study is currently being done that will clarify issues and provide data needed to assist with making decision. There were no comments heard from the floor during Open Hearings. The Committee made this item Informational.

At the 2011 NEWMA Annual Meeting, there were no comments heard on this item. The NEWMA recommended that this item move forward as an Informational Item.

At the 2011 CWMA Annual Meeting, the FALS Chair indicated that they are waiting for results from the CRC study and recommends this remain Informational because it is not fully developed. The CWMA L&R Committee recommended that this item move forward as an Informational Item.

At the 2011 NCWM Annual Meeting, FALS met and a presentation was provided by Mr. Jim McGetrick regarding background information on minimum octane levels. FALS is still waiting for the data from the CRC study (report no. 660). The CRC plans to collect additional data on octane. FALS is recommending this be kept Informational until additional information is received and a recommendation to the Committee can be prepared.

At the 2011 CWMA Interim Meeting, Mr. Hayes stated most new cars respond better to the research octane number rather than to the anti-knock index; however, this is still being studied by the CRC and research is ongoing. Therefore, it is recommended that the item remain an Informational Item.

At the 2011 WWMA, SWMA Annual and NEWMA Interim Meetings, the recommendation was to keep this an Informational Item.

At the 2012 NCWM Interim Meeting, Mr. Hayes reported to the L&R Committee that a FALS Task group continues to work on this item. Mr. Mahesh Albuquerque, Colorado, Task Group Chair reported that information is still being gathered and recommends it be an Informational Item. The L&R Committee is recommending that this item be Informational.

At the 2012 NEWMA Annual Meeting, a representative remarked that this is a non-issue. NEWMA recommends this be an Informational Item.

At the 2012 CWMA Annual Meeting, no comments were received. The CWMA recommends this be an Informational Item.

At the 2012 NCWM Annual Meeting, two industry representatives supported the further development of this item by the task group. Mr. Bill Studzinksi, General Motors, will be leading the discussion on this item for the FALS. And, a stakeholder remarked that we do not need a task force for this item and that we should refer to ASTM.

Additional letters, presentations, and data may have been part of the Committee's consideration. To review supporting documents, please refer to Appendix F in this report.

237-3 V Section 3.3. Diesel Fuel

(This item was adopted.)

Source:
Missouri Department of Agriculture (2012)

Purpose:
Establish uniform fuel dispenser nozzle colors for product recognition and limit diesel nozzle spout to a minimum size to prevent accidental mis-fueling.

Item Under Consideration:
Amend the NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation under Section 3.3. Diesel Fuel as follows:

3.3. Diesel Fuel.

3.3.1. Labeling of Grade Required – Diesel Fuel shall be identified by grades No. 1-D, No. 2-D, or No. 4-D.

3.3.2. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of diesel fuel shall comply with EPA pump labeling requirements for sulfur under 40 CFR § 80.570.

3.3.3. Delivery Documentation for Premium Diesel. – Before or at the time of delivery of 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.

(Added 1998) (Amended 1999)

3.3.4. Nozzle Requirements for Diesel Fuel. – Each dispensing device from which diesel fuel is sold at retail shall be equipped with a nozzle spout with a diameter that conforms to the latest version of SAE J285, "Dispenser Nozzle Spouts for Liquid Fuels Intended for Use with Spark Ignition and Compression Ignition Engines."

(Enforceable effective July 1, 2013)

(Added 2012)

(Added 1998) (Amended 1998, 1999 ~~and~~, 2008**, and 2012**)

Background/Discussion:
Missouri Weights and Measures receive numerous complaints each year related to the accidental mis-fueling of vehicles. Information received from many other states indicates the same problem exists nationwide.

At the 2011 CWMA Interim Meeting, an energy company representative gave a presentation with examples of colors of labels and other decals on dispensers as well as fuel containers and commented that there is a "rainbow of colors" out there. A state regulator commented and another agreed that all mis-fueling complaints in his state occurred because the consumer reached for a green handle thinking it was diesel. Multiple petroleum marketers contacted him to address this problem (refer to Appendix F). Additionally, all diesel fuel caps and replacement caps are color coded. Another state regulator stated that having the nozzle match the fuel cap is a good idea. Mr. Hayes, FALS Chairperson, stated that larger nozzles have virtually eliminated mis-fueling of diesel into gasoline tanks in his state. American Automobile Association (AAA) has contacted him and supports this proposal as do several auto manufacturers. The CWMA L&R Committee believes the proposal is ready for consideration and recommended moving this item forward as a Voting Item.

At the 2011 WWMA Annual Meeting the Western Petroleum Marketers opposed this item due to color limitations as there is not an issue with nozzle size requirements. There were several comments that a color coding system can be difficult to enforce. The WWMA L&R Committee concurs with the comments heard from the floor and believes their job is to perform quality assurance at the fuel stations. Colored nozzles are beyond the scope of their responsibilities. It also conflicts with current marketing practices. The WWMA recommendation is to Withdraw this item.

At the 2011 NEWMA Interim Meeting careful consideration was given to colors chosen so as not to conflict with existing colors. The NEWMA supports this item as a Developing Item.

No comments were received at the 2011 SWMA Annual Meeting. SWMA recommends placing this as a Voting Item.

Initial Item Under Consideration published in NCWM Publication 15 (2012):

- Establish uniform nozzle color requirements for easier product identification on motor fuel dispensers. Limit the minimum spout size for diesel dispensers to 0.93 inches to prevent accidental mis-fueling. Add the following to Section 3, Classification and Method of Sale of Petroleum Products:

3.1.4. Nozzle Color Requirement for Fuels. – Each dispensing device nozzle from which fuel is sold at retail shall not be yellow or green in color unless provided in sections 3.3.5. and 3.8.3.

(Added 20XX)

3.3.4. Nozzle Requirements for Diesel Fuel. – Each dispensing device from which diesel fuel is sold at retail shall be equipped with a nozzle spout having a terminal end with an outside diameter of not less than 23.63 mm (0.930 in).

(Added 20XX)

3.3.5. Nozzle Color Requirement for Diesel Fuel. – Each dispensing device from which diesel fuel is sold at retail shall be equipped with a nozzle green in color.

(Added 20XX)

3.8.3. Nozzle Color Requirement for E85 Fuel Ethanol. – Each dispensing device from which E85 Fuel Ethanol is sold at retail shall be equipped with a nozzle yellow in color.

(Added 20XX)

At the 2012 NCWM Interim Meeting during the FALS meeting, Mr. Hayes, FALS Chair, reviewed several letters regarding this item. A petroleum marketer recommends the term "E85" be replaced with "flex fuels." Concern was expressed that if all states do not adopt this regulation it could cause confusion in the marketplace. Mr. Hayes remarked that this proposal simply states that gasoline nozzles can be any color, other than green or yellow. This would help resolve the issue of individuals putting gas into diesel tanks. Currently, diesel fuel going into gasoline powered vehicles is controlled by the size of the nozzle spout. An industry representative expressed concern that this proposal may lead to additional restrictions, and there is no data to prove it will resolve the mis-fueling problem. A state inspector remarked that this is not a big impact on service station operators since stations are currently 90 % compliant in regards to color. FALS is recommending a one year implementation date (July 2013) and to exempt high flow meters at truck refueling sales. Consensus was reached and there were no objections to recommend the item move forward as a Voting Item with the modifications suggested.

Mr. Hayes provided the Committee with recommended modifications to the current language that would exempt high flow meters, with a July 2013 implementation date, and to change the term "E85" to "flex." After considerable discussion with the FALS they recommend the modified language move forward as a Voting Item.

During the open hearings a state regulator replied that it is necessary to add this proposal to the NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation since many states will adopt it. An industry representative expressed concerns requiring a change to colored nozzles citing that companies use nozzle color as part of their image requirements, and they have contractual agreements with retailers. An industry representative agreed that adding a standardized color requirement will not end mis-fueling problems and some states may not even adopt this requirement. Several industry representatives supported language for nozzle size and proposed that the language for nozzle color be withdrawn citing that gas pumps are clearly marked and labeled and consumers need to take responsibility for using the correct nozzle. A statement was made that mis-fueling happens in less than 1 % of all gas pump fills. A state regulator stated consumers are overwhelmed with the number of decals on the dispensers with advertisements on dispenser cabinets, dispenser toppers, and now streaming videos which distracts the consumer from important safety warning signs. A uniform nozzle color scheme is a simple, low cost solution to reduce mis-fueling at the pump.

A State Director supported this proposal due to issues with mis-fueling, agreeing there is a need to keep diesel and gasoline dispensers different. Another State Director questioned whether weights and measures is the appropriate place to regulate mis-fueling and recommended the item be withdrawn stating it oversteps NCWM bounds. Another State remarked that both nozzle size and color coding follow SAE practices. Another state regulator did not see how a color requirement will help, but does support requirements for nozzle sizes. A State Director remarked that they have done research on color coding, and it ultimately provides consumer protection. He submitted a letter from the Missouri American Automobile Association that concurs with this. A state official recommended separating this into two separate proposals.

The Committee reviewed the initial item under consideration and recommended withdrawing Section 3.1.4., 3.3.5., and 3.8.3.; and recommends that Section 3.3.4. move forward as a Voting Item with an effective date of July 1, 2013.

At the 2012 NEWMA Annual Meeting, a stakeholder remarked that this is currently practiced in the marketplace. A state regulator commented that the concern is the location of diesel nozzles on a dispenser and that larger nozzles help in alleviating the problem. Another state regulator commented that S&T had many unanswered questions, which he would like to see handled first. A consumer remarked that the Method of Sale should be allowed to

advance within L&R without waiting for S&T. A comment was made about how many diesel cars are unable to handle the larger nozzle size for the fuel intake and that automobile manufacturers should be consulted on this item.

At the 2012 CWMA Annual Meeting, a state regulatory official rose to support this item and would be submitting a new proposal to address product identity. Two additional stakeholders rose to support this item. The CWMA recommends this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 Annual NCWM Meeting, a consumer asked how many individuals have reviewed the ASTM J285 standard to see if there are requirements for relief valve, size of fitting, or other required items. The FALS Chairperson clarified that this is only for dispenser nozzle spouts for liquid fuels intended for use with spark ignition and compression ignition engines. It was recommended the L&R Committee add in the spout size requirement to the language. A state director requested that the actual SAE standard be referenced. Another state director urged the L&R Committee to also move forward with the nozzle colors to help prevent mis-fueling problems in his state such as gasoline into diesel vehicles and E85 into "gasoline only vehicles."

After discussing the comments from the 2012 NCWM Annual Meeting open hearings and the proposed changes, the L&R Committee agreed to modify the language in its Interim Report to that shown in this Final Report in the Item Under Consideration.

Additional letters, presentations, and data may have been part of the Committee's consideration. To review supporting documentation, please refer to Appendix F in this document.

237-4 V Section 3.13.1. Labeling of Vehicle Motor Oil

(This item was adopted.)

Source:
Central Weights and Measures Association (2011)

Purpose:
Amend the Fuels and Automotive Lubricants Regulation to require detailed invoicing requirements. Some oil facilities may not deliver the advertised oil, so consumers may be receiving lower quality oil. It is being recommended that retailers that provide oil change services be required to provide consumers with a document that lists the oil's manufacturer, brand name, SAE viscosity, and service requirements as defined in API 1509, SAE J183, or ASTM D4485.

Item Under Consideration:

3.13. Oil.

3.13.1. Labeling of Vehicle Engine (Motor) Oil Required

3.13.1.1. Viscosity. – The label on ~~**each container of**~~ **any** vehicle **engine (**motor**)** oil **container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank** shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300 "**Engine Oil Viscosity Classification**."

(Amended 2012)

3.13.1.2. Intended Use. – The label on ~~**each container of**~~ **any** vehicle **engine (**motor**)** oil **container** shall contain a statement of its intended use in accordance with the latest version of SAE ~~**J300**~~ **J183 "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")**."

(Amended 2012)

3.13.1.3. Brand – The label on any vehicle engine (motor) oil container and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle engine (motor) oil.

(Added 2012)

~~**3.13.1.3.1. Exception for Quantities of One Gallon (3.785 L) or Less. A container of engine vehicle motor oil with a volume of 1 gal (3.785 L) or less that does not meet an active service category, as defined by the latest version of SAE J183, shall bear a plainly visible cautionary statement in compliance with SAE J183, Appendix A, for obsolete API oil categories.**~~

3.13.1.3~~4~~. Engine Service Category. – The label on ~~**each container of**~~ **any** vehicle **engine (**motor**)** oil **container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) oil dispensed from a receptacle, dispenser, or storage tank** shall contain the engine service category, or categories, met in letters not less than 3.18 mm (1/8 in) in height, as defined by the latest version of SAE J183, "**Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")"** or API Publication 1509, "Engine Oil Licensing and Certification System."

(Amended 2012)

3.13.1.4.1. Inactive or Obsolete Service Categories. – The label on any vehicle engine (motor) oil container, receptacle, dispenser, or storage tank and the invoice or receipt from service on an engine that includes the installation of vehicle engine (motor) engine oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")" Appendix A, whenever the vehicle engine (motor) oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183, "Engine Oil Performance and Engine Service Classification (Other than "Energy Conserving")."

(Added 2012)

3.13.1.4~~.2~~5. Tank Trucks or Rail Cars. – Tank trucks, rail cars, ~~or~~ and types of delivery trucks that are used to deliver vehicle engine (motor) oil are not required to display the SAE viscosity grade and service category or categories as long as the bill of lading or other documentation provides that information.

(Added 2012)

All references to invoice or receipt will be enforceable effective on July 1, 2013.

(Amended 2012)

Background/Discussion:
At the 2010 CWMA Interim Meeting, a state regulator stated that oil changing facilities are affecting revenues from legitimate businesses by masquerading as branded facilities, while selling lower-quality oil (refer to Appendix G, in the *Report of the 96th NCWM* (SP 1125, 2011]). The consumer believes they are receiving the advertised brand of oil. At least one branded oil company has investigated certain questionable installers, filed lawsuits, and have successfully closed those suits with installers in the area of trademark infringement and deceptive trade practices. To assist in mitigating these unlawful trade practices and to protect consumers against fraudulent activity, it is recommended that invoice be established. A state regulator questioned if businesses were using the same hose for hydraulic and motor oil, or if the hose would be flushed prior to using it for a different product. He remarked that there would be a contamination factor. The CWMA recommends that the item under consideration move forward to the NCWM L&R Committee for consideration.

Original Proposal:

3.13. Oil.

3.13.1. Labeling of Vehicle Motor Oil.

3.13.1.1. Viscosity. – The label on each container of vehicle motor oil shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300.

3.13.1.2. Intended Use. – The label on each container of vehicle motor oil shall contain a statement of its intended use in accordance with the latest version of SAE J~~300~~**183**.

3.13.1.3. Engine Service Category. – The label on ~~**each**~~ **a** ~~**container of**~~ vehicle motor oil **container, receptacle, pump, dispenser, or storage tank and the invoice from the sale of vehicle motor oil dispensed from a receptacle, pump, dispenser, or storage tank** shall contain the engine service category, or categories, met in letters not less than 3.18 mm ($^{1}/_{8}$ in) in height, as defined by the latest version of SAE J183 or API Publication 1509, "Engine Oil Licensing and Certification System."

3.13.1.3.1. ~~Exception for Quantities of One Gallon (3.785 L) or Less~~ Inactive or Obsolete Service Categories. ~~**– A container of engine vehicle motor oil with a volume of 1 gal (3.785 L) or less that does not meet an active service category, as defined by the latest version of SAE J183, shall bear a plainly**~~ **The label on a vehicle motor oil container, receptacle, pump, dispenser, or storage tank and the invoice from the sale of vehicle motor oil dispensed from a receptacle, pump, dispenser, or storage tank shall bear a plainly** visible cautionary statement in compliance with SAE J183, Appendix A, ~~**for obsolete API oil categories**~~ **whenever the vehicle motor oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAI J183.**

3.13.1.3.2. Tank Trucks or Rail Cars. – Tank trucks or rail cars that are used to deliver vehicle motor oil are not required to display the SAE viscosity grade and service category or categories as long as the bill of lading or other documentation provides that information.

At the 2010 WWMA Annual Meeting, an industry representative, who submitted this proposal, recommended that the term "pump" be dropped from the language. A state official questioned if checking the labeling on bulk tanks is the responsibility of weights and measures, or is it an industry issue? The Technical Advisor suggested giving consideration to mirroring this same language in the method of sale. The L&R Committee recognizes that statement of brand is required on liquid measuring devices in NIST Handbook 44. The WWMA recommends this item be moved forward as Informational Item and have it be reviewed by the FALS**.**

3.13. Oil.

3.13.1. Labeling of Vehicle Motor Oil.

3.13.1.1. Viscosity. – The label on ~~**each container of**~~ **a** vehicle motor oil **container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank** shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300.

3.13.1.2. Intended Use. – The label on ~~**each container of**~~ **a** vehicle motor oil **container** shall contain a statement of its intended use in accordance with the latest version of SAE ~~**J300**~~ **J183**.

3.13.1.3. Brand – The label on a vehicle motor oil container and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle motor oil.

~~**3.13.1.3.1. Exception for Quantities of One Gallon (3.785 L) or Less. A container of engine vehicle motor oil with a volume of 1 gal (3.785 L) or less that does not meet an active service category, as defined by the latest version of SAE J183, shall bear a plainly visible cautionary statement in compliance with SAE J183, Appendix A, for obsolete API oil categories.**~~

3.13.1.3~~4~~. Engine Service Category. – The label on ~~**each container of**~~ **a** vehicle motor oil **container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank** shall contain the engine service category, or categories, met in letters not less than 3.18 mm ($^{1}/_{8}$ in) in height, as defined by the latest version of SAE J183 or API Publication 1509, "Engine Oil Licensing and Certification System."

3.13.1.4.1. Inactive or Obsolete Service Categories. – The label on a vehicle motor oil container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with SAE J183, Appendix A, whenever the vehicle motor oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183.

3.13.1.4.2. Tank Trucks or Rail Cars. – Tank trucks, rail cars, or other types of delivery trucks that are used to deliver vehicle motor oil are not required to display the SAE viscosity grade and service category or categories as long as the bill of lading or other documentation provides that information.

At the 2010 SWMA Annual Meeting, Mr. Ferrick, API, notified attendees that they were seeing a revised proposal. This revision was not presented at the 2010 CWMA and WWMA meetings. Mr. Ferrick supports this item stating that NIST Handbook 130 has required that labels on motor oil packages identify the oil's SAE viscosity and API performance level. Both of these items are important pieces of information for consumers. The changes proposed for NIST Handbook 130 are intended to apply the labeling requirements for packaged motor oils to oils sold in bulk. The changes as proposed would require motor oil manufacturers and distributors to identify the oils they deliver, and for installers to identify the oils they dispense. Requiring distributors to identify the motor oils they deliver to installers will help ensure that installers know what they are dispensing, and requiring installers to do the same on their invoices will provide the same level of information for consumers. The SWMA L&R Committee reviewed the revised language submitted and agreed that the item has merit. It was also noted that the language needs to be similar for the regulations as well as the method of sale in NIST Handbook 130. The SWMA forwarded this item to NCWM recommending it as an Informational Item.

At the 2010 NEWMA Interim Meeting, a representative of API spoke in favor of the need to disclose on all motor oil storage vessels and in receipts for oil change services the motor oil information. Currently, consumers may not be sure of what motor oil product they are receiving and may be subjected to fraud. A disclosure requirement would clearly disclose to consumers what they are purchasing and help eliminate any fraud. The NEWMA believes this is a consumer friendly issue, and that requiring retailer invoices for oil change services to disclose the manufacturer, brand name, SAE viscosity, and service requirements is appropriate. Proposed labeling requirements should be included on the agenda as a Developing Item.

At the 2011 NCWM Interim Meeting, Mr. Hayes reported that FALS recommends moving the Western (WWMA) language forward. An API representative and submitter of the item also recommend that this revised version presented at the WWMA move forward. The 2011 L&R Committee supported this item and designated it as a Voting Item.

3.13.1. Labeling of Vehicle Motor Oil.

3.13.1.1. Viscosity. – The label on ~~**each container of**~~ **a** vehicle motor oil **container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank** shall contain the viscosity grade classification preceded by the letters "SAE" in accordance with the SAE International's latest version of SAE J300.

3.13.1.2. Intended Use. – The label on ~~**each container of**~~ **a** vehicle motor oil **container** shall contain a statement of its intended use in accordance with the latest version of SAE ~~**J300**~~ **J183**.

3.13.1.3. Brand – The label on a vehicle motor oil container and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank shall contain the name, brand, trademark, or trade name of the vehicle motor oil.

~~**3.13.1.3.1. Exception for Quantities of One Gallon (3.785 L) or Less. A container of engine vehicle motor oil with a volume of 1 gal (3.785 L) or less that does not meet an active service category, as defined by the latest version of SAE J183, shall bear a plainly visible cautionary statement in compliance with SAE J183, Appendix A, for obsolete API oil categories.**~~

3.13.1.3~~4~~. Engine Service Category. – The label on ~~**each container of**~~ **a** vehicle motor oil **container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank** shall contain the engine service category, or categories, met in letters not less than 3.18 mm ($^1/_8$ in) in height, as defined by the latest version of SAE J183 or API Publication 1509, "Engine Oil Licensing and Certification System."

3.13.1.4.1. Inactive or Obsolete Service Categories. – The label on a vehicle motor oil container, receptacle, dispenser, or storage tank and the invoice from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank shall bear a plainly visible cautionary statement in compliance with SAE J183, Appendix A, whenever the vehicle motor oil in the container or in bulk does not meet an active API service category as defined by the latest version of SAE J183.

3.13.1.4.2. Tank Trucks or Rail Cars. – Tank trucks, rail cars, or other types of delivery trucks that are used to deliver vehicle motor oil are not required to display the SAE viscosity grade and service category or categories as long as the bill of lading or other documentation provides that information.

At the 2011 NEWMA Annual Meeting, it was noted that the title to the SAE and API standards technical title would editorially be added to the proposal. A request was made to change the word "motor" to "engine." A representative with API did not object to these changes. The NEWMA recommended that the item move forward as a Voting Item.

At the 2011 CWMA Annual Meeting, the FALS Chair noted there is an identical proposal under Item 232-4 for the method of sale. It was remarked by an API representative that some oils have no business in the marketplace because they may cause engine damage. He further noted that it is vitally important for this language to be accepted. The CWMA recommended that this item move forward as a Voting Item with the editorial corrections.

At the 2011 NCWM Annual Meeting, the FALS and Committee received a letter from a stakeholder in support of this proposal (refer to Appendix G). There is a corresponding method of sale proposal under Item 232-4. It was agreed that the title to the ASTM standards would be editorially added into the proposal. A stakeholder requested that the Committee give consideration to implementing the requirement of this information being available on the receipt to a later date. This will allow retailers time to change over their system. During Committee review, it was agreed that the term "motor" would not be changed to "engine." Consideration was given to adding the following

language with regard to receipts, "All references to invoice or receipt will be enforceable effective on July 1, 2012," and to add the word "or receipts" after the term invoice.

On a split vote, the item was returned to Committee. A motion was made during the voting session to remove Section 3.13.1.3. Brand; however, the motion failed. Mr. Hayes commented that brand is an important issue and removal of this section would facilitate continued fraud in the marketplace. Also, consumers would not have the required information to verify warranty work if product identity is removed from the proposal. Engine oils are different blends and stocks. Several states support the inclusion of brand.

At the 2011 WWMA Annual Meeting, a presentation was given by Mr. Ferrick, API, to clarify the issue of branding. API offered their assistance to the states regarding the testing of branding. A state regulator supported the item. There was concern regarding the bulk containers and comingling of product and several states expressed concern regarding the enforcement of branding. The Western Petroleum Marketers Association supported this item. The WWMA Committee feels the proposal is fully developed and recommends moving the item forward as a Voting Item with an editorial change to the effective date statement to read "All references to invoice or receipts will be enforceable effective on July 1, 2013."

At the 2011 NEWMA Interim Meeting, the NEWMA recommended the item to a Voting Item.

At the 2011 SWMA Annual Meeting, Mr. Ferrick stated that the presentation given earlier in the day also applies here. API has to know the brand when testing in order to take action and enforcement in an effort to protect consumers. Mr. Ferrick recommended a July implementation date if adopted. Because of the new information provided by API the SWMA recommended that the item be a Voting Item with a July 2013 implementation date.

At the 2012 NCWM Interim Meeting, the FALS met and Mr. Ferrick provided an updated that addressed the issues with the concerns on "brand." There were no objections heard so FALS is recommending this item to the Committee as a Voting Item.

Mr. Ferrick will provide guidance to at all regions and the 2012 NCWM Annual Meeting on the process to have brand tested in the event of a complaint. The 2012 L&R Committee designated this item as a Voting Item with a modification to the enforcement date to of July 2013 for invoice and receipt requirements.

At the 2012 NEWMA Annual Meeting, Mr. Ferrick presented a review of this item to the members, and he indicated his support for the item. NEWMA recommends this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 CWMA Annual Meeting, Mr. Ferrick gave a presentation, "Consumers Deserve to Know What Oil They're Buying." The CWMA recommends this item be considered for adoption at the 2012 NCWM Annual Meeting.

At the 2012 NCWM Annual Meeting, Mr. Ferrick gave a presentation on "Does Brand Matter for Motor Oil." The Committee received 33 letters in support and one letter of opposition for this item.

During open hearings there were three states that supported this item. The Committee agreed to make an editorial change the term "vehicle motor oil" to "vehicle engine (motor) oil" throughout the item and made minor editorial changes. The Committee maintains the status of the item as Voting. After discussing the comments from the 2012 NCWM Annual Meeting open hearings and the proposed changes, the Committee agreed to modify the language in its Interim Report to that shown in this Final Report in the Item Under Consideration.

Additional letters, presentations and data may have been part of the Committee's consideration. To view supporting documentation, please refer to Appendix G, in the *Report of the 96th NCWM* (NIST SP 1125, 2011) and Appendices B of this report for additional content.

237-5 I Section 3.15. Biodiesel and Biodiesel Blends

Source:
Southern Weights and Measures Association (SWMA) (2010)

Purpose:
Amend Section 3.15. Biodiesel and Biodiesel Blends of the Engine Fuels and Automotive Lubricants Regulation to remove the exemption for declaration of biodiesel content on product transfer documents for biodiesel blends up to 5 %.

Item Under Consideration:
Amend NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation, Section 3.15. Biodiesel and Biodiesel Blends.

3.15. Biodiesel and Biodiesel Blends.

3.15.1. 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."

3.15.2. Labeling of Retail Dispensers.

3.15.2.1. Labeling of Grade Required. – Biodiesel shall be identified by the grades S15 or S500. Biodiesel blends shall be identified by the grades No. 1-D, No. 2-D, or No. 4-D.

3.15.2.2. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of biodiesel blends shall comply with EPA pump labeling requirements for sulfur under 40 CFR § 80.570.

3.15.2.3. Automotive Fuel Rating. – Biodiesel and biodiesel blends shall be labeled with its automotive fuel rating in accordance with 16 CFR Part 306.

3.15.2.4. 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 that 6 mm (¼ 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~~ Required on Transfer Documents. – ~~**The retailer shall be provided, a**~~ **A**t the time of delivery of the fuel, a declaration of the volume percent biodiesel **shall be disclosed on all transfer documents.** ~~**on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; i**~~**I**t is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.

(Amended 20XX)

3.15.4. Exemption.

(a) 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~~,~~ **and** 3.15.2. Labeling of Retail Dispensers~~, and 3.15.3. Automotive Fuel Rating~~ when it is sold as "diesel fuel" as required in Section 3.3. **Diesel Fuel.**

(b) Diesel fuel containing less than 1 % by volume biodiesel is exempted from the requirement of 3.15.3. Documentation for Dispenser Labeling Purposes.

(c) Diesel fuel containing 1 % and not more than 5 % by volume biodiesel fuel is exempt from disclosing the actual percent by volume of biodiesel as required in Section 3.15.3. Documentation for Dispenser Labeling Purposes. However, the term "Contains Biodiesel" or other similar terms shall be used.

(Amended 20XX)

(Added 2005) (Amended 2008 **and 20XX**)

Background/Discussion:
At the 2009 SWMA Annual Meeting, a discussion over blending was presented by a FALS member. Biodiesel is being blended at many terminals across the country in concentrations up to 5 %. Marketers downstream of the terminal are then attempting to blend additional biodiesel to target levels, and finding that their product is being over-blended because they were not aware that the fuel contained any biodiesel. Per Mr. Jennings, Tennessee, at least one major truck stop operator has already voiced concerns to the FALS Chairperson. This amended proposal will remove the exemption declaration of biodiesel content on product transfer documents for biodiesel blends up to 5 %. Biodiesel is blended at terminals in concentrations up to 5 %. Mr. Jennings felt it was important to start this recommendation and have the FALS Chairperson vet the proposal out to all members of the FALS Committee for their comments before the NCWM Interim meeting in January 2010. The SWMA forwarded this item to NCWM, recommending it as a Voting Item.

3.15. Biodiesel and Biodiesel Blends

3.15.1. 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."

3.15.2. Labeling of Retail Dispensers.

3.15.2.1. Labeling of Grade Required. – Biodiesel shall be identified by the grades S15 or S500. Biodiesel blends shall be identified by the grades No. 1-D, No. 2-D, or No. 4-D.

3.15.2.2. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of biodiesel blends shall comply with EPA pump labeling requirements for sulfur under 40 CFR § 80.570.

3.15.2.3. Automotive Fuel Rating. – Biodiesel and biodiesel blends shall be labeled with its automotive fuel rating in accordance with 16 CFR Part 306.

3.15.2.4. 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 that 6 mm (¼ 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~~,~~ **and** 3.15.2. Labeling of Retail Dispensers~~, and 3.15.3. Automotive Fuel Rating~~ when it is sold as "diesel fuel" as required in Section 3.3. Diesel Fuel.

(Added 2005) (Amended 2008 **and 20XX**)

At the 2010 NCWM Interim Meeting, Mr. Hayes, FALS Chair, gave an update on the Subcommittee's work to remove the current exemption for biodiesel disclosure in diesel fuel at 5 % and below, on product transfer documents.

A draft of substitute language was circulated among FALS members prior to the Interim Meeting. This substitute language expanded the disclosure of biodiesel content on all transfer documents (not limited to ones to the retailer) and for levels greater than 1 % biodiesel. The substitute was an attempt to find middle ground. FALS members were more agreeable to this substitute, but many still felt more work is needed.

The L&R and FALS Committee received seven letters (refer to L&R Appendix E within the *Report of the 95th NCWM* [SP 1115, 2010]) that do not support this proposal as stated. The Committee does support working on this issue and receiving feedback from industry. There is concern with the documentation and co-mingling of fuels. If fuel is co-mingled, it would need to be sampled every time, which could be quite costly.

An official requested that this item move forward as a Voting Item and meanwhile NEWMA and CWMA could review and further develop the language at their spring 2010 meetings. API stated there are many things to consider, such as preemption language, cost implications, commercial issue of declaring with each transaction. API has worked with marketers, but there continues to be a difference of opinion and no consensus. It was voiced by industry that all biodiesel needs to be documented on the paperwork. If not, it puts the wholesaler, retailer, and consumer at risk. There was a comment from a stakeholder that they do not agree with API's comment and that this has been a two-year battle on who gets to do the blending. Blenders are over-blending because they are not aware of what the current blend is. To prevent this situation, it would require disclosure on the transfer document. The 2010 L&R Committee designated this item as an Informational Item. At the 2010 NEWMA Annual Meeting, a stakeholder reported that the FTC has not changed the existing posting rule. NEWMA recommended that this item remain as an Informational Item.

At the 2010 CWMA Annual Meeting, there were several comments stating that the exact percentage of an alternative fuel needs to be known. Without the percentage being known, mislabeling can occur, which is not good for consumer, marketers, the environment, and renewable fuels. What is the downside of providing this information? A representative of the National Biodiesel Board (NBB) does not support this proposal and would like to have further discussions to seek what is best for the entire industry. They also commented that FTC declined to modify requirements for disclosure on product transfer documents for fuels containing 5 % or less biodiesel. A state official disagrees that the exact percentage is necessary since it is the blender's responsibility to test the product prior to blending. A representative of the Renewable Fuels Association would like to see the proposal expanded to include all additives and stated that the focus needs to be in broader terms instead of renewable fuels and recommended that the scope include all blending components. THE CWMA recommended that item remain an Informational Item and that FALS form a task force under their guidance to develop this proposal.

At the 2010 NCWM Annual Meeting, the Committee received numerous letters (refer to Appendix E within the *Report of the 95th NCWM* [SP 1115, 2010]), and heard from fifteen stakeholders and industry representatives, supporting Section 3.15.3 that requires disclosure. Several participants expressed concerns with sections of the proposal. The FTC has the authority to protect consumers, and they are looking at requiring product transfer documents. Several stakeholders indicated that they expect FTC to issue a proposed rule on biodiesel in the near future. It would be best if we stayed in line with the FTC ruling on the biodiesel issue. The very low blends seem to be the challenge. The sections that are of concern to stakeholders are 3.15.4 (b) and (c), since it conflicts with reporting of taxes collected on biodiesel. The exact amount of the blend needs to be documented on the transfer document. The concern is when fuel is picked up from various locations and delivered; the actual amount of biodiesel is not documented. Currently blending at the terminal is not an issue.

The NCWM L&R Committee agreed to allow time for the FALS Committee to receive additional information and further discuss this item.

At the 2010 CWMA Interim Meeting, a representative from a Petroleum Marketers Association commented that disclosure sets the tone for a chain of events for biodiesel. It was important for disclosure to be provided all the way through the distribution process because of the potential for over-blending. He believes that it is not realistic for wholesale distributors to test for biodiesel due to the cost. He supports the proposal with exception of the exemptions provided in 3.15.4 Exemptions (b) and (c). A state regulator agreed with this testimony. Another state regulator commented that the current proposal follows the same format as the ethanol regulation. A petroleum dealer mentioned that due to the Renewable Fuels Standard (RFS), disclosure is needed in order to meet the mandates for blending.

A representative with the NBB commented that this proposal needs to be further developed by the FALS. This representative believes that we have not heard from all segments of the industry regarding this proposal, and also expressed concern that there will be no benefit to consumers if the cost of the extra testing of fuel is being passed on to consumers. It was mentioned that there are quick testing methods available for determining biodiesel content in the field; although, some are more accurate than others. The NBB representative also stated that the FTC believes that it is the responsibility of the blender to determine biodiesel content prior to blending.

A producer mentioned that the disclosure proposal would require terminals to purchase equipment and to do additional testing. The producer is concerned about tank stratification and the need to change bills of lading as the content varies. Cost and manpower are major concerns for producers. A marketer provided testimony that it is more efficient for terminals to purchase testing equipment as opposed to requiring all downstream blenders to purchase testing equipment. He stated that changing bills of lading is only a software change. He believes that it is the blenders' obligation to meet the law for labeling, and it is difficult if the biodiesel content is not disclosed. The NBB representative questioned how often marketers test. A marketer responded that they do not routinely test since they rely on the transfer documents to accurately state what they are getting. Another marketer stated that producers can control what goes into their tanks and questioned if producers know how much biodiesel is in each batch. A producer responded that for barrels received by water in Savannah, Georgia, the biodiesel content is only disclosed on Plantation pipeline shipments if it is more than 5 %. THE CWMA recommends that the proposal be further developed by the FALS.

At the 2010 WWMA and SWMA Annual Meeting, an industry representative spoke in support of keeping this item Informational and allow the FALS to further develop the requirements in light of the comments received. An industry representative also stated that all shipping documents should show the exact blend of biodiesel. Both Associations recommends that this item remain Informational.

At the 2010 NEWMA Interim Meeting, the L&R Committee received written comments from API. The NEWMA recommends that this item move forward as an Informational Item.

At the 2011 NCWM Interim Meeting, a member of both the FALS and L&R Committee reported that this item was debated during the FALS work sessions and a consensus could not be reached. It was agreed upon that a Biodiesel Disclosure Task Group be formed to further study this item. Steve Howell, MARC IV; and Samuel Bell, Echols Oil Company, Inc., will Co-chair this Subcommittee. The L&R Committee received five letters, yet no additional comments were received during Open Hearings. The Committee designated this as an Informational Item.

At the 2011 NEWMA Annual Meeting am NBB consultant stated that a report is currently being prepared and will be ready for the 2011 Annual NCWM meeting. The NEWMA recommended that this item move forward as a Developing Item.

At the 2011 CWMA Annual Meeting, FALS Chair, Mr. Ron Hayes, Missouri, remarked that a work group was formed under FALS to develop new language. A petroleum representative opposes the item as written and it does not allow the blender to disclose what level blending has occurred. Another petroleum representative remarked that there are other implications beyond small percentages of biodiesel with other additives. It was agreed that as blender you should know exactly what you are getting, but it needs to be tested. The question is, "Who is the

responsible party for providing the test?" The CWMA recommends that this item move forward as a Developing Item.

At the 2011 NCWM Annual Meeting, the FALS Chair reported that a Subcommittee has been formed to work out a compromise on the requirements, and a report with solutions should be prepared and available for FALS at the 2012 Interim Meeting.

At the 2011 CWMA Interim Meeting, the NBB representative stated a work group is coming up with compromise language for the 2012 NCWM Interim Meeting. The Petroleum Marketers and Convenience Stores of Iowa (PMCI) representative stated there were 137 biodiesel blenders in Iowa and the current proposed language is a real concern to blenders, especially the 5 % blenders. The marketers do not support an exemption of 5 % or less included on the product transfer documents. One state regulator agrees and suggests removing the exemption for 5 % blends stating that if percentage is known it reduces the need for downstream testing. The NBB representative countered that testing adds a lot of cost before the product reaches the consumer and that 5 % biodiesel or less meets the ASTM D975 diesel fuel specification and there is no performance difference. She also stated the current proposed language may be the best compromise that can be achieved. The state regulator stated that in her state terminals already certify how much biodiesel leaves the terminal. The NBB representative countered biodiesel was developed as a fungible product and is a drop-in fuel. Further, fungibility issues dictate that we not disclose the exact biodiesel content. The PMCI representative stated that gallons of biofuel must be reported, and the language in Item 237-3 is a compromise because his constituents did not have input into the exemption language. An energy company representative stated that Plantation Pipeline is saying diesel fuel may contain up to 5 % biodiesel. Therefore, batch certification would be required to determine content. Stratification is also a concern because even batch testing may not be indicative of the true content. The PMCI representative stated this issue is really about the renewable identification number (RIN) credit and how they are bought and sold. The NBB representative stated that weights and measures is most concerned with making sure there is equity in the marketplace and that profitability in the marketplace is left up to the market. Another state regulator questioned where the burden of analysis lies. He further stated if the blender is making a profit then it is reasonable to expect the blender to bear the cost. The FALS is currently gathering information on this item therefore the Committee recommends that the item remain Informational.

At the 2011 WWMA Annual Meeting, there were no comments heard. The WWMA would like to get a recommendation from FALS before taking further action. WWMA recommended making this item remain Informational.

At the 2011 NEWMA Interim Meeting, it was agreed that any action taken should be consistent with other federal agency labeling. NEWMA recommended keeping it an Informational item.

At the 2011 SWMA Annual Meeting, a representative of the NBB conveyed a message on behalf of the chairperson of the FALS, that it will meet before the NCWM Interim Meeting and provide a report to FALS for the NCWM L&R Committee. The SWMA recommended the item remain as an Informational Item.

FALS meet at the 2012 NCWM Interim Meeting. Mr. Sam Bell and Mr. Steve Howell, Task Group Co-Chairs provided a presentation on the updated data and study. They presented a written report to FALS on January 17, 2012. The white paper written on this item and will be posted to the FALS prior to the NCWM Annual Meeting. A plan was submitted for the activities of this task group for the next eighteen months. FALS recommended that this item remain an Informational Item.

At the 2012 NEWMA Annual Meeting, there were no comments received on this item.

At the 2012 CWMA Annual Meeting, the FALS Chair remarked the white paper on his item will be posted to FALS prior to the NCWM Annual Meeting.

At the 2012 Annual Meeting, the FALS Chair provided an update stating that Mr. Bell and Mr. Howell provided a presentation to the Subcommittee, however; there is no consensus on how to move forward with this item.

Mr. Hayes, FALS Chair, reported that work continues to progress with the task group. If you would like to participate in this Biodiesel Disclosure Task Group Subcommittee, contact Mr. Steve Howell, MARC-IV, (816) 903-6272, e-mail showell@marciv.com or Mr. Samuel Bell, Echols Oil Company, Inc., at (864) 233-6205, e-mail info@scpma.com.

Additional letters, presentations, and data may have been part of the Committee's consideration. To review the supporting documentation for this item, please refer to Appendix E, *Report of the 95th NCWM* (SP 1115, 2010), Appendix E in the *Report of the 96th NCWM* (SP 1125, 2011), and Appendix G within this document for additional content.

237-6 V Section 3.2.X. EPA Labeling Requirements Also Apply

(This item was adopted.)

Source:
Renewable Fuels Association (2012)

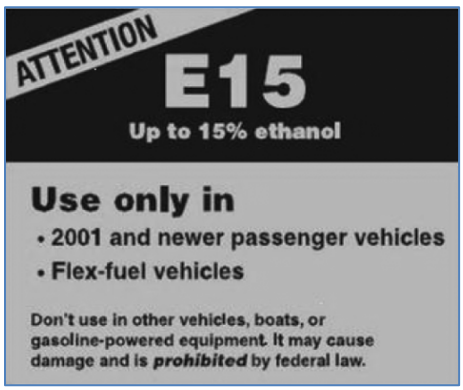
Purpose:
Amend NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation, Section 3. Classification and Method of Sale of Petroleum Products to recognize the mandatory label requirements included in the Environmental Protection Agency (EPA) Mis-fueling Mitigation final rule from July 25, 2011.

Item Under Consideration:
Amend the NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation as follows:

3.2.X. EPA Labeling Requirements Also Apply. – Retailers and wholesale purchaser-consumers of gasoline shall comply with the EPA pump labeling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (v%) ethanol (E15) under 40 CFR §80.1501.

(Added 2012)

Background/Discussion:
EPA included mandatory fuel dispenser labeling in the final rule. Refer to 40 CFR Part §80.1501 which included the creation of a fuel dispenser label that will be required on E15 fuel dispensers. This label informs and alerts consumers on appropriate E15 usage to avoid mis-fueling. On July 25, 2011, EPA finalized the "Regulation to Mitigate the Mis-fueling of Vehicles and Engines with Gasoline Containing Greater Than Ten Volume Percent Ethanol and Modifications to the Reformulated and Conventional Gasoline Programs." (*Federal Register* Notice Vol. 76, No. 142, Monday, July 25, 2011, Rules and Regulations) NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation, Section 3. Classification and Method of Sale of Petroleum Products includes the regulatory requirements for identification and labeling of each type of petroleum product. There is no expected cost to consumers with this amendment. The Renewable Fuels Association (RFA) is providing the appropriate fuel dispenser labels for E15 free of charge.



Based on U.S. EPA's recent action and mandatory use of a label, Renewable Fuels Association believes that NIST Handbook 130 should recognize this labeling requirement identically to the EPA mandated labeling requirement for Diesel Fuel as can be found in NIST Handbook 130, Section 3, specifically Section 3.3.2. EPA Labeling Requirements Also Apply. For convenience a copy of the label follows.

At the 2011 CWMA Interim Meeting, a representative with the RFA proposed adopting the current EPA E15 label. Two state regulators stood in support of this proposal. No other comments were heard. The

CWMA recommends moving this item forward as a Voting Item.

At the 2011 WWMA Annual Meeting, a county official commented about the term within the proposal "wholesale purchaser-consumers." An industry/FALS representative states that the term is in currently recognized federal regulations. The WWMA L&R would like FALS to review this item at their meeting prior to the 2012 NCWM Interim Meeting. The WWMA recommends the item as an Informational Item.

At the 2011 NEWMA Interim Meeting a comment was made that this will make NIST Handbook 130 compatible with federal mandate. Numerous questions arose about the availability of E15 for retail use, the decrease of miles per gallon (mpg) with the increase in ethanol with E15, and whether or not both E10 and E15 will be available at the same Retail Motor Fuel Dispenser (RMFD) when E15 is made available. There were also questions about consumer confusion when E15 becomes available. NEWMA recommends that the item is an Informational Item.

At the 2012 NCWM Interim Meeting, Mr. Bob Reynolds, Downstream Alternatives, Inc., recommended this item be moved forward as a Voting Item so that it matches what is already in Federal law. Mr. Hayes, FALS Chair, recommended to the L&R Committee that they move this item forward as a Voting Item. An industry representative expressed support for this item but inquired to why it was limited to E15? An official remarked that there has been no final ruling from EPA. Mr. Hayes responded to the questions by stating that this EPA labeling requirement is one of several steps that are necessary for final approval of E15 and addressing EPA labeling is consistent with referencing other EPA and FTC labeling in the model regulations for other fuels. An industry representative questioned why NCWM has this issue before them if it is under EPA enforcement. The Committee recommends this be a Voting Item with minor editorial corrections.

The NEWMA and CWMA both support this item during their spring meetings and recommended adoption by the NCWM.

At the 2012 NCWM Annual Meeting, Mr. Chuck Corr, Archer Daniels Midland, spoke in support of this item because it recognizes federal regulations and provides clarity.

237-7 V Section 4. Retail Storage Tanks and Dispenser Filters

(This item was adopted.)

Source:
Missouri Department of Agriculture (2012)

Purpose:
Update regulation to address sensitivity of today's engines to water content in fuel by amending NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation, Sections 4.1. Water in Gasoline-Alcohol Blends, Aviation Blends, Biodiesel Blends, E85 Fuel Ethanol, Aviation Gasoline, and Aviation Turbine Fuel and 4.2. Water in Gasoline, Diesel, Gasoline-Ether, and Other Fuels.

Item Under Consideration:
Amend NIST Handbook 130 as follows:

Section 4. Retail Storage Tanks and Dispenser Filters

4.1. Water in Gasoline-Alcohol Blends, ~~Aviation Blends,~~ Biodiesel Blends, E85 Fuel Ethanol, 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, E85 fuel ethanol, aviation gasoline, and aviation turbine fuel.

(Amended 2008 **and 2012**)

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, ~~**Aviation Blends**~~, Biodiesel Blends, E85 Fuel Ethanol, Aviation Gasoline, and Aviation Turbine Fuel. ~~***(consider all fuels at ¼ inch maximum water)***~~

(Amended 2008 **and 2012**)

Background/Discussion:
The current language in this section may no longer be appropriate for today's fuels. Engine manufactures and oil companies have demonstrated that today's vehicles are prone to damage with fuels in contact with water.

At the 2011 CWMA Interim Meeting, it was noted that the purpose portion of the proposal as submitted is incorrect. It should read "Amend Section 4." Considerable discussion regarding the maximum allowable water content was heard. Due to concerns expressed in the hearing, the submitter would like to develop language for further consideration. The CWMA L&R Committee believes that language needs to be developed before this proposal can be considered. The CWMA recommends this as a Developing Item.

At the 2011 WWMA Annual Meeting, there was a comment that it may be misleading to include dispenser filters in this section. The WWMA reviewed and discussed this with a FALS member and modified the proposal as stated below and recommends the item as a Voting Item.

4.1. Water in Gasoline-Alcohol Blends, ~~Aviation Blends,~~ Biodiesel Blends, E85 Fuel Ethanol, 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, E85 fuel ethanol, aviation gasoline, and aviation turbine fuel.

(Amended 2008 **and 20XX**)

4.2. Water in Gasoline, Diesel, Gasoline-Ether, and Other Fuels. – Water shall not exceed ~~**25 mm (1 in)**~~ **6 mm (¼ 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, ~~**Aviation Blends,**~~ Biodiesel Blends, E85 Fuel Ethanol, Aviation Gasoline, and Aviation Turbine Fuel.

(Amended 2008 **and 20XX**)

At the 2011 NEWMA Interim Meeting no comments were recorded and the Committee recommends the item be assigned as a Developing Item.

At the 2011 SWMA Annual Meeting, an industry representative and member of FALS stated that no one knows what "aviation blends" means so he recommends striking its reference. The Committee believes that clearer language and continued discussion need to occur with this item and recommend placing it as a Developing Item.

At the NCWM 2012 Interim Meeting, Mr. Hayes, FALS Chair, commented that FALS recommends moving this forward as a Voting Item with a language modification to Section 4.2. to remove the statement "consider all fuels at ¼ in maximum water." A consultant remarked that there needs to be a reference point. A state official questioned whether Sections 4.1. and 4.2. would be inconsistent if the statement is removed. An industry official commented that there seems to be a logical inconsistency in that ¼ in really means zero and is not measurable. The Committee recommends this as a Voting Item with the term "aviation blends" and the statement "consider all fuels at ¼ in maximum water" in Section 4.2. be removed.

The NEWMA and CWMA both supported this item and recommended adoption by the NCWM during their spring 2012 Annual Meetings.

At the 2012 NCWM Annual Meeting, Mr. Hayes clarified that this item to remove the term "aviation blends." A stakeholder suggested that the term "E85 fuel ethanol" be changed to "Ethanol Flex Fuel." Currently, the FALS is tasked with addressing terms within NIST Handbook 130 for flex fuels (refer to Item 237-11).

Additional letters, presentations, and data may have been part of the Committee's consideration. To review the supporting documentation for this item, please refer to Appendix J within this document.

237-8 I Section 4.3. Dispenser Filters.

Source:
Missouri Department of Agriculture (2012)

Purpose:
Amend NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation Section 4.3.1. Engine Fuel Dispenser Filters

Item Under Consideration:
Amend NIST Handbook 130 as follows:

4.3. Dispenser Filters.

4.3.1. Engine Fuel Dispensers.

(a) All gasoline, gasoline-alcohol blends, gasoline-ether blends, **biodiesel, biodiesel blends, diesel,** E85 fuel ethanol 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.

(Added 2008) **(Amended 20XX)**

Background/Discussion:
Thirty (30) micron filters provide virtually no protection to current diesel vehicles on the road today. The high pressure common rail diesel engines require 10 micron to 3 micron filters on board. Current dispensers with 30 micron filters are similar to having no filters according to engine manufacturers.

In 2007, the FALS recommended all diesel fuel, biodiesel, and biodiesel blend dispensers must be equipped with a 10 micron or smaller nominal pore-sized filter. During the voting session, an oil company representative stated that his company's stations were equipped with 30 micron filters and suggested this be amended to this size. The L&R Committee decided to amend this section to ensure passage of the entire item as many urgent changes were being considered in the Engine Fuels and Automotive Lubricants Regulation.

Abnormal dispenser filter plugging at retail will alert the retailer of potential storage tank problems. Requiring 10 micron filters for all products will reduce the inventory and the potential of installing the wrong filter for all products at the same site.

At the 2011 CWMA Interim Meeting, a state regulator commented that a smaller porosity filter may be acceptable but for now this is a reasonable start. The CWMA supports moving the item forward as a Voting Item.

At the 2011 WWMA Annual Meeting, need was expressed for more technical information, and there were concerns that the flow rate would be diminished, the size of the filter may need to increase, and coupled with biodiesel it would tend to clog the filter in colder climates. Because of these reasons the WWMA L&R Committee did not believe there was sufficient data to justify addressing this issue. The WWMA recommends that the submitter provide additional studies and technical documents to support this proposal. It is recommended that the item be Withdrawn.

At the 2011 NEWMA Interim Meeting, questions were raised as to whether or not "measurement" of filter content was within the ability of weights and measures officials. It was noted that better filters may enhance fuel quality. The Committee believes that the proposal has potential, given input from industry and NCWM members. NEWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2011 SWMA Annual Meeting, an industry representative stated that standard retailer dispensers use a 10 micron filter, and high capacity dispensers use 30 micron filters (i.e., diesel dispensed at truck stops). The company's engineers have determined that reducing a 30 micron filter to a 10 micron filter will drastically reduce flow rate to trucks. Another industry representative agreed and re-iterated that truck stops would see a tremendous reduction in flow. The SWMA L&R Committee believes this proposal is not practical and would have a negative impact and undue burden on the trucking industry. The SWMA recommends this item be Withdrawn.

At the 2012 NCWM Interim Meeting, Mr. Hayes informed the L&R Committee that FALS recommended this item be Informational because of industry concerns that the 10 micron filters would be too restrictive of flow in high-flow systems. One industry representative expressed opposition for the use of 10 micron filters and recommends this item to be Withdrawn. A representative of an automobile manufacturer claimed diesel passenger vehicles do not have the sophisticated filtration systems commonly found on commercial duty vehicles and 10 micron filters on dispensers are needed for protection from particulate contamination. As proposed, this item could cause clogging of diesel dispenser filters in colder climates. The L&R Committee believes this item has merit but lacks a consensus and also believes that FALS needs to address these concerns. Therefore, the 2012 L&R Committee designated this item as an Informational Item and assigned it to FALS for further development.

The NEWMA and CWMA, during their spring Annual Meetings, both support his item and recommended adoption by the NCWM.

At the 2012 NCWM Annual, several stakeholders spoke in opposition on this item. Mr. Hayes remarked that FALS worked on this item in 2007 and believes FALS needs to continue to work on this item. The NCWM L&R Committee also believes that this item is not ready and supports the continued work of the FALS.

Additional letters, presentations, and data may have been part of the Committee's consideration. To review the supporting documentation for this item, please refer Appendix H within this document for additional content.

237-9 V Section 2.XX. Requirements for Hydrogen Fuel

(This item was adopted.)

Source:
Western Weights and Measures Association and U.S. National Work Group on Hydrogen (2009 Developing Item)

Purpose:
Adopt engine fuel quality requirements for hydrogen in NIST Handbook 130 to address gaseous hydrogen refueling applications.

Item Under Consideration:
Amend the NIST Handbook 130, Engine Fuels and Automotive Lubricants Regulation as follows:

2.17. Hydrogen Fuel. – Shall meet the most recent version of SAE J2719, "Hydrogen Fuel Quality for Fuel Cell Vehicles."

(Added 20XX)

Background/Discussion:
Twenty-four states have hydrogen refueling dispensers in operation. Hydrogen stations using permanent and mobile refueling systems for automobiles, fleet vehicles (buses), forklifts, and airport totes are increasing and may go unnoticed. Many stakeholders, who are not familiar with the weights and measures standards process, will need to

participate at this stage before it becomes a commercial application. This effort by the USNWG for the Development of Commercial Hydrogen Measurement Standards is to ensure there are appropriate standards and test procedures in place in time for dispenser manufacturers, service agencies, and officials to educate the general public, not if, but when, retail hydrogen applications become commercially available.

Existing codes do not fully address hydrogen refueling applications because of hydrogen's properties and other technical differences in the setup and operations of dispensing systems. The development of legal metrology standards for newly emerging hydrogen technology is a necessary component of the hydrogen infrastructure. The weights and measures community must have time to consider requirements for hydrogen-refueling systems before this application is available for public access at corner service stations.

In 2009, the USNHWG first brought proposals for equipment, method of sale, and fuel quality requirements before the weights and measures community to share this information about upcoming standards for an emerging technology. The simultaneous development of the code and corresponding test procedures continues to allow for input from the weights and measures and hydrogen communities, appropriate trials of the standards, and to address all areas of concerns early in the standards development process. A specification table listing the maximum permissible levels of constituents for hydrogen fuel quality was developed by the USNHWG based on the fuel quality standard adopted by California until such time as nationally recognized standard was available.

This item was reviewed at the WWMA and SWMA 2008 Annual Meetings and at the NEWMA 2008 Interim Meeting. NEWMA members generally discussed the "hydrogen issue" and its usage in the marketplace. It is anticipated that hydrogen at first will be relegated to "fleet vehicles" (such as compressed natural gas [CNG]), and that retail sales will be slow in coming to the marketplace. These associations forwarded the item to NCWM, recommending it as a Developing Item.

At the 2009 Interim and Annual Meetings, the NIST Technical Advisor briefed the Committee on work that the USNWG Fuel Specifications Subcommittee (FSS) has done to date (refer to Appendix J in the *Report of the 94th NCWM* [SP 1099, 2009]).

At the WWMA 2009 Annual Meeting, industry representatives acknowledged that some details of the specifications for fuel standards are in development. The WWMA Committee believed it is best to be proactive on this item so that hydrogen stations can be prepare for retail sales.

At the SWMA 2009 Annual Meeting, a state recommended that the test methods be published as they are developed. The state also requested that documentation be produced on the effects of hydrogen if certain property values listed in the table "Hydrogen Fuel Quality Specification," are exceeded and why this is important in the testing of hydrogen.

There were no comments heard on this proposal at the CWMA 2009 Interim Meeting.

NEWMA reviewed this proposal at their 2009 Interim Meeting and recommended leaving this as a Developing Item.

At the NCWM 2010 Interim Meeting, the NIST Technical Advisor provided an updated Table 1. Hydrogen Fuel Quality Specification (refer to L&R Appendix B in the *Report of the 95th NCWM* [SP 1115, 2010]) that amends the chart to identify which Standards Committee is actively working on the test method under development. The 2010 L&R Committee designated this item as an Informational Item.

At the 2010 NEWMA and CWMA Annual Meetings, no comments were received on this item. Both associations are recommended that this remain as an Informational Item.

At the 2010 NCWM Annual Meeting, Mr. Jennings, Tennessee Department of Agriculture informed the Conference that the ASTM is actively working on a hydrogen specification. Until further developed by ASTM, there is nothing that can be done on this item. Mr. Jennings would also like to provide users with information on what the significance is of each property.

At the 2010 CWMA Interim, a representative of the USNHWG provided an update on ASTM efforts to establish test methods. An industry representative provided information that some of the specifications of the SAE standard contained parameters that could not be measured by the current test methods. A ballot cannot take place at ASTM until these test methods are established, and test methods will take some time to develop. The CWMA recommended that the item remain as an Informational Item to be further developed by the NCWM FALS due to their expertise in this area.

At the 2010 WWMA Annual Meeting, a state official, who is also a member of the USNHWG, recommended that this item be split into two separate proposals. One proposal would address "Specifications for Hydrogen Fuel for Internal Combustion Engines and Fuel Cells," and the other item would address "Definitions" with the existing language and definitions as recommended by the USNHWG FSS. The state official reported that the USNHWG has worked on definitions and that moving the terms to a vote would help move the implementation and acceptance of hydrogen. "Specifications" could take years to develop. The WWMA L&R Committee agreed with the recommendation in having the definitions as a separate item (refer to Item 237-2 [237-10 in the 2012 NCWM Annual Report). The WWMA recommends that this item remain as an Informational Item.

At the 2010 SWMA Annual Meeting, the NIST Technical Advisor informed the group that the WWMA recommended to separate the fuel specifications from the definitions. The SWMA Committee with that recommendation. The SWMA recommended that the item remain as an Informational Item.

At the 2010 NEWMA Interim Meeting, there were no comments on this item. NEWMA recommended that the item remain as an Informational Item. The recommendation for the definitions is documented in Item 237-2 (Item 237-10 in the 2012 NCWM Annual Report).

Table 1.
Hydrogen Fuel Quality Specifications*

	Property	Value	Unit	Limit	Test Method(s)	Responsible Standards Committee and Status of test method
1	Ammonia	0.1	ppm v/v	Maximum	ASTM D7653-10	
2	Carbon Dioxide	2.0	ppm v/v	Maximum	ASTM D7653-10 ASTM D7649-10	
3	Carbon Monoxide	0.2	ppm v/v	Maximum	ASTM D7653-10	
4	Formaldehyde	0.01	ppm v/v	Maximum	ASTM D7653-10	
5	Formic Acid	0.2	ppm v/v	Maximum	ASTM D7550-09 ASTM D7653-10	
6	Helium	300.0	ppm v/v		to be specified	ASTM D03.14
7	Hydrogen Fuel Index	99.97	% (a)		to be specified	
8	Nitrogen and Argon	100.0	ppm v/v		ASTM D7649-10	
9	Oxygen	5.0	ppm v/v	Maximum	ASTM D7649-10	
10	Particulate Concentration	1.0	mg/kg	Maximum	ASTM D7650-10 ASTM D7651-10	
11	Total Allowable Non-Hydrogen, Non-Helium, Non-Particulate constituents	100.0	ppm v/v	Maximum	to be specified	
12	Total Non-Hydrogen Gases	300.0	ppm v/v (b)	Maximum	to be specified	
13	Total Halogenated Compounds	0.05	ppm v/v	Maximum	to be specified	WK 23815 under ASTM D03.14

Table 1.
Hydrogen Fuel Quality Specifications*

	Property	Value	Unit	Limit	Test Method(s)	Responsible Standards Committee and Status of test method
14	Total Hydrocarbons	2.0	ppm v/v (c)	Maximum	to be specified	WK 22378 under ASTM D03.14
15	Total Sulfur Compounds	0.004	ppm v/v	Maximum	to be specified	WK 24073 under ASTM D03.14
16	Water	5.0	ppm v/v	Maximum	ASTM D7653-10 ASTM D7649-10	

Footnotes to Table 1:
a. Hydrogen fuel index is the value obtained with the value of total gases (%) subtracted from 100 %.
b. Total Gases = Sum of all impurities listed on the table except particulates.
c. Total Hydrocarbons may exceed 2 ppm v/v only due to the presence of methane, provided that the total gases do not exceed 300 ppm v/v.

*The FTC's Fuel Rating Rule (16 CFR Part 309) see the requirements in "Labeling of Alternative Fuels" at business.ftc.gov/documents/bus29-labeling-alternative-fueled-vehicles; requires dispensers to bear an declaration of minimum percent of hydrogen determined, according to test methods described in "Standard Test Method for Analysis of Natural Gas by Gas Chromatography" (ASTM D1946).

Updated 1/20/2011

At the 2011 NCWM Interim Meeting, the NIST Technical Advisor submitted an updated Table 1. Hydrogen Fuel Quality Specification that was received from the USNHWG. The USNHWG also submitted the following updated specifications for the allowable level of the constituents listed in Table 1. Hydrogen Fuel Quality Specifications and corresponding standardized procedures for collecting and measuring each constituent are now available for: Ammonia [1], Carbon Dioxide [2], Carbon Monoxide [3], Formaldehyde [4], Formic Acid [5], Nitrogen and Argon [8], Oxygen [9], Particulate Concentration [10], and Water [16]. The next stage in the development of these standards is to round robin the methods to establish precision and bias. Standard Test Methods for Sulfur [15] and Hydrocarbons [14] will be made available shortly since these standards are in publishing. ASTM Subcommittee D03.14 on Hydrogen and Fuel Cells has tentative plans for sending the standards for Helium [6] and Halogenates [13] to ballot in March 2011. The Committee recommends that the item remain Informational.

At the 2011 CWMA Interim Meeting, a state regulator supported moving the item forward because we now have ASTM test methods for hydrogen. An industry representative countered that additional work is necessary by the Hydrogen Work Group. Specifically, there is concern the specifications may be too restrictive and questioned if the limits actually fall within the scope of the test methods. After discussion, the Committee agreed that additional work is needed by the work group. The CWMA recommended that the item remain as an Information Item.

At the 2011 NEWMA and CWMA Annual Meetings, an updated specifications chart was reviewed. Both Regions are recommending this item move forward as an Informational Item until further developed by the USNHWG.

At the 2011 NCWM Annual Meeting, a revised chart updated on July 12, 2011, was distributed. It was noted by a representative of the USNHWG that the previous color coded chart was eliminated since only one constituent remains to be completed. The Committee is in agreement that the revised chart move forward as an Information item. The work on the test method for total halogenated compounds in anticipated to be completed by spring 2012 (refer to Item 237-1 in the *Report of the 96th NCWM* [SP 1125, 2011]).

At the 2011 WWMA Annual Meeting, Ms. Macey, spoke on behalf of the USNHWG, and California stating there is still work being done on this item. Ms. Macey noted that this item is ready for a vote. The WWMA Committee fully supports this item. If updates are received from the USNHWG, the WWMA Committee would like the NCWM L&R Committee to have editorial privileges with any updated information on standards that are received. The WWMA Committee fully supported any work done by the USNHWG. It is recommended that this item be a Voting Item.

At the 2011 NEWMA Interim Meeting, Mr. Collins, UTC Power gave a presentation on "Background on SAE J2719 Hydrogen Quality for Fuel Cell Vehicles." NEWMA recommended that the item remain as an Informational Item.

At the 2011 SWMA Annual Meeting, the NIST Technical Advisor to the USNHWG reported that the USNHWG recommended that Table 1 be deleted with a statement that makes reference to SAE International Standard J2719. This direct reference to an SAE fuel quality standard for hydrogen is proposed to entirely replace the previous table that had been developed by the USNHWG. SAE J2719 includes the constituents, maximum allowable levels and the effects of these compounds, definitions, a list of research papers supporting the document's development, and corresponding ASTM test methods. The USNHWG had developed the table to be harmonized with the developing SAE J2719 standard and as an interim measure until there was a nationally recognized standard. SAE J2719 has been approved for publication, a NIST Handbook 130 standard by direct reference to SAE J2719 is preferred by the FSS to facilitate continued harmonization with the SAE standard and to reflect the precedence of directly referencing SAE and ASTM standards that is set by other fuel quality standards found in Section 2. Standard Fuel Specifications (e.g., Gasoline and Gasoline-Oxygenated Blends, Diesel Fuel, Aviation Turbine Fuels, LPG, CNG, etc.).

The USNHWG supports the addition of the single sentence direct reference to SAE J2719 to NIST Handbook 130 for the purpose of meeting the need in the market place for uniformity in hydrogen fuel quality. Publication of the SAE J2719 standard was published in September 2011. The USNHWG will continue to accept input and work on this item as needed until NCWM interim meeting in January 2012. The SWMA recommended that the item be a Voting Item with the following changes as recommended by the USNHWG.

The recommended change is:

2.X. Hydrogen Fuel. – Shall meet the most recent version of SAE J2719, "Hydrogen Fuel Quality for Fuel Cell Vehicles."

At the 2012 NCWM Interim Meeting, the Technical Advisor to the USNHWG reported that the language appearing in the 2011 WWMA report has been approved by the USNHWG and encourages the Committee to move it forward as a Voting Item. The USNHWG recommended that the status of Item 237-10 not be dependent on the outcome of Item 237-9. The 2912 L&R Committee designated this item as a Voting Item.

Both NEWMA and CWMA supported this item and recommended its adoption by the NCWM during their spring 2012 Annual Meetings.

At the 2012 Annual Meeting, Ms. Juana Williams, NIST Technical Advisor to the DOE NIST USNHWG remarked that the USNHWG agrees that SAE J2719 is the appropriate fuel standard for hydrogen. This is consistent with national and international standards.

Additional information on this hydrogen proposal and the corresponding method of sale regulation and hydrogen gas measuring devices code can be found at www.nist.gov/pml/wmd/lmdg/hydrogen.cfm. For additional information on this item, contact Ms. Juana Williams, NIST OWM at juana.williams@nist.gov or (301) 975-3989.

Additional letters, presentations, and data may have been part of the Committee's consideration. To review the supporting documentation for this item, please refer to Appendix J of the *Report of the 94th NCWM* (SP 1099, 2009) L&R Committee Item 270-4, Appendix B in the *Report of the 95th NCWM* [SP 1115, 2010] L&R Committee Items 232-3 and 237-2, *Report of the 96th NCWM* (SP1125, 2011) L&R Committee Items 237-1 and 237-2, and Appendix I in this report.

237-10 V Section 1. Definitions, Hydrogen Fuel for Internal Combustion Engines and Fuel Cell Vehicles

(This item was adopted.)

Source:
Western Weights and Measures Association (WWMA). This item was previously within Item 237-1.

Purpose:
Adopt definitions for hydrogen fuel, internal combustion engine, and fuel cell.

Item Under Consideration:
In April 2009, the U.S. National Work Group (USNWG) for the Development of Commercial Hydrogen Measurement Standards Fuel Specifications Subcommittee (FSS) presented the following recommended definitions for consideration.

FSS supports the proposed new definitions to address gaseous hydrogen refueling applications.

1. Specification for Hydrogen Fuel for Internal Combustion Engines and Fuel Cells
2. Definitions

1.21. Fuel Cell. – An electrochemical energy conversion device in which fuel and an oxidant react to generate electricity without consumption, physically or chemically, of its electrodes or electrolytes.
(Added 2012)

1.29. Hydrogen Fuel. – A fuel composed of molecular hydrogen intended for consumption in a surface vehicle or electricity production device with an internal combustion engine or fuel cell.
(Added 2012)

1.30. Internal Combustion Engine. – A device used to generate power by converting chemical energy bound in the fuel via spark-ignition or compression ignition combustion into mechanical work to power a vehicle or other device.
(Added 2012)

Background/Discussion:
This proposal was reviewed at all the fall regional meetings under Item 237-1. At the 2010 WWMA and SWMA Annual Meetings and the 2010 NEWMA Interim Meeting, the regional associations made the recommendation to have the definitions for hydrogen fuel for internal combustion engines and fuel cell vehicles considered as separate items. The regional associations are recommending this item move forward as a Voting Item. (Refer to Item 237-1 above for additional background information)

At the 2011 NCWM Interim Meeting, a NIST Technical Advisor reported that the USNHWG and the 2011 L&R Committee supported this item as a Voting Item and recommended the item be adopted by the NCWM.

At the 2011 NEWMA and CWMA Annual Meetings, no comments were heard on this item. The NEWMA and the CWMA recommended that this item move forward as a Voting Item.

At the 2011 NCWM Annual Meeting, an official spoke in support of this item, and there was no additional comments heard. During the voting session, it was asked if online comments were reviewed for additional language changes, and the Committee Chair responded that the online comments were reviewed by the Committee.

Prior to the voting session, it was recommended that the definition for **hydrogen fuel** be amended to the language submitted by Mr. Simnick (refer to *Report of the 96th NCWM* [SP1125, 2011]). A representative of the USNHWG remarked that the substitution of the word molecular for chemical is questionable; accordingly they would like to

take the language back to the USNHWG for additional review and study. An official requested that the L&R Committee remove this item from Voting status and return to Informational status. The L&R Committee agreed that additional review is required by the USNHWG. The 2011 L&R Committee removed the item from the voting calendar and designated it as an Informational Item prior to a vote.

At the 2011 WWMA Annual Meeting, Ms. Macey spoke on behalf of California and the USNHWG in support of this item to move forward as a vote. The WWMA Committee fully supported the work of the USNHWG. WWMA recommended that the item remain a Voting Item with the following revisions.

Final updated or revised proposal recommended by the WWMA:

1.XX. Fuel Cell. – An electrochemical energy conversion device in which fuel and an oxidant react to generate ~~energy~~ electricity without any consumption, physically or chemically, of its electrodes or electrolytes.

(Added 20XX)

1.XX. Hydrogen Fuel. – A fuel composed of the ~~chemical~~ molecular hydrogen intended for consumption in a surface vehicle or electricity production device with an internal combustion engine or fuel cell.

(Added 20XX)

1.XX. Internal Combustion Engine. – A device used to generate power by converting chemical energy bound in the fuel via spark-ignition or compression ignition combustion into mechanical work to power a vehicle or other device.

(Added 20XX)

At the 2011 NEWMA Interim Meeting, the Committee supported definitions as submitted. NEWMA recommended that the item remain as a Voting Item.

The 2011 SWMA Committee supports the latest work of USNHWG. The SWMA recommended that the item remain as a Voting Item with the recommendations that appear in the 2011 WWMA Annual Report.

At the 2012 NCWM Interim Meeting, the Committee reviewed the language that appears in NCWM Publication 15 (2012).

1.XX. Fuel Cell. – An electrochemical energy conversion device in which fuel and an oxidant react to generate energy without consumption of its electrodes or electrolytes.

(Added 20XX)

1.XX. Hydrogen Fuel. – A fuel composed of the chemical hydrogen intended for consumption in a surface vehicle with an internal combustion engine or fuel cell.

(Added 20XX)

1.XX. Internal Combustion Engine. – A device used to generate power by converting chemical energy bound in the fuel into mechanical work to power a vehicle.

(Added 20XX)

The NIST Technical Advisor commented that the language the work group submitted at the 2011 WWMA has been approved and reviewed by the USNHWG with a recommendation that it move forward as a Voting Item. The USNHWG also recommended that the status of Item 237-10 not be dependent on the outcome of Item 237-9. The 2012 L&R Committee designated this item as a Voting Item.

Both NEWMA and the CWMA support the language from the WWMA and recommended adoption by the NCWM during their spring 2012 Annual Meetings. The NIST Technical advisor noted at the CWMA meeting that an editorial change to the definition "hydrogen fuel" needs to be made to remove the word "the."

At the 2012 NCWM Annual Meeting, the NIST Technical Advisor to the USNHWG noted that an editorial change for the definition of hydrogen fuel needs to be made by removing the word "the" in front of "molecular." After discussing the comments from the 2012 NCWM Annual Meeting Open Hearings and the proposed changes, the Committee agreed to modify the language in its Interim Report to that shown in this Final Report in the Item Under Consideration

Additional background information on this proposal is available in the *Report of the 94th NCWM* (SP 1099, 2009) L&R Committee Item 270-4 and Appendix J, *Report of the 95th NCWM* (SP 1115, 2010) L&R Committee Items 232-3 and 237-2, and Appendix B, and *Report of the 96th NCWM* (SP1125, 2011) L&R Committee Items 237-1 and 237-2. To review more current documentation on this item, please refer to Appendix I in this report.

Additional information on this hydrogen proposal and the corresponding method of sale regulation and hydrogen gas measuring devices code can be found at www.nist.gov/pml/wmd/lmdg/hydrogen.cfm. For additional information on this item, contact Ms. Juana Williams, NIST, OWM at juana.williams@nist.gov or (301) 975-3989.

237-11 I Section X.X. Flex Fuel Vehicles

Source:
Fuels and Lubricants Subcommittee Task Group (2012)

Purpose:
A number of changes have occurred related to fuels restricted to use in Flex Fuel Vehicles. Fuels Lubricants Subcommittee (FALS) has formed a task group to begin the review of NIST Handbook 130 related to these flex fuels. FALS will develop proposed modifications to NIST Handbook 130.

Item Under Consideration:
Proposal to be developed.

Background/Discussion:
The current wording in NIST Handbook 130 related to fuels restricted to use in Flex Fuel Vehicles should be reviewed. Input gathered from the regional meetings and other stakeholders will be utilized by FALS to develop recommended modifications to NIST Handbook 130.

At the 2011 CWMA and NEWMA Interim Meeting, there were no comments. The CWMA and NEWMA forwarded the item to NCWM recommending it as a Developing Item while FALS continues its work.

At the 2011 WWMA Annual Meeting, WWMA forwarded the item to NCWM recommending it as an Informational Item.

At the 2011 SWMA Annual Meeting, Mr. Chuck Corr, Archer Daniels Midland Company, gave a presentation on the topic. FALS task force identified several areas where stakeholder input is needed to propose updates to NIST Handbook 130 and to reflect new language in ASTM D5798. No comments were made during the hearing. FALS is expected to have a recommendation for the Interim Meeting. The SWMA forwarded the item to NCWM recommending it as a Developing Item.

At the 2012 NCWM Interim Meeting, Mr. Ron Hayes, FALS Chair provided an update on the task group's progress. Mr. Corr will lead an effort to get Regional input on a transition and implementation date. The 2012 L&R Committee designated this item as an Informational Item.

At the 2012 NEWMA Annual Meeting, no comments were received. The NEWMA recommended this remain an Informational Item.

At the 2012 CWMA Annual Meeting, Mr. Corr provided a presentation on "Flex Fuel Task Force Update." This presentation noted that ASTM standards D7794-12 and D5798-11 cover the standard for a full range of ethanol concentrations. Several comments were received that the 51 % to 83 % ethanol range is too broad. A state regulator was concerned with blends at the pumps; the fuel can be blended at any percentage. A stakeholder remarked that consumers are concerned with price and miles per gallon (MPG) and may not have enough knowledge in regards to blends. Another stakeholder remarked that ASTM 5798 is at the terminal and the Conference needs to address this issue. The CWMA recommends that FALS continue to develop this item.

At the 2012 NCWM Annual Meeting, Mr. Corr provided a FALS update that in Handbook 130 approximately 18 areas have been identified where modifications may be needed. A stakeholder commented that they fully support the work of Mr. Corr's Subcommittee working on this issue through FALS. Mr. Corr's group is to provide additional information at the 2013 NCWM Interim Meeting.

Additional letters, presentations, and data may have been part of the Committee's consideration. To review the supporting documentation for this item, please refer to Appendix J in this document for additional content.

250 NIST HANBOOK 130 – NCWN POLICY, INTERPRETATIONS, AND GUIDELINES, SECTION 2, EXCERPTS FROM NCWM PUBLICATION 3

250-1 W Section 2.7. Technology Difference of Standards

(This item was withdrawn.)

Source:
Total Meter Services (2012)

Purpose:
Address potential differences between verification results of meters using vapor capture prover apparatus and verification results using non-vapor capture proving apparatus, such as open-neck provers.

Item Under Consideration:
Add the following new section to NIST Handbook 130, Interpretations and Guidelines:

> **2.X. Technology Differences of Standards Differences in technology of standards used can lead to differences in verification results. For example: A volumetric standard that captures vapor during the device verification process may not yield the same result as an open volumetric vessel standard where vapors may be lost.**
>
> **(Added 20XX)**

Background/Discussion:
Evaporation Capture Provers – Small volume provers, displacer/piston type, that connect directly to the meter discharge have no evaporation losses associated with the device verification process. Consideration needs to be made of potential differences between verification results of meters using vapor capture prover apparatus and verification results using non-vapor capture proving apparatus, such as open-neck provers.

A. Vapor Losses During Dispensing (or Open Neck Proving)

The liquid losses from emissions or vapor losses associated with retail gasoline dispensing range from 1 in^3 to 3 in^3 per 5 gal, 0.09 % to 0.26 %. The actual number varies based on the fuel chemistry that can be adjusted for seasons, the temperature of the dispensing, and the amount of alcohol added. The losses are actually greater in winter due to fuel chemistry adjustments.

The range of vapor losses comes from studies by the California Air Resources Board, the EPA, and Measurement Canada.

Vapor Losses from Gasoline Dispensing (Liquid Equivalent)				
Source of Data	**Pounds**	**Gallons**	**Cubic Inches per Gallon**	**Cubic Inches per 5 Gallon**
California Air Res Board Study 2008 – Summer RVP 6	0.0058	0.0010	0.2196	1.098
California Air Res Board Study 2008 – Winter RVP 12	0.0092	0.0015	0.3484	1.742
EPA 2008 Trans and Mkt Petro liq vapor 5.2 Avg	0.0110	0.0018	0.4162	2.081
Measurement Canada Low (converted from metric)			0.1658	0.829
Measurement Canada High (converted from metric)			0.5939	2.969

These documented vapor losses are the same quantities of losses that occur during an open neck proving. The Canadian study is a direct comparison of vapor capture and non-vapor capture proving technologies.

B. Vapor Capture Proving Simulates the Current Refueling Process

When used for gasoline dispenser verifications and calibrations, vapor capture provers most closely resemble the current automobile refueling process.

Since 2000, automobiles sold in the United States have on-board vapor capture systems, On-board Refueling Vapor System (ORVR). Vapors associated with the fueling process are captured on the vehicle. Stage II vapor recovery on the dispenser that normally returns vapor to the underground tank is defeated at the nozzle in preference to the on-board recovery system.

Definitions:

On-board Refueling Vapor Systems (ORVR). – This equipment prevents vapors from escaping to the atmosphere during the fueling process, allows them to condensate, return back to liquid and re-enter the consumer's automobile fuel tank.

On-board Refueling Vapor Systems (ORVR) Nozzle. – Dispenser nozzle that senses the ORVR system and allows the on-board canister to capture refueling vapors instead of the Dispenser/Tank vapor recovery system.

Stage II Vapor Recover. – The Stage II system consists of special nozzles and coaxial hoses at each gasoline dispenser that captures vapors from the vehicle's fuel tank and routes them to the station's underground or aboveground storage tank(s) during the refueling process.

Details:

Around 1997, the EPA amended the Regulations to force U.S. automakers to build in to the fill pipe and fuel tank a carbon canister vapor recovery system, the ORVR System. This equipment prevents vapors from escaping to the atmosphere during the fueling process, allows them to condensate, return back to liquid and re-enter the consumer's automobile fuel tank. As a result, the consumer takes possession of the vapors that were once vented into the air or captured by the Stage II Vapor Recovery System.

The EPA phased in the rollout schedule as follows:

- 40 % of all United States' 1998 auto production must have ORVR equipment installed;
- 80 % of all United States' 1999 auto production must have ORVR equipment installed; and
- 100 % of all United States' model year 2001, and years forward, auto production must have ORVR equipment installed.

The EPA authorized large metropolitan areas to calculate the population of total vehicles on the road in the non-attainment areas and let them phase out Stage II Vapor Recovery at the dispenser as the population of ORVR equipped vehicles becomes the standard in their respective geographical area.

The EPA is currently taking comments on a proposal to waive Stage II requirements as of June 30, 2013. They estimate 73 % of vehicles on the road will have ORVR by that date. (Reference: EPA Fact Sheet 20110711)

The State of New York has suspended enforcement of Stage II Vapor Recovery because of the prevalence of ORVR. (Reference: Stage II Vapor Collection System Enforcement Discretion Directive, May 25, 2011)

C. "Predominately Negative"
Field Inspectors in some cases have guidelines or rules for addressing the predominance of a dispensing location. If most dispensers register less than the inspector's verification standard volume, "negative" results, some action may be taken by the inspector, even though the results are in tolerance. If the inspector's visit comes after a calibration by the service company using the vapor capture/closed loop prover, the "predominately negative' site is not due to a purposeful "mis-calibration" of the dispensers, but the difference between the verification technologies. The range of difference may be one-cubic inch to three-cubic inches as noted in the studies.

At the 2011 CWMA Interim Meeting, several state regulators agreed that this item is not ready to be developed until NIST, OWM makes a determination on whether this can be a traceable standard. Another state regulator commented that the proving method should matches the way the product is sold. A third regulator did not like the terminology and does not want the item moved forward. An independent consultant stated the need to show traceability. Because NIST, OWM does not recognize this as a traceable standard, the CWMA recommends the item be Withdrawn.

At the 2011 NEWMA Interim Meeting, concerns were raised about having two different methods to ascertain whether or not RMFDs were within tolerance if the results yielded different readings. There should not be two different standards. NEWMA Committee recommended that more study be conducted into the efficacy of this technology when considering the current method of testing RMFDs with open neck provers. NEWMA forwarded the item to NCWM recommending it as a Developing Item.

At the 2012 Interim Meeting, the original submitter withdrew this item. Ms. Carol Hockert, NIST, OWM Chief remarked that a meeting was held earlier in the week to gathered data and information on alternative test methods for liquid devices, and it was agreed at that session that this item would be removed from the L&R Agenda. As additional information and data is gathered on this technology the NIST, OWM will send a notice in regards to forming a work group.

260 NIST HANDBOOK 133

260-1 W Handbook 133, Section 2.3.8. Moisture Allowance - Moisture Loss for Products Not Listed.

Source:
Moisture Loss Work Group (MLWG) (2011)

Purpose:
Provide additional guidance for making moisture allowances for products not listed in Handbook 133.

Item Under Consideration:
Amend NIST Handbook 133 as follows:

2.3.8. Moisture Allowances

e. How is moisture loss handled for products not listed in NIST Handbook 133?

Officials can test products for which no moisture loss guidance has been provided. If studies are a necessity, they should be a collaborative effort between officials and industry. Because of the potential impact on interstate commerce, studies should be completed on a nationwide basis and not by individual jurisdictions unless circumstances justify only local consideration.

The amount of moisture loss from a package is a function of many factors, not the least of which is the product itself (e.g., moisture content, texture and density), packaging, storage conditions (e.g., temperature, humidity, and air flow), time, handling and others. If a packaged product is subject to moisture loss, officials must allow for "reasonable" variations caused by moisture either evaporating or draining from the product. Officials cannot set arbitrary moisture allowances based solely on their experience or intuition. Moisture allowances must be based on scientific data and must be "reasonable." Reasonable does not mean that all of the weight loss caused by moisture evaporation or draining from the product must be allowed. As a result of product and moisture variability, the approach used by an official must be developed on a case-by-case basis depending on many factors to include, but not be limited to, the manufacturing process, packaging materials, distribution, environmental influence and the anticipated shelf life of the product.

NIST Handbook 130 provides a starting point for developing a workable procedure in the Interpretation and Guideline Section 2.5.6. regarding "Resolution for Requests for Recognition of Moisture Loss in Other Packaged Products." Most studies involving nationally distributed products will require that products be tested during different seasons of the year and in different geographic locations to develop a nationally recognized moisture allowance. Some studies may require the development of laboratory tests used for inter-laboratory comparisons to establish moisture content in products at time of pack or at the time of inspection.

Moisture loss or gain is a critical consideration for any net content enforcement effort and one that, in most cases, cannot be addressed solely by a field official. If moisture loss issues are to be deliberated, it is the regulatory official's responsibility to resolve the packer's concern utilizing available resources and due process procedures. To fulfill this obligation the official may be required to utilize specialized test equipment and specific laboratory procedures. Additionally, the collection of adequate test data may require product examination over a broad geographical area and consideration of a wide range of environmental factors. If a national effort is required, a coordinated effort involving industry, trade associations, weights and measures officials, and federal agencies may be required. NIST will provide technical support upon request. If studies are a necessity they should be a collaborative effort between officials and industry but may be very time consuming depending on the product. Because of the potential impact on interstate commerce, studies must be completed on a nationwide basis and not by individual jurisdictions unless circumstances justify only local consideration.

Background/Discussion:
In previous years, the Moisture Loss Work Group (MLWG) reviewed draft changes that were developed to revise and update Handbook 133 (2005). Some of the proposed changes and recommendations were developed to improve the guidance on making moisture allowances. At the 2010 NCWM Annual Meeting, Item 260-1 (refer to the *Report of the 95th NCWM* [SP 1115, 2010]) was voted through the Conference with the exception of the item under of consideration.

At the 2010 CWMA Interim Meeting, a state regulator stated that Handbook 133 provides moisture allowance for only a few products. The regulator provided an example where a product was claiming moisture allowance for a product not contained in Handbook 133. This regulator was provided with only verbal assistance from NIST regarding what was needed to demonstrate the request for moisture allowance. The regulator believes written procedures need to be developed to provide guidance, and a step-by-step protocol developed for determining moisture allowance in a specific product. Another state regulator agreed and commented that determination of moisture allowance needs to be consistent. An industry representative agreed that more guidance is needed, and recommended that the proposal include the necessary information required to demonstrate moisture loss that warrants an allowance. The CWMA recommends that the MLWG continue to develop this proposal.

At the 2010 WWMA Annual Meeting, a county official expressed concern that the existing language is conflicting and does not provide specific guidance to weights and measures officials (i.e., statements that moisture loss should be determined on a case-by-case basis and at the same time calls for a nationwide study). It was recommended that the MLWG focus its effort on developing a clearer criteria and process for determining moisture loss. The WWMA agrees that the following language within the proposal is contradictory and vague and does not provide specific guidance to officials.

- should be a collaborative effort between officials and industry
- should be completed on a nationwide basis
- must be based on scientific data
- must be developed on a case-by-case basis
- may be required to utilize specialized test equipment and specific laboratory procedure
- a coordinated effort involving industry, trade associations, weights and measures officials may be required

The WWMA recommends that this be a Developing Item.

At both the 2010 SWMA Annual Meeting and the 2010 NEWMA Interim Meeting, both associations agreed that the item was not developed and recommended that this moved forward as a Developing Item.

At the 2011 NCWM Interim Meeting, the NIST Technical Advisor gave an update that the Handbook 133 had amendments that were voted in at the July 2010 Annual Meeting. However, the item under consideration was pulled back for further development by the MLWG. A state official commented that the MLWG needs to continue to develop this item. The L&R Committee would like to receive additional input from the regional associations. The NIST Technical Advisor will set up a MLWG meeting at the 2011 NCWM Annual Meeting. The 2011 L&R Committee designated this item as an Informational Item.

At the 2011 NEWMA Annual Meeting, the NIST Technical Advisor requested information from the region on how they would like to proceed on this item. Currently, the item under consideration stipulates store, data, and test procedures. NEWMA recommends that this item move forward as an Informational Item.

At the 2011 CWMA Annual Meeting, a state representative remarked that current moisture loss issues with a company cannot be resolved due to lack of guidance for proper determination. They would like to see an emphasis on national studies and not case-by-case situations. There were recommendations to form a work group or get an organization involved that can assist. This region would like to see an easy, implementable solution on how to demonstrate moisture loss. The CWMA would like to see a moisture loss determination for products not currently listed in NIST Handbook 133. For this reason, the CWMA would like to see this as an Informational Item.

At the 2011 NCWM Annual Meeting, a representative of Kraft Foods supported this as an Informational Item. Kraft will be providing NCWM with additional draft language for consideration. It is important that the language be clear as to who is to provide data, what purpose does the data serve, and is it for a specific product on a national or state level. Kraft will develop a detailed proposal to look at a few more principles of establishing moisture allowance. They will also provide recommendations on guidance for four areas in establishing moisture allowance in order to assist inspectors. The NIST Technical Advisor indicated that additional work needs to be done on this item and asks that comments be submitted from the fall regional meetings.

At the 2011 CWMA Interim Meeting, no comments were received, and the CWMA recommended the item remain as an Informational Item.

At the 2011 WWMA Annual Meeting, Mr. Chris Guay, Procter and Gamble Co., commented that moisture loss allowance needs to be addressed by NCWM. A procedure needs to be developed that is acceptable to both industry and regulators. A county official opposes the item as written but believes that the MLWG should continue to work and develop an acceptable procedure. The NIST Technical Advisor recommended that each region submit

information to the MLWG regarding what they would like to see. There is an item under consideration and no comments or recommendations have been received for MLWG to develop. The WWMA acknowledges that this item has been on the agenda for several years and no additional comments or recommendations for changes have been brought forward. The WWMA recommended that this item be Withdrawn so that a better prepared proposal may come forward.

At the 2011 NEWMA Interim Meeting, NEWMA recommended that this item be Withdrawn as there is insufficient data to support it.

At the 2011 SWMA Annual Meeting, a NIST Technical Advisor noted that this is not a NIST, OWM work group but a NCWM work group, and it is in need of a new Chair. No other comments were made from the floor. There is value in developing a process whether states decide individually to use it, or whether it is used as a tool for bringing items before NCWM for national consideration and uniformity. Regions are being asked to provide input. The SWMA recommends the item remain as an Informational Item until a new work group chair can be identified.

At the 2012 NCWM Interim Meeting, the Committee discussed that this item has been reviewed by the regions for last two years, and there have not been any amendments to the item under consideration. An industry representative recommended that the current language be deleted and this item be worked on to provide guidelines.

The language in this item should not remain on the agenda, but the work group needs to have a Chair nominated and the work group to be active. The 2012 L&R Committee designated this item as a Withdrawn Item and is placing a Developing Item 270-3 on the agenda to activate the work group. The L&R Chair, Ms. Judy Cardin will request that the NCWM Chair appoint a new Chair for this work group.

260-2 V HB 133, Section 2.3.8 Moisture Allowance - Pasta Products

(This item neither passed or failed and was returned to the Committee.)

Source:
Southern Weights and Measures Association (SWMA)

Purpose:
Amend HB 133 by adopting a 3 % moisture allowance for macaroni, noodle, and like products (pasta products).

Item Under Consideration:
Amend NIST Handbook 133, Section 1.2.(5)a. Package Requirements as follows:

a. Why and when do we allow for moisture loss or gain?

This handbook provides "moisture allowances" for some meat and poultry products, flour, **pasta products,** 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.

Test procedures for flour, **pasta products,** some meat, and poultry are based on the concept of a "moisture allowance" also known as a "gray area" or "no decision" area (see Section 2.3.9. "Calculations"). When the average net weight of a sample is found to be less than the labeled weight, but not more than the boundary of the "gray area," the lot is said to be in the "gray" or "no decision" area. The gray area is not a tolerance. More information must be collected before lot compliance or noncompliance can be decided. Appropriate enforcement should be taken on packages found short weight and outside of the "moisture allowance" or "gray area."

(Amended 2002 **and 20XX**)

Amend NIST Handbook 133, Section 2.3.8.b. Moisture Allowances as follows:

b. What are the moisture allowances for flour, dry pet food, pasta products, and other products? (See Table 2-3. "Moisture Allowances.")

Table 2-3.
Moisture Allowances

Verifying the labeled net weight of package 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.	
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 HB 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]).

(Amended 2010, **and 20XX**)

Amend NIST Handbook 133, Sections 2.3.9.b. and d. Calculations as follows:

b. How is a Moisture Allowance made prior to determining package errors?

If the Moisture Allowance is known in advance (e.g., flour, **pasta products,** and dry pet food), it can be applied by adjusting the Nominal Gross Weight (NGW) used to determine the sample package errors. The Moisture Allowance (MA) in Box 13a is subtracted from the NGW to obtain an Adjusted Nominal Gross

Weight (ANGW) which is entered in Box 14. The NGW is the sum of the Labeled Net Quantity of Contents (LNQC e.g., 907 g) and the Average Tare Weight (ATW) from Box 13.

(Amended 20XX)

d. What should you do when a sample is in the moisture allowance (gray) area?

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

Reasonable variations from net quantity of contents caused by the loss or gain of moisture from the package are permitted when caused by ordinary and customary exposure to conditions that occur under good distribution practices. If evidence is obtained and documented to prove that the lot was shipped from the packaging plant in a short-weight condition or was distributed under inappropriate or damaging distribution practices, appropriate enforcement action should be taken.

(Amended 2010 **and 20XX**)

Background/Discussion:
Studies indicate that moisture loss for pasta products is reasonably predictable over time. Pasta exhibits consistent moisture loss in all environments and packaging, which can vary more than 4 % due to environmental and geographic conditions. Although it eventually reaches equilibrium with the surrounding atmosphere because it is hygroscopic, this balance does not occur until long after packaging and shipping.

At the 2010 NCWM Interim Meeting, the Committee heard support for this item from industry and stakeholders. This item would amend the Moisture Allowance Table in NIST Handbook 133 giving pasta a 3 % moisture allowance. The Committee reviewed the submitted study (refer to the *Report of the 95th NCWM* [SP 1115, 2010]). The 2010 L&R Committee designated this item as a Voting Item.

At the 2010 NEWMA Annual Meeting a representative of the pasta industry gave the group an explanation of the item and expressed support for this item as written. NEWMA Committee also supports this item.

At the 2010 CWMA Annual Meeting, a representative from the National Pasta Association stated the data supports the 3 % moisture allowance. A weights and measures official commented that testing in their state does not support the proposal. An industry representative stated that guidance is needed for an established moisture allowance, and currently, there are no guidelines to establish the moisture loss percentage.

At the 2010 NCWM Annual Meeting, a representative for the National Pasta Association spoke on behalf of the proposal. This item will allow for a specific moisture loss percentage to be taken. Inspectors will now have a specific number that they can apply to the pasta product. Representatives of several pasta companies spoke in support of this item stating that it is consistent with numerous studies that have been done. A state director opposes this item, since pasta is known to have moisture loss due to the type of product it is. He further explained that applying a blanket 3 % moisture loss does not make sense, what may be good in Florida may not be good in New Mexico. Another official stated that applying the 3 % does not stop an inspector from going into a distribution or point of pack to inspect; especially if the inspectors believe the packer is under filling packages. He urged that this proposal be supported to provide a tool. Another official felt that the proposal should be voted through, it is important to recognize guidelines for consideration. A pasta association representative also agreed that this work goes back a couple of decades, and that several studies were provided for consideration. Another representative explained that they pack to net weight. Pasta contains 10 % to 13 % moisture; if the moisture standard is lowered the product falls apart along with the product quality. There was a split vote on this item at the 2010 NCWM Annual Meeting, and it was returned to the Committee.

At the 2010 CWMA Interim Meeting, a state regulator provided information regarding informal testing of pasta products in their state. The concern is pasta can gain moisture as well as lose moisture; therefore, they oppose a national moisture allowance for pasta products. It was further explained that moisture loss/gain seems to be

dependent upon the type of packaging used. This regulator also commented that product is no longer warehoused for long periods of time, and that it is mostly in climate controlled stores, which would prevent the need for a moisture allowance. Another state regulator agreed that a national standard may not be appropriate due to humidity differences from state to state. The CWMA is recommending that this item be Withdrawn.

At the 2010 WWMA Annual Meeting, a state official expressed support for adopting a 3 % moisture allowance for pasta, citing the significant work done and data provided by the National Pasta Association. The WWMA Committee recommended that any additional data from studies be provided for review. The WWMA also recommended that the item remain as a Voting item.

At the 2010 SWMA Annual Meeting, there were no comments heard on this item. The SWMA recommended this item be Withdrawn. However, if further studies are developed, then this should be taken into consideration.

At the 2010 NEWMA Interim Meeting, the Conference expressed strong reservations about this proposal. Comments were heard regarding industry practices in regards to moisture loss when packing and if there is a need to codify the moisture loss allowance at all. A member commented that if this proposal passed, other industries would now approach the Conference and ask for specific moisture allowances for their products. NEWMA recommends that this item be Withdrawn.

At the 2011 NCWM Interim Meeting, the National Pasta Association presented an overview regarding history and studies that have been performed on the moisture loss of pasta. Pasta is a hygroscopic product, and changes in moisture content in the product may occur in the package due to atmospheric changes. Hot, dry, and air conditioned store environments have less humidity and will pull moisture from the product. Subsequently; tropical, wet and high humidity environments (seldom seen in U.S. stores) will pull moisture into the product. According to Ms. Jayne Hoover, American Italian Pasta Company, pasta companies do pack to the law and have documented weight control programs. The 2011 L&R Committee designated this item as a Voting Item.

At the 2011 NEWMA Annual Meeting, a representative of the National Pasta Association gave a briefing on the history of this item. The representative stated that pasta is a mixture of flour and water, and that a moisture loss allowance was granted through the Conference for flour. She noted that packages are filled to weight. However, in the distribution process they may lose weight. Some states argued that they cannot support this item, given that the data reflects inconsistent loss. There was a question regarding whether the courts specify that you must grant a percentage when you consider moisture loss. NEWMA recommends that this item be Withdrawn and moisture allowance not be considered for pasta.

At the CWMA Annual Meeting, a state official opposed this item stating that with proper storage and limited items on a store shelf; moisture loss is not an issue. A representative with the National Pasta Association (NPA) stated that within the legal framework, the law requires that reasonable variations due to moisture loss be considered. There is a legal obligation to allow for reasonable variation under good distribution and manufacturing practices. The NPA has made available the pasta study that they believe continues to remain valid. The makeup of the product and the packaging has not changed, in fact, it is moisture that is adding or subtracting weight in the package. A state official questions whether 3 % is the correct number to use and would like to see a bell curve of data. Another state official would like to see data from NPA on whether moisture is different at separate points within the distribution points and shelf life. There was concern expressed that an average is taken rather than taking into account the different regional areas within the United States. A stakeholder remarked that this is a complex issue; however, we need to keep the solution simple. One strategy would be to define what is necessary to demonstrate moisture loss. Several states commented they are having issues resolving current moisture loss with companies due to lack of guidance on the procedure for proper determination. The CWMA recommended the item be an Informational Item.

At the 2011 NCWM Annual Meeting, a representative from the NPA gave a presentation with background information and a brief legal overview on moisture loss. They also distributed a page with frequently asked questions and a follow-up study (refer to Appendix I in the *Report of the 96th NCWM* [SP 1125, 2011]) that occurred in 2006 - 2007 shows a 2.5 % to 5 % moisture loss. Pasta consists of flour and water. Currently in NIST Handbook 133 flour is given a moisture loss allowance of 3 %. Pasta is packaged in either breathable film or paperboard cartons. This allows for the pasta to breathe and not mold. The industry is requesting that this proposal

be adopted by the Conference to give officials the guidance that is needed when performing inspections. On a split vote this item was returned to the Committee.

At the 2011 CWMA Interim Meeting, an industry representative stated that a uniform procedure for moisture loss is needed. Although difficult, we can develop a surrogate that can be easily done by manufacturers and easily verified by weights and measures and recommends this item be Withdrawn. The CWMA disagreed and believes that moisture loss is a legitimate issue and deserves consideration by NCWM. The CWMA recommended this item remain as a Voting Item.

At the 2011 WWMA Annual Meeting, a state official requested additional information concerning good manufacturing and distribution processes. The WWMA firmly believed that enough data had been established by industry to address questions regarding moisture allowances with pasta and pasta products. The WWMA recommended that this item remain as a Voting item.

At the 2011 NEWMA Annual Meeting, it was noted that NEWMA continues to oppose this item and would like the item Withdrawn from the agenda.

At the 2011 SWMA Annual Meeting, no comments were heard. The Committee noted that it appears as if proper protocol has been followed by the pasta industry. If the states do not support this item, SWMA recommended that the reason be provided so their issue(s) can be addressed. The SWMA recommended that the item remain as a Voting Item.

At the 2012 Interim, the Committee reviewed documents received from the NPA. A representative with the American Italian Pasta Company supported the language as presented. A county inspector, which has an active package inspection program, remarked that a significant amount of data has been provided by the NPA. The 2012 L&R Committee designated this item as a Voting Item.

The NEWMA and CWMA, during their spring 2012 Annual Meetings, both support this item and recommended adoption by the NCWM. At both regional meetings, Ms. Hoover representing the NPA gave a presentation on the development of this item. She also addressed some frequently asked questions regarding variability and current data. Both regions had several regulators that rose to oppose this item.

At the 2012 NCWM Annual Meeting, Ms. Hoover provided an overview on grey area, current data, and variability. Ms. Hoover urged the need for uniformity in the marketplace. Another pasta representative remarked that Congress established that it is important to keep in mind the grey area. The grey area is not a tolerance and moisture loss does not cause the product to be short weight. Several state representatives spoke in support of this item. Two state regulators oppose this item and noted that it should be dealt with on a case-by-case basis. On a split vote this item was returned to the Committee.

Additional letters, presentations, and data may have been part of the committee's consideration. To review the supporting documentation for this item, please refer to Appendix K, *Report of the 95th NCWM* (SP 1115, 2010), Appendix I, *Report of the 96th NCWM* (SP 1125, 2011), and Appendix K within this document for additional content.

260-3 I HB 133, Section 3.10. Animal Bedding

Source:
Central Weights and Measures Association (2012)

Purpose:
This proposal is to clarify appropriate test procedures for animal bedding.

Item Under Consideration:
Amend NIST Handbook 133, Test Procedures – For Packages Labeled by Volume as follows:

3.10. Mulch, ~~and~~ Soils, and Animal Bedding Labeled by Volume

a. What products are defined as mulch ~~and~~ soil, and animal bedding?

- Mulch is defined as "any product or material except peat or peat moss that is advertised, offered for sale, or sold for primary use as a horticultural, above-ground dressing, for decoration, moisture control, weed control, erosion control, temperature control, or other similar purposes."

- Soil is defined as "any product or material, except peat or peat moss that is advertised or offered for sale, or sold for primary use as a horticultural growing media, soil amendment, and/or soil replacement."

- Animal bedding as "animal bedding of all kinds, except for baled straw."

b. What type of measurement equipment is needed to test packages of mulch, ~~and~~ soil, and animal bedding?

- A test measure appropriate for the package size that meets the specifications for test measures in Table 3-4. "Specifications for Test Measures for Mulch, and Soils, and Animal Bedding"

- Drop cloth/polyethylene sheeting for catching overflow of material

- Level (at least 15 cm [6 in] in length)

Table 3-4.
Specifications for Test Measures for Mulch, Soils and Animal Bedding

Nominal Capacity of Test Measure[4]	Actual Volume of the Measure[4]	Interior Wall Dimensions[1]			Marked Intervals on Interior Wall[3]	Volume Equivalent of Marked Intervals
		Length	Width	Height[2]		
30.2 L (1.07 cu ft) for testing packages that contain less than 28.3 L (1 cu ft or 25.7 dry qt)	31.9 L (1.13 cu ft)	213.4 mm (8.4 in)	203.2mm (8 in)	736.6 mm (29 in)	12.7 mm (½ in)	524.3 mL (32 in^3)
28.3 L (1 cu ft)	28.3 L (1 cu ft)	304.8 mm (12 in)	304.8 mm (12 in)	304.8 mm (12 in)		
56.6 L (2 cu ft)	63.7 L (2.25 cu ft)	304.8 mm (12 in)	304.8 mm (12 in)	685.8 mm (27 in)		
		406.4 mm (16 in)	228.6 mm (9 in)	685.8 mm (27 in)		1179.8 mL (72 in^3)
84.9 L (3 cu ft)	92 L (3.25 cu ft)	304.8 mm (12 in)	304.8 mm (12 in)	990.6 mm (39 in)		
		406.4 mm (16 in)	228.6 mm (9 in)	990.6 mm (39 in)		

Table 3-4.
Specifications for Test Measures for Mulch, Soils and Animal Bedding

Measures are typically constructed of 1.27 cm (½ in) marine plywood. A transparent sidewall is useful for determining the level of fill, but must be reinforced if it is not thick enough to resist distortion. If the measure has a clear front, place the level gage at the back (inside) of the measure so that the markings are read over the top of the mulch.

Notes

[1]Other interior dimensions are acceptable if the test measure approximates the configuration of the package under test and does not exceed a base configuration of the package cross-section.

[2]The height of the test measure may be reduced, but this will limit the volume of the package that can be tested.

[3]When lines are marked in boxes, they should extend to all four sides of the measure if possible to improve readability. It is recommended that a line indicating the MAV level also be marked to reduce the possibility of reading errors when the level of the mulch is at or near the MAV.

[4]The Nominal Capacity is given to identity the size of packages that can be tested in a single measurement using the dry measure with the listed dimensions. It is based on the most common package sizes of mulch in the marketplace. If the measures are built to the dimensions shown above the actual volume will be larger than the nominal volume so that plus errors (overfill) can be measured accurately.

(Amended 2010)

c. How is it determined if the packages meet the package requirements?

Use the following procedure:

Steps:

1. Follow the Section 2.3.1. "Define the Inspection Lot." Use a "Category A" sampling plan in the inspection, and select a random sample, then use the following procedure to determine lot conformance.

2. Open each package in turn. Empty the contents of the package into a test measure and level the contents by hand. Do not rock, shake, drop, rotate, or tamp the test measure. Read the horizontal marks to determine package net volume.

Notes: **Mulch:** Some types of mulch are susceptible to clumping and compacting. Take steps to ensure that the material is loose and free flowing when placed into the test measure. Gently roll the bag before opening to reduce the clumping and compaction of material.

Compressed state animal bedding: To measure the usable volume, first empty the contents of the package on a drop cloth. Using your hands, or a tool if necessary, loosen the material until it is free of all clumps and compaction. When the product is free flowing, place in test measure. To determine volume of the compressed state animal bedding, follow section 3.9.a. Peat Moss, procedures for testing the volume of compressed peat moss.

3. Exercise care in leveling the surface of the mulch/soil**/animal bedding** and determine the volume reading from a position that minimizes errors caused by parallax.

d. How are package errors determined?

Determine package errors by subtracting the labeled volume from the package net volume in the measure. Record each package error.

Package Error = Package Net Volume − Labeled Volume

Evaluation of Results

Follow the procedures in Section 2.3.7. "Evaluating Results" to determine lot conformance.

Note: In accordance with Appendix A, Table 2-10. Exceptions to the Maximum Allowable Variations for Textiles, Polyethylene Sheeting and Film, Mulch and Soil Labeled by Volume, Packaged Firewood and Packages Labeled by Count with 50 Items or Fewer, apply an MAV of 5 % of the declared quantity to mulch and soil sold by volume. When testing mulch**,** ~~**and**~~ soil, and **animal bedding** with a net quantity in terms of volume, one package out of every 12 in the sample may exceed the 5 % MAV (e.g., one in a sample of 12 packages; two in a sample of 24 packages; four in a sample of 48 packages). However, the sample must meet the average requirement of the "Category A" Sampling Plan.

Background/Discussion:
NIST Handbook 130, Uniform Regulation for the Method of Sale, Section 2.23. Animal Bedding states:

2.23. Animal Bedding. – Packaged animal bedding of all kinds, except for baled straw, shall be sold by volume, that is, by the cubic meter, liter, or milliliter and by the cubic yard, cubic foot, or cubic inch. If the commodity is packaged in a compressed state, the quantity declaration shall include both the quantity in the compressed state and the usable quantity that can be recovered.

Example: 250 mL expands to 500 mL (500 in^3 expands to 1000 in^3).

(Added 1990)

However, NIST Handbook 133 does not include specific procedures for testing animal bedding volume declarations, compressed state quantity declarations, or usable quantity declarations. This proposal is to clarify appropriate test procedures for animal bedding.

At the 2011 CWMA Interim Meeting, the CWMA recommended in move this item to a Voting Item.

At the 2012 NCWM Interim Meeting, the Committee made minor editorial changes to align with the format and language currently in NIST Handbook 133. The submitter had the word "uncompressed" added under the note section within "Evaluation of Results." The Committee agreed and recommended the removal of the word "uncompressed."

This proposal includes adopting both the mulch and soil test method and the evaluation of results for animal bedding. The method of evaluating results for mulch and soil testing includes an exception to the maximum allowed variation: the MAV is 5 %, and one package out of a 12 item samples (2 packages in 24 item sample, 4 packages in a 48 item sample) is allowed to exceed the MAV. However, the sample must meet the average requirement of "Category A." This MAV exception for mulch and soil was developed based on a study of mulch and soil test results. The Committee will ask industry to submit animal bedding product information and test data to determine if the MAV exception is appropriate for animal bedding

An animal bedding industry representative was supportive of the 5 % allowance and also recommended a 12 × 12 × 12 cubic foot vessel. The submitter of the proposal has been using the mulch test procedure to test animal bedding and has not had issues using the procedure under the item for consideration. The 2012 L&R Committee designated this item as an Informational Item.

At the 2012 NEWMA Annual Meeting, the NEWMA L&R Committee received no comments.

At the 2012 CWMA Annual Meeting, the author, Ms. Judy Cardin, Wisconsin, provided an update that there is no current standard for animal bedding, subsequently industry is using a variety of test methods and are producing various results. She is encouraging the states to test animal bedding and to share data with NIST, OWM.

At the 2012 NCWM Annual Meeting, the L&R Committee requested that regulators and industry conduct animal bedding package testing, and submit their test results to judy.cardin@wi.gov or to david.sefcik@nist.gov. Preliminary analysis by NIST, OWM of available test data indicates that an exception for MAV is necessary for this product, but the Committee needs additional test data to determine the appropriate amount for that exception.

260-4 V HB 133, Chapter 4.7. Polyethylene Sheeting - Test Procedure - Footnote Step 3

(This item was adopted.)

Source:
Western Weights and Measures Association (WWMA)

Purpose:
Update NIST Handbook 133, Chapter 4.7. Polyethylene Sheeting – Test Procedure to provide new density values for heavier density plastics that are currently in the marketplace.

Polyethylene bags labeled as High Density (HDPE) or similar language have been found to package products whose labeled net weights meet calculated target net weights when employing a density factor of 0.92 g/cm³. When a density factor of 0.95 g/cm³ is used, as appropriate, in the calculation for high density polyethylene materials, these products commonly fail to meet the calculated target net weight. Further testing of these packages of polyethylene bags reveals that one or more of the labeled width, thickness, or count statements are inaccurate. HDPE product distributors that place a net weight statement on their packages based upon the Linear Low Density Polyethylene (LLDP) density value (0.92 g/cm³), have an approximately 3 % advantage over the distributor that uses the correct, high density, factor.

Item Under Consideration:
Amend the asterisked footnote below Step 3 as follows:

Amend NIST Handbook 133, Section 4.7. Polyethylene Sheeting, Step 3. footnote as follows:

> *~~**Determined**~~ **Defined** by ASTM Standard **D150~~03~~**, "Standard Test Method for Density of Plastics by the Density-Gradient Technique." **(2010 or latest issue) and ASTM Standard D883, Standard Terminology Relating to Plastics (2011 or latest issue)**
>
> For the purpose of this regulation, the minimum density **for linear low density (D) polyethylene plastics (LLDPE)** shall be 0.92 g/cm^3 (when D is not known).
>
> **For the purpose of this regulation, the minimum density for linear medium density (D) polyethylene plastics (LMDPE) shall be 0.93 g/cm^3 (when D is not known).**
>
> **For the purpose of this regulation, the minimum density for ~~linear~~ high density (D) polyethylene plastics (HDPE) shall be 0.94 g/cm^3 (when D is not known).**

Background/Discussion:
A proposal was presented at the WWMA 2009 Annual Meeting indicating that manufacturers and distributors of polyethylene bags labeled as "High Density" or HDPE have been found to package products whose labeled net weights meet calculated target net weights when employing a density factor of 0.92 g/cm³. When a density factor of 0.95 g/cm³ is used, as appropriate, in the calculation for high density polyethylene materials, these products commonly fail to meet the calculated target net weight. Further testing of these packages of polyethylene bags reveals that one or more of the labeled width, thickness, or count statements are inaccurate.

For example, a box of HDPE has stated dimensions of 24 in × 40 in × 0.4 mil, and a count of 250. Using the only density factor found in NIST Handbook 133, 0.92 g/cm³, the calculated target net weight, and that shown on the label, would be 6.38 lbs. If using the actual density factor for the HDPE bags of 0.95 g/cm³, the target net weight would be 6.59 lb. This means that HDPE product distributors that place a net weight statement on their packages

based upon the Linear Low Density Polyethylene (LLDP) density value (0.92 g/cm³), have an approximately 3 % advantage over the distributor that uses the correct, high density, factor.

When the original testing procedure was developed, HDPE bags had not yet entered the marketplace. Currently, this product is quite prevalent in the United States. Amending the test procedure will aid weights and measures inspectors in enforcing labeling requirements that allow true value comparisons and close a loophole within NIST Handbook 133.

Original Proposal:

> *****Determined by ASTM Standard D 1505-98 **(or latest issue)** "Standard Method of Test for Density of Plastics by the Density Gradient Technique." For the purpose of this handbook, **when the actual density is not known,** the minimum density **used to calculate the target net weight** shall be 0.92 g/cm³ **when the actual density is not known. For products labeled "High Density, HDPE, or similar wording, the minimum density (d) used to calculate the target net weight shall be 0.95 g/cm³.**

The 2009 WWMA Association supported this item and forwarded the item to the NCWM recommending it as a Voting Item.

NEWMA reviewed this item at their 2009 Interim Meeting. NEWMA forwarded this item to NCWM recommending it as a Developing Item.

At the NCWM 2010 Interim Meeting comments were heard on this item and Item 232-1 together during the open hearings. The Committee heard support for the suggestion that the density factor should change from 0.92 g /cm³ to 0.95 g/cm³. A California official stated that the information provided by the WWMA was data extracted from Internet searches. Manufacturers are complaining that under current practice, they cannot compete fairly.

Mr. Jackelen, Berry Plastics, urged the Committee to reject this proposal. Mr. Jackelen stated that 0.92 g/cm³ currently works for manufacturers and that changing it to 0.95 g/cm³ will cause undue cost and waste. Most manufacturers do not make high density (HD) bags, but are producing blends. Mr. Jackelen also stated an additional reason to reject the proposal is 0.95 g/cm³ bags, if punctured will continue to tear.

An official stated that if you use the term HD, then you are bound by the 0.95 g/cm³ density. If you use the length × width × thickness × density to determine the net weight, then the density needs to be added to the package labeling. Another official stated that manufacturers should consider disclosing the density factor on every product as part of the labeling. If there are questions about an absolute 0.95 g/cm³ density, then there should be an alternate suggestion. Another official stated that 0.95 g/cm³ will be factored in when the density is not known. The Committee received reviewed letters that were reviewed on this item (refer to Appendix I, *Report of the 95th NCWM* [SP 1115, 2010]). The 2010 L&R Committee designated this item as a Voting Item.

At the 2010 NEWMA Annual Meeting, there was concern about what appears to be a lack of data on this item. It was not reviewed by all regions and not presented to industry to seek comments. The Committee did not perceive this item as an emergency. NEWMA recommended that the item be an Informational Item to allow time for all the regions and industry to review and comment.

At the 2010 CWMA Annual Meeting there were no comments on this item. The CWMA recommended that this item remain as a Voting Item.

At the 2010 NCWM Annual Meeting, an official stated that his comments were the same as he expressed in Item 232-4 Method of Sale (refer to the *Report of the 95th NCWM* [SP 1115, 2010]). The official stated that with the amendments recommended by another official expressed in Item 232-4, Method of Sale, they would support this proposal. There is agreement that the role of the Conference is not to determine quality issues, but rather to set testing standards for inspectors. Moving this item to Informational status will allow time to receive additional information and data from manufacturers of polyethylene.

The Committee believed that additional work was needed on this item including reviewing the labeling requirement of polyethylene. This may include requiring a mandatory statement and review of ASTM standards. Following Open Hearings, the 2010 L&R Committee changed the status of this item from a Voting Item to an Informational Item to allow more time for development.

At the 2010 CWMA Interim Meeting, there were no comments on this item. The CWMA recommended that the item remain an Informational Item.

At the 2010 WWMA Annual Meeting, an official commented that he is in support of this item with the proposed amended changes to replace the existing language with:

> *****Determined by ASTM Standard D 1505-98 **(or latest issue)** "Standard Method of Test for Density of Plastics by the Density Gradient Technique." For the purpose of this **handbook regulation, when the actual density is not known (D) is not labeled on the package,** the minimum density **(D) used to calculate the target net weight for linear low density polyethylene products (LLDP) and products other than high density (HDPE)** shall be 0.92 g/cm³ **when the actual density is not known. For products labeled High Density, HDPE, or similar wording, that does not specify the minimum density (D) on the package label, the minimum density (D) used to calculate the target net weight shall be 0.95 g/cm³.**

The WWMA L&R Committee recommends that the item be a Voting Item as amended above.

At the 2010 SWMA Annual Meeting there were no comments heard on this item. The Committee recommended more time to seek additional information and comments from industry other than the material safety data sheets that were submitted. The SWMA recommended that the item remain as an Informational Item.

At the 2010 NEWMA Interim Meeting, there were no comments heard on this item. NEWMA would like this item to remain as an Informational Item.

At the 2011 NCWM Interim Meeting, a state official remarked that within their state there are extensive labeling problems with poly labeling. She recommends that the Committee consider the revised WWMA language as it will provide guidance and language for when the density is not known. The 2011 Committee recommends the revised language from the WWMA for adoption by the NCWM.

At the 2011 NEWMA and CWMA Annual Meetings, there were no comments heard on this item and both regions recommended this move forward as a Voting Item.

At the 2011 NCWM Annual Meeting, it was noted there is also a corresponding proposal for the method of sale under Item 232-1. A state official expressed concern with the term "when D is not known." Currently, 0.92 g/cm³ is the lower density rating when "D" is not known. The proposed language will allow industry to use products with densities lower than the 0.92 g/cm³. Several states spoke in support of this item since it does provide clarity for the test procedure. This testing can be destructive unless the density is known. A letter from industry was received stating that 0.95 g/cm³ density may not represent the density of HDPW currently in the marketplace. They indicated that 0.948 g/cm³ is a more accurate factor. The Committee believes that additional data from industry needs to be received on the density factors before proceeding with this item. The Committee removed this item from the voting calendar and designated this item as an Informational Item.

At the 2011 CWMA Interim Meeting, the CWMA requested more information from the regions and industry. The CWMA, therefore, recommends that the item remains as an Informational Item.

At the 2011 WWMA Annual Meeting, a county official recommended that density be required on the label. The WWMA L&R Committee reviewed the ASTM definitions for HD, Low Density, and Medium Density. It was agreed that the use of the ASTM defined density would clarify the proposal. WWMA recommended that this item be a Voting Item as revised below. Final updated or revised proposal recommended by the WWMA (taken from NIST Handbook 130 (2011 edition):

*~~**Determined**~~ **Defined** by ASTM Standard ~~**D1505-03, "Standard Method of Test for Density of Plastics by the Density-Gradient Technique."**~~ **D1505 68, Standard Method of Test for Density of Plastics by the Density Gradient Technique D883 (2011), Standard Terminology Relating to Plastics (or latest issue.)**

For the purpose of this regulation, the minimum density for **linear low density polyethylene plastics (LLDPE)** shall be 0.92 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for linear medium density polyethylene plastics (LMDPE) shall be 0.93 g/cm^3 (when D is not known).

For the purpose of this regulation, the minimum density for linear high density polyethylene plastics (HDPE) shall be 0.94 g/cm^3 (when D is not known).

At the 2011 NEWMA Interim Meeting, the Committee heard no comments or made no recommendations.

At the 2011 SWMA Annual Meeting, the Committee heard no comments on this item. The SWMA recommended that the item be a Voting Item pending agreement on the high density.

At the 2012 NCWM Interim Meeting, the Committee reviewed language from the 2011 WWMA. The Committee designated this as a Voting Item using the language received from the 2011 WWMA along with editorial changes to add reference to ASTM D1505 and ASTM D883.

At the 2012 NEWMA Annual Meeting, NEWMA received a comment on whether 0.093 g/cm^3 resolves the issue. It was discussed that this allows the density to meet an ASTM standard. NEWMA agreed that this item should be designated as a Voting Item.

During their spring 2012 Annual Meetings both the NEWMA and CWMA supported this item and recommended it for adoption by the NCWM.

At the 2012 NCWM Annual Meeting no comments were heard on this item. The Committee made two editorial changes to the item under consideration. The first change is to replace the term "products" with "plastics" and to remove the word "linear" from the definition of high density polyethylene. The Committee decided to change the language to align with the ASTM standard and maintain the status of the item as a Voting Item. After discussing the comments from the 2012 NCWM Annual Meeting Open Hearings and the proposed changes, the Committee agreed to modify the language in its Interim Report to that shown in this Final Report in the Item Under Consideration.

Additional letters, presentations and data may have been part of the Committee's consideration. Please refer to Items 232-4 and 260-3 and Appendix I in the *Report of the 95th NCWM* (SP 1115, 2010) and Item 260-2 and Appendix C in the *Report of the 96th NCWM* (SP1125, 2011), and Appendix C within this document for additional content.

260-5 D Printer Ink and Toner Gravimetric Package Testing Work Group

Source:
Printer Ink and Toner Gravimetric Package Testing Work Group (2012)

Purpose:
Provide notice of the formation of a new Subcommittee reporting to the L&R Committee. This Subcommittee will provide additional guidance for developing test procedures for printer ink and toner cartridges.

Item Under Consideration:
None

Background/Discussion:
At the 2012 NCWM Annual Meeting, it was announced there is a new Printer Ink and Toner Gravimetric Package Testing Work Group that met to discuss a test method that would require industry to label cartridges with a tare (packaged materials) weight. Weights and measures inspectors would weigh the packaged product, and subtract this tare weight from the gross weight of the product to obtain the net weight. The tare weight provided on the package would be a cartridge tare weight, or a total tare weight, that would include the weight of the empty cartridge and all other package materials, that could appear on the outer box.

During open hearings, Mr. Matthew Barkley, Hewlett Packard, commented that the agenda for the work group was received prior to coming to the Conference, but he did not have a proper amount of time to conduct a review. Hewlett Packard products are manufactured on three continents and packaged within the United States. Some labeling could be difficult and costly, and the additional cost of doing this would be passed on to the consumer. Mr. Barkley did submit a letter into the Committee with his comments and concerns. Mr. Barkley also requested that his documentation be submitted at the 2011 NCWM Annual remain with the Committee as this item continues to develop (refer to Appendix C in the *Report of the 96th NCWM* [SP 1125, 2011]).

Anyone interested in participating in the Printer Ink and Toner Gravimetric Testing WG should contact Judy Cardin, Wisconsin Weights and Measures, at judy.cardin@wi.gov or Lisa Warfield, NIST, OWM Technical Advisor at lisa.warfield@nist.gov.

Additional letters, presentations and data may have been part of the Committee's consideration. To review the supporting documentation for this item, please refer to Appendix C, *Report of the 95th NCWM* (SP 1115, 2010), Appendix C, *Report of the 96th NCWM* (SP 1125, 2011), and Appendix C within this document for additional content.

270 OTHER ITEMS – DEVELOPING ITEMS

INTRODUCTION

The NCWM established a mechanism to disseminate information about emerging issues which have merit and are of national interest. Developing items are those items that have not received sufficient review by all parties affected by the proposals or may be insufficiently developed to warrant review by the NCWM L&R Committee. The Developing items listed are currently under review by at least one regional association, Subcommittee, or work group.

The Developing Items are marked according to the specific NIST handbook into which they fall – NIST Handbook 130 or NIST Handbook 133. The Committee encourages interested parties to examine the proposals included in the appendices and to send their comments to the contact listed in each part.

The Committee asks that the regional weights and measures associations, Subcommittees, and work groups continue their work to fully develop each proposal. Should an association, Subcommittee, or work group decide to discontinue work on a Developing Item, the Committee asks that it be notified. When the status of an item changes because the submitter withdraws the item, the item will be listed in a table below. For more details on items moved from the Developing Items list to the Committee's main agenda, refer to the new reference number in the main agenda.

270-1 D Fuels and Lubricants Subcommittee (FALS)

Source:
The Fuels and Lubricants Subcommittee (FALS) (2007)

Purpose:
Update the Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation in NIST Handbook 130. Another task will be to update the Basic Engine and Fuels, Petroleum Products, and Lubricants Laboratory Publication.

Item Under Consideration:
This item is under development. FALS has met since the 2007 NCWM Annual Meeting and continues its work on a number of items in addition to preparing a major revision of the Fuel Ethanol Specifications.

Background/Discussion:
The Subcommittee met on January 24, 2007, at the NCWM Interim Meeting to undertake a review of a number of significant issues related to fuel standards. Their first project was to undertake a major review and update of the Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation in NIST Handbook 130. The Subcommittee also met at the 2007 NCWM Annual Meeting and continued its work on a number of items in addition to preparing a major revision of the Fuel Ethanol Specifications.

An additional project will be to update and possibly expand the Basic Engine Fuels, Petroleum Products, and Lubricants Laboratory Publication. The Subcommittee will undertake other projects as time and resources permit.

At the 2009 NCWM Interim Meeting and Annual Meeting, the FALS Chair informed the L&R Committee that FALS is working toward getting changes made to the language within the document.

At the CWMA 2009 Interim, the WWMA 2009 Annual, the SWMA 2009 Annual, and NEWMA 2009 Interim Meetings, there were no comments heard. The associations recommend that this proposal remain a Developing Item.

At the 2010 NCWM Interim Meeting, the FALS Chair, Mr. Ron Hayes, informed the L&R Committee that FALS is still working on this project. No comments were heard during the open hearings, and the L&R Committee agrees that this item should remain a Developing Item.

At the 2010 NEWMA Annual Meeting no comments were heard on this item. NEWMA recommends that this item remain as a Developing Item.

At the 2010 CWMA Annual Meeting, the NIST Technical Advisor provided information that NIST had begun work on the development of a handbook for state fuel laboratories.

At the 2010 NCWM Annual Meeting, a comment from a petroleum representative stated that this item is premature and that action needs to be taken by the EPA. Mr. Hayes clarified that this item is for a laboratory guide and that FALS supports NIST, OWM's efforts to develop a handbook for state fuel laboratories. The item mentioned by the petroleum representative is for a new proposal that is being submitted through the regions modifying NIST Handbook 130, as a result of a potential EPA waiver for gasoline containing more than 10 volume percent ethanol.

During the 2010 SWMA Annual Meeting, the CWMA and NEWMA Interim Meetings, all of the associations supported the recommendation that this item be considered as a Developing Item.

At the 2011 NCWM Interim Meeting, the NIST Technical Advisor reported that a draft laboratory guide for state laboratories will be available for distribution and comment by March 2011. The NCWM L&R Committee recommended this item move forward as an Informational Item. Mr. Hayes added that FALS is considering a number of new items including:

- Section 3.2.5. – Prohibition of Terms. – possible deletion of altitude adjustment for octane and economy grades;

- Reference ASTM microbial contamination standards;

- Reference ISO 22241.1 NOx Reduction Agent Part 1 – Quality Requirements (quality standard for Diesel Exhaust Fluid);

- Section 3.1.2. – Retail Dispenser Labeling. – Review for potential clarification of "gasoline" identity on retail motor fuel dispensers; and

- Establish regulations to determine if OEM labelled claims for Automatic Transmission and Tractor Fluids are met.

At the NEWMA 2011 Annual Meeting, NEWMA agreed that additional work is needed to establishing a requirement for mis-fueling.

At the CWMA 2011 Annual Meeting, the FALS Chair noted the first draft related to mis-fueling was released for comment on June 6, 2011.

At the 2011 NCWM Annual Meeting, the FALS Chair gave an update. FALS is working on the altitude adjustment table. Today's vehicle population requires fuel with the same octane requirements regardless of altitude. A state official expressed concern that unleaded fuel is currently marketed as regular and unleaded 85 octane. FALS is in agreement that ASTM needs to address this issue as it involves pre-1971 vehicles. Currently, all engine manufacturers require no less than 87 octane. The NIST Technical Advisor remarked that a second draft laboratory guide will be made available prior to October 2011 for distribution and review.

At the 2011 CWMA and NEWMA Interim Meetings there were no comments. The CWMA and NEWMA recommended that the item be a Developing Item.

At the 2011 WWMA Annual Meeting, the WWMA continues to support the work of the FALS and recommends the item be an Information Item.

At the 2012 Interim Meeting, the NIST Technical Advisor remarked that comments on the draft laboratory guide for state laboratories are due into NIST by February 1, 2012. The 2012 L&R Committee designated this item as a Developing Item and assigned its development to FALS.

At the 2012 NEWMA and CWMA Annual Meetings, there were no comments received, and it was recommended that the item be a Developing Item. At the CWMA meeting, the NIST Technical advisor remarked that there were extensive changes received on the laboratory guide for state laboratories. NIST is currently compiling another draft for release.

At the 2012 NCWM Annual Meeting, the NIST Technical Advisor remarked the laboratory guide for state laboratories (NIST, Handbook 156, *Program Handbook for Engine Fuels, Petroleum and Lubricant Laboratories*) will be published by October 1, 2012. Mr. Hayes provided an update on items that FALS items and will provide an additional update at the 2013 NCWM Interim Meeting.

If you would like to participate in this Subcommittee, contact Mr. Ron Hayes, Chairperson Fuels and Lubricants Subcommittee, at (573) 751-2922, e-mail: ron.hayes@mda.mo.gov or Mr. David Sefcik, NIST at (301) 975-4868, e-mail: david.sefcik@nist.gov.

270-2 D Packaging and Labeling Subcommittee (PALS)

At the 2011 NCWM Interim Meeting, the Packaging and Labeling Subcommittee (PALS) met for the first time to discuss ongoing issues and agenda items in regards to packaging and labeling regulations. There were 11 attendees that represented industry, state and county regulatory officials, and a NIST Technical Advisor.

The mission of PALS is to assist the NCWM L&R Committee in the development of agenda items 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. The PALS will report to the NCWM L&R Committee.

The NIST, OWM Technical Advisor reported that Federal Trade Commission (FTC) will do a review of Fair Packaging and Labeling Act (FPLA) in 2013.

It was announced at the 2011 NEWMA and CWMA Annual meetings that Mr. Chris Guay, PALS Chair, is actively seeking volunteers. Mr. Guay has requested at least one representative from each regional association.

At the 2011 NCWM Annual Meeting, the PALS were unable to meet since the Chair, Mr. Guay, was not in attendance. Volunteers were solicited for this Committee.

At the 2011 CWMA Interim Meeting, the PALS Chair stated the goal is to be active before the 2012 NCWM Interim Meeting and stated there is a need to prioritize labeling issues. No action was needed, and the CWMA recommended that the item remain as a Developing Item.

At the 2011 WWMA and NEWMA Interim Meetings, both associations recognized that this would be an ongoing item, and recommended that remain as a Developing Item.

At the 2012 NCWM Interim Meeting, PALS met to discuss its formation and strategy for moving forward. The NCWM Chair will appoint eight voting members on the Committee to consist of four regulatory officials (one from each region), and four from industry (two retailers and two manufacturers). Mr. Guay remarked that the work of the Subcommittee will be done through webinar meetings and will be held approximately four times a year. PALS members will be responsible for providing updates at their regional meetings and to seek input into issues. Mr. Guay added that PALS will be developing proposals and providing guidance and recommendations on existing proposals as assigned by the NCWM L&R Committee. Mr. Guay also stressed the need and importance of having key federal agencies (FDA, FTC, and USDA) participating. Mr. Guay gave a presentation on a number of packaging issues he has encountered over the last several years. The NIST Technical Advisor commented that the FTC announced that they will be doing a review on the FPLA in 2013. Mr. Kurt Floren, NCWM Chair stated he is committed to making the final Committee appointments, and understands the urgency and necessity for the work of this Subcommittee. The 2012 L&R Committee designated this item as a Developing Item and assigned its development to PALS.

At the 2012 NCWM Annual Meeting, the PALS met and is currently considering the following for further development:

- **Additional Net Content Declarations on the PDP** – Package net contents are most commonly determined by the product form, for example, solid products are labeled by weight and liquid products are labeled by volume. Semi-solid products such as pastes, creams, and viscous liquids are required to be labeled by weight in the United States and by volume in Canada.

- **Icons in Lieu of Words in Packages Labeled by Count** – Clear and non-misleading icons take the place of the word “count” or “item name” in a net content statement. While existing Federal regulation requires regulatory label information to be in “English,” the increasing presence of multilingual labels and the growing diversity of the U.S. population suggest more consumers are served with a clear and non-misleading icon.

- **Multilingual Labels**

- **Multipacks and Bundle Packages** – The net content statements for multipacks and bundled packages of individually labeled products can be different based on the approach used to calculate them. The difference is the result of the degree of rounding for dual inch-pound and metric declarations. Using two apparently valid but different methods can yield one net content statement result, which provides more accuracy between the metric and inch-pound declarations and a different net content result, which is consumer friendly.

Anyone interested in assisting the Packaging and Labeling Subcommittee, please contact Mr. Chris Guay, PALS Chair at (513) 983-0530, e-mail: guay.cb@pg.com or Mr. David Sefcik, NIST, OWM at (301) 975-4868, e-mail: david.sefcik@nist.gov.

270-3 D Moisture Allowance

Source:
Moisture Allowance Subcommittee (2012)

Purpose:
Provide notice of formation of a new Subcommittee reporting to the L&R Committee. This Subcommittee will provide additional guidance for making moisture allowances for products not listed in NIST Handbook 133.

Item Under Consideration:
None

Background/Discussion:
At the 2012 NCWM Interim Meeting, the L&R Committee Chair will be requesting that the NCWM Board of Directors to form a new Subcommittee to review moisture allowance.

At the 2012 NCWM Annual Meeting, it was announced that Mr. Kurt Floren will be the Chair for the Moisture Allowance Subcommittee.

Anyone interested in assisting with the work should contact Mr. Kurt Floren, Chair at (626) 575-5451 or e-mail kfloren@acwm.lacounty.gov or Ms. Lisa Warfield, NIST Technical Advisor at (301) 975-3308 or lisa.warfield@nist.gov.

Ms. Judy Cardin, Wisconsin, Chair
Mr. Richard Lewis, Georgia
Mr. Tim Lloyd, Montana
Mr. Raymond Johnson, New Mexico
Mr. Louis Sakin, Towns of Hopkinton/Northbridge, Massachusetts
Ms. Judy Cardin, Wisconsin, Chair, Printer Ink and Toner Gravimetric Package Testing
Mr. Kurt Floren, Los Angeles County, CA, Chair, Moisture Loss Work Group
Mr. Christopher Guay, Chair, PALS
Mr. Ron Hayes, Missouri, Chair, FALS

Mr. Rob Underwood, Associate Membership Representative
Mr. Lance Robertson, Canadian Technical Advisor
Mr. David Sefcik, NIST Technical Advisor
Ms. Lisa Warfield, NIST Technical Advisor

Laws and Regulations Committee

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Appendix A

NIST Handbook 130 – Uniform Packaging and Labeling Regulation

Item:

231-2: 10.3. Aerosols and Similar Pressurized Containers

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From: Sefcik, David
To: Warfield, Lisa
Subject: FW: More interesting aerosol information

Date: Monday, January 23, 2012 5:16:21 PM

From: Scott Ciurana [sciurana@bluemagicusa.com]
Sent: Sunday, January 22, 2012 9:55 AM
To: judy.cardin@wisconsin.gov; Sefcik, David
Cc: Morgan Gibson; Joe Stewart
Subject: FW: More interesting aerosol information

Hi Judy and David,
The communication below from Beaumont Products may answer some of the questions before the committee.

Thank you,
Scott Ciurana

BLUE MAGIC
Just Like New. Just Like Magic!™

The information contained in this email is intended only for the use of the individual or entity to whom it is addressed. It may contain information that is privileged, confidential, and exempt from disclosure under law. If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering the message to the intended recipient, you are notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify it@bluemagicusa.com. Thank you.

From: Steve Molnar [mailto:smolnar@beaumontproducts.com]
Sent: Friday, January 20, 2012 4:55 PM
To: Scott Ciurana
Subject: Fwd: More interesting aerosol information

This is from a recycling organization:
http://infohouse.p2ric.org/ref/32/31985/Aerosol_Cans.htm
"Aerosol cans are expensive and have greater environmental consequences. Ounce for ounce, spray-on product sold in aerosol cans is roughly twice the cost of bulk product. You pay for propellants in every aerosol can you purchase. Most aerosol cans contain 10-15% propellant by weight. "

The British are required to report aerosol fill by volume:
http://www.bama.co.uk/prescribed_quantities/

"**PRESCRIBED QUANTITIES LEGISLATION**

- Effective from April 2009
- Aerosols are deregulated from prescribed quantities sizes
- All aerosols can be labeled with volume only
- Containers must show nominal fill capacity

Industry Self Regulation

- BAMA with FEA – the European Aerosol Federation – have produced a standard for 'standard fill'
- This is designed to ensure that aerosols are not overfilled (dangerous) or under filled (deceptive packaging)"

The CSPA (Consumer Specialty Products Association)may have useful information, but we'd have to pay for it:



http://www.cspa.org/news-media-center/publications.html

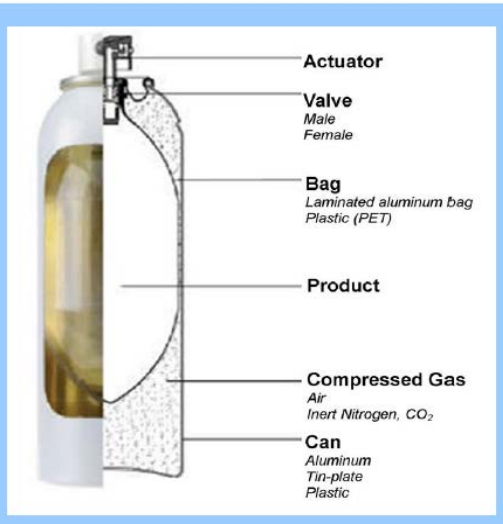
1560 Big Shanty Drive Kennesaw,
GA 30144
www.beaumontproducts.com

BAG-ON-VALVE TECHNOLOGY
and
NIST Handbook 130, Section 10.3

NATIONAL CONFERENCE ON WEIGHTS AND MEASURES LAWS AND REGULATIONS
2012 INTERIM MEETING
January 22-25, 2012
New Orleans, LA

Paul C. Van Slyke
Partner
Locke Lord LLP
(713) 226-1406
pvanslyke@lockelord.com

BOV Technology





BOV v. Conventional Aerosol

Feature	Conventional Aerosol	PURE CITRUS "Non-Aerosol"
Spray Content	Fragrance, water, odor reducers and other ingredients, and chemical propellant	**Fragrance only (no added water or chemical propellant)**
Inactive ingredients	90% - 95%	**0%**
Active ingredient (fragrance) expelled	**5% - 10%**	**100% Fragrance**

Labeling BOV Products With Current Regulations Leads To Customer Confusion

	Total (wt. oz.)	Active Ingredient (%)	Active Ingredient (wt. oz.)	Container Price ($)	Price/Total ($/wt. oz.)	Price/Active Ingredients ($/wt. oz.)	Price of Container with 100% Active Ingredients ($)
Exemplary conventional aerosol air freshener	9	5%	0.45	$1.19		$2.64	$23.80
Exemplary conventional aerosol air freshener	9	10%	0.9	$1.19	$0.13	$1.32	$11.90
Exemplary BOV technology air freshener	5.88	100%	5.88	$4.49	$0.76	$0.76	$4.49

Consumer Confusion - Labeling BOV Products Under Conventional Aerosol Regulations

- Incomplete labeling for inactive ingredients in conventional aerosols leads
  - to deception with BOV products
  - misinformation for comparisons with BOV
- Consumers can be misled into purchasing a seemingly less expensive conventional aerosol product that can be more expensive than BOV

Consumer Confusion - Labeling BOV Products Under Conventional Aerosol Regulations

Underlying assumption of an ability to accurately compare BOV technology to conventional aerosol technology under the current regulations is flawed.

Solutions

10.3. The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed.

Solution 1

10.3. The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed.

10.3.1 Containers that separate propellant from the expelled product so that the propellant is not expelled (such as containers using bag-on-valve technology) shall be prominently labeled NON-AEROSOL. The declaration of quantity shall disclose the net quantity of the commodity in terms of fluid measure.

Solution 2

10.3. The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed, provided however that containers that separate propellant from the expelled product so that the propellant is not expelled (such as containers using bag-on-valve technology) may be labeled either with weight or volume of the quantity of the commodity that will be expelled.

Summary of BOV Differences

- Fundamentally and inherently different since the propellant need not be expelled
- Consumers cannot make accurate and meaningful comparisons with conventional aerosols
- Compliance with existing NIST and state standards inhibits accurate consumer comparison
- Solutions to Avoid Confusion: Modify the conventional aerosol standards 1) to allow BOV labeling as NON-AEROSOL, or 2) to exclude BOV technology from weight labeling requirement
- Determining a volumetric amount of contents in a BOV product is simple



July 10, 2012

Judy Cardin
Wisconsin Weights and Measures
2811 Agriculture Drive
P.O. Box 8911
Madison, WI 53708-8911

Delivered via E-Mail
judy.cardin@wisconsin.gov

Re: Item 231-2 Section 10.3 Aerosols and Similar Pressurized Containers

Dear Ms. Cardin:

The Consumer Specialty Products Association[1] (CSPA) and its Aerosol Products Division (APD) represent the USA aerosol products industry, representing approximately 140 companies engaged in the manufacture and marketing of aerosol products. CSPA and its members are therefore vitally interested in the issues raised at the Interim Meeting of the National Conference on Weights and Measures in January regarding the appropriate net contents declaration for aerosols and similar pressurized containers. Starting in February, the CSPA APD formed a workgroup on this issue, and soon after reached out to product marketers interested in this issue that were not already CSPA members. This CSPA workgroup has been engaged since that time in seeking an industry consensus on this issue.

CSPA has worked for decades to support the development of fair and reasonable regulations that promote the public good, provide a fair marketplace for all consumer specialty products, and are enforceable by regulators. The Association fully supports the goal of the Fair Packaging and

[1] The Consumer Specialty Products Association (CSPA) is the premier trade association representing the interests of companies engaged in the manufacture, formulation, distribution and sale of more than $80 billion annually in the U.S. of familiar consumer products that help household and institutional customers create cleaner and healthier environments. CSPA member companies employ hundreds of thousands of people globally. Products CSPA represents include disinfectants that kill germs in homes, hospitals and restaurants; candles, and fragrances and air fresheners that eliminate odors; pest management products for home, garden and pets; cleaning products and polishes for use throughout the home and institutions; products used to protect and improve the performance and appearance of automobiles; aerosol products and a host of other products used every day. Through its product stewardship program, Product Care®, and scientific and business-to-business endeavors, CSPA provides its members a platform to effectively address issues regarding the health, safety and sustainability of their products. For more information, please visit www.cspa.org.

1667 K Street, N.W., Suite 300 | Washington, DC 20006 | www.cspa.org | p.202-833-7304 f. 202-223-2636

Labeling Act to assure that product labels give accurate information regarding the net quantity of contents, and thereby facilitate value comparisons by consumers. We also fully support the goals of the National Conference on Weights and Measures (NCWM) to assure that compliance can be consistently and effectively monitored by those regulators.

We have determined that CSPA members are in strong consensus that net weight is the appropriate measure of net contents for traditional aerosol products. CSPA is still seeking consensus, however, regarding some types of pressurized products such as bag-on-valve (BOV) products. Our APD workgroup continues to work to determine whether there are any classes of these products for which net volume declaration would be more appropriate.

While our search for an industry consensus continues, we urge that the NCWM Laws and Regulations Committee keep this issue in information gathering status. While I will not be able to attend the upcoming NVWM Annual Meeting, CSPA members will be in attendance and can answer any questions that you may have regarding our deliberations. In addition, please feel free to contact me at any time to discuss what we are doing, and provide your viewpoint on the issue.



Sincerely,

D. Douglas Fratz
Vice President, Scientific & Technical Affairs
& Aerosol Products Division Staff Executive

Cc: CSPA Aerosol Products Division Executive Board, Advisors, and BOV Workgroup
David Sefcik, NIST, Office of Weights and Measures, david.sefcik@nist.gov



Beaumont Products, Inc.

January 17, 2012

Mr. David A. Sefcik
NIST, Weights and Measures
100 Bureau Drive - M/S 2600
Gaithersburg, MD 20899-2600

Mr. Don Onwiler
National Conference on Weights and Measures
1135 M. Street, Suite 110
Lincoln, Nebraska 68508

Re: Comments on Laws and Regulations Committee Interim Agenda for 2012 Regarding the Proposal for NIST Handbook 130, Section 10.3.

Gentlemen:

As President of Beaumont Products, Inc., I am writing in support of Blue Magic, Inc.'s position on the aerosol/non-aerosol labeling issue raised by Mr. Charles H. Carroll of the Division of Standards, from the Commonwealth of Massachusetts.

Beaumont Products, Inc. has been marketing a number of natural citrus air care products in non-aerosol packages since 1991. In addition, I personally managed a Conventional Aerosol business prior to founding Beaumont Products, Inc.

I agree with Blue Magic's position that the Aerosol labeling regulations do not and should not apply to the Citrus Air Freshener products for two reasons.

1. Such products are not Aerosols, and

2. Aerosol weight designations are misleading.

Aerosol Background

The term "aerosol" is derived from AERated SOLution as a concept, dating back to 1790, and as an invention in 1926. Conventional Aerosol products include a gas propellant mixed inside a container with a liquid ("payload"). Once sprayed, the propellant evaporates quickly, leaving the payload suspended as very fine particles or droplets. In the Conventional Aerosol container, the sprayed output is not pure, because the payload is mixed with the gas propellant. The liquid payload is aerated by dispensing a mixture of liquid and gas from the gas pressurized

1560 Big Shanty Road • Kennesaw, GA 30144 • (404) 514-9000 • Fax (404) 514-7400 • 1-800-451-7096

Conventional Aerosol container. The consumer benefit of a Conventional Aerosol is convenience of delivery and rapid disbursement.

The derivation of the term Aerosol (AERated SOLution) provides the definition of a Conventional Aerosol as being an aerated (mixed gas & payload) solution, mixed in both the container and in the air.

Another pertinent definition of a Conventional Aerosol, from Hawley's Condensed Chemical Dictionary is: "A suspension of liquid or solid particles in a gas, the particles often being in the colloidal size range. Fog and smoke are common examples of natural aerosols; fine spray (perfumes, insecticides, inhalants, anti-perspirants, paints, etc.) are man-made."

A newer packaging alternative with similar consumer benefits, known as "Bag-on-Valve" (BOV), avoids some of the problems with the Conventional Aerosol technology. The BOV Technology uses a bag to contain the payload. The bag is contained within a can, and an environmentally friendly gas is placed outside the bag, but within the can. The bag is sealed to the stem of the valve within the can so the payload and the environmentally friendly gas never mix. When the valve actuator is pressed, the ambient pressure within the can "squeezes" the payload out of the sealed bag into the air, without the propellant leaving the can. As such, the payload is sprayed, in its pure form, without the mixed gas propellant, out of the sealed bag into the air.

The BOV Technology keeps the propellant and the payload separate so they never mix, either in the container or in the air upon disbursement. In the BOV, the propellant is not sprayed with the payload; instead the propellant remains in the can. With the BOV Technology, the payload does not need to mix with gases that add weight and volume to the container just to spray/aerate the payload.

Aerosol Labeling Requirements

The Uniform Packaging and Labeling Regulations require an "Aerosol package and similar pressurized containers to disclose the net quantity of the commodity in terms of net weight.

The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed."

Citrus Air Freshener Products Are Not Aerosols.

Such products, which use the newer BOV technology, are not Conventional Aerosols because:

a. In the BOV container, the pressurized gas does NOT mix with the payload;

b. The pressurized gas is NOT expelled with the payload;

c. The pressurized gas does NOT aerate the liquid payload.

Proof of the differences in Conventional Aerosols and the BOV technology is in the package instructions. All aerosols require "shake before using" (to mix the product and gas propellant

within the can). The BOV package does not require "shaking" because there is no mixing required, as the gas never leaves the can.

To "disclose the net quantity of the commodity (including propellant) 40 terms of weight that will be expelled" applies to the Conventional type of aerosol air freshener of which we are not.

Misleading Labeling

All liquids packaged and sold in the US, except aerosols, are labeled with a fluid ounce declaration. When Conventional Aerosols were first introduced in the 1920s, the Aerosol Industry wanted to declare fill levels in Aerosols on a weight basis in order to include the weight of the gas propellants in the aerosol mixture in the cans.

In my opinion, the Conventional Aerosol product label is misleading to consumers, because by claiming the weight of both the payload and the propellant, the consumer is led to believe that he is buying more active product than actually exists since the weight of the gas is claimed as part of the weight of the product. In fact, the gas is not product, but part of the delivery system. The true "tare" should be the weight of the payload, net of the gas propellant.

Even if one can justify claiming the weight of the gas as part of the product in a Conventional Aerosol, that same logic does not apply to the BOV container because the gas propellant does not leave the container. The weight of the gas in the BOV system is not "consumed" with the payload as it is with a Conventional Aerosol. Unlike Conventional Aerosols, when fully exhausted, the weight of the gas remains in the "empty" BOV package.

Please let me know if you need any additional information.

Sincerely yours,

Hank Picken
President & CEO
Beaumont Products, Inc.

cc: Scott Ciurana – Blue Magic, Inc.

Curriculum Vitae

Mr. Picken has been in the Consumer Products business since the early 1970's and has held various management positions at Colgate-Palmolive, Lever Brothers and Pfizer.

He also managed a Conventional Aerosol business, AMREP a manufacturer and supplier of Aerosol cleaning chemicals to the Janitorial Supply business, before founding Beaumont Products in 1991. At Beaumont, Mr. Picken pioneered the use of non-aerosol spray delivery systems such as the BOV and the EXXEL/ATMOS package because of environmental concerns.

Prior to beginning his career in Consumer Products, he worked for Price Waterhouse where he earned his CPA from New York State.

Mr. Picken has an AB in Government & Law from Lafayette College and an MBA from the Amos Tuck School of Business Administration at Dartmouth College.

He also served in the United States Army as an Infantry Captain with a tour of duty in Vietnam.

He is currently a Board Member on the Kennesaw State University Advisory Board to the School of Marketing and Professional Sales and is a past Director of the Tommy Nobis Rehab Center in Marietta, Georgia.

Beaumont Products, Inc.

July 11, 2016

Corrected date:
July 11, 2012

Ms. Judy Cardin
NIST, Weights and Measures
100 Bureau Drive – M/S 2600
Gaithersburg, MD 20899-2600

Dear Ms. Cardin:

I am writing to you in support of Scott Ciurana's, (of Blue Magic, Inc.) position on the BOV volume declaration issue.

We, Beaumont Products, Inc., manufacturers of Citrus Magic®, recommend that the declaration issue (item 231-2, Section 10.3 Aerosols and Similar Pressurized Containers) currently before the Laws and Regulations Committee remain in the information gathering status pending an industry consensus on the proper way to measure compliance of the liquid fill declaration of a pressurized BOV container.

It is Beaumont's opinion that Liquid Fill is the proper label declaration for our BOV product because the pressurized gas that propels the product from the BOV container, remains in the container after the product is fully dispensed. Therefore, the gas and its weight – which in our case is filtered, ambient air – should be considered part of the package and not part of the product. To label otherwise would be misleading to consumers.

The fact that the gas in our BOV container, remains in the can and is never mixed with the product, or dispensed with the product is the distinguishing characteristic that differentiates our BOV package from Conventional Aerosols.

Beaumont Products will be represented at the NCWM annual meeting and I am planning to address the Law & Regulations Committee accordingly, during the open hearings.

I look forward to meeting you in Portland next week

Sincerely yours,

Hank Picken
President & CEO
Beaumont Products, Inc.

cc Don Onwiler
David Sefcik
Scott Ciurana

1560 Big Shanty Road • Kennesaw, GA 30144 • (404) 514-9000 • Fax (404) 514-7400 • 1-800-451-7096

BOVsolutions
dispensing *beyond* green™ since 1982

3897 W. Homosassa Trail, Lecanto, FL 34461 ~ Talk * 352-746-6731 / Send * 352-746-6765

January 16, 2012
Via Email: dsefcik@nist.gov
NIST, Weights and Measures
100 Bureau Drive – M/s 2600
Gaithersburg MD 20899-2600

CC:
Scott Ciurana: sciurana@bluemagicuse.com
Judy Cardin: judy.cardin@wisconsin.gov
Don Onwiler: dononwiler@NCWM.net
David Sefcik: dsefcik@nist.gov

Re: Comments on laws and regulations committee interim Agenda for 2013 Regarding the Proposal for NIST Handbook 130 Section 10.3 and all other agencies and or Corporations considering the matter of Bag-On-Valve (BOV's) weights and measurements regulations.

Dear David:

This letter is in reference to proposals being made for regulation changes to the NIST Handbook 130 Section 231-2 section 10.3 Aerosols and Similar Pressurized containers currently under consideration before the National Conference on weights and measures laws and regulations. This letter also responds to the November 13, 2011 letter from the National Aerosol Association.

We are BOV Solutions, Inc., one of the founders of Bag-On-Valve technology and contract packagers and promoters of the same for more than twenty years. Please see our following comments below:

Hundreds of different products are currently on the market using Bag-On-Valve alternative aerosol technology (BOVs). Each would be greatly affected by the proposed regulation change requiring weight, not volume, to be listed on all BOV's.

BOV's (Bag-On-Valve technology) is entirely different from standard aerosol systems if for no other reason than no propellants are discharged with the product, only pure product.

BOVs are also different because they do not require gas propellants. BOVs use the air we take in with each breath, eliminating the hazards associated with standard aerosol systems. They should not be listed as standard aerosols for the same reasons.

Most products currently packaged in BOVs are products that were packaged prior to being packaged in BOVs. They were previously packaged in tubs, bottles or similar Non-Aerosol containers! In these cases product reformulation was not necessary or required therefore the products that were or may still be in

tubs, bottles or similar Non-Aerosol containers all note fluid ounce measurements. These are, in fact, still the very same products the consumer used when the products were only packaged in tubs, bottles or other Non-Aerosol containers. If BOVs are not allowed to continue the use of fluid ounce measurement it will greatly confuse the consumers who are using them.

When you dispense a product from standard aerosol system into a container and measure the volume you will find it is less after the propellants evaporate. When consumers dispense from BOVs they can measure the volume very simply and they know what they are getting.

Marketing companies who are offering the very same product in tubs, bottles or other Non-Aerosol containers, as well as in BOVs, but are not allowed to market them as the same volume will greatly confuse consumers.

Proposed changes requiring BOVs to be labeled the same as standard aerosol products should not be considered because, if for no other reason, it has been more than twenty years since we have been listing fluid once weight on BOVs, as well as making the claim that they are non-aerosol and all natural when referring to products like Pure Citrus.

BOV Solutions, Inc. are the inventors and promoters of all natural citrus odor eliminating air fresheners, the real reason for BOVs becoming commercially available. For many years the Pure Citrus type products were the only products packaged in BOV's here in the United States. The idea behind the BOV's invention was for following reasons:

1. To offer a natural non-aerosol product with a continuous spray action.

2. To keep product formula separated completely from propellants.

3. To protect the product from air and light.

4. To provide a better delivery system for dispensing products without the interference of propellants or the harmful effects caused by them.

5. To provide a system to help cut back on the harmful emissions of aerosols being released into the atmosphere and keep the pure citrus fragrances from going bad. (No oxidation in BOV's)

It is also confusing to allow foods to be filled in BOV's and use volume when standard aerosol must use weights for food items. We fill eatable cooking oils in BOV's yet ConAgra who fills cooking oil sprays (Pam) in standard aerosol they must use weight. We agree they should not be allowed to use volume because it is not a pure product. When we fill Extra Virgin Olive oils in a BOV's it is the very same oils that you purchase in a bottle, how confusing would that be if we could not use the same measurement system used for the same product and setting in the stores right next to each other? Same goes for other product filled in a BOV's.

When regulations were researched back in the early 1980's, before BOVs were made commercially available, it was noted that the definition for aerosol did not coincide with that of BOV's. After many discussions and a number of phone calls to various governing agencies, it was determined BOVs should be considered different for contents than aerosols because of how BOVs dispense products.

Now decades after the fact, the National Aerosol Association and the Weights and Measures wants to consider changing the method used with BOVs and understood by consumers for more than a Generation. Why did it take these agencies so long to look into this issue and come to the understanding it was necessary to make changes now to a system that has not caused any confusion in the market place? Could the reason be BOVs are taking a bite out of the standard aerosol markets? Regardless of the reason, we do not feel it is justifiable to make changes to a system that is fundamentally different from the system to which it is being compared.

BOV Solutions, Inc. agrees fully with the contents of the letter prepared by Paul C. Van Slyke and addressed to the David A. Sefcik with NIST, Weights and Measures dated January 6, 2012. Any changes in the requirements for the labeling of BOVs will inflict great financial harm to all those required to make what we consider unrealistic label changes.

It is hoped that those making the decisions will do so with an open mind and only after considering the alternatives and repercussions that may come about as a result of such unnecessary changes.

Sincerely Yours,



Paul R. Hertensen
Founder/CEO
BOV, Solutions, Inc.
3897 W. Homosassa Trail
Lecanto, Florida 34461

BOVsolutions
dispensing beyond green™ since 1982

2400 North Essex Avenue, Hernando, FL 34442 ~ Talk * 352-746-6731 / Send * 352-746-6765

Ms. Judy Cardin
NIST, Weights and Measures
100 Bureau Drive – M/S 2600
Gaithersburg, MD 20899-2600

July 13, 2012

Dear Ms. Cardin:

We write to you in support of Scott Ciurana's (Blue Magic, Inc.) position on the BOV volume declaration issue.

It is BOV Solutions, Inc. recommendation that the declaration issue (item 231-2, section 10.3 Aerosols and Similar Pressurized Containers) currently before the Laws and Regulations committee remain in an information gathering phase until industry consensus on the proper way to measure compliance of the liquid fill declaration of a pressurized BOV container can be reached.

We at BOV Solutions, Inc. strongly support Liquid Fill as the proper label declaration for our BOV products as the pressurized gas that propels our products from the container remains in the container after the product is fully dispensed. The gas and its weight, which in our case is simply air, should be considered part of the packaging, not the product. Including the weight of the gas in the label will be misleading to customers.

By its very nature, BOV packaging prevents the gas in our container from ever mixing with or being dispensed with our products. This distinguishing characteristic of our packaging system sets us far apart from conventional aerosols.



Sincerely Yours,

Paul Hertensen Founder &
CEO BOV Solutions, Inc.

From: Cardin, Judy L - DATCP
To: Doug Raymond
Cc: ncwm-laws-and-regulations@lists.ncwm.net; Warfield, Lisa; Peter, Stephen T - DATCP; don.onwiler@ncwm.net; Lindsay Hier (lindsay.hier@ncwm.net); Sefcik, David
Subject: RE: Item 231-2 Section 10.3 Aerosols and Similar Pressurized Containers

Date: Friday, July 13, 2012 5:54:32 PM

Mr. Raymond,

The item will be in an Informational status for this meeting. We will next consider the voting status at our January, 2013 NCWM Interim meeting. I appreciate your efforts reach to a consensus proposal from your industry, and look forward to hearing more from you. The four regional weights and measures associations meet in September or October, and if you are ready in time, you should forward your recommendation to the Regional groups also- Lisa Warfield or I can help you get the proposal to the regions.

Judith L. Cardin
Chief, Wisconsin Weights and Measures
Division of Trade and Consumer Protection
608 224 4945

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From: Doug Raymond [mailto:djraymond@me.com]
Sent: Friday, July 13, 2012 4:48 PM
To: Cardin, Judy L - DATCP
Subject: Item 231-2 Section 10.3 Aerosols and Similar Pressurized Containers

July 13, 2012

Judy Cardin
Wisconsin Weights and Measures
2811 Agriculture Drive
P.O. Box 8911
Madison, WI 53708-8911

Re: Item 231-2 Section 10.3 Aerosols and Similar Pressurized Containers

Dear Ms. Cardin:

The National Aerosol Association (NAA) presented at the January meeting of the National Conference on Weights and Measures (NCWM) in New Orleans, on the Bag on Valve issue with the weights/volume declaration. The item number 231-2 section 10.3. Aerosols and Similar Pressurized Containers. This item is currently in an information gathering status.

After the January meeting, NAA representatives met with Blue Magic and others to discuss this issue. In addition, NAA informed other organizations interested in the pressurized

packages of this issue. Currently, we are all working together to try and determine the most appropriate avenue to use to convey net contents for comparison to the consumers for our products.

Unfortunately at this time the industry does not have a working proposal to provide to the National Conference on Weights and Measures (NCWM). We are hopeful to be able to have a consensus position by January to present to your organization. Thus at this time we recommend that the issue be kept in the information gathering status.

I will be attending the July conference and available to discuss this issue with you. Thank you for your attention to this issue.

On behalf of the NAA

Doug Raymond



116 Swift Street
Edgerton, WI 53534
608-884-3411
Lawrence B. Midtbo
President

11 January 2012

Ms. Judy Cardin

Dear Ms. Cardin:

I recently saw your name on a copy list from a Mr. Paul Slykes, in reference to a letter Mr. Slykes sent to the Bureau of Weights and Measures regarding an upcoming hearing on the reclassifying of BOV (Bag on Valve) form of packaging from an aerosol class where the unit of measure is Net Weight to a unit declaration of Fluid Ounces. Our company, (a Wisconsin company since 1955) has been involved in the pressurized packaging of products and would like you to be aware of some of Mr. Slykes' misconceptions. First, the BOV technology is not "new", it has been commercially used for more than 10 years. Secondly, it uses standard aerosol packaging components, the main difference being in the "Bag" attached to the aerosol valve. Thirdly, it inaccurate to call the package environmentally more friendly, when in fact, it has additional plastic or metal (from the bag) than a standard aerosol. He makes
his claim based, not on the package, but rather on the propellant type used.

We urge that you understand the process before you give your support to Mr. Slykes. Should you desire to follow up on this letter, I would be happy to invite you to tour our facility in Edgerton, WI (30 miles south of Madison) to discuss this matter in more depth.

Very truly yours,

Lawrence B. Midtbo
President

Locke Lord LLP

Attorneys & Counselors

2800 JPMorgan Chase Tower, 600 Travis
Houston, TX 77002
Telephone: 713-226-1200
Fax: 713-223-3717
www.lockelord.com

Paul C. Van Slyke
Direct Telephone: 713-226-1406
Direct Fax: 713-229-2516
pvanslyke@lockelord.com

January 6, 2011

Via Email: dsefcik@nist.gov
And U.S. Mail

Mr. David A. Sefcik
NIST, Weights and Measures
100 Bureau Drive - M/S 2600
Gaithersburg MD 20899-2600

Re: Comments on Laws and Regulations Committee Interim Agenda for 2012 Regarding the Proposal for NIST Handbook 130, Section 10.3

Dear David:

This letter is in response to the request for comment to the proposal for NIST Handbook 130, Section 231-2 Section 10.3 Aerosols and Similar Pressurized Containers currently under consideration before the National Conference on Weights and Measures Laws and Regulations (L&R) Committee Interim Agenda. This letter also responds to the November 13, 2011 letter from the National Aerosol Association ("NAA"). We represent the interests of our client Blue Magic, Inc. that markets the product PURE CITRUS Air Freshener.

As explained in more detail below,

- The new bag-on-valve (BOV) technology is inherently and fundamentally different than the conventional aerosol technology since the propellant is not expelled with active ingredients.
- The consumer cannot make an accurate or meaningful comparison between the conventional aerosol products and the BOV technology products, when existing conventional aerosol regulations are applied to BOV products.
- Compliance with existing NIST and state standards inhibit this consumer comparison.
- A solution is to modify the conventional aerosol standards to require labeling of active ingredients (either net weight or volume) in lieu of total net weight or in addition to total net weight.
- Determining a volumetric amount of contents in a BOV technology product is relatively simple by just emptying the contents through the container nozzle into a container and measuring the volume.

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I. Aerosol and BOV Technologies Are Inherently and Fundamentally Different

A. Conventional Aerosol Design

Conventional aerosol technology uses a compressed liquid diluent and other liquids mixed with the active ingredients to create a mixture that is expelled through a release nozzle. The amount of active ingredients (such as a fragrance in an air freshener) is generally understood to be about 5% to 10%. Most of the weight (estimated at 90% to 95%) is from other ingredients, including water, propellants, emulsifiers, solubilizes, stabilizers, and other chemicals (for purposes herein termed "inactive ingredients").

The consumer is purchasing the container for the results that the *active ingredients* produce (such as, air freshness from air fresheners) and *not for the inactive ingredients*--but is paying for a container with 90% or more inactive ingredients.

The propellants in a conventional aerosol are generally petroleum-based products having volatile organic products (VOCs). The most common propellants are propanes and butanes, with dimethyl ether (DME) and methyl ethyl ether also used. All of these chemicals have the disadvantage of being flammable. Nitrous oxide and carbon dioxide are also used as propellants to deliver foodstuffs (for example, whipped cream and cooking spray). Medicinal aerosols, such as asthma inhalers, use hydrofluoroalkanes (HFA): either HFA 134a (1,1,1,2,-tetrafluoroethane) or HFA 227 (1,1,1,2,3,3,3-heptafluoropropane) or combinations of the two. Conventional aerosols are considered to be responsible for two percent (2%) of all human VOC emissions. Studies report health hazards from regular exposure to such aerosols.[1]

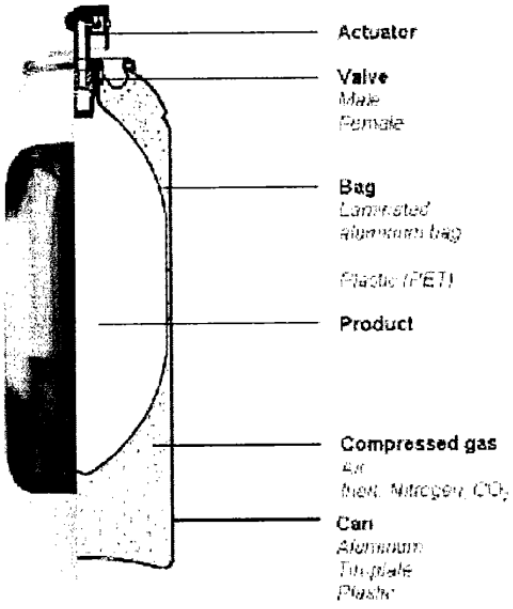
[1] Supporting documents are provided as exhibits in our letter to you dated February 28, 2011.

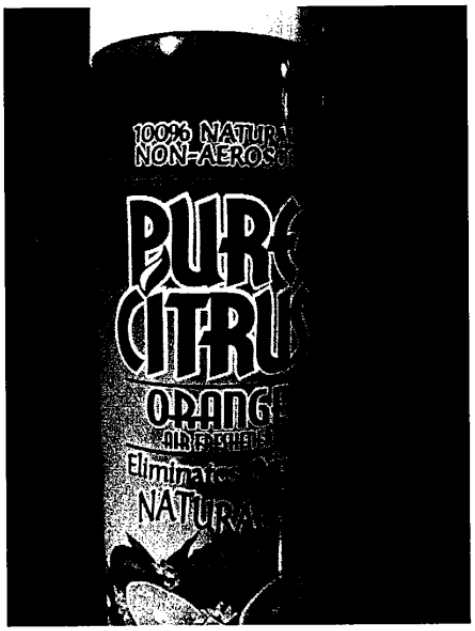
January 6, 2012

B. BOV Design

In contrast, the newer BOV technology uses compressed gas (such as air, nitrogen, or inert gases) to pressurize an external surface of a bag filled with a material to be released and "squeezes" the material in the bag through the release nozzle. The active ingredients are expelled through the nozzle, but the compressed gases are *not* expelled through the nozzle. The active ingredients are not dependent on a mixture of other ingredients to be expelled. The BOV technology has therefore the advantage of using a gas rather than a liquid, because no propellant solution or suspension is necessary to expel the active ingredients. In contrast to the conventional aerosol technology, *the compressed gas in a BOV container has virtually no weight.* Because the gas used as a pressurized source around the bag is not expelled into the atmosphere in normal use, BOV technology is inherently environmentally-friendly. Additionally, the gas itself is generally a harmless gas, such as air, nitrogen, or an inert gas.

For illustrative purposes, a typical construction of a BOV technology container is shown below on the left. The contents of the bag are isolated from the compressed gas around the bag. The intended contents are expelled from the container; the compressed gas remains in the container. A PURE CITRUS® container constructed using BOV technology is shown on the right. It is labeled as a "NON-AEROSOL" product to differentiate from the conventional aerosol technology.





C. Exemplary BOV Products

Examples of BOV technology products currently on the market include: Simply Saline™ wound wash saline from Blarix Laboratories, Ultra Defense™ sunscreen from Banana Boat from Connecticut, Citrus Magic air freshener from Beaumont Products, Inc. (not from the supplier of the PURE CITRUS® air freshener) from Georgia, and Coppertone Sport® sunscreen from Schering-Plough from Tennessee, among others, including the PURE CITRUS® air fresheners by our client. It is common to designate BOV

Technology products in volume, such as fluid ounces.[2] *All five of the above BOV technology products designate their products in fluid ounces.*

The table below shows representative differences from the design and technology between a typical conventional aerosol air freshener and the PURE CITRUS non-aerosol product, and are believed to be a reliable calculation of the percentage based on laboratory tests by a vendor.

Feature	Conventional Aerosol	PURE CITRUS "Non-Aerosol"
Spray Content	Fragrance, water, odor reducers and other ingredients, and chemical propellant	Fragrance only (no added water or chemical propellant)
Inactive ingredients	90% - 95%	0%
Active ingredient (fragrance) expelled	5% - 10%	100% Fragrance

BOV technology represents a radical shift away from conventional aerosol technology. BOV technology delivers an intended substance without the weight, without the non-active ingredients, and without the potentially harmful effects on humans and the environment. Thus, comparisons between conventional aerosol technology products and BOV technology products are like comparing "apples and oranges."

II. Conventional Aerosol Technology Benefits From an Industry-Accepted Misnomer

A. Current Aerosol Regulations

The pertinent part of Section 10.3 in the Uniform Packaging and Labeling Regulations reads as follows:

> 10.3. The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed.

[2] On April 8,. 2011, we forwarded to Mr. Charles H. Carroll examples of other BOV products with markings showing their contents in fluid ounces. Specifically, the list included Coppertone Sport Sunscreen (active ingredients 24%, 6 fl. oz.), Citrus Magic air freshener (not from the supplier of the PURE CITRUS air fresheners) (active ingredients 100%, 3.5 fl. oz.), Simply Saline, Wound Wash Saline (active ingredients 0.9%, 3.0 fl. oz.), and Banana Boat, Ultra Defense Sheer Protection (active ingredients 34%, 6 fl. oz.).

These regulations were written under the decades-old technology of conventional aerosols with the propellant and other inactive ingredients mixed with the active ingredients, so that the mixture of all contents is expelled. Therefore, the regulations specifically included the term "(including propellant)" as part of the "commodity" to be expelled, as the accepted method of indicating the contents. However, such regulations lead to at least three misperceptions with consumers.

B. Conventional Aerosol Products Labeling is Misleading to Consumers

1. *Most Conventional Aerosol Consumers Unknowingly Purchase a Product With Only About 5 – 10% of Active Ingredient*

First, the typical consumer purchases a product to deliver the results of the active ingredients in the product. An air freshener delivers fragrance to freshen air, a lubricant spray delivers lubricant to lubricate, and so forth. The consumer does not purchase a product for the inactive ingredients. Most consumers have no idea that only about 5% - 10% of the net weight in the container that they are purchasing is the intended product.

Consider the following example of a conventional aerosol technology air freshener purchased at a local grocery store. The container is labeled as a 9 oz. container and was purchased for $1.19.[3] Assuming the standard contents of about 5% to 10% fragrance, the active ingredients are about 0.5 to 0.9 wt. oz. with the remaining 9.1 to 9.5 wt. oz. being inactive ingredients. Thus, most of the advertised net weight of the contents is based on non-active ingredients—not the ingredients for which the consumer is purchasing the product. At an exemplary price of $1.19 for a 9 wt. oz. aerosol, the consumer is paying $0.13 per wt. oz., as might be labeled on the shelf next to the product, even though only a fraction of the contents is active ingredients. The equivalent price for the active ingredients in the container with 10% active ingredients is $1.32 per wt. oz. (1.19 divided by (9 x 10%)). Stated differently, if the aerosol container expelled 9 ounces of active ingredients, then at the price of $1.32 per wt. oz. of active ingredients, the aerosol container price would calculate to be $11.90 for the 9 wt. oz. aerosol at 100% active ingredients. This misnomer by labeling the weight of *all* ingredients, even the inactive ingredients, creates a misrepresentation to consumers of more value from more net weight, and appears to have become entrenched in the conventional aerosol industry.

2. *Conventional Aerosol Consumers Are Not Able to Compare Conventional Aerosol Products Based on the Actual Amount of Active Ingredients*

Second, consumers cannot compare two conventional aerosol products under current regulations, even of the same type of product and even when both are labeled with the same weight. One brand of a conventional aerosol product with 9 wt. oz. might have 5% active ingredients (0.45 wt. oz.), yet another brand of conventional aerosol product with the same weight might have 10% active ingredients (0.90 wt. oz.). At an exemplary price of $1.19 for the

[3] Conventional GLADE aerosol container purchased on sale at Kroger grocery store in Houston, Texas on December 1, 2011—standard price is $1.29. Interesting, the container simply states "9 OZ" --neither weight or volume, so is even more confusing to customers. It does have a secondary note in parenthesis of "(225 g)", but the consumer would have to understand that the "g" is an abbreviation for grams and would have to then understand the measurement is for weight. It is likely that many consumers are not sophisticated to this understanding.

a conventional aerosol, the consumer is paying $2.64 per wt. oz. of active ingredients for the 5% active ingredient aerosol and $1.32 per wt. oz. of active ingredients for the 10% active ingredient aerosol.

Thus, the consumer does not know the *real* value for an *accurate comparison*, because the total net weight of water, propellant and other inactive ingredients is included in the net weight of the container with an *unknown quantity of active ingredients.*

C. Current Label Regulations Make the BOV Products Misleading to Consumers

Third, using the weight comparison for an entirely different technology, such as the BOV technology, only exacerbates the misnomer above. The use of a total net weight comparison, if applied under current regulations, will cause a misperception and consumer confusion. For example, the net weight of a PURE CITRUS® air freshener using the newer BOV technology is approximately 5.9 wt. oz. and retails at grocery stores for about $4.49.[4] The full amount is active ingredient. Because the gas is virtually weightless and the only material released is the active ingredients, then 100%, rather than 5% or 10%, of the net weight is calculated into a price of $0.76 per wt. oz. of active ingredients.

This $0.76 per wt. oz. of active ingredients in the BOV technology aerosol compares with the above $1.32 to $2.64 per wt. oz. of active ingredients for the conventional aerosol. Yet, the shelf label for the BOV technology aerosol will likely be $0.76 per wt. oz. and the shelf label for the conventional aerosol will likely be $0.13 per wt. oz., nearly 6 times *less*, even though in actuality, the amount of active ingredients using the conventional aerosol technology costs the consumer one and one-half (1 1/2) to three and one half (3 1/2) times *more* than the PURE CITRUS air freshener using BOV technology.

The table below summarizes the above calculations and shows the resulting confusion in an attempted comparison between existing conventional aerosol products and between a BOV product.

	Total (wt. oz.)	Active Ingredient (%)	Active Ingredient (wt. oz.)	Container Price ($)	Price/Total ($/wt. oz.)	Price/Active Ingredients ($/wt. oz.)	Price of Container with 100% Active Ingredients ($)
Exemplary conventional aerosol air freshener	9	5%	0.45	$1.19	$0.13	$2.64	$23.80
Exemplary conventional aerosol air freshener	9	10%	0.9	$1.19	$0.13	$1.32	$11.90
Exemplary BOV technology air freshener	5.88	100%	5.88	$4.49	$0.76	$0.76	$4.49

[4] Based on PURE CITRUS® aerosol using BOV technology that was purchased at Kroger grocery store in Houston, Texas on December 1, 2011.

III. The Underlying Assumption of an Ability to Compare Using Conventional Aerosol Technology is Flawed

The underlying assumption in attempting to apply BOV technology to the current regulations drafted for conventional aerosol technology is that a weight comparison of the total contents (1) is appropriate, and (2) is accurate to the consumer.

The evidence shows that a weight comparison of the total contents is neither appropriate nor accurate. Such a comparison based on incomplete labeling under current practice in the conventional aerosol technology leads to a deception and misinformation to the consumer, *because the consumer does not have sufficient information from the conventional aerosol technology labeling.*

Consumers can be easily misled into purchasing a seemingly less expensive conventional aerosol product that in fact is much more expensive—potentially several times more expensive than the exemplary BOV technology product.

A forced net weight comparison of BOV technology products under existing regulations for conventional aerosol technology products also leads to unfair competition against the newer BOV technology. A forced net weight comparison of an inaccurate and unfair metric leads to a misrepresentation of the nature and quality of the product compared to non-equivalent conventional aerosol technology.

In summary, these reasons are sufficient to show why the apples of conventional aerosol technology should not be compared to the oranges of BOV technology based on total net weight of the contents, as NAA alleges. Conventional aerosol technology benefits from an industry-accepted misnomer that includes propellants in the net weight that are inactive ingredients and a large majority of the contents that are purchased. In contrast, BOV technology does not expel propellant and inherently has much less net weight for a given product without the expelling propellant. Conventional aerosol consumers are not able to compare conventional aerosol products based on the actual amount of active ingredients that may be 5-10% against BOV technology products that may contain much higher levels of active ingredients, such as 100% in PURE CITRUS air fresheners. Enforcing current label regulations against the BOV products would be confusing and misleading to consumers, because current regulations can result in the BOV products being perceived as having much less value per quantity of active ingredients compared to conventional aerosol products, when the above example shows quite the opposite could in fact be true. Thus, the underlying assumption of an ability to accurately compare BOV technology to conventional aerosol technology under the current regulations is flawed.

IV. NAA's Definitions Should Not Control A Different Technology

We also respond to the November 13, 2011 comments provided by the National Aerosol Association (NAA) on the BOV technology's inclusion under the conventional aerosol technology standards.

A. NAA's Three Citations to Regulations Do Not Apply to BOV Technology

We make the following observations to NAA's three citations in its letter. Quoted text below is taken from the NAA letter.

1. ***NAA**: "NIST Handbook 130 sections 2.2.6 and 2.2.7 references the Office of Weights and Measures of the National Institute of Standards 10.3."*

The NIST Handbook 130 that references the NIST section 10.3 for the weight of the "commodity (including propellant), that will be expelled" applies to "aerosols" and "similar pressurized packages." Consistent with the observations in our letter of February 28, 2011, this Section can apply to the BOV technology only if the BOV technology is deemed to be an "aerosol." We suggest that the BOV technically is not an "aerosol" as the term is conventionally defined and used. Even under this regulation, the BOV technology does not apply. The regulation requires, or at least assumes, the commodity to have a propellant that is expelled when it states a "commodity (including propellant)." Using BOV technology, *no propellant* is expelled. There is no solution, dispersion, or suspension of the propellant with the active ingredients to be expelled. The BOV technology is an inherent and foundationally different technology and so is not "a "similar pressurized package," as well.

2. ***NAA**: "CFR 49 section 171.8"*

The 49 CFR 171.8 definition of an "aerosol" requires a receptacle containing a gas under pressure to expel a liquid, paste, or powder and fitted with a release device "allowing the contents [of the receptacle] to be ejected by the gas." (emphasis added). Here, too, the BOV technology does not apply to this definition, which is based on conventional aerosol technology. Under conventional aerosol technology, the propellant combined with the active ingredients constitutes the *contents* of the receptacle. In conventional aerosol technology, the *contents* are ejected. In BOV technology, the *contents* of the receptacle are *not* ejected, because the compressed gas *remains* in the receptacle. Thus, this definition actually illustrates the differences between BOV technology and conventional aerosol technology, and is further evidence that the BOV technology is not an "aerosol."[5]

3. **NAA:** *"CFR 49 section 173.306a(3)"*

Actually, the citation to 49 CFR 173.306(a)(3) can be understood as *supporting a labeling requirement by* volume rather than weight. This section relates to labeling requirements for a compressed gas based on *volumetric* quantities and pressures of the containers. The cited section specifically measures containers in terms of liters and not weight. It states "Capacity must not exceed 1 L". The full citation is noted in the footnote below."[6]

---

[5] Further, some BOV technology products label in volume, such as fluid ounces. Please see examples in Note 2.

[6] The 49 CFR 173.306(a)(3) subsection reads as follows:

(3) When in a metal container for the sole purpose of expelling a nonpoisonous (other than a Division 6.1 Packing Group III material) liquid, paste or powder, provided all of the following conditions are met. Special exceptions for shipment of aerosols in the ORM-D class are provided in paragraph (i) of this section.

(i) Capacity must not exceed 1 L(61.0 cubic inches).

(ii) Pressure in the container must not exceed 180 psig at 130 °F. If the pressure exceeds 140 psig at 130 °F., but does not exceed 160 psig at 130 °F., a specification DOT 2P (§ 178.33 of this subchapter) inside metal container must be used; if the pressure exceeds 160 psig at 130 °F., a specification DOT 2Q (§ 178.33a of this subchapter) inside metal container must be used. In any event, the metal container must be capable of withstanding without

NAA refers to the BOV as "simply one of the barrier pack aerosol options." In reply, the nomenclature itself illustrates the fundamental differences between conventional aerosol technology and BOV technology in using the term "barrier pack", that is, a package having a barrier between the pressurized gas and the contents to be expelled. The nomenclature of an "aerosol" applied to BOV technology is irrelevant to the fundamental differences between conventional aerosol technology and BOV technology.[7] Such nomenclature is also irrelevant to the likely misperception and confusion to consumers when attempting to make a comparison between conventional aerosol technology and BOV technology.

NAA states that labeling the BOV with volume would be confusing to consumers. To the contrary, labeling the new BOV technology according to the conventional aerosol regulations of net weight results in confusion and deception to consumers. Consumers would misperceive that a greater quantity of useful material is in the conventional aerosol technology product due to the heavier weight of the large percentage--90% or more--of *inactive* ingredients that are expelled out of the container. By comparison, a BOV technology product can propel out 100% active ingredients with much less net weight, because it can have no inactive ingredients in the commodity to be expelled, and it can use a virtually weightless compressed gas external to the bag to expel the contents.

V. Additional Considerations for Testing of BOV Technology Products

A. Contents Are Easily Tested in BOV Containers

The question was raised at the 2011 Northeastern Weights and Measures Association (NEWMA) Interim Meeting on testing for contents as to whether the contents can easily be tested, just as manufacturers test the contents periodically for quality assurance and control ("QA/QC"). The answer is yes. The advantage of a BOV technology product is that there is no propellant in the expelled contents to compromise the testing in contrast to the volatile propellants in a conventional aerosol container. The procedure of testing BOV contents can be as simple as emptying the contents into a bottle and noting the volume.

---

bursting a pressure of one and one-half times the equilibrium pressure of the content at 130 °F.
(iii) Liquid content of the material and gas must not completely fill the container at 130 °F.
(iv) The container must be packed in strong outside packagings.
(v) Each container must be subjected to a test performed in a hot water bath; the temperature of the bath and the duration of the test must be such that the internal pressure reaches that which would be reached at 55 °C (131 °F) (50 °C (122 °F) if the liquid phase does not exceed 95% of the capacity of the container at 50 °C (122 °F)). If the contents are sensitive to heat, the temperature of the bath must be set at between 20 °C (68 °F) and 30 °C (86 °F) but, in addition, one container in 2,000 must be tested at the higher temperature. No leakage or permanent deformation of a container may occur.
(vi) Each outside packaging must be marked "INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS."

[7] It is possible that the term "aerosol" may have been loosely applied in initial inceptions of the BOV technology for commercial reasons of acceptability in the marketplace. However, if so, then such initial usage of the term does not reduce in any way the fundamental differences between the technologies and the impact that conventional aerosol regulations have on the labeling requirements of BOV technology that create misleading and inaccurate comparisons with consumers.

For example, a regulatory inspector can use the same method that the maker of PURE CITRUS uses to test for QA/QC the net volumetric content, such as the volume of PURE CITRUS fragrance extract. The inspector could use a simple tool that the manufacturer can provide or even more simply empty the BOV container in a few seconds by using the nozzle spray to spray the droplets of fragrance extract into some measuring cup to allow the droplets to form a liquid volume. The measuring cup can be a laboratory graduated cylinder that permits measurement of volume in fluid ounces to compare against the net fluid ounces indicated on the BOV container. This simple act does not require puncturing or otherwise destroying the BOV container in order to obtain the correct volume.

Even a consumer could use a similar measurement method to the one described above to verify the contents in volume. Using the same technique, a consumer could simply empty the container in a few seconds by using the nozzle to spray the droplets of fragrance or other contents from the BOV container into a measuring cup where the droplets form a liquid volume. The measuring cup could have fluid measuring marks on the side. The consumer could then read the amount of fluid ounces corresponding with the level of the liquid in the pitcher.

The method recommended above could measure accurately the volume of contents dispensed of what is delivered. These contents are in contrast to the deliverables dispensed in a conventional aerosol spray like Glade that include large amounts of flammable and noxious gas propellants, odor reducers, and water, and much small amounts of fragrance extract.

We suggest that the volumetric measurement method recommended is at least as simple and perhaps simpler than the standard methods inspectors use to measure the net weight in a conventional aerosol spray like Glade. Under current standards, simply placing a container of conventional aerosol spray on a weight scale will give net weight of the entire contents of the container, but will not give the net weight of the useful part that contains the active ingredients for which the consumer is purchasing. To test the net weight of a conventional aerosol container, an inspector could purchase a container, measure the total weight, release the contents of the container by pressing the nozzle, and reweigh the empty container to confirm the net weight. Thus, it appears that the effort to measure the volumetric contents of the BOV container would be a straightforward effort and no more complicated than current procedures.

B. Contents Are Generally Fully Expelled in BOV Containers

Another question that was raised at the 2011 NEWMA Interim Meeting was whether the entire contents of a BOV technology product is expelled. The answer is yes, where as usual sufficient pressure is loaded into the container surrounding the bag of deliverable product. The amount of pressure surrounding the bag with the deliverable contents is generally sufficient at least in the PURE CITRUS products to "squeeze" the contents out of the bag through the nozzle.

VI. Two Suggestions for Resolution

NAA's concerns can be addressed by one or more relatively simple and straightforward additions to the standards, such as Sections 6.4 and/or 10.3. There are two solutions listed below, either of which reduces the probable confusion and misrepresentations to consumers that would occur if conventional aerosol technology regulations were applied *carte blanche* to BOV technology products. Proposed adjustments to Section 10.3 are shown in underlined format below each suggestion.

1. NIST standards can require that the label for a BOV technology product differentiate it from a conventional aerosol technology product. Consumers would thus be under no illusion or confusion to compare fundamentally different technology products. There are several optional wordings that can show this differentiation, such as "Non-Aerosol", "Non-Propellant Based Technology", and others. For example, for Section 10.3, a subsection 10.3.1 could be added as follows:

> ***10.3. The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed.***
>
> > ***10.3.1 Containers that separate propellant from the expelled product so that the propellant is not expelled (such as containers using bag-on-valve technology) shall be prominently labeled NON-AEROSOL. The declaration of quantity shall disclose the net quantity of the commodity in terms of fluid measure.***

(OR)

2. NIST can amend the standards to recognize that the BOV technology is so substantially different from the conventional aerosol technology and not require that containers with the BOV technology be labeled with net weight. That amendment would avoid the problem of inadvertently creating misperception and confusion in attempted comparisons among consumers as to the value of the BOV product. For example, Section 10.3 can be amended as follows:

> ***10.3. The declaration of quantity on an aerosol package and on a similar pressurized package shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when the instructions for use as shown on the container are followed, provided however that containers that separate propellant from the expelled product so that the propellant is not expelled (such as containers using bag-on-valve technology) may be labeled either with weight or volume of the quantity of the commodity that will be expelled.***

VII. Conclusion

BOV technology products are desirable. They are "green", environmentally-friendly products that can be used to help meet the increasing higher standards for EPA. The use of BOV technology will most likely increase with time. The current standards are outdated and were written in the context of and for conventional aerosol technology existent at the time. They fail to take into consideration recent advances in container technologies that are not only green but labeled in a way that clearly informs the consumer about the quality of the product and weight of the contents that they are purchasing.

Attempts to compare the BOV technology with the conventional aerosol technology under the current standards of weight results in more misinformation and misleading advertising to the consumer, primarily because of the lack of sufficient information labeled on conventional aerosol

January 6, 2012

technology products that combines the large percentage of inactive ingredients with much smaller amounts of active ingredients.

Further, current standards written for conventional aerosol technology should not unfairly burden or hinder the deployment and sale of the newer BOV technology from becoming more widespread in the marketplace.

Either adjustments in the standards need to be initiated for the newer BOV technology or the BOV technology needs to be excluded from the current standards. Updating of the labeling standards is more appropriate than trying to fit the "square peg into a round hole."

Such adjustments in the standards or exclusion of the BOV technology from a net weight labeling applied to the different conventional aerosol technology allows the most important part of underlying public policy to be met: to avoid creating a misperception and confusion to the consumer.

Yours truly,

Paul C. Van Slyke

cc: Ms. Lisa Warfield (Technical Advisor, NIST)
Mr. Charles H. Carroll (Director, Mass. Division of Standards)
Mr. Scott Ciurana (Vice-President, Blue Magic, Inc.)
Ms. Judy Cardin via email Judy.cardin@Wisconsin.gov

2800 JPMorgan Chase Tower, 600 Travis
Houston, TX 77002
Telephone: 713-226-1200
Fax: 713-223-3717
www.lockelord.com

Locke Lord Bissell & Liddell LLP
Attorneys & Counselors

Paul C. Van Slyke
Direct Telephone: 713-226-1406
Direct Fax: 713-229-2516
pvanslyke@lockelord.com

April 6, 2011

Via Email: dsefcik@nist.gov
And U.S. Mail

Mr. David A. Sefcik
NIST, Weights and Measures
100 Bureau Drive - M/S 2600
Gaithersburg MD 20899-2600

Dear Mr. Sefcik:

It was a pleasure to speak with you by telephone on March 30, 2011 to discuss the questions and comments raised in your email letter regarding the quantity designation on the label for the PURE CITRUS non-aerosol room spray product.

FDA Regulations

During our conversation, I mentioned that the FDA had in its regulations for packaging and labeling, an exception for foods packed in containers designed to deliver the food under pressure. I was able to locate the exact FDA regulation that is found in the FDA Manual Guide, 7563.7, in the regulation designated 21 CFR 101.105(g) reading as follows:

> *[i]n the case of foods packed in containers designed to deliver the food under pressure, the declaration shall state the net quantity of the contents that will be expelled when instructions for use as shown on the container are followed. The propellant is included in the net quantity declaration.* [net quantity is defined in 21 CFR 101.105(a) as "fluid measure if the food is liquid]

Other Pressurized Spray Products Labeled in Fluid Ounces

Also, during our conversation, we discussed that other manufacturers using the new BOV technology include fluid ounces as the label designation. Specifically, the manufacturer of Coppertone uses BOV technology in its SPORT Sunscreen product and labels its package in 6 fluid ounces. Likewise, the manufacturer of SIMPLY SALINE for Wound Wash Saline uses BOV technology in its product and labels its package as 3.0 fluid ounces.

NIST Guidelines

The above FDA exception for foods in pressurized containers is inconsistent with the guidelines section of NIST Handbook 130 , Sections 6.4 and 10.3 when read together:

> **"6.4. Terms: Weight, Measure, Volume, or Count.** – The declaration of the quantity of a particular commodity shall be expressed in terms of:
>
> (a) weight if the commodity is solid, semisolid, viscous, or a mixture of solid and liquid; or
> (b) volume measure if the commodity is liquid or dry, if the commodity is dry; or
> (c) linear measure or area; or
> (d) numerical count.
>
> However, if there exists a firmly established general consumer usage and trade custom with respect to the terms used in expressing a declaration of quantity of a particular commodity, such a declaration of quantity may be expressed in its traditional terms, provided such traditional declaration gives accurate and adequate information as to the quantity of the commodity. Any net content statement that does not permit price and quantity comparisons is forbidden."

"10.3. Aerosols and Similar Pressurized Containers. The declaration of quantity on an aerosol package and on a similar pressured shall disclose the net quantity of the commodity (including propellant), in terms of weight, that will be expelled when instructions for use as shown on the can."

Currently the NIST is interpreting the requirement in Section 6.4 that the declaration of quantity be a volume measurement if the commodity is a liquid like air freshener as being overridden by the provision in 6.4 that net weight may be used since net weight is "a firmly established general consumer usage and trade custom"

Unfortunately, NIST's interpretation of the requirements of Section 6.4 to permit labeling of air freshener by net weight overlooks the most important part of Section 6.4:

> *Any net content statement that does not permit price and quantity comparisons is forbidden.*

For conventional aerosol air sprays like Glade, "the firmly established general consumer usage and trade customer" that permits a declaration of net weight does not permit price and quantity comparisons without a requirement to declare the weight or volume of **active** ingredients expelled.

- The net weight declaration deceives the consumer into believing that the active ingredients expelled are the net weight.
- In fact, the active ingredients are not listed on the package.
- What is expelled includes mostly water, and propellant.

- Only a small quantity of active ingredients are expelled (perhaps 5% or less).
- The consumer expects to buy fragrance and odor-reducing active ingredients that are expelled.
- The consumer is not expecting to buy water and propellant that is the majority of the contents expelled.
- NIST guidelines do not require the declaration of the weight or volume of active ingredients.
- The consumer cannot compare the weight or volume of active ingredients expelled.
- The "commodity" referred to in Sec. 6.2 is only the active ingredient.
- The weight or volume of "active ingredients" are what the consumer needs to compare from one product to another.

Since the NIST guidelines do not currently require a declaration of the weight or volume of **active** ingredients expelled, the consumer cannot make price and quantity comparisons required by the guidelines for different mixtures of active ingredients. For example, one manufacturer of aerosols can mix 5% active ingredients of fragrance and another manufacturer can mix 10% and each charge the same price, yet the consumer cannot make a price and quantity comparison of the commodity (fragrance) for which the consumer is purchasing the product.

PURE CITRUS currently shows on its can the volume of its active ingredients expelled in fluid measurement. PURE CITRUS is actually more in compliance with the guidelines that the conventional aerosol manufacturers. **PURE CITRUS reveals the active ingredients (100%), the quantity, and the price.**

There are two solutions to the serious violation of the guideline against "*Any net content statement that does not permit price and quantity comparisons is forbidden":*

1. NIST can amend Sections 6.2 and 10. to require adding to the declaration of net weight the weight or volume of active ingredients expelled, or

2. NIST can amend Sections 6.2 and 10 to require air sprays to declare only the active ingredient expelled in terms of weight or volume

Until NIST makes one of these changes to its guidelines, the maker of PURE CITRUS requests that NIST consider the new BOV Technology as not within the scope of a conventional aerosol package or a "similar pressurized package" for which the current NIST guidelines were apparently drafted and have been applied. Alternatively, the makers of PURE CITRUS requests a waiver of compliance with the current guidelines.

Reponses to Questions Raised in Your Letter

In answer to your questions raised in your email letter of March 1, 2011, please consider the responses below:

1. In order for a regulatory inspector to verify the net content in volume, he would need to be able to accurately obtain the net contents. This would likely mean that the packaging would have to be punctured or otherwise destroyed, in order to obtain the correct volume. How would you recommend volume be accurately determined? Would volume if dispensed be based on what is "delivered"?

- We recommend that a regulatory inspector use the same method that the maker of PURE CITRUS uses to accurately determine net content of the active ingredients; i.e. the PURE CITRUS fragrance extract. They would use a simple tool that the maker can provide or even more simply empty the can in a few seconds by using the nozzle spray to spray the droplets of fragrance extract from contents of the can into a container where the droplets will condense to form a liquid volume. The container can be a laboratory graduate marked with volume markers that permit measurement of volume in fluid ounces to compare against the net fluid ounces indicated on the can. This does not require puncturing or otherwise destroying the can in order to obtain the correct volume.

- Even a consumer could use a similar measurement method to the one described above to verify the accuracy of the PURE CITRUS contents in volume. Using the same technique, consumer would simply empty the can in a few seconds by using the nozzle spray to spray the droplets of fragrance extract from contents of the can into a standard glass measuring pitcher where the droplets will condense to form a liquid volume. The glass measuring pitcher would have fluid measuring marks on the side. The consumer would then read the amount of fluid ounces corresponding with the level of the liquid in the pitcher.

- The method recommended above would measure accurately the volume dispensed of what is "delivered"; namely, the pure fragrance extract in the can. This is in contrast to the "deliverables' dispensed in a conventional aerosol spray like Glade that include small amounts of fragrance extract, and much larger amounts of noxious gas propellant, odor reducers, and water.

- The volumetric measurement method recommended is much simpler and more useful than the standard methods inspectors use to measure the net weight of "net weight" in a conventional aerosol spray like Glade. Currently, placing a can of conventional aerosol spray on a weight scale will give net weight of the entire contents of the can, but will not give the net weight of the useful part of the net weight that contain the active deliverables the consumer is paying for.

- To achieve the same results as the recommended volumetric measurement, an inspector would have to buy multiple cans of conventional aerosol, release the contents of one or more full cans by pressing the nozzle, and weigh the full and empty cans to obtain a comparison of a NET weight It appears that the effort to measure the volumetric contents of the PURE CITRUS can with BOV technology would be easier, faster and cheaper to determine compliance with the quantity of product showing on the can.

2. Is there any concern that if packaging was "destroyed" that there would be a risk of explosion or harm?

- With the recommended volumetric measurement, the can is not punctured or destroyed. Even if the PURE CITRUS can were accidentally punctured or destroy, there is no risk of inflammability or explosion since the can contains no propellant that presents a risk of flame or explosion. The PURE CITRUS can using BOV technology uses pure air to apply pressure around the bag of contents to create the force to dispense the active ingredients. Also, If the PURE CITRUS can is accidentally punctured, the escaping air does not harm the environment.

- In contrast, conventional aerosols generally use a flammable propellant, such as isobutene and propane and their labeling warns consumers to keep the can away from flames. But a conventional aerosol dispersion makes an impressive blow torch when sprayed across a flame.

3. It appears your product is marketed in the same category and very similar to aerosol deodorizers. How do consumers compare value if one product is sold by weight and the other by volume?

- Consumers cannot compare the net quantity of active ingredients of any of the aerosols currently on the market.

- Until and unless NIST guidelines require a declaration of the weight or volume of active ingredients, the consumer can make no comparison of price or quantity as to the actual commodity that the consumer wants, that is, the active ingredients.

- Net weight of the entire contents of the can is not what consumers are buying.

- Consumers are deceived into believing that net weight is the active ingredients.

- Active ingredients vary from one product to another.

- The current firmly established trade custom of declaring net weight is misleading and deceptive.

- The current firmly established trade custom of declaring net weight does not permit the consumer to make comparisons of price or quantity of active ingredients.

4. Below is a definition I found online.

aer•o•sol
–noun
1. Physical Chemistry . a system of colloidal particles dispersed in a gas; smoke or fog.
2. a liquid substance, as a disinfectant or deodorant, sealed in a metal container under pressure with an inert gas or other activating agent and released as a spray or foam through a push-button valve or nozzle: an aerosol for cleaning ovens.

Based on this definition, Pure Citrus would seem to fit this category. Any thoughts?

- ✓ **it is a liquid substance**
- ✓ **it is sealed in a metal (aluminum) container**
- ✓ **it is under pressure**
- ✓ **has an activating agent (air)**
- ✓ **is released as a spray through a push button**

My thoughts are as follows:

First, based on this definition, PURE CITRUS does not fit this category .

- The liquid substance is not sealed in a metal container.
- It is sealed in a bag inside of a metal container.
- The word "sealed" is derived from the noun "seal' defined as "a tight and perfect closure: or the verb "seal" defined as "to make secure against access, leakage, by a fastening or coating." Webster's Ninth New Collegiate Dictionary, 1991.
- The liquid is "sealed" by the enclosure bag, not by the can under these definitions.
- The bag containing the liquid substance is separate and apart from the metal container.
- The sealing of the liquid substance in a separate bag is crucial to BOV technology.
- The activating ingredient (air) is not released as a spray through a push button.
- The activating ingredient (air) remains in the can.

Second, you picked a definition of "aerosol" from the science of Physical Chemistry. I submit that the proper definition to be used is the one best understood by consumers who typically buy and use aerosol sprays. In our earlier letter, we simply used the definition readily at hand in a Webster's New World Collegiate Dictionary, a definition a typical consumer would understand. Further, in the earlier letter, we tried to use the term "conventional aerosol" for the main part of our discussions to emphasize whatever definition is used, PURE CITRUS with the BOV technology is fundamentally different than an aerosol.

For these two reasons, I suggest that the PURE CITRUS product is not an "aerosol" or "a similar pressurized container" within the meaning of the NIST guidelines.

The National Conference on Weights and Measures recommends all aerosol packages and similar pressurized containers be labeled by net weight. (The PURE CITRUS product is not an "aerosol" or "a similar pressurized container" for the reasons stated above) **The reasons for recommending such changes are as follows:**

1. Net quantity labeling of aerosol packaged products in terms of net weight is a firmly established trade practice for such products.

- I agree.

- The current method of selling does not disclose the weight of active ingredients.

- Failure to disclose or declare the weight of volume of active ingredients misleads and deceives consumers.

2. Net quantity labeling of aerosol packaged products (and similar pressurized containers) in terms of volume is difficult (if not impossible) to verify with consumer verification methods or by conventional package inspection methods. State or local enforcement action is discouraged by such labeling.

- This is true of aerosol packaged products.

- It is not true for the substantially different PURE CITRUS non-aerosol product.

- The measurement method described above for the quantity of active ingredients in PURE CITRUS is not difficult to verify with consumer verification methods or by package inspection methods.

3. Since the labeling of aerosol packaged products (and similar pressurized containers) by volume cannot be compared with the labeling of such products in terms of net weight, labeling in terms of volume and weight inhibits value comparisons and causes consumer confusion with respect to the quantity of products the consumer is buying and can be a form of deceptive labeling.

- As indicated above, the consumer can easily empty the contents of PURE CITRUS to verify the labeled fluid content.

- A more accurate and less misleading format is to require aerosol spray products to display the amount of **active ingredients** to be delivered—either by weight or by volume.

- The consumer is not buying the aerosol can for the amount of isopropane and butane in the can.

- The consumer is primarily interested in the end result—here, a pleasant dispersed fragrance in a room or other area.

- An aerosol can that is labeled with the active ingredients, weight or volume would help establish the true value to the consumer.

- The propellants, water, and other miscellaneous ingredients would not be included in the net weight (or volume) designations, and be a more accurate amount of the delivered active ingredient to the consumer.

- The PURE CITRUS product already shows on the label the amount of active ingredients, because of its BOV technology allows the active ingredients in the bag to be separated from the compressed air around the bag.

4. Uniformity between all state and federal regulations is highly desirable for both enforcement and fair competition in the marketplace. The Uniform Packaging and Labeling Regulation and the FTC and EPA Regulations require net quantity labeling of aerosol packaged products in terms of net weight.

- Uniformity is desirable for aerosol packaged products.
- FDA regulations already permit net quantity labeling of food products by volume.
- PURE CITRUS is not an aerosol packaged product.
- Therefore, PURE CITRUS is not subject to these aerosol based uniform standards.
- Pressurized products with BOV Technology are not aerosols or a "similar pressurized package" for which the current NIST guidelines were apparently drafted and have been applied.
- Alternatively, the makers of PURE CITRUS requests a waiver of compliance with the current guidelines.
- Either solution will avoid misunderstandings by state authorities, like Mr. Carroll in Massachusetts.

Yours truly,

Paul C. Van Slyke
PCV/jb

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Appendix B

NIST Handbook 130 – Uniform Regulation for the Method of Sale Commodities

Item:

232-4: Uniform Regulation for the Method of Sale of Commodities, 2.33. Vehicle Motor Oil
237-4: Uniform Engine Fuels and Automotive Lubricants Regulation, 3.13.1. Labeling of Vehicle Motor Oil

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AUTOMOTIVE OIL CHANGE ASSOCIATION
SINCE 1987

May 1, 2012

Standards Department
American Petroleum Institute
1220 L Street, NW
Washington, DC 20005

Re: API 1525A, First Edition, December 2011

Dear Sir/Madam:

These comments to API 1525A (First Edition, December 2011) are submitted on behalf of the Automotive Oil Change Association (AOCA), the national representative for 3,873 small business fast-lube facilities, all of which utilize bulk oil storage. As you know, in 2006, AOCA published fast lube industry best practices designed to prevent damages associated with fraudulent, substandard, and/or shorted-load bulk motor oil distribution. We find 1525A problematic for a number of reasons, most of which involve API's apparent misunderstanding of fast lube operations and consumers' lack of interest in API branding.

Fast lube operators need flexibility in product purchasing decisions

Although fast lubes generally stock bulk motor oil in compliance with the latest edition of 1509, attempting to impose it as an absolute mandate is impractical (7.1). Fast lubes service a wide variety of vehicles, many of which are quite old and getting older.[1] Therefore, when API publishes a new edition of 1509 and/or creates a new service category, a reasonable phase-in period may be necessary to accommodate older vehicle owners' needs; i.e., it may be in their best interests—both functionally and economically—to use motor oil developed in accordance with an earlier edition or service category so long as the automobile manufacturer originally recommended it and its continued use has no impact on any remaining warranty coverage. In addition, for fast lube operators to automatically upgrade bulk oil stock at API-determined intervals would be tantamount to giving API control over the price of oil change services regardless of what the market can bear. When has the cost of a new motor oil ever gone *down*?

AOCA would also like to know how automobile manufacturers' proprietary motor oils fit into the concept of compliance with the latest edition of API 1509? If these proprietary products are superior as some allege, then shouldn't the API requirement be changed to read "*meets or exceeds* the latest edition of API 1509"? It is important to keep in mind that fast lubes follow automobile manufacturer recommendations; if a conflict arises between API and the automobile manufacturer, the latter wins.

Fast lubes should get the oil they order and pay for

AOCA already recommends that fast lubes order bulk product in writing and obtain a written receipt verifying that the product they ordered was the one delivered. The terms that must be specified include brand name (if any), viscosity grade, performance level, quantity, and API service category. AOCA questions, however, API's requirement to include "API-license status" (7.2.1). Does API actually test the motor oil associated with every application for API certification? If so, adding a reference to "API-license status" could have a positive, substantive impact at the install level. If not, adding that reference seems like a technicality designed to support API's brand

[1] The average age of U.S. cars on the road in 2011 was 11.1 years, according to the Polk Research Firm.

without any particular value to the installer or end consumer. Is it possible for motor oil to comply with the latest edition of 1509 without being licensed by API?

AOCA would also like to know why installers are required to use specific ordering terms when distributors have complete authority to designate how the oil will be described on their drop ticket and invoice (7.2.2)? Uniformity of terms in documentation would help everyone in the chain as well as prevent installers from needing to chase after distributors in order to "ensure" receipt of the correct order. Additionally, why would the installer request that the distributor notify him/her every time the information in 7.2.1 changes (7.2.3)? The order terms are part of the contract. If the distributor isn't going to be able to meet its contractual obligations, then it's in breach unless it can secure an alternate agreement with the installer. Fast lubes will not agree to alter this basic contractual relationship by going along with API's creation of a new duty for installers to *request* distributor notification of failure to meet contract terms. And last, 7.2.1 cross-references 5.3.2.1, which doesn't exist.

Fast lube operators shall maintain control over their operations

Receiving Practices: If specifically requested to do so, a distributor *may* assist a fast lube operator in labeling bulk oil tanks and related equipment, but access will not be guaranteed as required in 7.4.1. Bulk engine oil equipment at fast lubes is labeled and maintained in accordance with applicable laws, necessity, and private arrangements between individual fast lube operators and their distributors. Similarly, while a fast lube operator *may* coincidentally undertake similar procedures to the cross-referenced API 1525, that guideline is designed for distributors and, therefore, does not belong in the installer section of 1525A (7.4.2). Placing a distributor guideline inside an installer requirement can lead to confusion and disputes among participants.

Section 7.4.2 would require installers to confirm that the brand name, SAE viscosity grade, API service category, and quantity of engine oil being delivered matches the product ordered *prior* to allowing the distributor to dispense anything. How are they supposed to do that when 1525A gives the distributor total control over the information presented on its drop ticket and invoice? Are installers supposed to take the distributor's word for it? Also, although the installer may be able to verify whether the quantity listed matches the order—assuming the distributor sees fit to list the quantity on its documentation—the only way to determine if the distributor actually dispenses the right amount of oil is to measure the subject tank before and after delivery, and/or to check the truck driver's meter head to make sure it is zeroed out.

Lastly, having the installer maintain documentation and tote samples is a compelling idea, but impractical. The average fast lube facility has neither room to store oil samples nor off-site facilities to transfer them to. Maintaining a "paper trail" might be possible if it were instead a "byte" trail of digital content, but even then care must be taken to ensure the requirements don't become too onerous since fast lubes generally don't have dedicated administrative support staff.

Installation: Fast lube operators already provide clear and accurate oil change options to consumers (7.5.1). However, the mere inclusion of a requirement to do so in this best practices document leads AOCA to wonder if there isn't something specific API wants to see. AOCA would appreciate receiving a clarification from API as to their concept of how one "clearly and accurately" represents oil change options.

Customer Receipts: Fast lubes *may* choose to identify API service category and API license status of oil installed on customer receipts, but inclusion of such information will not be guaranteed as required in 7.6. In the vast experience of fast lube operators nationwide, the average consumer does not recognize the acronym API and, therefore, including it adds no value.

House Brand Clarification Request: AOCA would appreciate clarification regarding API's preference that installers describe all "house" brand motor oil as "unlicensed." First, what is API's definition of "house" brand? Second, is it API's position that an installer who uses the general house brand description for API-licensed oil is committing some sort of actionable misrepresentation? If so, this issue should not be handled in a voluntary best practices document that is—for reasons described above—unlikely to attract significant fast lube operator participation. AOCA would prefer to have an open discussion of any infractions perceived by API and to assist in industry education on the subject if appropriate.

Cost/benefit ratio may not support buy-in absent enforcement functions and significant consumer outreach

Although compliance with 1525A is voluntary, it is AOCA's understanding that API will only list installers as compliant if they pay a fee. How much is the fee? Is it a one-time payment or an annual requirement? Has API considered a tiered fee structure to reflect the difference between oil company-owned facilities and independent facilities? Do facilities in the paid version of the program receive inspections to verify the validity of the program or is it a pay-to-play scenario similar to the Better Business Bureau? i.e., pay the fee and get a sticker. Although Better Business Bureau doesn't actually perform any concrete approval process, they will investigate consumer complaints. What will API do to investigate consumer complaints? What will API do to investigate an installer's complaint against a participating distributor?

How does API plan to market this program to consumers? If consumers don't automatically recognize the value of fast lube operators participating in 1525A, then there is little incentive for fast lube operators to do so. As mentioned previously, fast lube operators nationwide report that customers don't recognize the acronym "API." Moreover, automobile manufacturers' proprietary products and services mandates tend to eclipse the importance of all other organizations' recommendations. How will API get past that to instill a concept of inherent value in consumers' minds?

AOCA appreciates the opportunity to submit comments to 1525A and looks forward to future discussions with API regarding the best ways to prevent bulk oil distribution fraud.

Sincerely,

Patricia Wirth
AOCA President

cc: Kevin Ferrick

FTC Consumer Alert

Federal Trade Commission • Bureau of Consumer Protection • Division of Consumer & Business Education

Auto Warranties, Routine Maintenance, and Repairs: Is Using the Dealer a Must?

If you own a car, you know how important it is to keep up with routine maintenance and repairs. But can a dealer refuse to honor the warranty that came with your new car if someone else does the routine maintenance or repairs?

The Federal Trade Commission (FTC), the nation's consumer protection agency, says no. In fact, it's illegal for a dealer to deny your warranty coverage simply because you had routine maintenance or repairs performed by someone else. Routine maintenance often includes oil changes, tire rotations, belt replacement, fluid checks and flushes, new brake pads, and inspections. Maintenance schedules vary by vehicle make, model and year; the best source of information about routine scheduled maintenance is your owner's manual.

What is a warranty?

A warranty is a promise, often made by a manufacturer, to stand behind its product or to fix certain defects or malfunctions over a period of time. The warranty pays for any covered repairs or part replacements during the warranty period.

Do I have to use the dealer for repairs and maintenance to keep my warranty in effect?

No. An independent mechanic, a retail chain shop, or even you yourself can do routine maintenance and repairs on your vehicle. In fact, the Magnuson-Moss Warranty Act, which is enforced by the FTC, makes it illegal for manufacturers or dealers to claim that your warranty is void or to deny coverage under your warranty simply because someone other than the dealer did the work. That said, there may be certain situations where a repair may not be covered. For example, if you or your mechanic replaced a belt improperly and your engine is damaged as a result, your manufacturer or dealer may deny responsibility for fixing the engine under the warranty. However, according to the FTC, the manufacturer or dealer must be able to demonstrate that it was the improper belt replacement — rather than some other defect — that caused the damage to your engine. The warranty would still be in effect for other parts of your car.

Will using 'aftermarket' parts void my warranty?

No. An 'aftermarket part is a part made by a company other than the vehicle manufacturer or the original equipment manufacturer. Simply using an aftermarket part does not void your warranty.

The Magnuson-Moss Warranty Act makes it illegal for companies to void your warranty or deny coverage under the warranty simply because you used an aftermarket part. Still, if it turns out that the aftermarket part was itself defective or wasn't installed correctly, and it causes damage to another part that is covered under the warranty, the manufacturer or dealer has the right to deny coverage for that part and charge you for any repairs. The FTC says the manufacturer or dealer must show that the aftermarket equipment caused the need for repairs before denying warranty coverage.

Tips To Avoid Warranty Issues

Here's how to get the most out of your vehicle's warranty:

- **Read your warranty.** Often bundled with your owner's manual, the warranty gives a general description and specific details about your coverage. If you have misplaced your owner's manual, look for it online. Check the "Owners" section of your manufacturer's website.
- **Be aware of your warranty period.** If problems arise that are covered under the warranty, get them checked out before the warranty expires.
- **Service your car at regular intervals.** This is a good idea in any case. But for the sake of keeping your warranty intact, follow the manufacturer's recommended service schedule. Details are in your owner's manual.
- **Keep all service records and receipts, regardless of who performs the service.** This includes oil changes, tire rotations, belt replacement, new brake pads, and inspections. Create a file to keep track of repairs; it will come in handy if you have to use your warranty. If you ever have a warranty claim and it appears that you did not maintain your vehicle, your claim could be denied.
- **Complain.** If you think a dealer's service advisor denied your warranty claim unfairly, ask to speak with a supervisor. If you still aren't satisfied, contact the manufacturer or go to another dealer. You also may wish to file a complaint with your state Attorney General, local consumer protection office, local Better Business Bureau, or the FTC.

For More Information

Visit **ftc.gov** for free information on buying, financing, leasing, renting and maintaining vehicles.

The FTC works to prevent fraudulent, deceptive and unfair business practices in the marketplace and

to provide information to help consumers spot, stop and avoid them. To file a complaint or get free information on consumer issues, visit **ftc.gov** or call toll-free, **1-877-FTC-HELP** (1-877-382-4357); TTY: 1-866-653-4261. Watch a new video, *How to File a Complaint,* at **ftc.gov/video** to learn more. The FTC enters consumer complaints into the Consumer Sentinel Network, a secure online database and investigative tool used by hundreds of civil and criminal law enforcement agencies in the U.S. and abroad.

December 2010



July 11, 2012

Submitted via electronic mail

Ms. Judy Cardin, Chair
NCWM Laws & Regulations Committee
Judy.cardin@wisconsin.gov

Re: Actions proposed in the L&R 2012 Interim Report affecting the Fast Lube Industry

Dear Ms. Cardin:

The following comments are submitted for your consideration on behalf of the Automotive Oil Change Association (AOCA), which represents the North American fast lube industry and now has a representative—Dr. R. Scotti Lee—on the NCWM Fuels & Lubricants Subcommittee. The proposed actions of immediate concern to AOCA are in the L&R Interim Report Sections 232-4 (pages 29-31) and 237-4 (pages 47-51): both of these sections contemplate amendments to vehicle motor oil labeling standards that could be seriously detrimental to both the fast lube industry and consumers.

The Fast Lube Industry

The fast lube industry plays a major role in the automotive maintenance delivery system, providing an estimated 118 million oil changes annually in the United States alone. The estimated 16,531 facilities purchase more than $4 billion in products annually from oil companies, filter manufacturers, computer and software manufacturers, and additive manufacturers. In order to implement the services associated with these products, the fast lube industry employs over 100,000 men and women with an estimated payroll of $2.5 billion.

Among the various businesses that comprise the automotive maintenance sector, the fast lube industry has the distinction of servicing a large percentage of the motoring public while operating on small margins. Consumers rely on fast lube service because of a simple cost/benefit analysis: regular oil changes are the best and least expensive way to keep a vehicle in good working condition. Fast lubes are able to keep the service inexpensive because of streamlined operations combined with customer volume and the reasonable cost keeps customers coming back on a consistent basis.

Another factor distinguishing fast lubes from other service providers (like automobile dealerships) is that, in order to remain competitive, fast lubes must be capable of servicing the entire vehicle fleet rather than one or two makes. Every car on the road regardless of make, model, and year can get excellent service from conveniently located fast lube facilities nationwide so long as regulators don't inadvertently dig ditches in "the playing field" of competition for the motoring public's patronage.

L&R 2012 Interim Report Section 232-4; Labeling of Vehicle Motor Oil in *NIST Handbook 130*, Method of Sale Regulation

AOCA has several questions and concerns regarding the recommended amendments to the Method of Sale Regulation under the section entitled 2.33.1 Labeling of Vehicle Motor Oil. First, AOCA requests clarification as to whether the repeated reference to "motor oil container" includes any form of pre-packaged goods. If it does, AOCA urges NCWM to recognize that installers have no control over the packaging description of packaged goods and, therefore, should have no responsibility for whether packaged goods comply with section 2.33.1. Fast lubes follow vehicle manufacturers' recommendations for fluids, including motor oil, which means they may carry a wide variety of packaged motor oils to accommodate very old, very new, and specialty vehicles. It is important that NCWM not destroy automotive service providers' ability to provide consumers with the products intended for their vehicles because the manufacturers of those products don't comply with proposed section 2.33.1.

With regard to subsection 2.33.1.3 Brand, AOCA requests clarification as to what is meant by the following sentence: "The label on a vehicle motor oil container and the invoice or receipt from service on an engine that includes the installation of vehicle motor oil dispensed from a receptacle, dispenser, or storage tank *shall contain the name, brand, trademark, or trade name of the vehicle motor oil*" (emphasis added). Does that mean the receipt should list either the name or brand or trademark or trade name? Or does it mean that the receipt should list the name, brand, and trademark or alternatively the trade name alone? In any case, AOCA urges NCWM to eliminate the trademark requirement from the list as oil companies have been notoriously difficult to work with regarding trademark usage. Listing of trade name should suffice for identification purposes.

With regard to subsection 2.33.1.4.1, AOCA is concerned that this subsection could be used to prevent automotive service providers from providing consumers with the motor oil intended for their vehicles. As mentioned above, the fast lube industry services the entire vehicle fleet. The average age of cars in the current fleet is eleven years old and it is not unusual for fast lubes to have customers with vehicles twice that age. The fact is American consumers are hanging onto their vehicles longer than API is hanging onto its service categories. When API designates a motor oil category as inactive or obsolete, that doesn't mean the consumers with vehicles designed to use that category turn in their cars or otherwise want to buy a more expensive grade of motor oil going forward. Therefore, a category of motor oil designed to work for particular makes and models of vehicles should not be considered "obsolete" with respect to those particular vehicles regardless of API's time table for listing categories as inactive or obsolete.

Another example of how the "inactive/obsolete" designation doesn't reflect real life involves the growing trend of automakers developing their own proprietary oil standards. Instead of an API rating, many of these oils are rated by ACEA. Even if some of these oils do have an API/ILSAC rating, they would be technically "obsolete" under the proposed regulation, which would create an extremely confusing dichotomy: the exact recommended oil for a vehicle should be sold as "obsolete"?

Installers should not be forced to designate vehicle-appropriate motor oil as "inactive" or "obsolete" on tanks and receipts because it would have a chilling and/or discriminatory effect on consumers' opinion of the operators. Consumers don't recognize API but a term like "inactive" could only be understood as negative. It is not reasonable to expect the average consumer and small business operator to have a twenty-minute in-depth discussion over the distinction between inactive and active API service categories and how an "inactive" designation doesn't mean the type of oil originally recommended for the consumer's car is suddenly now bad for it.

The new standard phase-in factor must be considered as well. The standard referred to subsection 2.33.1, SAE J183, cross-references API 1509. When API publishes a new edition of 1509 and/or creates a new service category, a reasonable phase-in period is necessary to accommodate older vehicle owners' needs; i.e., it may be in their best interests—both functionally and economically—to use motor oil developed in accordance with an earlier edition or service category so long as the automobile manufacturer originally recommended it and its continued use has no impact on any remaining warranty coverage. For fast lube operators to automatically upgrade bulk oil stock at API-determined intervals would be tantamount to giving API control over the price of oil change services regardless of what the market can bear.

In consideration of the problems outlined above, AOCA urges NCWM to include a clarifying sentence in 2.33.1.4.1 as follows: "NOTE: no cautionary statement per SAE J183 or other negative designation such as 'obsolete' or 'inactive' shall be necessary where the motor oil used is in the category of motor oil originally designated for the consumer's vehicle."

Lastly, it is imperative that any installer labeling and/or receipt information requirements be matched by corresponding NCWM requirements for motor oil distributors. Installers cannot purport to verify via any form of documentation information that distributors have not documented at delivery. For NCWM to require otherwise would be manifestly unfair to installers by subjecting them to liability for the bad acts of distributors without any paperwork trail to rely upon in their own defense.

L&R 2012 Interim Report Section 237-4; Labeling of Vehicle Motor Oil in *NIST Handbook 130*, Engine Fuels and Automotive Lubricants Regulation.

AOCA's questions and concerns with this section are identical to those described above with regard to L&R 2012 Interim Report Section 232-4. AOCA urges NCWM to include a clarifying sentence in subsection 3.13.1.4.1 as follows: "NOTE: no cautionary statement per SAE J183 or other negative designation such as 'obsolete' or 'inactive' shall be necessary where the motor oil used is in the category of motor oil originally designated for the consumer's vehicle."

Potential Overlap with the Motor Oil Matters Program/API Standard 1525A

To the extent that any of the proposed actions in the L&R 2012 Interim Report relate to or rely upon the future private enforcement of the Motor Oil Matters (MOM) Program, AOCA urges NCWM to table consideration pending resolution of serious issues associated with the program as it relates to installers. AOCA has submitted detailed objections and suggested amendments to the American Petroleum Institute (API)'s draft Standard 1525A, which will be the basic standard for the MOM Program. One of the primary reasons AOCA objects to 1525A is that it requires installers—fast lubes—to verify information controlled by distributors that distributors are not required to provide. Any chain of custody regulation aimed at preventing fraud must apply information and verification requirements *equally* throughout the chain: fast lubes cannot be expected to verify brand to consumers if distributors are not required to first verify that brand upon delivery.

AOCA developed its own bulk oil delivery guidelines back in 2006 because no one wants to prevent bulk motor oil distribution fraud more than fast lube operators. Should a product quality problem occur with packaged goods, it's relatively easy to trace the goods back to the manufacturer. However, this is not the case with motor oil transported in bulk; it all looks alike, it may have "changed hands" numerous times before reaching the fast lube facility, and even with testing can be impossible for a fast lube to verify because oil companies use chemical markers that only they can identify. Since motor oil specifications have become so precise—and so expensive—fast lube operators stand to lose thousands of dollars every time a distributor delivers a lesser product. Moreover, when a distributor delivers the wrong

product, it's the fast lube operator who gets stuck holding the bag for consumer claims. It can take weeks before a bad load is detected and by then anywhere from 500 to 700 customers have been serviced. The remedy? All of the customers must be called back and re-serviced for free before any damage occurs.

AOCA's Guidelines were developed to prevent such horrendous events:

Product Order Specificity: When placing an order for bulk motor oil, fast lube operators should specify the brand (if any), viscosity grade, performance level, and quantity of motor oil they wish to purchase. If an operator means to purchase the highest performance level of motor oil, which is required for vehicles under warranty, then he/she specifies, for example, API SN / ILSAC GF-5 until the next performance level of motor oil is due. (Note: This specification is important because it is legal for distributors to sell motor oil with lower performance levels; i.e., SA, SB . . . SJ, etc.) All of this information—brand, viscosity grade, performance level, and quantity—should appear on every written and/or digital summary memorializing a purchase. It is recommended that operators purchase motor oil meeting the specifications required by the automaker for the model year of vehicles being serviced.

Purchase Documentation: Although it has been a long standing industry practice to verbally order and re-order bulk motor oil products, fast lube operators who want the ability to verify orders placed should either request a written summary of each purchase order from their supplier or draft their own dated summary, including a supplier initial line, and fax or email it to their supplier for verification.

Delivery Procedure – Measuring the Tanks: Taking tank measurements assists with inventory control and gives the operator the ability to double-check the distributor's measurement of product delivered. Prior to receiving a bulk delivery of motor oil, a fast lube operator simply measures via tank gauge or other measurement device the contents of the tank(s) into which the motor oil will be dispensed. The operator may also check the delivery truck driver's meter-head to make sure it's zeroed out. After delivery, the operator takes the same measurements again. Keeping this information in an ongoing log at the fast lube facility provides valuable documentation in the event of a dispute.

Delivery Procedure – Verifying Distributor Documentation: Prior to allowing a distributor to dispense product into the fast lube facility tank(s), an operator should seek the following information in writing and/or digital form (i.e., email or cell phone/tablet scan) from the driver:

(1) The brand (if any), viscosity grade, performance level, and quantity of motor oil being delivered;
(2) The names, addresses, contact personnel, and phone numbers of every facility that has come in contact with the shipment of motor oil from the original supplier down to the distributor currently onsite;
(3) An agreement by the distributor to take direct responsibility for any and all fast lube customers affected by the delivery of product that does not meet the standards (taking into account any commercially-accepted degree of variation) of the product ordered by the fast lube operator; and
(4) An acknowledgment by the distributor that an actual sample of the load (i.e., a "retain") has been taken from the truck as the product was being delivered and that this sample will be retained by the distributor for at least a year.

Have any distributors been willing to provide the basic documentation described above? No. Is API proposing to require it in Standard 1525A? No. Is NCWM contemplating inclusion of these points in its regulation? No. The oil companies and distributors who seem very interested in fraud prevention—at

least according to NCWM's regulatory history on this subject—do not, however, seem interested in doing much about it themselves. Their emphasis has been placed on the install level as if all bulk motor oil distribution fraud risk lies there alone. This is simply not true and behaving as if it were is a tremendous waste of a legitimate regulatory opportunity to establish a fair chain of custody system that protects everyone equally. After all, fast lubes are the customers of oil distributors just as household vehicle owners are the customers of fast lubes and oil distributors are the customers of oil companies. Either all of these "customers" are protected by the system or none of them are.

Another of AOCA's primary objections to draft Standard 1525A involves API's lack of routine distributor testing. For reasons described in detail above, a chain of custody standard has no real value to fast lubes unless it has a mechanism to identify problems with distributors' bulk oil *before* it reaches the install level. Once it reaches the install level, it's too late. API has provided no indication to AOCA that it plans to engage in anything other than an after-the-fact complaint process and the occasional random testing of distributors, which is a lot like a shark with no teeth: a bad actor might get caught once in awhile, but he'd have to be so far out in the open as to get swallowed whole. For further information on this subject, AOCA's entire set of comments and suggested amendments to draft 1525A accompanies this submission. Again, AOCA urges NCWM to table any pending actions that rely upon connection to the MOM Program/1525A until such time as the problems outlined above have been solves.

Clarification of Regulatory History on Brand Identification Requirements

The existing regulatory history regarding the rationale for adding brand identification on service receipts indicates that it is necessary for automobile warranty purposes: "consumers would not have the required information to verify warranty work if product identity is removed from the proposal." (L&R 2012 Interim Report at 50) This reflects an all too common misunderstanding. In fact, the federal Magnuson Moss Warranty Act specifically prohibits automobile manufacturers from creating product "tying" arrangements under their warranties. The only exceptions to this rule require the manufacturer to either give the tied product to the consumer for free or obtain a waiver from the FTC after having first proven that only the tied product will allow the warranted product to function properly. The latter option has never been accomplished by an automobile manufacturer, and the former, if offered, would place consumers outside the normal service arrangement where buying motor oil is a factor.

AOCA would very much appreciate it if the L&R Committee and/or the Fuels & Lubricants Subcommittee would formally disconnect the issue of requiring brand on receipts from automobile manufacturers' warranty requirements. Something to the effect of the following sentence would be helpful:

> "Despite prior subcommittee discussion on this subject, the Magnuson Moss Warranty Act prohibits manufacturers from tying branded products to warranty coverage and, therefore, NCWM's sole purpose in requiring motor oil brand designation on receipts would be to promote anti-fraud, chain of custody measures."

For your reference, a copy of the Federal Trade Commission's most recent Magnuson Moss Warranty Act Bulletin accompanies this submission.

Conclusion

AOCA appreciates this opportunity to submit comments on these crucial issues. If you have any questions or concerns regarding this submission or require additional information, please contact the undersigned at 1-800-331-0329.

Sincerely,

Patricia A. Wirth

Patricia Wirth
AOCA President

cc: Ron Hayes, Chair, Fuels & Lubricants Subcommittee

Kevin Ferrick
Manager, Engine Oil Licensing and Certification System

Certification Programs

1220 L Street, NW Washington, DC 20005-4070
USA
Telephone 1-202-682-8233
Fax 1-202-962-4739
Email ferrick@api.org
www.api.org/eolcs

July 13, 2012

Judy Cardin
Chair, National Conference on Weights and Measures
Laws and Regulations Committee

Dear Ms. Cardin:

API received a copy of the July 2012 letter the Automotive Oil Change Association sent to you regarding items 232-4 and 237-6 currently under consideration by the National Conference on Weights and Measures Laws and Regulations Committee. I believe a number of comments made in the letter are incorrect and merit a response. For ease of reference, I have excerpted specific AOCA statements (in *italics*) and then follow with my response.

> *AOCA: Does that mean the receipt should list either the name or brand or trademark or trade name? Or does it mean that the receipt should list the name, brand, and trademark or alternatively the trade name alone?*
>
> Ferrick: Yes, the receipt should list name or brand or trademark or trade name. One is sufficient. It's at the installer's discretion.
>
> *AOCA: When API designates a motor oil category as inactive or obsolete, that doesn't mean the consumers with vehicles designed to use that category turn in their cars or otherwise want to buy a more expensive grade of motor oil going forward.*
>
> Ferrick: API service categories generally are declared obsolete when the tests used to verify the oil's performance are no longer available. API does not advocate preventing oil marketers from manufacturing and selling oils meeting an obsolete standard, but if such oils are being used, consumers deserve to know that there is currently no way to verify through ASTM engine testing the claims made for the oils. The API industry standard for engine oil performance, API 1509, *Engine Oil Licensing and Certification System,* requires engine testing to establish that an oil meets the requirements for a current API service category. Oils claiming to meet an obsolete category such as API SG are either formulated based on perhaps 20-year-old data or crafted using engineering judgment.
>
> Consumers also deserve to know that, for most automobiles, the latest API service category meets or exceeds the performance level of the previous categories. This means an API SL, SM, or SN oil will meet or exceed API SG, SH, and SJ performance requirements.

An equal opportunity employer

When API does adopt a new service category or performance standard, the standard's introduction includes waiting and "phase-in" periods. For ILSAC GF-5, API instituted a 9-month waiting period before oils could be licensed against the standard. Once the GF-5 standard went into effect, API permitted oil marketers to maintain licenses against the GF-4 standard for 1 year after the GF-5 first licensing date. It is also important to note that API still licenses oils to use the API Service Symbol in conjunction with earlier API categories back to API SJ. API SJ has been in effect since 1993. Thus, API licenses motor oils meeting owner's manual recommendations for vehicles up to 20 years old.

Most OEMs selling automobiles and trucks in the North American market recommend oils meeting ILSAC or API performance requirements. When ILSAC introduces a new specification, ILSAC recommends that specification for its current and previous model year vehicles because the new specification is an improvement over the earlier one. This has also been true to some extent for the last few diesel categories. Additionally, ILSAC recommends oils displaying the API Starburst, an evergreen symbol not tied to an API service category. ILSAC opted for this evergreen symbol specifically because ILSAC wants its customers to use oils meeting the latest and most stringent performance requirements.

AOCA: Many of these oils are rated by ACEA.

Ferrick: ACEA oils are recommended for European automobiles, and these usually include an API rating. Most US, Korean and Japanese automakers recommend oils meeting the latest ILSAC standard for their new cars and older cars on the road today. It might also be useful for you to know that ACEA does not monitor the quality of oils in the marketplace that claim ACEA performance, a stark difference between API and ACEA.

AOCA: Installers should not be forced to designate vehicle-appropriate motor oil as "inactive" or "obsolete" on tanks and receipts because it would have a chilling and/or discriminatory effect on consumers' opinion of the operators. Consumers don't recognize API but a term like "inactive" could only be understood as negative. It is not reasonable to expect the average consumer and small business operator to have a twenty-minute in-depth discussion over the distinction between inactive and active API service categories and how an "inactive" designation doesn't mean the type of oil originally recommended for the consumer's car is suddenly now bad for it.

The new standard phase-in factor must be considered as well. The standard referred to subsection 2.33.1, SAE J183, cross-references API 1509. When API publishes a new edition of 1509 and/or creates a new service category, a reasonable phase-in period is necessary to accommodate older vehicle owners' needs; i.e., it may be in their best interests—both functionally and economically—to use motor oil developed in accordance with an earlier

edition or service category so long as the automobile manufacturer originally recommended it and its continued use has no impact on any remaining warranty coverage. For fast lube operators to automatically upgrade bulk oil stock at API-determined intervals would be tantamount to giving API control over the price of oil change services regardless of what the market can bear.

Ferrick: API service categories generally are declared obsolete when the tests used to verify the oil's performance are no longer available. API does not advocate preventing oil marketers from manufacturing and selling oils meeting an obsolete standard, but if such oils are being used, consumers deserve to know that there is currently no way to verify through ASTM engine testing the claims made for the oils. The API industry standard for engine oil performance, API 1509, requires engine testing to establish that an oil meets the requirements for a current API service category. Oils claiming to meet an obsolete category such as API SG are either formulated based on perhaps 20-year-old data or crafted using engineering judgment.

Consumers also deserve to know that, for most automobiles, the latest API service category meets or exceeds the performance level of the previous categories. This means an API SL, SM, or SN oil will meet or exceed API SG, SH, and SJ performance requirements.

When API does adopt a new service category or performance standard, the standard's introduction includes waiting and "phase-in" periods. For ILSAC GF-5, API instituted a 9-month waiting period before oils could be licensed against the standard. Once the GF-5 standard went into effect, API permitted oil marketers to maintain licenses against the GF-4 standard for 1 year after the GF-5 first licensing date. It is also important to note that API still licenses oils to use the API Service Symbol in conjunction with earlier API categories back to API SJ. API SJ has been in effect since 1993. Thus, API licenses motor oils meeting owner's manual recommendations for vehicles up to 20 years old.

If AOCA members want to give consumers an option to use an oil meeting an older or obsolete performance category, AOCA should make it clear to the consumer that that's what they're getting. Lack of consumer knowledge could easily result in misapplication.

AOCA: NOTE: no cautionary statement per SAE J183 or other negative designation such as 'obsolete' or 'inactive' shall be necessary where the motor oil used is in the category of motor oil originally designated for the consumer's vehicle."

Ferrick: Engine oil consumers include installers and vehicle owners. Omitting the cautionary statement would deprive installers of the warning that it is no longer possible to perform engine testing for performance characteristics on the oil installers are purchasing. The API

industry standard for engine oil performance, API 1509, requires engine testing to establish that an oil meets the requirements for a current API service category. The obsolete designation puts the installer on notice that they are assuming additional risk by selling an oil that may not have undergone engine testing, could fail to meet performance requirements, and could harm their customers' vehicles. Omitting the obsolete designation would also deprive vehicle owners of a warning that the performance level of the oil being installed in their vehicles cannot be independently engine tested.

Further, deletion of references to an oil's obsolete status and deference to the vehicle manufacturer's original oil recommendation may not address the issue. With the introduction of the API Starburst in 1993, vehicle manufacturers began recommending in their owners' manuals that owners use oil bearing the API Starburst certification mark rather than recommending specific API service categories. The Starburst mark is evergreen, meaning it is used for the most recently approved engine oil standard. Therefore, in the common case of a vehicle manufacturer that has recommended the Starburst sometime in the last 20 years, deferring to the vehicle manufacturer's original oil recommendation may not give consumers the information they need to make an informed decision on the right oil for their vehicle.

AOCA: Lastly, it is imperative that any installer labeling and/or receipt information requirements be matched by corresponding NCWM requirements for motor oil distributors.

Ferrick: API is launching a voluntary licensing program for distributors and installers that have implemented basic chain of custody procedures for engine oils. API's goal is to ensure that distributors and installers have the information they need to be able to clearly identify the engine oils ultimately being installed in consumers' vehicles.

AOCA: fast lubes cannot be expected to verify brand to consumers if distributors are not required to first verify that brand upon delivery

Ferrick: API's program requires that participating distributors verify the identity of the products delivered.

AOCA: testing can be impossible for a fast lube to verify because oil companies use chemical markers that only they can identify

Ferrick: Bench testing to confirm volatility and SAE J300 viscosity requirements can easily be done to verify well-known, published industry parameters. Oil marketers that don't use markers (not all do) routinely rely on this type of testing when confirming product identity.

AOCA: It is recommended that operators purchase motor oil meeting the specifications required by the automaker for the model year of vehicles being serviced.

Ferrick: Deletion of references to an oil's obsolete status and deference to the vehicle manufacturer's original oil recommendation may not address the issue. With the introduction of the API Starburst in 1993, vehicle manufacturers began recommending in their owners' manuals that owners use oil bearing the API Starburst certification mark rather than recommending specific API service categories. The Starburst mark is evergreen, meaning it is used for the most recently approved engine oil standard. Therefore, in the common case of a vehicle manufacturer that has recommended the Starburst sometime in the last 20 years, deferring to the vehicle manufacturer's original oil recommendation may not give consumers the information they need to make an informed decision on the right oil for their vehicle.

If an installer carries inventory of older category oils in bulk, the possibility of misapplication in cars needing oils meeting more recent categories is likely increased. Requiring the information in the revised HB 130 language may help prevent misapplication.

AOCA: fast lube operators who want the ability to verify orders placed should either request a written summary of each purchase order from their supplier or draft their own dated summary, including a supplier initial line, and fax or email it to their supplier for verification.

Ferrick: API adopts its consensus industry standards through an open, transparent process that responds directly to all technical comments, whether submitted by oil marketers, distributors, installers, or other interested parties. In response to AOCA's comments on the previous ballot of API 1525A, *Bulk Engine Oil Chain of Custody and Quality Documentation*, API plans to conduct an open ballot on the provisions shown in the attached draft API 1525A.

AOCA: (1) The brand (if any), viscosity grade, performance level, and quantity of motor oil being delivered;
(2) The names, addresses, contact personnel, and phone numbers of every facility that has come in contact with the shipment of motor oil from the original supplier down to the distributor currently onsite;
(3) An agreement by the distributor to take direct responsibility for any and all fast lube customers affected by the delivery of product that does not meet the standards (taking into account any commercially-accepted degree of variation) of the product ordered by the fast lube operator; and

(4) An acknowledgment by the distributor that an actual sample of the load (i.e., a "retain") has been taken from the truck as the product was being delivered and that this sample will be retained by the distributor for at least a year.

Have any distributors been willing to provide the basic documentation described above? No.

Ferrick: As part of the open development process of API 1525A, API has received comments from marketers, distributors, and installers confirming that distributors routinely provide the basic information in item 1 through bills of lading and other materials.

AOCA: Is API proposing to require it in Standard 1525A? No.

Ferrick: API 1525A requires or recommends 1, 2, and 4 above. API sets industry standards following procedures accredited by the American National Standards Institute. API's *Procedures for Standards Development* do not permit API standards to include substantive allocations of business risk between buyers and sellers, such as guarantees and warrantees. However, with the documentation required by API 1525A, the installer would be free to negotiate its own warranty provisions as it sees fit.

AOCA: Is NCWM contemplating inclusion of these points in its regulation? No.

Ferrick: API's requested changes to the NCWM provisions are intended to provide consumers with basic product identity information.

AOCA: Their emphasis has been placed on the install level as if all bulk motor oil distribution fraud risk lies there alone. This is simply not true and behaving as if it were is a tremendous waste of a legitimate regulatory opportunity to establish a fair chain of custody system that protects everyone equally.

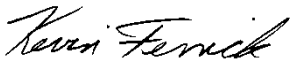
Ferrick: API is currently balloting a new, voluntary industry standard, API 1525A that will provide chain of custody guidance for the entire engine oil supply chain, for marketers, distributors, and installers. API appreciates AOCA's technical comments submitted during the open standards development process of API 1525A, and API has incorporated most of AOCA's suggested changes into a final draft form of API 1525A that is currently being balloted.

AOCA: API has provided no indication to AOCA that it plans to engage in anything other than an after-the-fact complaint process and the occasional random testing of distributors, which is a lot like a shark with no teeth: a bad actor might get caught once in awhile, but he'd have to be so far out in the open as to get swallowed whole.

Ferrick: Upon adoption of the final API 1525A, API intends to implement a voluntary industry certification program that will license distributors and installers to use an API "Motor Oil Matters" certification mark that will serve as a representation by the distributor or installer to its customers that the distributor or installer has implemented chain of custody requirements consistent with API 1525A. API will test distributors before licensing and conduct random sampling and testing of products at licensed distributors and installers for product identification. Additionally, as per AOCA's comments on the draft API 1525A, API is currently balloting a final draft that includes a requirement for licensed distributors to maintain information on oils for at least 1 year. This requirement would include Certificates of Analysis and other quality information.

I appreciate the opportunity to respond.

Sincerely,



Kevin Ferrick
Manager, API Global Industry Services/EOLCS

Bulk Engine Oil Chain of Custody and Quality Documentation

DRAFT WITH BALLOT ITEMS JULY 2012
API 1525A
FIRST EDITION, XXXXX 2012

AMERICAN PETROLEUM INSTITUTE

Bulk Engine Oil Chain of Custody and Quality Documentation

Downstream Segment

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API 1525A
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Foreword

API 1525A *Bulk Engine Oil Chain of Custody and Quality Documentation* provides procedures for managing bulk engine oil chain of custody to ensure oil quality from the point of manufacture to installation in the end user's vehicle. All parties involved with supplying finished bulk engine oil to consumers have a role in protecting the quality of the oil throughout the supply chain. Responsibility for quality starts with the marketer/blender and ends with the installer. The blender, the transporter/distributor and the installer that originally ordered the product have a role in ensuring the quality of the engine oil received matches the quality ordered.

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Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, D.C. 20005, standards@api.org.

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Bulk Engine Oil Chain of Custody and Quality Documentation

1 Scope

This document provides procedures for managing bulk engine oil chain of custody to ensure oil quality from the point of manufacture to installation in the end user's engine. The procedures specifically address the following key topics: marketer/blender practices; the ordering of oils meeting API 1509; chain-of-custody documentation that identifies bulk engine oil throughout the supply system; and requirements for informing consumers about the types of engine oil available for installation and requirements for notification (written and/or electronic) of the oil installed in engines.

All parties involved with supplying bulk engine oil to consumers (end users) have a role in protecting the quality of the oil throughout the supply chain. Responsibility for quality starts with the marketer/blender and ends with the installer. The marketer/blender, the distributor and the installer that originally ordered the product have a role in ensuring the quality of the engine oil received matches the quality ordered.

This document builds on procedures published in API Recommended Practice 1525, *Bulk Oil Testing, Handling, and Storage Guidelines*. API 1525 addresses storage and handling of bulk oil, facility and equipment standards, loading and unloading, comingling in distributor storage, multiple transporters between marketer/blender and oil-change facilities, personal safety equipment, training, and governmental requirements and reviews.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API 1509[1], *Engine Oil Licensing and Certification System*

API 1525, *Bulk Oil Testing, Handling, and Storage Guidelines*

API Engine Oil Licensing and Certification System (EOLCS) Application for Licensure

ASTM D445[2], *Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)*

ASTM D1500, *Standard Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)*

ASTM D4052, *Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)*

ASTM D4927, *Standard Test Methods for Elemental Analysis of Lubricant and Additive Components—Barium, Calcium, Phosphorus, Sulfur, and Zinc by Wavelength Dispersive X Ray Fluorescence Spectroscopy*

ASTM D4951, *Standard Test Method for Determination of Additive Elements in Lubricating Oils by Inductively Coupled Plasma Atomic Emission Spectrometry*

ASTM D5293, *Standard Test Method for Apparent Viscosity of Engine Oils Between 5 and 35°C Using the Cold Cranking Simulator*

[1] API, 1220 L Street, NW, Washington, DC 20005 USA
[2] ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428 USA

API 1525A

ASTM D5762, *Standard Test Method for Nitrogen in Petroleum and Petroleum Products by Boat Inlet Chemiluminescence*

ASTM D5949, *Standard Test Method for Pour Point of Petroleum Products (Automatic Pressure Pulsing Method)*

ASTM D5950, *Standard Test Method for Pour Point of Petroleum Products (Automatic Tilt Method)*

ASTM D5985, *Standard Test Method for Pour Point of Petroleum Products (Rotational Method)*

ASTM D6362, *Standard Practice for Certificates of Reference Materials for Water Analysis*

ASTM D6481, *Standard Test Method for Determination of Phosphorus, Sulfur, Calcium, and Zinc in Lubrication Oils by Energy Dispersive X ray Fluorescence Spectroscopy*

ASTM D7279, *Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids by Automated Houillon Viscometer*

ISO 17050-1[3], *Conformity Assessment — Supplier's Declaration of Conformity — Part 1: General Requirements*

SAE J300[4], *Engine Oil Viscosity Classification*

3 Terms and Definitions

For the purposes of this document, the following definitions apply:

3.1 Terms

a) May—indicates provisions that are optional and, consequently, are at the discretion of the designer or operator.
b) Must—indicates important legal or safety considerations.
c) Shall—indicates provisions that are mandatory to meet this API standard.
d) Should—indicates provisions that are recommended but not mandatory. Implementation of these provisions will be made based on consideration of the following, as appropriate: (a) risk/benefit analysis, (b) company standards, (c) company experience, and (d) company philosophy.

3.2 Definitions

a) API service category—is an engine oil designation (for example, API SM, SN, CH-4, CI-4, and CJ-4) that defines a specific level of performance as measured in engine and bench tests.
b) Batch—is a delivery of finished engine oil from a marketer/blender to a distributor from a maximum of one vehicle, rail car or portable container. A delivery of the same product from multiple compartments from a single vehicle at the same time may be considered a single batch if loaded from a single storage tank.
c) Bulk engine oil—is engine oil dispensed and delivered in metered quantities.
d) Distributor—is the entity that stores and delivers to multiple users (other distributors or installers) finished engine oils obtained from another source or from a qualified in-house blending operation.
e) Formulation—is a specific mixture of lubricant base stocks and performance additives (additive package), including treat levels of all components, that results in an engine oil.
f) Installer—is the entity that puts engine oil into the engine of a consumer (end user).

[3] ISO, 1, ch. de la Voie-Creuse, CP 56, 1211 Genève 20, Switzerland
[4] SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 USA

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g) Licensable category—is an API service category listed in API 1509 as eligible for use in the API Service Symbol.
h) Licensed formulation—is a formulation that meets the requirements of API 1509 for the service category claimed and is licensed by API.
i) License status—is a statement that the formulation used to blend an engine oil is licensed or not licensed by API.
j) Candidate Data Package – is a record of each test program conducted under the American Chemistry Council Code of Practice (see www.americanchemistry.com for details).
k) Marketer/blender—is the entity that mixes engine oil base stocks and performance additives (additive package) to produce an engine oil.
l) Ownership—is the top management position in the legal entity (private or corporate) responsible for all actions carried out by all distributors and/or installers owned or controlled by the entity.
m) Product—is a marketer/blender's finished engine oil sold in bulk with a unique brand name, viscosity grade, and API service category.
n) Product delivery—is the offloading of product to a distributor or installer's tanks or the transfer of product in a portable container to the distributor or installer's custody.
o) Product identification information—is the unique marketer/blender's name, brand name, viscosity grade, API service category, and API licensure status that is specific to an engine oil or engine oils.
p) Product quality—is defined as an engine oil's ability to meet API, OEM, industry, national or international specifications.
q) Qualified formulations—are specific engine oil formulations identified by unique codes for which acceptable performance against API performance standards has been demonstrated. Proof of performance against API standards requires the successful completion of engine and bench tests.
r) Quality assurance—is a program for the systematic monitoring and evaluation of the various aspects of a project, service, or facility to ensure that standards of quality are being met.
s) Quality control—is the aggregate of activities (as design analysis and inspection for defects) designed to ensure adequate quality especially in manufactured products.
t) Quality statement—is a document that confirms that an engine oil delivered meets the characteristics and performance level expected from the marketer/blender. The quality statement can be a Certificate of Analysis (C of A), Certificate of Conformance (C of C) or other document as agreed between the parties prior to product delivery.

1) Certificate of Analysis (C of A)—is a certification report of the analysis performed to develop the certified values reported on the Certificate of Analysis. It shall list the test method(s) used for analysis and industry specification limits for tests listed, when available, for the engine oil(s) supplied (see latest edition ASTM D6362).
2) Certificate of Conformance (C of C)—is a document that contains a Certificate of Conformity of a manufactured product. The certificate documents that the product conforms to manufactured specifications (see latest edition ISO/IEC 17050-1).

4 General Principles

4.1 Equipment for Handling, Sampling and Testing Engine Oils

Engine oils should be handled, sampled and tested in accordance with the latest edition of API 1525. At minimum, clean, dry, and clear glass or plastic bottles shall be used when making visual comparisons to reference samples for color, water, and contamination.

4.2 Procedures

Engine oil marketer/blenders, distributors and installers should have written procedures consistent with those described in the latest edition of API 1525.

5 Requirements for Marketer/Blenders Supplying Engine Oil to API-Certified Distributors

5.1 Basic Requirements for Marketer/Blenders

5.1.1 A marketer/blender shall have available for supply to distributors or installers engine oils that are in compliance with the latest edition of API 1509.

5.1.2 The marketer/blender shall clearly identify to all recipients for each engine oil to be supplied the API license status, API service category, SAE viscosity grade, and brand name. Notification may be made by paper or electronic record.

5.1.3 The marketer/blender shall verify an engine oil's license status by providing a valid copy of its Schedule A License Agreement or citing API's on-line Directory of Licensees (www.api.org/eolcs). Notification may be made by paper or electronic record.

5.1.4 The marketer/blender owning the brand name must maintain pertinent sections of the Candidate Data Package provided by the technology supplier sufficient to document the API service category of each formulation supplied.

5.1.5 Records required by this section shall be maintained a minimum of 6 months. Candidate Data Packages shall be maintained as long as the formulations the packages support are supplied.

5.2 Marketer/Blender Practices to Support Chain of Custody

5.2.1 Batch Quality and Tracking Management

The marketer/blender shall implement and maintain a quality testing and tracking system to allow identification of and assure conformance to the API service category claimed for every batch of engine oil delivered to distributors and installers.

5.2.1.1 Tracking System

The tracking system shall include, at minimum:

a) A separate, unique code for each blend/batch.
b) Blend code traceable to Part Q of the API Engine Oil Licensing and Certification System (EOLCS) Application for Licensure.
c) Certificates of Analysis for components used in oil batches.
d) Records of the results of quality certification testing (See 5.2.1.2) on each batch.
e) Record of batches in a tank for a given day (identify the most recent two batches added to a tank).
f) The customers for all deliveries made each day from each engine oil storage tank.

5.2.1.2 Batch/Quality Certification Testing

The marketer/blender shall run appropriate tests on each batch to certify the oil has been blended to meet identifiable properties. Tests should include the following (appropriate ASTM procedures, when available, are recommended):

a) Kinematic viscosity at 100°C—ASTM D445 or D7279.
b) CCS @ temperature for viscosity grade (defined in SAE J300)—ASTM D5293.
c) Additive elements sufficient to confirm additive package and additive component level (Ca, Mg, P, Zn, Molybdenum, Na, B & N and/or others if appropriate)—ASTM D4951; D4927; and D6481, D5762 or D6443.
d) Appearance (Visual).

e) Color (ASTM D1500).
f) Specific gravity/density (ASTM D4052).
g) Pour point (ASTM D5949, D5950, D5985).

5.2.1.3 Retain Samples

The marketer/blender shall retain at least 8 ounces of product from each blend, and these retain samples shall be traceable to the batch. The marketer/blender shall retain samples for a minimum of 3 months (up to 6 months is recommended)in an environment free from exposure to UV light to prevent deterioration and contamination.

5.3 Chain-of-Custody Documentation—Marketer/Blender Delivery to Distributor

5.3.1 Order Information

The marketer/blender shall provide a paper or electronic record with each sale of product that identifies the quality of the product. At minimum, the record shall include the following:

a) Brand name.
b) SAE viscosity grade. c) API service category.
d) API license status (API-licensed or unlicensed). The API license status of the oil shall be confirmed by the distributor. API-licensed oils are listed on-line at www.api.org/eolcs.
e) Information necessary to ensure traceability to product performance claim.

5.3.2 Bill of Lading

The marketer/blender shall provide a Bill of Lading, consisting of a paper or electronic record, for each oil delivery to each distributor or installer receiving an engine oil or oils. This Bill of Lading shall include the information below for each oil in each compartment delivered or the distributor shall be able to link to a system [for example, through product or stock-keeping unit (SKU) numbers] that defines the following:

a) Marketer/blender name(s).
b) Brand name(s).
c) SAE viscosity grade(s).
d) API service category.
e) API license status (API-licensed or unlicensed).
f) Oil quantity(s).
g) Date of shipment.
h) Delivery vehicle compartment from which oil is dispensed.

5.3.3 Quality Statement

5.3.3.1 The marketer/blender shall provide, if requested by an API-licensed distributor, a quality statement for all engine oil deliveries to the distributor at the time of product delivery. The quality statement shall certify that the product has been inspected and tested and conforms to established specifications. The person responsible for the product quality shall sign the quality statement either by actual signature or electronic identification.

5.3.3.2 The quality statement shall be in the form of a Certificate of Analysis (C of A), Certificate of Conformance (C of C) or other document as agreed between the parties prior to product delivery.

5.3.3.3 The quality statement should contain at least the following information about each engine oil being transferred:

a) Marketer/blender name(s).
b) Brand name(s).
c) SAE viscosity grade.
d) API service category.
e) API license status (API-licensed or unlicensed). f) Oil quantity.
g) Date of shipment.

5.3.3.4 The C of A should include results from tests as agreed between the marketer/blender and the oil recipient (see 5.2.1). Examples of tests include the following:

a) Kinematic viscosity at 100°C—ASTM D445 or D7279.
b) CCS @ temperature for viscosity grade (defined in SAE J300)—ASTM D5293. c)
Elemental analysis—ASTM D4951, D4927, D6481 or D5762.
d) Appearance (Visual).
e) Density, relative density by digital density meter (ASTM D4052) or API gravity by D1250
f) Pour point (ASTM D5949, D5950, D5985).

The C of A should list industry specification limits for tests run, when available, for the engine oil(s) supplied. The marketer/blender and distributor shall agree on what test results will be shown in the C of A or C of C.

5.3.3.5 A C of C should contain a statement of conformity that states that the engine oils manufactured meet the industry standards claimed.

5.3.4 Retain Sample

The marketer/blender shall draw a minimum of 4 ounces of engine oil loaded onto the delivery vehicle. If the vehicle is loaded from more than one storage tank, the marketer/blender shall take a retain that represents product from each storage tank. Retain samples shall be traceable to the delivery, including the unique delivery vehicle identification and compartment number. Retain samples shall be retained for a minimum of 3 months (up to 6 months is recommended)s from the date of shipment in an appropriate environment free from exposure to UV light to prevent deterioration and contamination.

5.3.5 Invoice

All invoices for engine oil delivered to a distributor shall contain at least the following information or link to a system (for example, through product or SKU numbers) that defines the following:

a) Marketer/blender name(s).
b) Brand name(s).
c) SAE viscosity grade(s).
d) API service category.
e) Oil quantity(s).
f) Date of shipment.

5.3.6 Record Retention

The marketer/blender shall maintain copies of the order, Bill of Lading, quality statement and invoice for at least 6 months in paper or electronic format.

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6 Requirements for Distributor of Bulk Engine Oil

6.1 General Requirements and Record Retention

6.1.1 This section applies to all bulk engine oils handled by the distributor. Records required by this section shall be maintained a minimum of ~~6 months~~1 year in paper or electronic format.

6.1.2 A distributor's engine oil offerings shall comply with the latest edition of API 1509.

6.2 Chain-of-Custody Documentation—Distributor Receipt of Engine Oil

6.2.1 Order Information

The distributor shall order engine oil from a marketer/blender by requesting and ensuring receipt of, at minimum, the information listed below:

a) Brand name.
b) SAE viscosity grade. c) API service category.
d) API-license status (API-licensed or unlicensed). The API license status of the oil shall be confirmed by the distributor. API-licensed oils are listed on-line at www.api.org/eolcs.
e) Information necessary to ensure traceability to product performance.

6.2.2 Purchase Order

6.2.2.1 When ordering engine oil from a marketer/blender, the distributor shall order by requesting the information listed in 6.2.1. As an example, a distributor would order 2,000 gallons of Brand X SAE 5W-30 API-licensed ILSAC GF-5/API SN engine oil. The distributor shall confirm the API license status of the engine oils ordered. API-licensed oils are listed on-line at www.api.org/eolcs.

6.2.2.2 The distributor shall document in writing the order placed including the information required in 6.2.1~~.1~~. If the distributor places a ~~V~~verbal order~~s~~, the distributor should request a written summary from the marketer/blender or draft a dated summary and fax or email it to the marketer/blender for return verification. The written summary shall include at least the information ~~are acceptable provided that the distributor documents the information~~ required by 6.2.1~~.1 after placing the verbal order~~.

6.2.3 Receiving Inspection

The distributor shall ensure that the Bill of Lading and quality statement, if requested, meet the purchase order requirements prior to product off-loading. This review must include confirmation of the following:

a) Marketer/blender name.
b) Brand name.
c) SAE viscosity grade.
d) API service category.
e) Oil quantity.
f) Date of shipment.
g) Delivery vehicle compartment from which oil is dispensed.
h) Bill of Lading number.
i) Carrier identification.
j) Density or relative density by ASTM D4052 or API gravity by D1250.
k) Batch number or other method of traceability.
l) Supply point.
m) Person taking delivery.

6.2.4 Record Retention

The distributor shall maintain records of product deliveries received from marketer/blenders for at least 6 months. Records shall include the batch identification, the purchase order, the Bill of Lading, and the quality statement as well as the product identification information in 6.2.1.1, date of delivery and the unique identification of the delivery vehicle, including compartment number.

6.2.5 Retain Samples

The distributor shall draw a minimum of 4 ounces of engine oil from each delivery vehicle compartment from which delivery is accepted. The sample shall be traceable to the specific production batch and shall be retained for a minimum of 3 months (up to 6 months is recommended)in an appropriate environment free from exposure to UV light to prevent deterioration and contamination.

6.3 Chain-of-Custody Documentation—Distributor Delivery to Installer

6.3.1 Customer Order

The distributor shall document the specific engine oil(s) ordered by the installer including product identification information (see 3.2).

6.3.2 Drop Ticket

6.3.2.1 The distributor shall provide a drop ticket for each engine oil delivery that includes at least the following information for each oil delivered:

a) Marketer/blender name(s).
b) Brand name(s).
c) SAE viscosity grade(s).
d) API service category.
e) Oil quantity(s).

6.3.2.2 If the format for the drop ticket limits the number of characters that can be used, abbreviations may be used as long as the brand, viscosity grade, and API service category are discernable. For example, “Brand X SAE 5W-30 ILSAC GF-5/API SN” could be abbreviated as “BrdX5W30GF5SN.”

6.3.3 Invoice

All invoices for engine oils delivered to installers shall contain, at minimum, the following information on the engine oils delivered:

a) Marketer/blender name.
b) Brand name.
c) SAE viscosity grade.
d) API service category.
e) API-license status (API-licensed or unlicensed).

6.3.4 Pre-Dispensing Verification

Before dispensing engine oil into an installer’s bulk tank, the distributor shall confirm with the installer that the brand name, SAE viscosity grade and API service category of the engine oil being delivered matches the oil ordered. This confirmation shall be provided in written form (paper or electronic format). The distributor should dispense the oil in accordance with API 1525.

6.3.5 Post-Dispensing Verification

After the engine oil has been dispensed, the distributor shall allow the installer to verify that the meter- head on the delivery vehicle is zeroed out.

6.3.4~~5~~6 Retain Samples

The distributor should as a best practice retain at least 4 ounces of engine oil from each compartment of the delivery vehicle either after loading product into a compartment or at time of delivery to an installer. The sample shall be traceable to the delivery of oil from each compartment at each drop and shall be retained for a minimum of 3 months (up to 6 months is recommended) in an environment free from exposure to UV light to prevent deterioration and contamination.

6.3.5~~6~~7 Record Retention

The distributor shall maintain records of product deliveries to installers for at least 6 months. Records shall include the customer order, the drop ticket, and the invoice as well as the product identification information, date of delivery, and unique identification of the delivery vehicle including compartment number.

6.4 Direct Delivery from Marketer/Blender to Installer

If a marketer/blender delivers engine oil directly to an installer, the requirements in paragraph 6.3 shall apply.

6.4.1 Retain Samples from Compartments

The marketer/blender shall retain at least 4 ounces of engine oil loaded into each compartment of the delivery vehicle. The samples shall be retained for a minimum of 3 months (up to 6 months is recommended)in an environment free from exposure to UV light to prevent deterioration and contamination.

6.4.2 Retain Samples from Intermediate Bulk Container (IBC)

A marketer/blender delivering engine oil by intermediate bulk container (IBC) shall retain at least 4 ounces of engine oil loaded into the IBC. The samples shall be retained for a minimum of 3 months (up to 6 months is recommended)in an environment free from exposure to UV light to prevent deterioration and contamination.

6.5 Multiple Transfers Between Initial Distributor and Installer

6.5.1 If an engine oil is transferred more than once after being shipped to a distributor by a marketer/blender, practices outlined in Section 6 shall be followed by each entity transferring the oil. This is mandatory to maintain chain of custody and ensure the final user of the engine oil receives the proper information on each oil.

6.5.2 Distributors operating in accordance with this standard that receive engine oil from another distributor shall draw a minimum of 4 ounces of engine oil from each delivery vehicle compartment from which delivery is accepted.

6.5.3 Two or more products with different properties as identified in items a through e of 5.3.3.3 shall not be commingled, even if the products are similar. Mixing different oils with different additive systems is in conflict with the requirement under 5.3.1 to provide sufficient documentation to identify product properties and quality. The distributor shall ensure that tanks are drained and flushed between different products, different grades of the same product, and different products or product groups.

7 Installer Ordering, Receipt and Installation of Bulk Engine Oil

7.1 Product Offering

An installer's bulk engine oil offerings shall comply with the latest edition of API 1509.

7.2 Order Information

7.2.1 The installer shall order engine oil from a distributor by requesting ~~and ensuring receipt of~~, at minimum, the information listed below:

a) Brand name.
b) SAE viscosity grade.
c) API service category.
d) Verification of API-license status ~~(API-licensed or unlicensed)~~. The API license status of the oil shall be confirmed by the distributor. API-licensed oils are listed on-line at www.api.org/eolcs.
~~e) Information necessary to ensure traceability to product performance. At a minimum, the information found in 5.3.2.1 and 6.3.2.1 shall be deemed necessary to ensure traceability.~~

7.2.2 The distributor shall designate how the oil will be described on its drop ticket and invoice in accordance with 6.3.2.1.

7.2.3 The installer ~~shall~~ should request that the distributor notify him or her every time the information above changes.

7.3 Oil Ordering Practices

7.3.1 When ordering engine oil from a distributor, an installer shall request a specific brand, SAE viscosity grade, API service category, and quantity of oil per the information agreed-upon by the entities involved. As an example, the installer staff member responsible for ordering engine oil would order 2,000 gallons of Brand X SAE 5W-30 API-licensed ILSAC GF-5/API SN engine oil. If the distributor no longer carries the brand requested, the installer shall request and receive the information required under 7.2.1 before accepting a substitute brand.

The API license status of the oil shall be confirmed by the distributor. API-licensed oils are listed on-line at www.api.org/eolcs.

7.3.2 If a verbal order is placed, the installer ~~shall~~ may request a written summary from the distributor or draft a dated summary and fax or email it to the ~~supplier~~ distributor for return verification. The written summary shall include at least the information required by 7.2.1.

7.4 Installer Receiving Practices

7.4.1 The ~~distributor shall~~installer should request that the distributor assist the installer in labeling all bulk oil tanks with the brand name, SAE viscosity grade, and API service category of the engine oil being stored.

7.4.2 Prior to allowing a distributor to dispense product into a bulk tank, the recipient of the delivery shall complete the following steps:

a) Using the paper or electronic confirmation provided by the distributor in accordance with 6.3.4, confirm that the brand name, SAE viscosity grade, and API service category~~, and quantity of engine oil being delivered~~ match~~es~~ the product ordered. ~~Delivery of the product should be conducted in accordance with API 1525.~~
~~a)~~b) Measure via tank gauge or other device the contents of the tank into which the engine oil will be dispensed. The installer may also check the distributor's meter-head to make sure it is zeroed out. After delivery, the installer should take the same measurements again. The installer should document these

measurements in a written log maintained by the installer to provide a long-term record that can be used to verify the quantity of deliveries.

7.4.3 Drop tickets or any other written documentation associated with the quality and quantity of the bulk engine oil delivered shall be kept for at least 6 months by the installer.

~~**7.4.4** An installer receiving engine oil in an unsealed tote should retain 4 ounces of the oil from the tote. The sample shall be retained for a minimum of 3 months (up to 6 months is recommended)in an environment free from exposure to UV light to prevent deterioration and contamination.~~

7.5 Installation Practices

7.5.1 Engine oil change options shall be clearly and accurately represented to consumers through a menu board, list of services, or other promotional methods.

7.5.2 Bulk engine oil installation hoses, hose reels or nozzles shall be clearly labeled with the brand name, SAE viscosity grade, and API service category of each oil being dispensed.

7.6 Customer Receipts

The customer receipt for the engine oil change shall clearly identify the brand name, SAE viscosity grade, API service category and API license status of the oil installed. For example, the receipt would provide the following information: “Specific Brand SAE 5W-30 API-Licensed SN/GF-5.”

An installer has the option to indicate that the brand of oil is a “house brand.” Note, however, that an API engine oil license is not transferable and the licensee does not have the right to grant sublicenses. If an installer chooses to rename an engine oil as a “house brand,” the oil must be identified as “unlicensed.” For example, the receipt would provide the following information: “House Brand Unlicensed 5W30 SN/GF-5.”

From: Scott Tredinnick
To: judy.cardin@wisconsin.gov
Cc: don.onwiler@ncwm.net; Warfield, Lisa; Scott Tredinnick
Subject: Handbook 130
Date: Wednesday, June 27, 2012 6:24:31 PM
Attachments: DOC062712-001.pdf

Dear Ms. Cardin,

With the downturn in the economy and unethical business practices, the sale of uncertified bulk oil and sometimes even waste oil being re-sold as new oil in the Los Angeles marketplace has become unbelievable. Orange Line Oil only sells quality products and supports Handbook 130 and the API.

Imagine how you would feel, if you took your new car to a quick lube facility and they changed your oil with out-of-spec product just to save a few cents. You would most likely not see an immediate problem; however, as you drove your car with the non-spec oil, your engine would slowly be destroyed due to the lack of proper lubrication, while at the same time your catalytic converter would become clogged and possibly ignite a fire under you vehicle.

Please encourage the committee to adopt these important changes for Handbook 130.

Sincerely,

Scott Tredinnick
President/CEO
Orange Line Oil Company
QUALITY & SERVICE SINCE 1979
www.orangelineoil.com
(909) 623-0533

Orange Line Oil Company, Inc.
QUALITY & SERVICE SINCE: 1970

404 E. Commercial St.
Pomona, CA 91767

Ms. Judy Cardin
Chair, Laws & Regulations Committee,
National Conference on Weights and Measures
Wisconsin Weights and Measures
2811 Agriculture Drive
P.O. Box 8911
Madison, WI
53708-8911
judy.cardin@wisco
nsin.gov

Dear Ms. Cardin:

As a motor oil distributor, I am expressing my support for the proposed changes to Handbook 130 (Laws and Regulations Committee interim report sections 232-4 and 237-4). This set of changes will help my business to further highlight its commitment to providing quality products to my customers.

It's important for customers to know they're receiving the motor oil they've come to know and trust. The proposed changes to Handbook 130 would standardize the motor oil information installers provide to customers on the quality of the bulk oil installed.

If adopted, Handbook 130 will also help API in its annual audit of motor oils. This important program has for many years helped to ensure the quality of motor oils, but the level of information currently available from installers has made it difficult to verify the chain of custody for bulk oils.

I support the changes proposed for Handbook 130 and strongly urge you to support them as well.

Sincerely,

Scott Tredinnick
President

C: Don Onwiler
National Conference on Weights and Measures, Inc.
1135 M Street
Suite 110
Lincoln, NE 68508
don.onwiler@ncw
m.net

Lisa Warfield
NIST, Office of Weights and Measures
100 Bureau Drive
MS 2600
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lisa.warfield@nist.gov

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June 27, 2012

Ms. Judy Cardin

Chair, Laws & Regulations Committee,

National Conference on Weights and Measures

Wisconsin Weights and Measure

2811 Agriculture Drive

PO Box 8911

Madison, WI 53708-8911

Dear Ms. Cardin,

We are a motor oil distributor in California with an ever expanding business which prides itself on supplying quality products to all of our customers. I feel that the proposed changes to Handbook 130 are timely and important to our business going forward. These changes will help us to highlight our commitment to our customers and give them something to rely upon as they compare competing products.

We struggle on a daily basis to prove to our customers that our oil meets all industry and automotive specifications because many other products, which do not meet the required specifications, are sold at a lower price with false information. The changes to the Handbook would set standards that all installers would have to meet and thus assure their customers the quality of the product they are receiving.

Also, with the adoption of these changes, the API will be helped as they audit the use and specifications for motor oils. This program needs the backing of the Handbook so they can substantiate that all installers are meeting the requirements of the oils they are selling.

We do support the changes proposed for Handbook 130 and hope that you will as well.

Best Regards,

Ron Van De Pol

Ron Van De Pol, President

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(209) 722-2752 • Merced
(559) 233-7261 • Fresno
(559) 698-7201 • Tranquility

Form letters were received from the following individual/organizations in support of NIST Handbook 130, Laws and Regulations Committee Interim Report.

Item 232-4: Uniform Regulation for the Method of Sale of Commodities, 2.33. Vehicle Motor Oil and

Item 237-4: Uniform Engine Fuels and Automotive Lubricants Regulation, 3.13.1. Labeling of Vehicle Motor Oil Required.

Name	Organization	Address
Sita Compton, Owner	BC Automotive Center	378 N. Tuscola Road., Bay City, MI 48708
Robert Scott, Vice President Lubricants	Dilmar Oil Company	1951 W. Darlington Street, Florence, SC 29501
Marla Carlson, Director of Sales	Dion and Sons, Inc.	1543 West 16th Street, Long Beach, CA 90813
K. John Dooley, President Oil Inc.	Dooley Oil, Inc.	P.O. Box 370, Laramie, WY 82073 P.O. Box 1831, Fort Collins, CO 80522 P.O. Box 189, Evansville, WY 82636 P.O. Box 1241, Cheyenne, WY 82007
John P. Kirby	Graff Motor Sales	1100 W. Cedar Avenue, Gladwin, MI 48624
Garrett Otten, Sales Manager	Hays Oil	8290 14th Street, White City, OR 97503
Imad Hassen	Unknown	
Patricia Blonde	Imlay City Lube Center, Inc.	1824 S. Cedar Street, Imlay City, MI 48444
Charlene Radwanski	Magnum Oil	2668 Knowles Avenue, Winnipeg, Manitoba R2G 2K^
Randy Marshall	Marshall's Express	2325 W. Grand River, Howell, MI 48843
Ronald Smith, Lubricant Manager	Mulgrew Oil Company	10314 Silverwood Drive, Dubuque, IA 52003
Patrick Feldpausch, President	One Stop Wash-n-Lube	Dewitt, MI 48820
Joe Smith, President	Penco Oil Company	510 N. Palace, P.O. Box 659, Tyler, TX 75710-0659
John E. Coteil	Pride Auto Truck Repair	Not provided
Sam Edmondson	Quality Petroleum, Inc.	P.O. Box 15308, Little Rock, AR 7221-5308
William D. Rice, President	Rice Properties Ltd., D/b/a J. R.'s Lube Shop	P.O. Box 189, New Baltimore, MI 48047
John Wisz, Owner	R&L 10 Minute Oil Change	880 W 14 Mile Road, Birmingham, MI 48009
Mike Rowley, Brenda Rowley, Franklin Hanes, and various (10 letters received)	Rowleys Wholesale	Rowley Brothers, 3604 Wilder Road, P. O. Box 1115, Bay City, MI 48706
Jacques Poirier, Vice President – LA Operations and Louisiana	Sun Coast Resources, Inc.	http://suncoastresources.com
Steven Oxener, Sales Representative	Sun Coast Resources, Inc.	http://suncoastresources.com

THE FORM LETTER TEXT FOLLOWS.

Ms. Judy Cardin
Chair, Laws & Regulations Committee,
National Conference on Weights and Measures
Wisconsin Weights and Measures
judy.cardin@wisconsin.gov

Dear Ms. Cardin:

As a motor oil distributor/installer, I am expressing my support for the proposed changes to Handbook 130 (Laws and Regulations Committee interim report sections 232-4 and 237-4). This set of changes will help my business to further highlight its commitment to providing quality products to my customers.

It's important for customers to know they're receiving the motor oil they've come to know and trust. The proposed changes to Handbook 130 would standardize the motor oil information installers provide to customers on the quality of the bulk oil installed.

If adopted, Handbook 130 will also help API in its annual audit of motor oils. This important program has for many years helped to ensure the quality of motor oils, but the level of information currently available from installers has made it difficult to verify the chain of custody for bulk oils.

I support the changes proposed for Handbook 130 and strongly urge you to support them as well.

Sincerely,

C: Don Onwiler
National Conference on Weights and Measures, Inc.
don.onwiler@ncwm.net

Lisa Warfield
NIST, Office of Weights and Measures
lisa.warfield@nist.gov

Appendix C

NIST Handbook 130 – Uniform Regulation for the Method of Sale Commodities

Item:

232-6: 2.XX. Printer Ink and Toner Cartridges Labeling

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From: Barkley, Matthew
To: Warfield, Lisa
Cc: Cardin, Judy L - DATCP
Subject: Open Hearing Comments: Transcript
Date: Tuesday, July 17, 2012 8:42:42 PM

Lisa-

Below is the transcript of the comments I made during the Open Hearings. I hope this helps. Please let me know if you have any questions.

Thanks and regards,

Matt

Chair, Members of the L&R Committee, and members of the association – my name is Matthew Barkley representing Hewlett Packard. Thank you for the opportunity to speak with you today.

As the agenda and proposal regarding test methodology were delivered late last week, and our first opportunity to discuss it in detail just yesterday, HP and industry in general have not yet had the time to formulate a clear position or provide detailed comments on the test methods we discussed. However, as the proposal moves forward in consideration and revision by the NCWM I would urge the membership to keep in mind the following concerns which HP and other industry members have:

First, any proposal should weigh whether it creates significant competitive disadvantage or advantage for any particular technology or sub-sector of our industry. For example, since our products are subject to re-use and remanufacturing we should be sure that the burdens of compliance are fairly and consistently placed across all players in the market.

Second, some of the proposals discussed by the work group could place manufacturers under a substantial cost burden to comply – costs incurred as a result of mandatory changes to a very complex, very developed and very global manufacturing and distribution system. For example in our discussions yesterday, I cited the example of products manufactured in various locations around the globe and imported to the US for final packaging in a variety of states – as individual cartridges or as multipacks. The costs from changes to this complex system would surely be passed on to consumers.

Third, we must ensure that the proposals put forward into consideration be clearly aimed to help consumers make value comparisons that inform their purchase decisions – to HP this is an especially important criteria as whatever gets places on packaging for our industry will be used by consumers to facilitate – or even be determinative to – their purchase decisions amongst several different competitive options in the market. It would be harmful to HP, to the substantial

investments its made in its product and technology, and to its customers if changes to Handbooks 130 and 133 resulted in consumers making erroneous value comparisons in their purchase decisions.

To that end, I would like to submit to the record a letter and addendum industry prepared and submitted to the former work group chair following our meetings last year in Missoula. While clearly linked to our discussions on the method of sale proposal it also addresses industry's concerns with testing methodology and the comments I have made here today.

Thank you again for the opportunity to speak to you today.



Information Technology Industry Council
Leading Policy for the Innovation Economy

August 10, 2011

Ms. Maureen Henzler
Chair, Task Group on Printer
Ink and Cartridges
<Via Email>

Mr. Ms. Henzler:

On behalf of the Information Technology Industry Council (ITI) and participating industry members, I would like to take this opportunity to share additional comments on the NCWM proposal before Laws & Regulations Committee's Task Group on Printer Ink and Toner Cartridges ("the TG"). We appreciate the opportunity to participate in the 96th Annual Meeting and to share our presentation with the TG concerning products, technologies, consumer value, and the ISO/IEC standards related to the proposal. We regret that there was insufficient time to provide our entire presentation, nor time for the TG to fully discuss the complex issues raised by the presentation. A copy of the presentation is attached along with additional comments that will both be submitted for inclusion in the NCWM Publication 16. We look forward to continuing to inform and support the TG's efforts.

The participating industry members viewed the TG session in Montana to be very productive. At the same time, it is clear that a great deal of work remains. To facilitate the process moving forward, we recommend that all interested parties reflect on the content shared to-date and frame questions, observations, and the like, to be shared with the group in advance of our next meeting. We would also suggest that it might be helpful for the Chair to circulate a "work plan" to identify all steps necessary to reach a satisfactory outcome for the TG process. This should be shared with all participants for feedback. A work plan might also help avoid any further misunderstanding or miscommunication concerning expectations of participants.

This miscommunication was evident at the TG meeting in Montana, when there were several comments indicating that a proposal was expected as part of industry's presentation. We were unaware that any of the TG participants were asked or expected to develop a proposal. To our knowledge, the only proposal pending comes from the Southern Weight and Measures Association and mandates that provision of weight and volume measurements on inkjet and toner cartridges. Our presentation in Montana addressed (as time allowed) questions circulated by the Chair to task group members at the 2011 Interim meeting and detailed the reasons for our opposition to this proposal. Our presentation also outlined the general reasons why we believe that the application of page yield based on relevant ISO/IEC standards might better achieve the current proposal's objective to clarify the labeling requirements for industry, consumers and weights and measures officials.

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It is our hope that a full discussion of the issues, including resolution of the many questions and concerns highlighted in the attached, will help the TG progress toward a resolution acceptable to all stakeholders. To that end, we make the following recommendations:

- **Poll all stakeholders to identify missing or incomplete information.** We have highlighted several items in the addendum to this letter. It would be helpful for state regulators and other TG members to identify any outstanding technical or other information that industry could begin working to develop and provide.

- **Provide further input on how best to communicate efficiently and effectively on these complex issues.** We appreciate the suggestion that industry representatives attend the upcoming NCWM regional meetings and hold further discussion on this issue. However, considering the early stage of our exploration of the issues involved and the need for additional guidance from the TG (as noted above), we question how effective it would be to attend such meetings at this time.

- **Have the TG jointly develop a formal written request to the FTC seeking legal determination as to the scope of the "ink" exemption under the FPLA.** Resolution of how federal law applies to the labeling of cartridges is central to what, if any, action is considered by the NCWM.

- **Compile all consumer complaints submitted to weights and measure jurisdictions that would be helpful in determining the scope and nature of the problem being addressed by the proposal before the TG.** Such data will help the participating industry members to better understand the consumer complaints that brought this issue before NCWM and evaluate possible solutions.

- **Provide further detail of the intended end-point of this process.** Will a final report be submitted to the Laws & Regulations Committee? Will all stakeholders be able to review the draft report before it is finalized and sent to the L&R Committee? Is the goal to reach consensus? If not, or consensus is not reached, what is the goal? How have other working groups addressed these issues?

We appreciate the thoughtful dialogue advanced by the Task Group and look forward to your reply regarding the next steps in the process.

Sincerely,



Josh Rosenberg
Director, Global Policy

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Printer Toner and Ink Cartridges:

Best Practices for Conveying Yield Performance to the consumer

This paper has been prepared by the Information Technology Industry Council (ITI). ITI is the premier voice, advocate, and thought leader for the information and communications technology (ICT) industry. ITI is widely recognized as the tech industry's most effective advocacy organization in Washington D.C., and in various foreign capitals around the world. ITI's members include the leaders of printer manufacturing technologies including Epson, Hewlett Packard, Kodak, and Lexmark, among others.

Executive Summary:

The ultimate goal of any product measure is to provide information to a customer that facilitates an informed purchase decision. At first glance, comparing the volume or weight of ink or toner would seem to be a good proxy for the page yield. For a host of reasons this is often not the case. Toner and ink cartridges are complex mechanisms designed to deliver a consistent customer experience and because of this, ink or toner can be used in different amounts when printing and for purposes other than printing. All of this is highly dependent on the design of the larger printing system of which the cartridge is a critical but not independent part.

The printing industry realized the difficulty of presenting cartridge performance information to the customer and because of this voluntarily chose to develop several standards for measuring yield performance. These standards are developed specifically for these devices and use standard test patterns and methods to provide accurate and repeatable measurement. Moreover, the standards include protocols for clear and consistent communications to users regarding cartridge yields. The industry wholly believes that these test procedures provide a more reliable means of measurement and a more accurate method for consumers to determine value than comparing the volume or weight of ink or toner.

1101 K Street, NW • Suite 610 • Washington, DC 20005 • t: 202.737.8888 • f: 202.683.4922 • www.itic.org

Printer Toner and Ink Cartridges:

Best Practices for Conveying Yield Performance to the consumer

Objectives of weights and measures regulations include facilitating value comparisons and providing a standard of fairness in the marketplace. When it comes to selecting printer hardware and replacement supplies, these objectives dictate that weights and measures criteria that could lead the consumer to making economically incorrect decisions regarding value should not be implemented.

Some customers are interested in making comparisons on the relative value between printing supplies, both at the initial printer purchase and afterwards when purchasing additional supplies. In addition to cost, product reliability, brand reputation and print quality another important measure considered by some customers during the supply purchase is page yield. At first glance, comparing the volume or weight of ink or toner would seem to be a good proxy for the page yield. Unfortunately this is often not the case. This paper will outline the drawbacks of using weight or volume as a proxy for page yield and highlight the reasons why all major printer manufacturers use a set of ISO/IEC standards to measure and communicate printer yield.

Depending on the printing technology, the use of ink or toner can be impacted by several factors.

The amount of toner applied in printing pages compared to the amount of toner supplied in the cartridge is dependent on many factors and that a simple measure of the weight of the toner will not give a clear indication of ultimately how many pages can be printed. In electro-photographic (laser) printers, different toner formulations will use different amounts of toner when printing the same page. This is due to charge, particle size and formulation variation between toners. These attributes are engineered and varied by each cartridge vendor to provide what they feel to be the best experience to their customers. Some customers prefer thin sharp lines and fine detail, others prefer thick bold lines. Depending on the choices that a given manufacturer makes in toner formulation (base polymer, particle size, charge distribution and charge control agents), the amount of toner used to print the same page may vary. Additionally, the amount of toner cleaned and deposited in the waste hopper depends on several variables including the job size, coverage environment and printer design. Finally, the bulk densities of toners are not the same; for a given volume of toner, there can be significant differences in weights. All of these factors result in the reality that two different toner supplies of the same weight will not necessarily deliver the same number of pages.

Similar to laser printers, inkjet printer cartridge vendors manipulate several variables in their ink formulation to meet the needs they identify as important for their customers. Some of the variables that manufacturers consider and apply include: different ink formulations; dye vs. pigment inks, actual loads of pigment or dye in the ink formulation, and drop size. Different combinations of these ink content characteristics will result in substantially different ink consumption rates while printing the

same page. In addition, all inkjet systems perform routine servicing, and those servicing routines may be driven by a number of factors such as the ink formulation, usage and content. In addition, changes to non-ink materials by the inkjet cartridge manufactures or during remanufacture can affect the amount of ink that can be used in printing pages. Finally, for the same volume of ink, two different systems or the same model cartridge from two different vendors can print a different number of pages.

Ultimately what matters to many customers is answering the question, "How much can I print with a cartridge in a given printer?" Page yield reported using the ISO/IEC methodology better addresses this question than weight or volume. ISO/IEC JTC1 SC28 identified this as a consumer need in 2000 and started working on a family of standards that address this customer need. Standards now published measure yield for monochrome laser printers (ISO/IEC 19752), color laser and color inkjet printers (ISO/IEC 19798 & ISO/IEC 24711) using a common test suite (ISO/IEC 24712). Currently under development are standards to measure photo yield consisting of a methodology for inkjet printers (ISO/IEC 29102) and a photo test suite for any printing technology (ISO/IEC 29103). These standards are based on common design philosophies and change their methods slightly, depending on the technology being measured. The following attributes are endemic to each standard:

1. Use of a well defined consumer type document for printing – Coverage can vary depending on how it is measured and depending on what choices are made in defining coverage; the same "coverage" page can perform differently. For the ISO/IEC standards, the test pages were defined so that a consumer can more easily relate them to their work stream. These pages are freely available so customers can view and understand what the standard is based on. These test pages can be found at www.iso.org/jtc1/sc28.

2. Testing of multiple printers and cartridges to account for printer and supply variation – There is manufacturing variation not only with how much ink or toner is put in a supply, but how effectively a printing system uses that ink or toner. This usage is also impacted by the specific printer used during test; some printers of the same model will use more or less ink or toner. For this reason, the ISO/IEC standards require a minimum of three cartridges to be used on a minimum of three printers (minimum of 9 cartridges tested). The yield information from these 9 cartridges is reported using a lower 90% confidence bound (LCB) on the mean. This gives a reliable estimate of lowest predicted average yield with 95% statistical confidence. The LCB not only takes into account the average performance of the cartridges tested, but also the breadth of variation in the cartridges and printers tested. The goal is to try and characterize the end user experience taking into account some of the normal variations in printers and supplies.

3. A well controlled printing environment – The environment that a printing system operates in can have an impact on the number of pages printed for a given amount of ink or toner. For laser systems both temperature and humidity can impact the amount of toner used. For this reason both the temperature and humidity are controlled for toner yield testing. For inkjet,

temperature is the main environmental driver for ink usage, so only temperature is controlled during testing.

4. A well defined end of life criteria – For the purposes of the ISO standards, end of life is defined in one of two ways. First, when the printer stops printing and reports that the supply should be changed. The other method requires a visual assessment of elements on the test targets. This visual assessment is defined as a visually significant fade in the target elements greater than 3mm as compared to the 100th print for that cartridge. These two methods are meant to represent the two common criteria that users would choose to determine if a supply has to be changed.

When the publication of the first yield standard occurred in the summer of 2004 it was accepted by industry and consumer's groups as the best method for conveying one attribute of cartridge performance that was of interest to customers. Building on this acceptance, ISO/IEC JTC1 SC28 created additional standards for yield; these have been met with similar market acceptance as the original.

Because well established methods for the measure of cartridge yield exist and weight and volume are not as useful or meaningful in making value comparisons, this group recommends that cartridge performance information be conveyed to customers using the developed ISO/IEC yield standards.

Footnotes to press releases and reception of ISO yield standards:

http://www.pcmag.com/article2/0,2817,2183959,00.asp

http://www.hp.com/hpinfo/newsroom/press/2004/040617b.html

http://www.incits.org/press/2007/pr200701.pdf

Appendix D

NIST Handbook 130 – Uniform Engine Fuels and Automotive Lubricants Regulation

Item:

237-1: 2.1.2. Gasoline-Oxygenated Blends

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Colonial Pipeline Company

January 20, 2012

Mr. Ron Hayes

Colonial Pipeline objects to aligning the RVP 1.0 psi relief in HB 130 with ASTM D4814. D4814 does not address the 1.0 psi for RVP during Non-VOC periods that the EPA addresses. It is Colonial 's understanding that all states along our system grant a 1.0 psi waiver for Non-VOC controlled RVP with the exception of Virginia, which adopts the latest version of HB 130. If this proposal were to go into effect, it would create a unique fuel to the State of Virginia markets.

The Northeast is already seeing multiple refineries shut in, and creating a unique fuel for one state would constrain a supply system and possible create shortages to the consumer.

Regards,

Keith Penn
Quality Assurance Coordinator

Brian Knapp

Marketing Policy Advisor, Downstream

1220 L Street, NW
Washington, DC 20005-4070
USA
Telephone 202-682-8172
Fax 202-682-8051
Email knappb@api.org
www.api.org

January 19, 2012

Laws & Regulations Committee c/o
Judy Cardin, Chairwoman
Wisconsin Weights & Measures PO Box 8911
2811 Agriculture Drive
Madison, WI 53708-8911

Fuels and Lubricants Subcommittee c/o
Ronald G. Hayes, Chairman Missouri Weights & Measures
PO Box 630
1616 Missouri Boulevard
Jefferson City, MO 65102

Re: 2012 Interim Meeting – NCWM Publication 15: Item 237-1
NIST Handbook 130 – Uniform Engine Fuels and Automotive Lubricants Regulation, Section 2.1.2 – Gasoline-Oxygenated Blends

Dear Committee Chairs:

I write today to clarify and expand on the American Petroleum Institute's (API) comments made at the Fuels and Lubricants Subcommittee (FALS) Meeting during the 2011 Annual NCWM Meeting in Missoula, Montana regarding changes to Handbook 130 Section 2.1.2 Gasoline-Oxygenated Blends.

The current NIST Handbook 130 provides a 1.0 psi RVP allowance for 9-10 vol% ethanol during EPA RVP control period (summer) and a 1.0 psi RVP waiver during the remainder of the year for blends of 1-10 vol% ethanol. At the 2011 NCWM Annual Meeting, the FALS provided a new draft proposal that would simply reference the ASTM standard and delete Sections 2.1.2 and 2.1.3.

Removal of the 1 psi RVP waiver for non-VOC gasoline by NCWM would reduce the available gasoline pool by an estimated 2.5 vol%. Additionally, the current 1 psi RVP waiver for E10 has been in Handbook 130 for nearly 20 years, and allowing it to remain preserves the status quo. This waiver has been thoroughly vetted by the states and industry. It was supported by state regulators, the automotive industry and the ethanol industry.

By the end of this January, NIST Handbook 130 and ASTM D4814, Standard Specification for Automotive Spark-Ignition Engine Fuel, will be harmonized for two of the three volatility properties: T 50 min and TV/L = 20. It is requested that for the third volatility property, RVP, the 1.0 psi RVP waiver for non-VOC gasoline be allowed to remain in place until ASTM takes action.

API appreciates the opportunity to provide these further comments, and would be pleased to provide additional information regarding our views on this proposal. Please contact me at (202) 682-8172 if you have any questions.

Sincerely,

Brian Knapp

Madam Chair, L&R Committee Members, Delegates and Associate Members,

My name is Win Gardner. I'm Fuels Quality Manger at ExxonMobil and I appreciate the opportunity to comment on item 237-1 regarding gasoline oxygenate blends. I'm the vice chair of the volatility section of the committee at ASTM which deals with RVP and other volatility properties. And, I have been a member of the Fuels and Lubricants Subcommittee since its inception in the early nineties and worked with Ron Hayes, Curt Williams, Randy Jennings and a few others in this room to hammer out compromise positions on issues like the one we face here. I have always appreciated the willingness of this group to come to middle ground in order to move things forward.

ExxonMobil is opposed to the adoption of the language in Publication 16 for item 237-1.

You've been advised that the FALS did not reach consensus on alternate language for this item. A vote, taken in May, offered three options and FALS members were asked to list their preferred option, other options which were acceptable and those that were unacceptable. The options were... 1) to do nothing, 2) to adopt the language In Pub 16 and a 3) to adopt one that would provide RVP allowances for ethanol blends. There were 20 members who submitted votes.

While no single option garnered enough Preferred and Acceptable votes to stand out against the other options, there was consensus on all of the key aspects of this issue.

Elimination of the 10% ethanol cap – 18 of the 20 members voting found elimination of the 10% ethanol cap to be either preferred or acceptable.

RVP allowances for ethanol blends – 17 of the 20 members voting found RVP allowances to be either preferred or acceptable, although there was disagreement regarding how much of an allowance should be allowed.

Capping Class E RVP at 15.5 psi or less – 15 of the 20 members voting supported options which limited ASTM Class E RVP to either 15 or 15.5 psi.

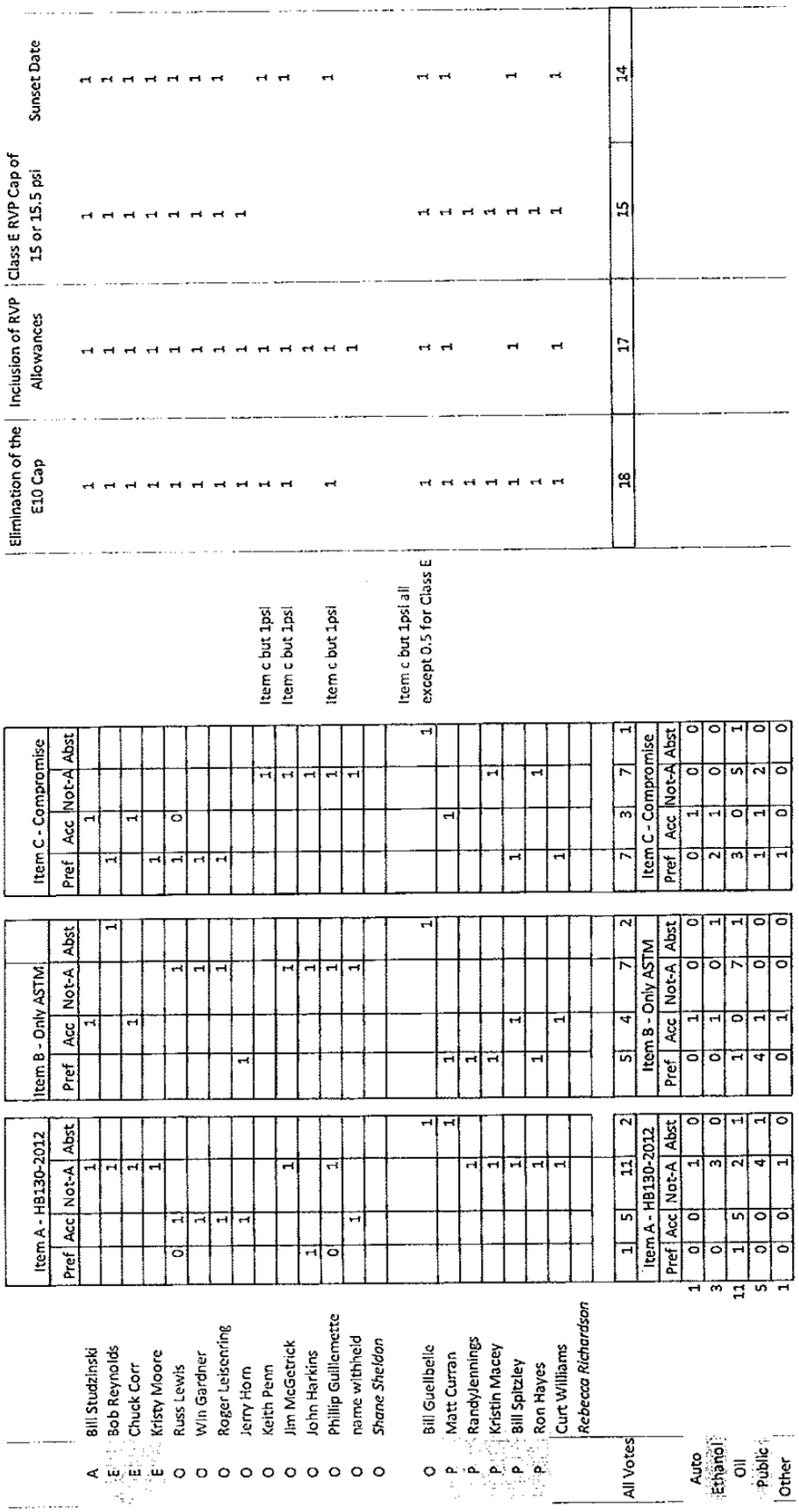
Sunset date for the expiration of RVP allowance - Another area of consensus that has been apparent in the FALS meetings is the desire to align ASTM 04814 with Handbook 130. 14 of the 20 voters expressed support the option which included the sunset date of May 1, 2016 when the RVP allowances would expire.

I've included the tally sheet for the FALS vote, modified to show support for the several key areas of consensus below.

Concluding my remarks, ExxonMobil cannot support the proposed change as it appears in publication 16. We can accept alternative language which maintains RVP allowances, eliminates the 10% ethanol cap, restricts the maximum Class E RVP and sets a sunset date to ensure alignment between Handbook 130 and ASTM 04814. We believe, and have shown, that strong consensus exists for such alternative language.

Thank you for your consideration.

K. W. Gardner
Fuels Quality Manager
ExxonMobil



		Item A - HB130-2012				Item B - Only ASTM				Item C - Compromise				Elimination of the E10 Cap	Inclusion of RVP Allowances	Class E RVP Cap of 15 or 15.5 psi	Sunset Date
		Pref	Acc	Not-A	Abst	Pref	Acc	Not-A	Abst	Pref	Acc	Not-A	Abst				
A	Bill Studzinski			1			1				1			1	1	1	1
E	Bob Reynolds			1					1	1				1	1	1	1
E	Chuck Corr			1			1				1			1	1	1	1
E	Kristy Moore			1						1				1	1	1	1
O	Russ Lewis	0	1					1		1	0			1	1	1	1
O	Win Gardner		1					1		1				1	1	1	1
O	Roger Leisenring		1					1		1				1	1	1	1
O	Jerry Horn		1			1						1		1	1	1	
O	Keith Penn											1		Item c but 1psi	1		1
O	Jim McGetrick			1				1				1		Item c but 1psi	1		1
O	John Harkins	1						1				1			1		
O	Phillip Guillemette	0		1				1				1		Item c but 1psi	1		1
O	name withheld		1					1				1			1		
O	*Shane Sheldan*																
O	Bill Guellbelle				1				1				1	Item c but 1psi all except 0.5 for Class E	1	1	1
P	Matt Curran				1	1						1			1	1	1
P	RandyJennings			1		1								1		1	
P	Kristin Macey			1		1				1			1	1		1	
P	Bill Spitzley			1			1			1				1	1	1	1
P	Ron Hayes			1		1					1			1		1	
	Curt Williams			1			1			1				1	1	1	1
	Rebecca Richardson																
All Votes		1	5	11	2	5	4	7	2	7	3	7	1	18	17	15	14

	Item A - HB130-2012				Item B - Only ASTM				Item C - Compromise			
	Pref	Acc	Not-A	Abst	Pref	Acc	Not-A	Abst	Pref	Acc	Not-A	Abst
Auto	0	0	1	0	0	1	0	0	0	1	0	0
Ethanol	0		3	0	0	1	0	1	2	1	0	0
Oil	1	5	2	1	1	0	7	1	3	0	5	1
Public	0	0	4	1	4	1	0	0	1	1	2	0
Other	0	0	1	0	0	1	0	0	1	0	0	0
	1	3	11	2	5	4	7	2	7	3	7	1

Herman & Associates
3730 Military Road NW Suite 400
Washington, DC 20015
202-362-9520
202-362-9523 f MHerman697@aol.com
www.HermanAssociates.com

July 17, 2012

Ms. Judy Cardin
Chair, Laws and Regulations Committee
National Conference on Weights and Measures

Re: Item 237-1 - Gasoline-Oxygenate Blends

Dear Chairperson Cardin:

We are writing to you to express our support for the alternative proposal submitted by API for Item -237-1 on July 16, 2012.

Herman & Associates is a Washington, DC-based consulting firm with expertise in fuel specifications and regulations. Our company provides legislative and regulatory assistance to a broad spectrum of companies in the transportation and energy sector. In addition, I am a founding member of the NCWM Fuels and Lubricants Subcommittee. I also serve as Chair of the ASTM D02.A Section on Oxygenated Fuels and Components in ASTM which governs standards for ethanol, E85, Mid-Level Ethanol Blends, and other oxygenated fuels.

In particular, we support the API proposal submitted to the Laws and Regulations Committee on July 16, 2012 as an alternative proposal to that incorporated in Publication 16.

The proposed alternative provides the necessary flexibility to permit marketing of gasoline-ethanol blends while providing ASTM the time necessary to review vapor pressure specifications for gasoline-ethanol blends.

Adoption of the proposed alternative language provides a number of benefits:

• **Is Consistent With State Laws and Regulations in 46 States Providing a 1.0 psi RVP Waiver to Ethanol Blended Fuels:** Forty Six states provide ethanol blends a year-round vapor pressure waiver. This proposal would continue that treatment, while providing

the necessary lead-time for ASTM to review volatility standards for ethanol blended fuels.

• **Facilitates Ethanol Marketing:** This proposal provides the necessary flexibility to refiners and marketers by allowing ethanol to be blended with a commercially available gasoline meeting ASTM specifications without major disruptions of supply.

• **Facilitates Compliance with State and Federal Renewable Fuels Mandates:** This proposal will enable marketers to more easily comply with state and Federal Renewable Fuels Standard programs by facilitating the marketing of ethanol-blended fuels. In addition to the Federal Renewable Fuels program, many states have adopted ethanol mandates requiring the use of ethanol blended fuels.

• **Allows for ASTM Review of RVP Allowances for Ethanol-Gasoline Blends:** ASTM is a data driven organization. This proposal provides the necessary lead-time for ASTM to conduct the necessary studies in order to determine what if any changes are required to ethanol vapor pressure standards. The sunset date in the proposal provides the necessary lead-time for ASTM to conduct CRC studies, review the available data, and make determinations regarding modifications to the ASTM D4814 standard for gasoline and gasoline-oxygenate blends.

In conclusion, we support the proposal submitted by the industry and API to revise and update the wording regarding ethanol-gasoline blends in the Uniform Engine Fuels and Automotive Lubricants Regulation in NIST HB 130. Adoption of this proposal will facilitate ethanol marketing while enabling NCWM's model regulation to be aligned with the fuel specifications in 46 states throughout the U.S.

We appreciate the opportunity to provide these comments. Please feel free to contact us should you have any questions or if we can clarify any item.

Sincerely,
Marilyn J. Herman
President, Herman & Associates

ROD LAWRENCE Manager
Quality Control Magellan
Midstream Partners One
Williams Center MD 31
Tulsa, OK 74172 (918) 574-7286
rod.lawrence@magellnalp.com

January 19, 2012

Mr. Ron Hayes
Chairman
Fuels and Lubricants Sub Committee
National Conference of Weights and Measures
1135 M Street, Suite 110
Lincoln, Nebraska 68508

RE: Magellan Midstream Partners Comments – Potential Amendments to Handbook 130 – Engine Fuels and Automotive Lubricants

Dear Ron:

Thank you for the opportunity to provide comments to NCWM's Fuels and Lubricants Sub-Committee.

Background - Magellan owns and operates the nation's longest refined products pipeline system and over 80 petroleum distribution terminals. Our pipeline system transports refined petroleum products from refinery origins in TX, OK, KS, MN and WI to distribution terminals in Texas, Oklahoma, Kansas,
Missouri, Colorado, Arkansas, Illinois, Iowa, Nebraska, South Dakota, North Dakota, Minnesota and Wisconsin. Our pipeline system is connected to over 40% of the nation's refining capacity. The majority of our terminals have the storage and distribution capacity for fuel-grade ethanol.

Magellan does not generally own the petroleum products transported or stored in our system. The petroleum products are owned by our shippers and position holders. The Magellan Pipeline system is an "open-stock" system which depends upon product fungibility. The system is very efficient and appeals to a wide variety of shippers and position holders because of our ability to transport and store large volumes of a common grade of refined products. At this time, the most common grade of gasoline in our system is "N grade" – 87 octane with an RVP meeting ASTM, NCWM and state standards.

While we appreciate the desire to align NCWM's Handbook 130 with the recent EPA waivers regarding higher level ethanol blends, we believe the negative impacts to the supply and distribution of gasoline would be far greater than any benefit associated with harmonizing NCWM with EPA's recent action. Therefore, Magellan is opposed to a proposal under consideration to amend Section 2.1.2.(a)(2) which would eliminate the 1psi waiver for ethanol blends during the winter months. We are opposed to the elimination of the waiver because it would (1) create a boutique fuel in several states (2) reduce pipeline efficiency which would result in supply disruptions (3) reduce gasoline supply by requiring a reduction of RVP and (4) impact the price unsuspecting motorists pay at the pump. Lastly, we are opposed because we are not aware of technical data which would support the need to modify section 2.1.2.

Boutique Fuel – A "boutique fuel" is a specialized fuel formulation that is unique to a particular market, usually by virtue of federal, state or local laws, and that cannot be obtained from other markets in the same regional distribution system. The Energy Policy Act of 2005 (EPACT05) already limits the number of boutique fuel formulations created under Clean Air Act-mandated State Implementation Plans ("SIP" fuels) to the number of fuels available in September 2004. EPACT prohibits EPA from adding to the number of fuel formulations but allows a new formulation when an existing formulation is dropped. EPA's definition of a boutique fuel does not include specific formulations that are a result of renewable
fuel mandates; federal or local. However, the elimination of the 1psi RVP waiver would indeed create the need for a special fuel suitable for ethanol blending.

As an example, if the proposed amendment to Section 2.1.2 was enacted, the state of Kansas would automatically adopt the standard. Therefore, the RVP of gasoline suitable for sale in conventional gasoline areas in the state of Kansas would need to be reduced if a distributor chooses to blend 10% volume ethanol with the base gasoline. This would create a special or boutique fuel.

Fungibility – Our pipeline system delivers gasoline to terminals in Wichita, Topeka, Great Bend, Scott City, Olathe, St. Joseph and Kansas City. With the exception of Kansas City and Olathe, the remainder of our terminals in the state of Kansas distribute N grade gasoline (87 octane) with an RVP which meets the ASTM and state standards. The N grade gasoline can be delivered directly to retail service stations with
or without the addition of 10% volume ethanol. The elimination of the waiver under Section 2.1.2 would create the need for a new product which would be suitable for ethanol blending. In most cases, Magellan does not have adequate storage capacity to accommodate an additional grade of gasoline. A new fuel would require (1) adequate storage and (2) other modifications to the terminal piping and loading rack.

Generally, the addition of a new, special fuel formulation will decrease pipeline efficiency which can lead to increased supply disruptions.

Reduction of Gasoline Supplies – While we are not the experts in this area, the proposed amendment to Section 2.1.2 would require refiners to remove various blendstocks. The components most likely to be removed to reduce the RVP of gasoline are butane and pentanes which are lower in value than finished gasoline. Therefore, available gasoline supply is reduced which can have pricing implications for motorists.

Thank you again for providing Magellan the opportunity to provide comments to the proposed amendments to Section 2.1.2. We encourage the Sub-Committee to reject the proposed amendment at this time.

Sincerely,

Rod Lawrence

Testimony of Russ Lewis, Marathon Petroleum,
at the NCWM 2012 Annual Meeting Open Hearings on July 15, 2012 in Portland, Maine

Madam Chair, L&R Committee members, Delegates, and Associate members of NCWM – Good day.

I am Russ Lewis, a research chemist/supervisor at Marathon Petroleum that manages one of the fuel quality sections for our company. I have worked in fuels quality and quality-related issues for 24 years and am an active member of ASTM, CRC, and NCWM, among several other industry organizations. Marathon does not support the proposed language present in Publication 16 for Item 237-1. This was supposed to have been a placeholder and does not represent a consensus position of the FALS members.

You are going to hear a lot of testimony regarding Item 237-1. All with varying perspectives on what is the right thing to do as a path forward. I would like to take some time to give the background on Item 237-1 and how we got to where we are today.

On August 27, 2010, Kristy Moore of the RFA filed a Pub 15 to revise language of NIST HB 130 to remove the 10% ethanol maximum on gasoline blends. This proposal made no mention of removing the vapor pressure waiver currently in HB 130. The focus of her proposal was to remove the E10 cap from the model regulation.

Ms. Moore's Pub 15 proposal was discussed at the FALS session on Sunday during the interim January 2011 meeting but no decision/consensus was achieved on the proper language to consider at that time. The item remained informational.

Ms. Moore's proposal was again discussed at the July 2011 annual meeting during the FALS session. During this time, Randy Jennings of Tennessee suggested an alternative proposal that would focus on "ASTM D4814 only". Jim McGetrick of BP raised concern about the 1 psi vapor pressure waiver and the potential impact to production. Several other oil companies present affirmed this concern. Oil companies stated that they would need time to review Mr. Jennings alternative proposal to determine potential impacts on production and get back with NCWM. There was no consensus or vote taken during the FALS meeting to accept Mr. Jennings' proposal in lieu of Ms. Moore's as a voting item. When the minutes of the 2011 Annual meeting were published, Mr. Jennings' proposal was listed as a recommended voting item. There was discussion by several FALS members after this was published as to how this became the item moving forward in any form other than Informational.

As a result of this proposed change to the gasoline model regulation, Marathon proposed an alternative to Mr. Jennings' proposal during the annual 2011 SWMA meeting in October of that year. The Marathon proposal would have removed the ethanol cap and continued with the 1 psi waiver during non-VOC season for ethanol-blended gasoline. This was accepted during the SWMA and was recommended to NCWM as an alternative voting item at the 2012 interim meeting.

During the 2012 NCWM interim meeting in January of this year, a very long discussion was held on Mr. Jennings' Pub 16 proposal and Marathon's alternative at the FALS session on Sunday. At the conclusion of the meeting, many of those in attendance thought that consensus had been reached on a path forward that would remove the ethanol cap and keep the vapor pressure waiver in place.

At the Open Session on Monday at the 2012 Interim NCWM, FALS presented language that would have kept the 10% maximum cap in place, while keeping the vapor pressure waiver intact. This resulted in several entities speaking in opposition of the FALS recommendation.

Following the Monday open session at the 2012 Interim NCWM, compromise language based on discussions heard during the Sunday FALS and the Monday Open Session was crafted and circulated for comment to several of the stakeholders. The initial compromise language would have removed the E10 cap, kept the 1 psi waiver in place for all but Class E which would get a 0.5 psi waiver, and put in a sunset date to give ASTM to make changes to the specifications. The initial review of this proposal received general agreement with some word-smithing identified. It was reported to the L&R by the FALS chair that compromise language was being prepared and that something should be available for the annual meeting to consider in place of the Pub 16 proposal by Mr. Jennings. It was understood that this was supposed to be a placeholder for FALS to work toward consensus from the group.

Over the next several months (March – May), multiple teleconferences were held and revisions were circulated to the FALS group. On May 9th, a final compromise proposal was put forward. This language contained "staggered" vapor pressure relief for gasoline classes, removal of the E10 cap, and a sunset date for ASTM implementation. All individuals on the call were asked if they could live with the proposal. No one took exception. It was determined that FALS would send out the proposal for vote.

Once the options were circulated for voting by FALS, additional entities that had not been involved initially had the opportunity to review and weigh in on the items. Several of pipeline companies expressed concerns with the "staggered" vapor pressure approach. As a result of these concerns and apparent changes of heart by a couple of other parties that had been involved in the process, a strong consensus was not reached on any of the options presented. However, most voters were still in agreement that some form of vapor pressure relief is needed and the E10 cap should be removed.

Yesterday during the FALS session, a discussion of roughly 1.5 hours was held on this item. Many "new" stakeholders attended this NCWM as a result of the potential impact to their business. Once the discussion was wrapped up, there appeared to be a general agreement among most of the membership that some vapor pressure relief should remain in place, the E10 cap should be removed, harmonization with ASTM is needed but that time for ASTM to change the specifications should be given and that a sunset date was the appropriate mechanism for NIST Handbook 130. Although it was requested the FALS chair take a vote, no vote was taken (not even a straw vote).

My industry is not trying to impede harmonization with ASTM D4814. Rather we are asking for the time needed to generate the data required by ASTM to make changes to the vapor pressure limits in the

D4814 specifications, similar to what was done for TVL20 and T50 waivers that were previously listed in NIST Handbook 130. We have 20+ years of data suggesting that the currently allowed vapor pressure waiver is not creating customer issues. We heard during the FALS session on Sunday that the TVL20 limits now listed in ASTM further restrict the maximum vapor pressure that can be achieved with ethanol blending. Eliminating this waiver is not in the best interest of the consuming public or the private sector.

It is my opinion that consensus was never established on Mr. Jennings' Pub 16 proposal, either during the July 2011 Annual NCWM meeting or since then (including the vote in May by the FALS group which showed this option with the least amount of support). What is apparent is that if the Pub 16 Item 237-1 is accepted by this body, then significant negative and immediate impact on production and distribution will be observed in the marketplace. Removal of the vapor pressure waiver is estimated to negatively impact 840,000 gallons of gasoline blending components per day during the non-VOC blending period for my company alone.

A compromise position can be reached that will allow for the removal of the E10 cap, keep in place vapor pressure relief that has been in effect for over 20 years with minimal disruption to production/distribution, and put in place a sunset date for implementation of ASTM specification changes which would then harmonize ASTM D4814 and NIST Handbook 130.

With that said, I strongly encourage this body to reject the Pub 16 proposal and consider alternative language that was presented by Prentiss Searles of API.

Thank you for allowing me the opportunity to present this information today.

Russ Lewis
Supervisor
Process Reliability and Development
Refining Analytical & Development
Marathon Petroleum Company

Appendix E

NIST Handbook 130 – Uniform Engine Fuels and Automotive Lubricants Regulation

Item:

237-2: 2.1.5. Minimum Motor Octane Number

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FLINT HILLS resources®

January 9, 2012

Ms. Judy Cardin, Chair
National Conference on Weights and Measures
Laws and Regulations Committee
2811 Agriculture Drive, PO Box 8911
Madison, WI 53718

Dear Ms. Cardin,

We have reviewed L&R item 237-2 Section 2.1.7. Minimum Motor Octane Number. and the comments from the regional weights and measures associations as published in the NCWM Publication 15. We are in agreement with the report from the 2011 Southern Weights and Measures Association L&R Committee and the two exceptions they cite; keep the 1.0 psi waiver in 2.1.3.a. and modify 2.1.2.a 2 by changing 10% ethanol to 15% ethanol.

We support this proposal with the two exceptions as a reasonable approach to harmonize NIST Handbook 130 with ASTM D4814 without significantly increasing refinery costs that could potentially lead to decreasing supplies.

Thank you for the opportunity to comment on this proposal.

Sincerely

Rita H. Hardy
VP Quality and Compliance

cc: Don Onwiler, NCWM Executive Director
1135 M Street, Suite 110
Lincoln, Nebraska 68508

4111 East 37th Street North- Wichita, Kansas 67220- P.O. Box 2917- Wichita, Kansas 67201

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Appendix F

NIST Handbook 130 – Uniform Engine Fuels and Automotive Lubricants Regulation

Item:

237-3: 3.1. General Considerations, 3.1.X. Nozzle Color Requirements for Fuels
3.3. Diesel Fuel

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MPCA

Missouri Petroleum Marketers & Convenience Store Association

205 East Capitol Avenue, Suite 200 • Jefferson City, Missouri 65101
Phone 573.635.7117 • Fax 573.635.3575 • www.mpca.org

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Michelle Hoerstkamp, Washington
Clark Houghton, Kaiser*
Tom Kolb, Jefferson City*
Gary Litzsinger, Sr., Arnold
Steve Madras, St. Louis
David Mangelsdorf, Barnhart*
Don McNutt, St. Louis*
Ryan McNutt, St. Louis
Dave Milligan, Overland Park
Steven Miltenberger, Jefferson City
Joe Naegler, Springfield
Chris Patterson, Lee's Summit*
Lane Patterson, Lee's Summit
Brian Suter, Kansas City
Ken Suter, Sr., Kansas City*
Laura Younghouse, Cape Girardeau

*Active Past President Directors
** Ex-Officio

To: NCWM & CWMA L&R Committees
From: Ronald J. Leone, Executive Director
Date: April 25, 2011
Subject: Motor Fuel Nozzle Color

The Missouri Petroleum Marketers and Convenience Store Association (MPCA) is a 350+ member statewide trade association which represents the majority of the convenience stores, gas stations and petroleum marketers located in and around Missouri.

MPCA fully supports a national motor fuel nozzle color rule designed to reduce misfuelings by making motor fuel nozzle colors consistent, uniform & predictable across the country.

Sincerely,



Ronald J. Leone
MPCA Executive Director
C: 573.864.5189

January 19, 2012

Judy Cardin
Chairwoman, NCWM Laws and Regulations Committee
Wisconsin Dept. of Ag & Consumer Protection
PO Box 8911, 2811 Agriculture Drive
Madison, Wisconsin 53708

Lisa Warfield and David Sefcik
NIST
Office of Weights and Measures
1000 Bureau Drive Stop 2600
Gaithersburg, MD 20899-2600

Dear Chairwoman Cardin, Mrs. Warfield and Mr. Sefcik:

The undersigned organizations, representing thousands of small business petroleum marketers, truck stop operators and convenience store owners, would like to thank you for your efforts to address important issues relevant to our industry during the National Conference on Weights and Measures (NCWM) interim and annual meetings. We are writing you today to urge you to withdraw items 237-3 Section 3.1 *Standardized Colors for Nozzles* and 237-8 *Section 4.3. Dispenser Filters* from the NCWM Laws and Regulations Committee agenda. We believe that both items are not practical and could potentially lead to unintended consequences on our member companies and their customers.

237-3 Section 3.1 Standardized Colors for Nozzles

Preventing consumer misfueling is important to our member companies; however, 237-3 Section 3.1 *Standardized Colors for Nozzles* is unnecessary and outside the scope of the NCWM mission. Regulations are already in place requiring clear, conspicuous labeling for consumers, and there is no evidence that color coding will be any more effective in preventing misfueling. Fuel retailers go to great lengths with conspicuous labels and separate dispensers, in some cases, to ensure customers know what fuel they are dispensing. Adding measures designed to remove conscious decision-making on the part of the costumer regarding their fuel choice is the incorrect precedent to set given the future availability of many different automotive fuels (i.e., ethanol blends, biodiesel blends, biobutanol, etc.) It is important that consumers remain engaged in the refueling process.

Furthermore, an additional precedent that this proposal sets is one where each fuel is assigned a specific color in order to "alert" consumers. There are not enough distinct colors to accommodate all the different types of fuel a marketer currently is selling or mandated to sell, such as ethanol blended fuels. Additionally, this precedent would eliminate the ability for uni-hose dispensers because these dispensers dispense multiple types of fuel from one nozzle.

Finally, our associations believe the NCWM is attempting to go beyond their scope of mission, which is the "development and implementation of uniform and equitable weights and measures standards." Regulating nozzle size for the purpose of preventing misfueling has nothing to do with weights or measures standards in the opinion of the undersigned organizations.

237-8 Section 4.3. Dispenser Filters

Our associations also oppose item *237-8 Section 4.3. Dispenser Filters* which would mandate a 10 micron or smaller nominal pore-sized filter for diesel fuel dispensers. This change is unnecessary. The diesel engines on trucks are equipped with two or three filters, which are more than adequate in filtering out any impurities. As biodiesel blends continue to be more frequently used in the marketplace, smaller filters may also clog due to the fuel's properties, especially in colder climates. In addition, a 10-micron filter will slow the fueling process by 50 percent or more. This additional time in refueling could be costly to the trucking industry. With federal regulations limiting the hours-of-service that commercial drivers can operate their trucks, saving time during fueling is critical. Any lost time resulting from a slower refueling process could increase waiting time in the fueling lanes at truck stops, resulting in traffic backups in the lanes, jeopardizing safety and increasing idling time.

Our associations agree with the Western and Southern Weights and Measures Regions' position that item 237-8 be withdrawn from the agenda.

Sincerely,

American Petroleum Institute, API
NATSO, Representing America's Travel Centers and Truckstops
NACS, The Association for Convenience and Fuel Retailing
Petroleum Marketers Association of America, PMAA
Society of Independent Gasoline Marketers of America, SIGMA

From: Cardin, Judy L - DATCP
To: ncwm-laws-and-regulations@lists.ncwm.net
Subject: [ncwm-laws-and-regulations] FW: Uniform Color for Nozzles
Date: Thursday, January 26, 2012 6:09:31 PM

This came on Monday.

-----Original Message-----
From: MRight@aaamissouri.com [mailto:MRight@aaamissouri.com]
Sent: Monday, January 23, 2012 11:18 AM
To: Cardin, Judy L - DATCP Cc:
Ron.Hayes@mda.mo.gov Subject:
Uniform Color for Nozzles

Please accept this email as our endorsement of the proposal by the Missouri Department of Agriculture for standardized colors for gasoline and diesel dispensing nozzles and a minimum diameter for diesel dispensers.

With the expanded array of fueling options, motorists are often confused by the complexities of information on the pumps and an alarming number of motorists are misfueling their vehicles, costing hundreds of dollars in needless repairs.

The proposal before your group would offer a significant step in helping to protect consumers from the growing complexities of fuel options that can have expensive and hazardous consequences if an inappropriate fuel choice is made.

Thank you for your consideration of our views on this important consumer protection regulation.

Mike Right, Vice President, Public Affairs, AAA Missouri.

Appendix G

NIST Handbook 130 – Uniform Engine Fuels and Automotive Lubricants Regulation

Item:

237-5: 3.15. Biodiesel and Biodiesel Blends

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Product Transfer Documentation: Biodiesel Current Status and Considerations

Prepared by Steve Howell and Sam Bell as background for discussion with the Biodiesel Product Transfer Document Working Group of the Fuels & Lubes Subcommittee of NCWM.

It has not been approved or sanctioned by the Fuels & Lubricants Subcommittee or by NCWM. The options for consideration are not exhaustive. Additional background and options for consideration are being solicited and are encouraged.

Original Draft: January 16, 2012; Last updated January 22, 2012.

Biodiesel Industry Background

Biodiesel is a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats which meets the requirements of ASTM D6751, 'Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels'. Biodiesel is intended to be used in equipment or applications that currently use petroleum based diesel fuel or heating oils. Biodiesel can be used as a pure fuel, or as a blend with conventional petrodiesel as it blends completely with petrodiesel in any percentage and does not come out of solution even in the presence of tank water bottoms. Most biodiesel used today is in blends of B20 or less with petrodiesel.

Biodiesel, being made from fats and oils produced each year as natural by-products of producing food (high quality meats or seed oil meal such as soybean meal), is a renewable, domestically produced fuel. Biodiesel use reduces particulate matter, unburned hydrocarbon and carbon monoxide emissions compared to petrodiesel when used in un-modified diesel engines, and also reduces NOx in home heating oil applications. Biodiesel was recently certified by US EPA as an 'Advanced Biofuel' under the new Renewable Fuel Standard-2 program and is a low cost compliance option for RFS2 'obligated parties' (i.e. petroleum refiners) to meet the Bio-mass based diesel and Advanced Undifferentiated Biofuels requirements of the RFS2. These two category requirements ramp up over time, reaching a total fuel requirement of 5 billion gallons by 2022.

Since biodiesel is produced domestically it creates domestic jobs, reduces dependence on foreign oil, and reduces the overall US trade deficit. According to the National Biodiesel Board, 800 million gallons per year of biodiesel production support over 31,000 domestic jobs, while 2.5 billion gallon per year would support 74,000 domestic jobs.

Lastly, B20 and lower blends can be transported, stored, blended and dispensed using the same equipment as conventional petrodiesel. Biodiesel blends (B5) are currently being transported in pipelines that carry jet fuel in Europe as well as non-jet pipelines in the US. Efforts are currently underway to facilitate biodiesel blend pipeline shipments in jet lines in the US as well.

All of these factors have given rise to increasing biodiesel use in the US, with over 1 billion gallons of B100 produced and used in the US in 2011. At present, installed biodiesel production capacity exceeds 2 billion gallons or pure biodiesel (B100) per year, and the National Biodiesel Board has provided comments to the US EPA that there is a sufficient current supply of oils and fats available for biodiesel production to allow the industry to supply 2.5 billion gallons of B100 by 2017.

Current status of ASTM Specifications and Previous Deliberations on Blend Content Disclosure

The effort to develop an ASTM specification for biodiesel began in 1993. The biodiesel specification was developed as a performance specification in a similar way as ASTM has developed specifications for petroleum based diesel fuels (petrodiesel for short).

For traditional petrodiesel, the specification is based on the properties necessary for proper engine operation and not on the particular crude oil, refinery unit operations, or blending done to achieve the final petrodiesel product. As long as it meets the performance specifications identified in D975 it is an acceptable fuel. In addition, there are two grades of D975 fuel used for conventional diesel engines, No. 1 and No. 2. Even though blending No. 1 and No. 2 diesel fuel is common—especially in northern parts of the country in the winter—there is no separate set of specifications for blends of No. 1 and No. 2 petrodiesel. If the No. 1 meets spec, and the No. 2 meets spec, then the two may be blended in any percentage and used in conventional engines without re-analyzing or checking fuel properties.

Following the lead and example of the petrodiesel industry, the biodiesel (B100) specifications were based on the properties needed for proper engine operation and not on the vegetable oil or animal fat feedstock, biodiesel processing options, or blending done to achieve the final B100 product. The B100 specification (approved as D6751 in 2001) was also based on precedent set by petrodiesel as far as blending with petrodiesel was concerned. If the B100 met specification and the petrodiesel met specification (either No. 1 or No. 2) then biodiesel and diesel fuel may be blended in any percentage and used in conventional diesel engines without re-analyzing or checking fuel properties.

Although Europe had experience with B100 as a pure fuel, most experience in the US was with B20 blends or lower. So in the end, ASTM members voted to change the biodiesel specification to a blend stock specification intended for B20 use and lower. Users should consult their engine manufacturer for use of D6751 in blends higher than B20. Passage of D6751 in 2001—and the use of the 'if the parent fuels meet their specifications the two can be blended' philosophy—provided a base set of quality procedures which allowed the industry to thrive. Soon after the initial specs passed in 2001, OEM's, regulators, and users requested ASTM go ahead and develop finished product specifications for biodiesel blends as it was difficult to determine if a biodiesel blend was acceptable if the parent fuel analysis was not known or available.

After significant deliberation, ASTM modified the existing petrodiesel specification ASTM D975 to include the allowance of up to 5% biodiesel meeting D6751 prior to blending as a fungible component into the D975 performance specification in 2008. No changes were made to the test methods or parameters in D975 for the B5—the finished biodiesel blend must meet all the same requirements as petrodiesel did previously. Biodiesel is now just considered one of a variety of blending compounds at the disposal of refiners and blenders, as the engine does not care if the blend contains 1% or 5%--it all meets the same performance standard, ASTM D975. As part of the balloting and deliberation, however, significant changes to the D6751 standard were required before the ASTM committee agreed to modify D975 to include up to B5. An oxidation stability parameter was added to D6751, the acid number was lowered, and further controls were required on veg oil and animal fat minor components—those which can be found in vegetable oils and animal fats but which aren't found in petrodiesel and are not therefore measured in petrodiesel.

ASTM decided the B6 to B20 standard would need to be a separate specification, since the committee determined B6 to B20 should contain additional parameters for acid number and stability that are not found in D975. It passed in 2008 as D7467. The B6 to B20 specification, D7467, is also a performance based specification not dependent on the blend level as the engine doesn't care whether the blend contains 6%, 11%, or 20%. With little experience and only small use of blends over B20, very little work has been done on finished specifications higher than B20 at ASTM.

While the biodiesel levels must be maintained within the stated values of D975 or D7467, and this is a requirement of the specification, the specifications do not require the exact blend level to be reported for either D975 or D7467. This is because ASTM sets performance based specifications and as long as the blend falls within the specification sufficient engine performance does not depend on the exact blend level. There was also a strong desire among the ASTM members to maintain the low cost, fungible, performance based nature of the ASTM specifications so there was no need to re-analyze any property of the fuel after blending or co-mingling two compliant fuels together. Requiring the reporting of the exact blend level would require re-analysis for the blend level in order to provide that information each time two D975 fuels or two D7467 fuels were blended or co-mingled. Negatives were cast on both the D975 and on D7467 ballots suggesting the exact blend level of biodiesel should be a requirement. These negatives were overwhelming voted non-persuasive using the reasoning stated above.

Subsequent to the passage of the blend specifications in 2008, ASTM received a comment from members of the truck stop industry that adding 5% biodiesel to diesel fuel already containing an un-disclosed amount of biodiesel may cause the resulting blend to fall outside of D975, and they requested changes in the ASTM standard to address this issue. After much deliberation and several ASTM subcommittee ballots on the wording, the subcommittee passed ballot wording below which was aimed at addressing the concern. Some members thought the information was redundant, but the ASTM members were willing to put in the

wording to show support for the truck stop industry. The proposed wording in D975 (a similar version was balloted for D7467) was:

> "A D975 compliant diesel fuel may contain up to 5 vol% biodiesel without declaring the biodiesel content. Therefore those blending biodiesel into a D975 compliant fuel to produce a D975 compliant diesel fuel are cautioned to confirm the biodiesel content of base diesel fuel or of the resulting blended product in order to ensure that the final blend does not exceed the maximum allowable biodiesel content of 5 vol%."

Very few negatives were received on this wording at the ASTM D2 main committee level indicating good overall support for the additional informative wording. In the end this wording was not adopted by ASTM at the request of different members of the truck stop sector, the standard was left as-is (i.e. no reporting requirement for exact blend level) and further discussion of the issue was dropped from consideration.

Current status: Federal Trade Commission (FTC) Labeling Requirements

In 2008, the Federal Trade Commission amended the Fuel Rating Rule - 16 CFR Part 306 – to incorporate specific labeling requirements for biodiesel and all biomass-based diesel fuels above 5 percent concentration, as required by Section 205 of the Energy Independence and Security Act of 2007 ("EISA"), 42 U.S.C. 17021. The Fuel Rating Rule designates methods for rating and certifying fuels, as well as posting the ratings at the point of sale. The Rule also requires refiners, importers, and producers of any liquid automotive fuel to determine that fuel's "automotive fuel rating" before transferring it to a distributor or retailer. In addition, any covered entity, including a distributor that transfers a fuel must certify the fuel's rating to the transferee either by including it in papers accompanying the transfer or by letter. Finally, the Rule requires retailers to post the fuel rating by adhering a label to the retail fuel pump and provides precise specifications regarding the content, size, color, and font of the label.

The Commission received 12 comments in response to its March 2, 2009 Federal Register Notice of changes to the Fuel Rating Rule. The comments generally supported the Rule but proposed several amendments, focusing on three key issues, only one of which was related to biodiesel or biomass-based diesel. Commenters urged the Commission to change its biodiesel fuel provisions in two ways: 1) by requiring producers to rate (i.e., specify exact blend level) biodiesel blends at or below 5 percent concentration; and 2) exempt biomass-based diesel (or non-ester renewable diesel) from the Rule.

On March 16, 2010, the Commission published a Notice of Proposed Rulemaking (NPRM) responding to the commenters' suggestions including a response to the two issues pertaining to biodiesel and biomass-based diesel. The Commission did not propose revising the Rule's biodiesel fuel provisions. The Commission explained that rating blends at or below 5 percent would unnecessarily burden producers and distributors by requiring them to rate fuel that does not require a label under EISA and that retailers blending biodiesel did not

need such rating and certifications to comply with the Rule. The Commission found that although the Rule may burden small businesses, adopting the proposed change would increase the OVERALL rating burden on industry. Currently, the Rule does not require rating or labeling of blends at or below 5 percent concentration. Under the commenters' proposed change, however, ALL manufacturers would have to rate these blends regardless of whether retailers would eventually use them to create a fuel subject to the Rule. The Commission found that the commenters had not provided evidence showing that the burden on retailers who blend a fraction of this fuel would be greater than the burden they propose putting on manufacturers to rate ALL of it. Therefore, the Commission declined to require rating on blends of 5 percent and below.

With regard to other biomass-based diesel fuels (or non-ester renewable diesel), the Commission defines biomass-based diesel as any "diesel fuel substitute produced from nonpetroleum renewable resources that meets the registration requirements for fuels and fuel additives established by the Environmental Protection Agency," without limitation, including limitations regarding co-processing. Thus, all renewable diesel blends discussed in the record are "biomass-based diesel blends" under EISA, and there is no inconsistency in treatment. Therefore, the Commission declined to exempt or distinguish any difference for non-ester renewable diesel.

Therefore, NCWM should consider adding a section for non-ester renewable diesel that mirrors the same exact wording as the biodiesel section in Handbook 130.

Consumer needs/considerations:

The needs of consumers to know the content of biodiesel in the fuel they buy falls into two general areas.

One area is the need for a consumer to know the biodiesel blend level in order to determine if that level is recommended, supported, or approved by the particular equipment they plan to use the fuel in. At present, all manufacturers support the use of B5 in diesel engine applications, while a little over 60% support up to B20 blends and an even lower percentage supporting blends over B20. The ASTM specifications mirror this, with blends up to B5 considered fungible fuels with conventional petrodiesel (ASTM D975), B6 to B20 blends falling under D7467, and there being no separate ASTM specifications for biodiesel blends over B20. The proper affixture of the FTC label on a public pump—which is now a Federal legal requirement in all states in US—is sufficient to meet this consumer need and is already supported by marketers, petroleum refiners and biodiesel producers. This need could be considered a consumer requirement, and information to facilitate the proper labeling of consumer pumps on product transfer documents seems appropriate for a model regulation by NCWM.

The second area is one of a more general desire of a customer to know how much biodiesel is in the blend they are using for reasons outside of the vehicle warranties mentioned above.

Some customers may want to only purchase B20 so they maximize their usage which is supported by their OEM, or some may wish to use a minimum of B2 to insure the fuel has proper lubricity, or some may want to use blend levels higher than B5 to maximize the emissions and carbon reductions which can be garnered through the use of higher blends of biodiesel. These needs can be considered more of a desire than a requirement, and may or may not be appropriate for a model regulation by NCWM depending on the number of customers who desire such information vs. the cost of providing it to every customer. Some consumers may want to pay additional for the information and some may not, so the greater good of the consumer needs to be taken into account.

For purposes of this discussion cold flow properties are not taken into account, as the cold flow considerations and needs by consumers are the same for biodiesel blends as they are for petrodiesel. Therefore, consumer information on cold flow properties for biodiesel blends and petrodiesel should be exactly the same and there is no need for NCWM to treat them differently.

Other needs for blend content declaration:

In some states, statewide legislation providing usage requirements or incentives have been put into place. This varies widely by state, but for the most part each piece of legislation specifies or requires a certain blend level to meet the legislation. Some states require that a minimum of 2% or 5% biodiesel be used, while others provide incentives only if the biodiesel content is over a certain value (i.e., 1%, 2%, 11%, 20%, etc.) or the incentives are based upon how much biodiesel is actually used (i.e., using 10% yields more incentives than use of 2%).

In these states, the nature of the use requirements or incentives may have already caused state legislation mandating blend level disclosure. Or, the state legislation may have provided the impetus for private companies to provide blend level declaration on product transfer documents of the exact level of biodiesel or declaration of a minimum biodiesel level as either a means to secure an incentive or as risk mitigation to potential penalties. For the most part, whether by state legislation or private market force, biodiesel blend content is already being placed on product transfer documents to meet these needs without further action by NCWM on a national basis. In addition, it is difficult for these requirements to be placed into an NCWM model regulation for the entire country as they vary widely from state to state and are constantly changing based on the legislative branch in each state.

Other considerations, RFS2:

The Congressionally mandated Renewable Fuel Standard-2 places requirements on large refiners and importers of petroleum products (so called ‘obligated parties’) to insure that increasing levels of renewable biofuels are used in the US each year. Certain requirements are placed on each individual biofuel that is eligible for the RFS2, largely based on the life cycle reduction of CO2 compared to its petroleum based counterpart. Each obligated party is required to manufacture or purchase increasing amounts of RFS2 qualifying biofuels and

see to it the increasing RFS2 mandated levels are incorporated into the fuels sold in the US each year. In addition to the other requirements mentioned, the RFS2 program contains requirements for four different categories of fuels. Biodiesel produced today fits under two of the four categories, 'Biomass Based Diesel' and 'Advanced Biofuel--Undifferentiated'. The biomass based diesel category requires 1 billion gallons in 2012, and the advanced biofuels—undifferentiated category ramps up over time eventually requiring an additional 4 billion gallons by 2022. In order to facilitate the most cost effective means to achieve the RFS2 volumes, EPA worked with the obligated parties, biofuel producers, and other stakeholders to determine how best to implement the RFS2 volumes.

As part of this effort, EPA determined they would allow obligated parties to purchase credits for renewable fuels from other obligated parties who had over-complied, or from those who used fuel but were not covered by the program as an obligated party. To manage this effectively, EPA set up a kind of renewable fuel currency called a 'Renewable Identification Number'. Renewable fuels produced or imported in the US generate a unique RIN value ranging from 1 to 2.5 RIN's per gallon and biofuels producers or importers must submit paperwork on these gallons to EPA and make the RINs available to the obligated parties. At the end of the year, each obligated party must report to EPA the RIN numbers of the renewable fuels they have incorporated and used—along with those they have purchased from others who may have over-complied—in sufficient number to meet their individual RFS2 requirement.

The buying and selling of RINs has provided a unique environment for biodiesel blenders/marketers, petroleum refiners, and biodiesel producers. From a layman's perspective, downstream fuel blenders who are not covered by RFS2 can purchase biodiesel with RINs attached and then sell the RINs on the open market to obligate parties or other traders. Alternatively, a biodiesel company can sell biodiesel with the RINs detached and sell the RINs on the open market—or a variety of choices in between. At the end of 2011, the RIN values for biodiesel were in a range equating to around $2/gallon of biodiesel. The RIN market is still relatively young, but the value of the RIN allows biodiesel to be priced similar to petrodiesel (or less than petrodiesel in some cases), or it value has been used to facilitate blending infrastructure and marketing of biodiesel blends where it was not profitable to do so previously.

The RFS2 and the resulting RIN value has heightened the discussion on blend level disclosure on product transfer documents. It will be necessary to either know the blend level of the petrodiesel before blending—or measure the blend level afterward—to determine which FTC label to utilize for a public dispenser if one is going to add more biodiesel and benefit from the RIN values facilitated by RFS2.

Biodiesel blend testing technology:

ASTM has approved D7371 as the referee test method for determining biodiesel blend concentration. It utilizes mid infrared equipment (FTIR-ATR-PLS Method) that is normally

suited for a chemical lab environment. Method EN14078 used in Europe can also be used, as it is also a mid IR method. Several advances in rapid analysis technology more suitable for field determinations (suitcase type analysis) to analyze biodiesel blends as an alternative to the mid IR have occurred over the past two years. The following field methods are currently in use in the field and are being used as screening instruments for biodiesel blenders.

Wilks Enterprise InfraCal Biodiesel Blend Analyzer
Miniscan IRXpert (new technology to IROX Diesel)
Petrospec by Ametek

At a biodiesel technical workshop in November, one pipeline company reported positive experience with the Wilks unit in the field (approximate cost $6,000 to $7,000), with the unit being reliable and providing accurate values. Wilks is in the process of securing an ASTM test method number that will cover its technique for blend level determination, and will request it be added as an official option in the ASTM specifications once complete.

There are two additional industry developments of interest. Veeder Root is in the process of developing an option to add biodiesel blend level testing capability to their existing tank level controls and/or leak detection equipment for storage tanks. Kam Controls is in the process of commercializing an in-line piece of pipeline equipment that will provide instantaneous values of biodiesel blend content down to the ppm level. While neither of these units is commercially available at the present time, they may represent significant steps forward in blend level testing technology.

One of the major issues in this discussion is who will pay for the equipment to run the testing and how much effort the test will take to run in terms of overall 'time to result', personnel time for sampling and running the analysis, and out of pocket disposables for the test.

Continued development of quick, inexpensive field tests for biodiesel blend level determination—or of in-line or on-tank equipment that takes little time to get a result and essentially no on-going manpower—will help to facilitate the cost effective procurement and sharing of blend level data. This should be encouraged.

In addition, in the past there have been significant federal grants and funding available for support and development of alternative fuel vehicles or infrastructure. Use of this type of funding for the purchase and installation/use of biodiesel blend level testing equipment could be of significant assistance in facilitating the cost effective documentation of biodiesel content in petrodiesel.

Summary: Downstream Marketer/Blender Comments/Desires for Blend Level Documentation

In general, downstream marketers and blenders active in deliberations have been various state based petroleum marketers or convenience store associations and the national PMAA

group. Additional interactions have occurred with individual marketers in preparation of this document.

The most common feedback from these groups in deliberations at NCWM is the desire to have the exact biodiesel blend concentration declared at all points in the distribution system. This would include invoices, bills of lading, shipping papers, and product transfer documents. Disclosure of specific blend content would help to facilitate blending more biodiesel into petrodiesel downstream as no biodiesel measuring equipment would be needed downstream. Accurate record of the amount blended, and the initial biodiesel content, would be sufficient to provide the information needed to label the product at the pump as D975, D7467 or with content higher than B20. It would also help to avoid potential over-blending (and the various liabilities associated with over-blending such as mis-labeling, equipment compatibility, or breach of supply contract) if the base D975 fuel already contained some level of biodiesel and the biodiesel added by the marketer is sufficient to put the product in a different specification category.

If exact blend level is not disclosed, marketers wishing to add more biodiesel to a D975 fuel and sell the biodiesel as a D975 fuel will need to perform an analysis on the fuel prior to blending (or after blending) as adding more biodiesel to diesel fuel already containing biodiesel may cause the fuel to be outside of the D975 ASTM specification. This sampling and testing will require each marketer to purchase equipment and provide staff to take the sample and conduct the analysis prior to adding more biodiesel. Alternatively, the marketer can take a sample and ship it to an outside laboratory for analysis. From a practical basis, marketers may not be in a position to hold fuel while the analysis is being conducted either internally or by an outside laboratory unless sufficient isolated storage is available. Marketers would also either need to pass the cost associated with the analysis onto their customer or add these costs to their expenses, neither of which are desired by the marketer unless the added value of marketing biodiesel and garnering of the RIN value outweigh the costs.

If exact blend level is not disclosed, marketers wishing to add more biodiesel to a D975 fuel and sell the biodiesel as a D7467 fuel will need to conduct an analysis prior to blending in order to determine the amount that needs to be added so the finished fuel falls between 6 and 20 % biodiesel. Alternatively, the marketer can add a minimum of 6 % biodiesel or a maximum of 15 % biodiesel to a D975 compliant fuel and be assured the fuel will still fall within D7467.

In areas where there is significant downstream blending, it may be more cost effective for the consumer for the terminal or bulk supplier to purchase the testing equipment and conduct the blend level analysis for downstream petroleum marketers who wish to blend in more biodiesel than for each downstream marketer to purchase the same piece of equipment and conduct the analysis themselves.

Summary: Upstream Petroleum Refiner Comments/Desires

In general, upstream petroleum refiners active in deliberations have been individual refiner companies and the API. Additional interactions have occurred with the pipeline companies as part of the development of this document.

The most common feedback from this sector is for the inclusion of ranges of biodiesel content consistent with and necessary to meet the FTC required labeling provisions, but not the exact blend level. In addition, the blend range should not be required on all transfer documents—only those documents necessary for their customers to be able to label the pump properly. Requiring the disclosure of exact biodiesel content would mean taking a sample and re-analyzing for blend content every time two D975 fuels were blended or co-mingled, or every time two D7467 fuels were blended or co-mingled—regardless of whether additional biodiesel will be added downstream. This co-mingling can happen at a refinery storage tank, at a pipeline terminal tank, at a bulk blending tank, or through various other activities of the downstream marketers. Allowance of co-mingling of product meeting the same specification without re-analysis is a key factor in reducing the cost to the end user while still providing fuels that meet the required ASTM specifications.

This market sector believes if an entity receives a D975 fuel and chooses to blend in more biodiesel, then it should be that entity's responsibility—or their liability—for determining whether the fuel remains a D975 fuel, should be classified as D7467, or classified as over B20. To require exact blend level disclosure on all diesel fuel would place the cost burden on all diesel consumers, whether or not more biodiesel was being added to the fuel they receive. At present, there are many more cases where diesel fuel is co-mingled than there are cases where more biodiesel is planned for blending into petrodiesel. Exact blend level disclosure—and the resulting additional testing it would require—could increase the cost of fuel to many customers for the benefit of relatively few. This market sector also brought up the issue of whether the FTC regulation (16 CF 306.4) preempts state laws that are not the same as the FTC rules.

Blends up to B5 are commonly transported in pipelines in Europe, including those that carry jet fuel provided the biodiesel found in jet fuel is no higher than 5 ppm. Biodiesel blends are also being transported via pipeline in the US, but only on pipelines that do not carry jet fuel at present as the 5 ppm level in jet is harder to maintain in the US pipeline system. Work is underway to increase the allowable level of biodiesel in jet fuel to 100 ppm, which may be sufficient for more common use of biodiesel blend transport in US pipelines that also carry jet fuel—especially as biodiesel volumes rise due to the RFS2. Pipeline transport is the least expensive means of fuel transport, and as the biodiesel industry grows refiners expect more biodiesel blends will be transported on the US pipeline system.

If the exact blend level within each grade of biodiesel (D975, D7467, over B20) is required to be disclosed then each pipeline terminal tank, bulk blending tank, or other location throughout the downstream distribution chain will need to perform an analysis on the fuel

every time product is sold from that tank if new fuel has been introduced since the last test. This will require the tank owner to purchase testing equipment and provide staff to take the sample and conduct the analysis prior to adding more biodiesel. Alternatively, the tank owner can take a sample and ship it to an outside laboratory for analysis. From a practical basis, the tank owner may not be in a position to hold fuel while the analysis is being conducted either internally or by an outside laboratory unless sufficient isolated storage is available. It may also be very difficult to secure samples from many of these tanks as they aren't normally sampled, the tanks may be stratified with fuels of different batches with differing biodiesel concentrations (all meeting specification), or the tanks may be manifolded where the product going to the rack actually comes from several tanks at the same time each with different biodiesel concentrations.

Tank owners would also either need to pass the cost associated with the analysis onto their customer or add these costs to their expenses, neither of which are desired by the tank owner. This is especially true when the tank owner does not derive any of the financial benefit from the subsequent blending of biodiesel downstream.

Alternatively, tank owners can stipulate that no biodiesel be contained in pipeline shipments or incoming diesel fuel loads they receive (and thus avoid the need for testing equipment or sampling) or they can segregate storage tanks or build new tanks for biodiesel blends of sufficient capacity and design (i.e. recirculation or in tank stirring) to be able to sample and analyze for biodiesel content prior to shipment to a customer.

Options for Consideration:

At a minimum, in order to meet federal biodiesel labeling requirements sufficient information should be provided by the seller to allow the placement of a proper FTC label should the buyer choose to market the fuel purchased to an end consumer. Therefore, the absolute minimum required to meet this need is to identify whether the fuel falls under D975 (i.e. B5 or less), D7467 (i.e. B6 to B20) or whether it fall over the B20 level. The current wording in Handbook 130 contains this information, so any future wording should also contain at least this minimum information.

If more biodiesel is to be added to petrodiesel, the biodiesel content in the existing fuel will either need to be known or measured at some point, or the fuel will need to be measured for biodiesel content after blending. To do so will require added expenses, additional record keeping, or both.

The question in front of NCWM is whether it is in the best interest of the consumer to be more prescriptive on how this blend level information should be managed and to recommend that to the entire country via Handbook 130, whether the decision on how prescriptive should be left to individual states, or whether it is in the best interest of the consumer to let the management of that information be left to the private market.

In order to modify Handbook 130, and thus make a recommendation for the entire country, all of the above information should be taken into account to help determine what is in the best interest of the consuming public.

There have been several options laid out or suggested for wording that would address various needs or requests for biodiesel blend content disclosure as model language for the entire country in Handbook 130. As a starting place for more detailed discussion and negotiation, all the general options—and a few new ones—are outlined below:

A. Add a requirement for specific blend level disclosure on all BOL, PTD, invoices, shipping papers or other documents for all biodiesel blends regardless of biodiesel level.
B. Requiring identification of the range of biodiesel in the fuel on all BOL, PTD, invoices, shipping papers or other documents but not the exact level (i.e. contains B1 to B5—D975, contains B6 to B20—D7467, contains over B20)
C. Requiring either A or B on only some of the documents but not on all BOL, PTD, invoices, shipping papers or other documents
D. Require B, as well as documentation of any biodiesel intentionally added or known to be in the fuel for blends less than B5
E. Require A, but provide an exemption for blends below B5, with or without the 'intentionally added or know to be in the fuel' wording
F. Require A, but provide an exemption for some de minimis level of biodiesel.
G. Keep the current Handbook 130 wording as-is, with additional wording that the most economical way to meet this need varies depending on local conditions and is best left to the market to determine.
H. Requiring B, with additional wording that individual states may find more prescriptive guidance to be in the best interest of the consumer.
I. Require A or B, with added clauses similar to that for E85 that would allow blends up to B25 to be considered to fall within the FTC labeling requirements.

Warfield, Lisa

From:	Cardin, Judy L - DATCP <judy.cardin@wisconsin.gov>
Sent:	Thursday, June 14, 2012 10:30 AM
To:	ncwm-laws-and-regulations@lists.ncwm.net
Cc:	Vicky Dempsey (DempseyV@mcohio.org); Albert, John (John.Albert@mda.mo.gov); Warfield, Lisa; Sefcik, David
Subject:	[ncwm-laws-and-regulations] FW: Informational Item 237-5 Biodiesel and Biodiesel Blends - Request feedback to Work Group
Attachments:	Biodiesel Product Transfer Document Working Group slides Jan 2012 final,.pptx; Product Transfer Documentation Background Jan 22 2012.docx

Please see Ron and Steve's messages below.

From: Hayes, Ron [mailto:Ron.Hayes@mda.mo.gov]
Sent: Wednesday, June 13, 2012 6:20 PM
To: Cardin, Judy L - DATCP
Subject: Informational Item 237-5 Biodiesel and Biodiesel Blends - Request feedback to Work Group

Judy, could you forward a copy of this email to your committee and ask that the regional L&R members to forward a copy to their respective committees?
Ron

To: NCWM Laws and Regulations Committee and Regional L&R Committees

The Fuels and Lubricants Subcommittee formed a working group co-chaired by Steve Howell and Sam Bell to focus on developing consensus on item 237-5 I Section 3.15. Biodiesel and Biodiesel Blends (page L&R-51). Steve and Sam presented the attached presentation at the 2012 Interim meeting and at the FALS meeting. However, the white paper was previously provided to only FALS members. This white paper is attached and has recently been added to the on-line version of Publication 16 in the "Download Letters" section.

Please review the information and provide any feedback or additional thoughts to Steve and Sam by the end of June. Your thoughts are greatly appreciated and will assist this work group in discussion during the FALS meeting to be held July 15. This provides time for the work group to formulate a final proposal to present at each regional meetings this Fall and the 2013 Interim meeting.

Thank you for assisting the work group in this matter.

Ronald G. Hayes
Director, Weights, Measures & Consumer Protection Division
PO Box 630
Jefferson City, MO 65102-0630
P: 573-751-4316
F: 573-751-0281

Biodiesel Product Transfer Document

Working Group,

Fuels & Lubricants Subcommittee

National Conference on Weights and

Measures, January 2012

Activity Update

Prepared by: Steve Howell, Co-Chair

Sam Bell, Co-Chair

Biodiesel PTD Working Group

- Objective: Develop consensus wording regarding the biodiesel information that should be contained on various shipping documents
- Volunteer Co-Chairs of the Working Group:
  - Steve Howell with MARC-IV Consulting, Inc. and the National Biodiesel Board (NBB)
  - Sam Bell, with Echols Oil and the Petroleum Marketers Association of America (PMAA)
- Formed in January 2011 at NCWM Interim meeting

Status Update, January 2012

- Mr. Bell and Mr. Howell have prepared a useful background document, "Product Transfer Documentation: Biodiesel Current Status and Considerations"
- It contains background information on the biodiesel industry, ASTM specifications, FTC labeling, various needs or desires regarding biodiesel blend content, biodiesel blend testing technology, a general summary of the input from all parties thus far, and other considerations such as the Renewable Fuel Standard-2.
- It also contains a summary of the various options that have been proposed thus far, as well as some new options.

Status Update, January 2012

- The background document was provided to the working group members January 17, 2012
- A conference call of the working group was held Friday January 20 with the following objectives:
  – Overview the background document
  – Solicit WG input:
- Additional considerations or factors to consider
- Additional options for wording to consider
  – Outline a path forward for the WG activities

Status Update, January 2012

- The WG agreed to secure additional information on State Low Carbon Fuel Standards, particularly California, for the WG to consider
- It should be noted the background document has not been approved or sanctioned by the Working Group or by NCWM
  – It is simply a good source of background information for the WG and others at this point
- It should be noted the options for consideration list is not exhaustive
  – Additional options for consideration are expected

Status Update, January 2012

- Mr. Howell and Mr. Bell shared the plans for the WG activities over the next 18 months:
  1. Provide 10 minute update to F&L subcommittee at January New Orleans Interim meeting
  2. Solicit additional factors and considerations from the working group, as well as options for consideration, at the interim meetingand via conference calls and face to face meetings before the 2012 Annual meeting
  3. Report on the status of the WG activities at the Annual meeting in the summer of 2012

Status Update, January 2012

- Mr. Howell and Mr. Bell shared the plans for the WG activities over the next 18 months:
  4. If consensus is reached, share the consensus wording at the summer 2012 annual meeting
  5. Utilize the fall 2012 regional NCWM meetings to build support and additional consensus for the proposed wording and any additional input
  6. Recommend consensus wording be moved to voting item at the January Interim 2013 meeting
  7. Vote on the consensus wording at the 2013 annual meeting in the summer of 2013.

Biodiesel PTD Working Group

January 2012

Ron	Hayes	Missouri Weights and Measures
Steve	Howell	MARC-IV and NBB
Sam	Bell	Echols Oil and PMAA
Rich	George	BP
Rebecca	Richardson	MARC-IV and NBB
Curtis	Williams	CP Williams Energy Consulting, LLC
Brian	Knapp	API
Ivan	Hankins	Iowa Weights and Measures
James	McGetrick	BP
Mike	Harrington	Iowa Weights and Measures
Mahesh	Albuquerqu	Colorado Weights and Measures
Ron	Leone	Missouri Petroleum Marketers
Alex	Schuettenb	Conoco Phillips
Brad	Stotler	NATSO
Rob	Underwood	PMAA
John	Maynes	Iowa Petroleum Marketers
Ann	Hines	Arkansas Oil Marketers Assn.
Tim	Columbus	Steptoe & Johnson LLP
Andrea	Martincic	Arizona Petroleum Marketers
Chuck	Corr	ADM
Russ	Lewis	Marathon Petroleum

Michael	Fields	South Carolina Petroleum Marketer
Jerry	Horn	Chevron
Win	Gardner	ExxonMobil
Bill	Hornbach	Chevron
Brad	Oberg	EPCO

Appendix H

NIST Handbook 130 – Uniform Engine Fuels and Automotive Lubricants Regulation

Item:

237-8: 4.3. Dispenser Filters

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NATSO, PMMA, energy API, SIGMA, and NACS	3

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January 19, 2012

Judy Cardin
Chairwoman, NCWM Laws and Regulations Committee
Wisconsin Dept. of Ag & Consumer Protection
PO Box 8911, 2811 Agriculture Drive
Madison, Wisconsin 53708

Lisa Warfield and David Sefcik
NIST
Office of Weights and Measures
1000 Bureau Drive Stop 2600
Gaithersburg, MD 20899-2600

Dear Chairwoman Cardin, Mrs. Warfield and Mr. Sefcik:

The undersigned organizations, representing thousands of small business petroleum marketers, truck stop operators and convenience store owners, would like to thank you for your efforts to address important issues relevant to our industry during the National Conference on Weights and Measures (NCWM) interim and annual meetings. We are writing you today to urge you to withdraw items 237-3 Section 3.1 *Standardized Colors for Nozzles* and 237-8 *Section 4.3. Dispenser Filters* from the NCWM Laws and Regulations Committee agenda. We believe that both items are not practical and could potentially lead to unintended consequences on our member companies and their customers.

237-3 Section 3.1 Standardized Colors for Nozzles

Preventing consumer misfueling is important to our member companies; however, 237-3 Section 3.1 *Standardized Colors for Nozzles* is unnecessary and outside the scope of the NCWM mission. Regulations are already in place requiring clear, conspicuous labeling for consumers, and there is no evidence that color coding will be any more effective in preventing misfueling. Fuel retailers go to great lengths with conspicuous labels and separate dispensers, in some cases, to ensure customers know what fuel they are dispensing. Adding measures designed to remove conscious decision-making on the part of the costumer regarding their fuel choice is the incorrect precedent to set given the future availability of many different automotive fuels (i.e., ethanol blends, biodiesel blends, biobutanol, etc.) It is important that consumers remain engaged in the refueling process.

Furthermore, an additional precedent that this proposal sets is one where each fuel is assigned a specific color in order to "alert" consumers. There are not enough distinct colors to accommodate all the different types of fuel a marketer currently is selling or mandated to sell, such as ethanol blended fuels. Additionally, this precedent would eliminate the ability for uni-hose dispensers because these dispensers dispense multiple types of fuel from one nozzle.

Finally, our associations believe the NCWM is attempting to go beyond their scope of mission, which is the "development and implementation of uniform and equitable weights and measures standards." Regulating nozzle size for the purpose of preventing misfueling has nothing to do with weights or measures standards in the opinion of the undersigned organizations.

237-8 Section 4.3. Dispenser Filters

Our associations also oppose item *237-8 Section 4.3. Dispenser Filters* which would mandate a 10 micron or smaller nominal pore-sized filter for diesel fuel dispensers. This change is unnecessary. The diesel engines on trucks are equipped with two or three filters, which are more than adequate in filtering out any impurities. As biodiesel blends continue to be more frequently used in the marketplace, smaller filters may also clog due to the fuel's properties, especially in colder climates. In addition, a 10-micron filter will slow the fueling process by 50 percent or more. This additional time in refueling could be costly to the trucking industry. With federal regulations limiting the hours-of-service that commercial drivers can operate their trucks, saving time during fueling is critical. Any lost time resulting from a slower refueling process could increase waiting time in the fueling lanes at truck stops, resulting in traffic backups in the lanes, jeopardizing safety and increasing idling time.

Our associations agree with the Western and Southern Weights and Measures Regions' position that item 237-8 be withdrawn from the agenda.

Sincerely,

American Petroleum Institute, API
NATSO, Representing America's Travel Centers and Truckstops
NACS, The Association for Convenience and Fuel Retailing
Petroleum Marketers Association of America, PMAA
Society of Independent Gasoline Marketers of America, SIGMA

Appendix I

NIST Handbook 130 – Uniform Engine Fuels and Automotive Lubricants Regulation

Items:

237-9: 2.XX. Requirements for Hydrogen Fuel

237-10: Section 1. Definitions, Hydrogen Fuel for Internal Combustion Engines and Fuel Cell Vehicles

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California Fuel Cell Partnership 3

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California FUEL CELL PARTNERSHIP
DRIVING FOR THE FUTURE

California Fuel Cell Partnership
3300 Industrial Blvd.
Suite 1000
West Sacramento, CA 95691
(916) 371-2870

www.fuelcellpartnership.org
info@cafcp.org

Chrysler
Daimler
GM
Honda
Hyundai
Nissan
Toyota
Volkswagen

Automotive Fuel Cell Cooperation

Cal/EPA Air Resources Board
California Energy Commission
South Coast AQMD
U.S. Department of Energy
U.S. Department of Transportation
U.S. Environmental Protection Agency

AC Transit
Air Liquide
Air Products
Ballard Power Systems
CA Dept of Food and Agriculture
ITS-UC Davis
Linde North America, Inc.
NFCRC-UC Irvine
NREL
Powertech Labs
Praxair
Santa Clara VTA
SunLine Transit Agency

January 17, 2012

Judy Cardin
Wisconsin Dept Agric Trade and Consumer Protection
PO Box 8911
Madison, WI 53708

Lisa Warfield
David Sefcik
Juana Williams
NIST Office of Weights and Measures
1000 Bureau Drive MS 2600
Gaithersburg, MD 20899-2600

RE: The USNWG's latest recommendation for a hydrogen fuel quality specification

Dear Mrs. Cardin, Mrs. Warfield, Mr. Sefcik, and Mrs. Williams,

The California Fuel Cell Partnership is a private-public partnership of auto manufacturers, energy companies, fuel cell companies, government, academia, and transit agencies. We actively collaborate to support fuel cell vehicle commercialization to help achieve California's goals for clean air, reduced greenhouse gases, and reduced petroleum use.

We would like to support the language proposed by the U.S. National Work Group's recommendation for a hydrogen fuel quality specification in its entirety. Specifically, the CaFCP supports the following position and language:

> The USNWG's latest recommendation for a hydrogen fuel quality specification is shown below. This alternate USNWG recommendation supersedes its earlier recommendation(s) that appear in L&R Committee Agenda Item 237-9 "Requirements for Hydrogen," to read:
>
> **Section 2. Standard Fuel Specifications**
>
> **2.XX.Hydrogen Fuel. – Shall meet the most recent version of SAE J2719, "Hydrogen Fuel Quality for Fuel Cell Vehicles."**
> The USNWG's latest recommendation for defining three hydrogen related terms is also shown below. This alternate USNWG recommendation supersedes its earlier recommendation(s) that appear in L&R Committee Agenda Item 237-10 "Definitions for Hydrogen Fuel for Internal Combustion Engines and Fuel Cell Vehicles," to read:
>
> **Section 1. Definitions**
>
> **1.XX. Fuel Cell. – An electrochemical energy conversion device in which fuel and an oxidant react to generate electricity without any consumption, physically or chemically, of its electrodes or electrolyte.**

The California Fuel Cell Partnership is a collaboration in which several companies and government entities are independent participants. It is not a joint venture, legal partnership or unincorporated association.

(Added 201X)

1.XX. Hydrogen Fuel. – A fuel composed of molecular hydrogen intended for consumption in a surface vehicle or electricity production device with an internal combustion engine or fuel cell.

(Added 201X)

1.XX. Internal Combustion Engine. – A device used to generate power by converting chemical energy bound in the fuel via spark-ignition or compression ignition combustion into mechanical work to power a vehicle or other device.

(Added 201X).

The USNWG also agreed to recommend that modifications be made to the current NIST Handbook 130 Method of Sale Regulation definition for *"hydrogen fuel"* to ensure the term is defined the same as proposed above for the fuel regulation.

This language reflects the industry needs and was developed with the best available information provided by industry experts, including members of the California Fuel Cell Partnership.

Sincerely,



Catherine Dunwoody
Executive Director

Appendix J

NIST Handbook 130 – Uniform Engine Fuels and Automotive Lubricants Regulation

Item:

237-11: Section X.X. Flex Fuel Vehicles

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Flex Fuel Vehicle Task Force	3

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Flex Fuel Vehicle Fuel Task Force (FFVFTF)

Interim NCWM
January 22, 2012
New Orleans, LA

Flex Fuel Vehicle Fuel TF

- Formed at FALS – NCWM Montana 2011
- Address full range of blends restricted to FFVs
- Incorporate changes to ASTM documents
- Develop consensus wording for HB 130

- Progress has been made

Fuels restricted to FFVs

Current HB 130 language

ASTM D4814	for conventional vehicles
ASTM D5798	restricted to FFVs Previous
D5798	68 to 83 % ethanol

Changes to be Incorporated

Current D5798	51 to 83 % ethanol
ASTM DXXXX	MLEB - full committee vote soon
	GT conventional & LT 51% ethanol

Progress on Fuel for FFVs

- Ethanol Flex Fuel
  - Ethanol concentrations restricted to FFVs
  - Differentiate from methanol and others
  - Easy consumer identification
- Identified locations in HB 130 needing modification
  - Ethanol & Denatured Fuel Ethanol
  - Definitions, specifications, labeling …

Naming & Labeling - Unresolved

1 **- Ethanol Flex Fuel**

Mid-Level Ethanol Flex Fuel	ASTM DXXXX Conv. → 51%	EXX +/- 5%
High-Level Ethanol Flex Fuel	ASTM D5798 51 → 83 %	High-Level Ethanol Flex Fuel (Min 51%)

2 **- Ethanol Flex Fuel**

Mid-Level Ethanol Flex Fuel	ASTM DXXXX Conv. → 51%	EXX +/- 5%
High-Level Ethanol Flex Fuel	ASTM D5798 51 → 83 %	High-Level Ethanol Flex Fuel (min 51%)
E85	ADTM D5798 &68 → 83 %	E85 (Min 68%)

3 **- Ethanol Flex Fuel**

[other options may be proposed]

How to handle transitions??

* FTC ruling ??

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Appendix K

NIST Handbook 133 – Chapter 2. Test Procedures

Item:

260-2: Section 2.3.8. Moisture Allowance – Pasta Products

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American Italian Pasta Company	3
Moisture Loss in Pasta Frequently Asked Questions	8

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AMERICAN ITALIAN PASTA COMPANY AIPC
Producers of the World's Finest Pasta
A Division of Ralcorp Holdings, Inc.

January 19, 2012

Judy Cardin
Chairman, Laws & Regulation Committee
National Conference on Weights and Measures
c/o Wisconsin Weights and Measures
2811 Agriculture Drive
Madison, WI 53708

Dear Ms. Cardin,

At the request of the National Conference on Weights and Measures' Laws & Regulations Committee, we are providing further supporting information regarding Agenda Item 260-2, Moisture Allowance for Pasta Products. This information was developed during a moisture loss study conducted between July 26, 2006 – August 4, 2007, supplementing information about this study that was previously shared with the Conference. The attached charts and data illustrate the following information:

Page 1
- Typical life cycles of pasta products from manufacturing to consumer purchase, illustrating the moisture loss for each stage
- Warehouse storage study with table of results for the average losses by month along with the minimum and maximum moisture loss values
- Retail outlet simulation outlining additional loss once product is uncased and put on the store shelf

Page 2
- Regional warehouse storage study results by month, outlining weight loss for 3 regions (West, Central, East) along with an average loss of the three.
- The first graph focuses on cartons, which comprise >70% of the sku's in the marketplace. The second graph includes all packaging types. All averaged data sets exclude lasagna, as its inclusion would increase the average moisture loss values.

Page 3
- Data tables for warehouse study charts provided on page 2

Page 4
- Warehouse storage study with tables detailing weight loss average by product type used in the study.

We appreciate the opportunity to share this information with the Committee and answer any further questions you may have. I look forward to seeing you at the Interim meeting next week.

Sincerely,

Jayne Hoover

Jayne Hoover
VP Quality Assurance

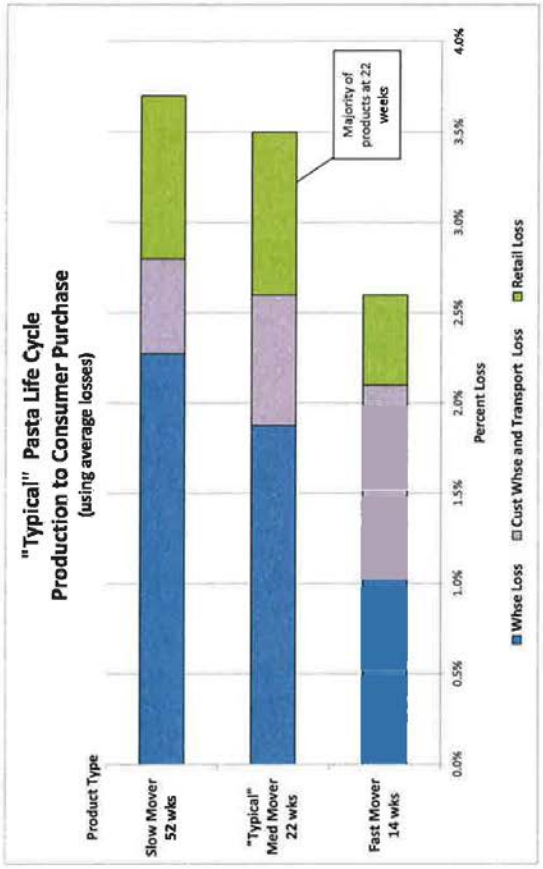
Attachments

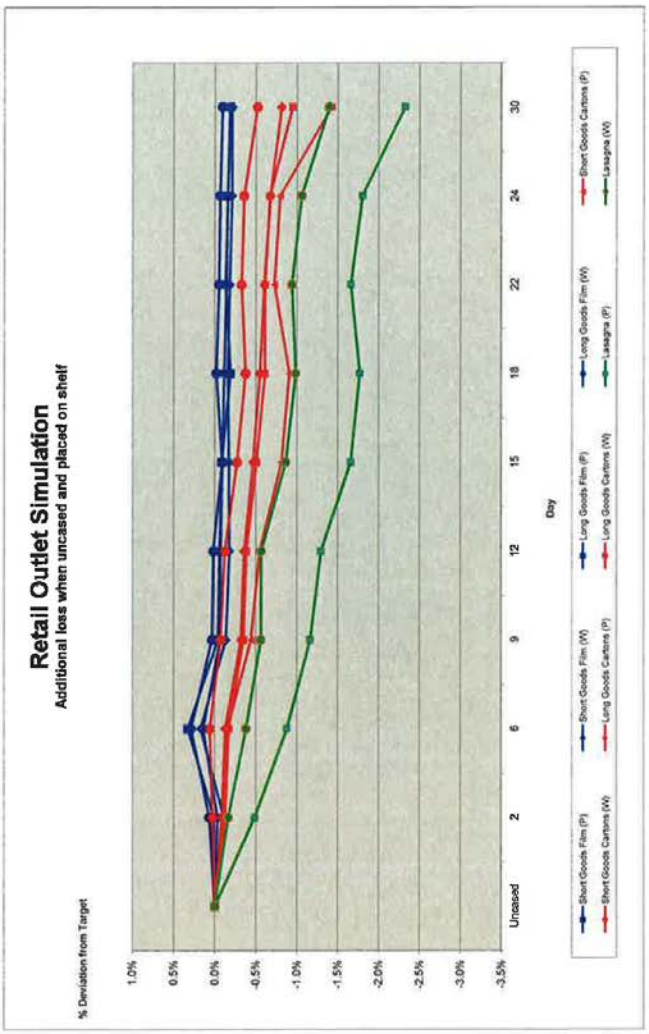
1251 N.W. Briarcliff Parkway, Suite 500 Kansas City, MO 64116 PH: (816) 584-5000 FX: (816) 584-5100

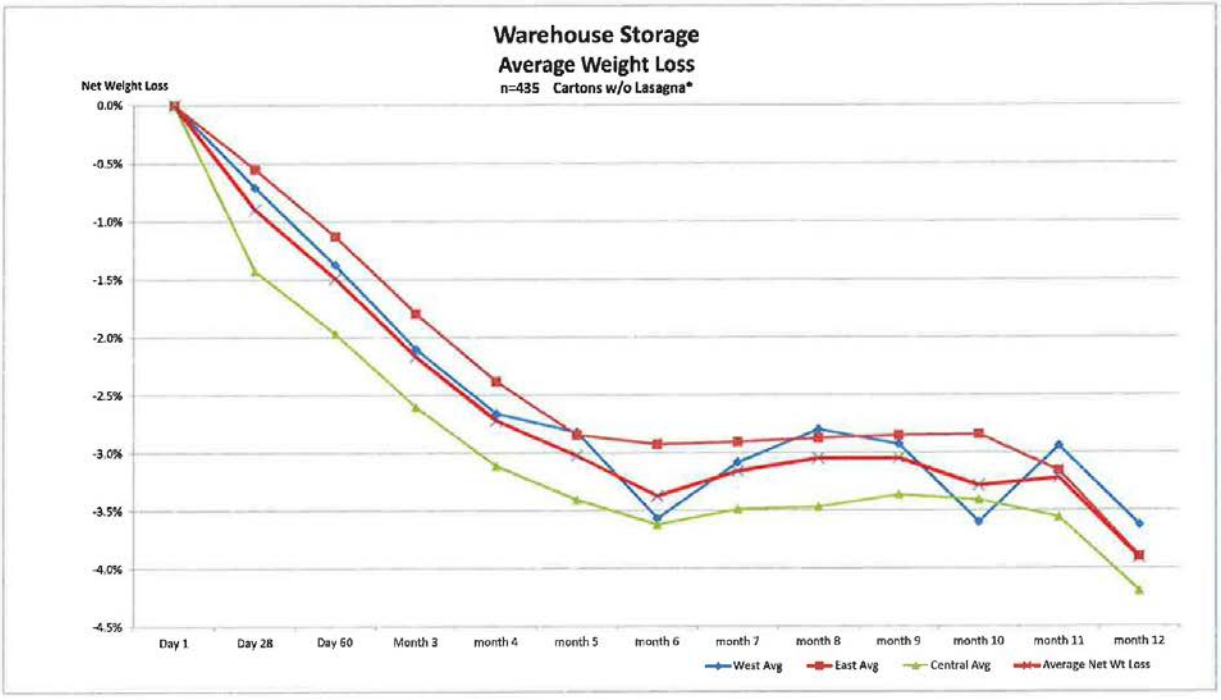
Warehouse Storage Study
Weight Loss Variability*
n=613 All Products w/o Lasagna**

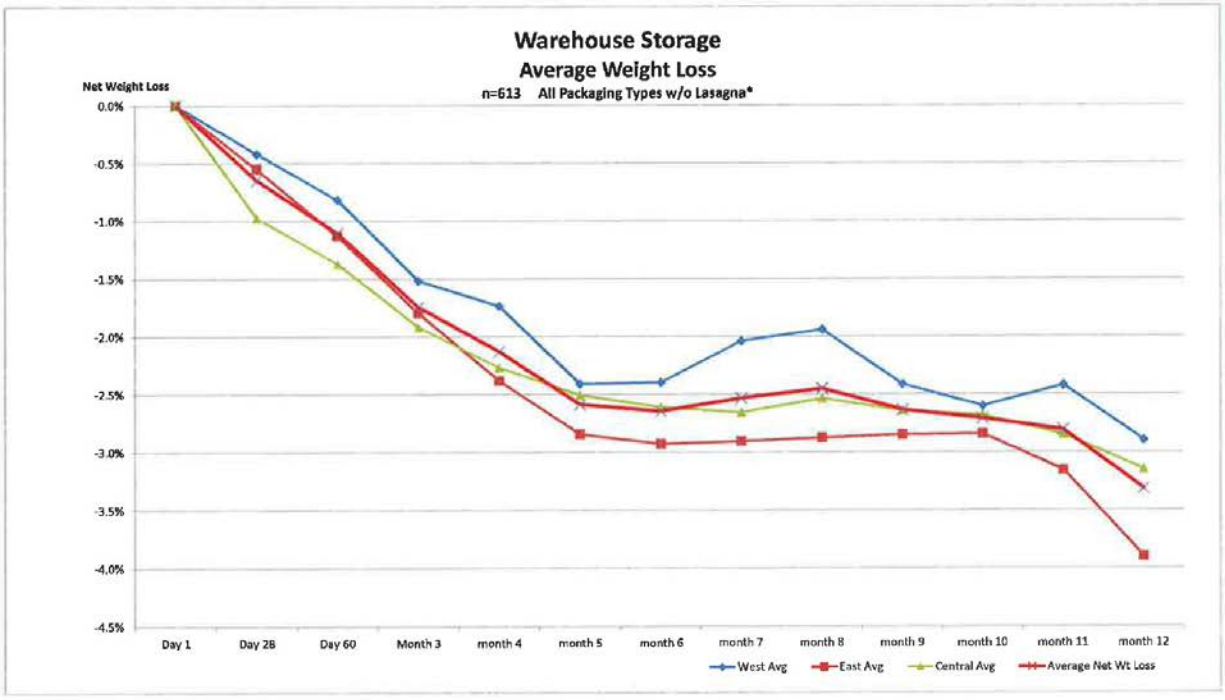
Month	Average	Min Loss	Max Loss
1	-0.6%	0.6%	-3.6%
2	-1.1%	0.4%	-3.6%
3	-1.7%	0.1%	-5.3%
4	-2.1%	-0.1%	-4.8%
5	-2.6%	-0.2%	-5.0%
6	-2.6%	-0.5%	-4.6%
7	-2.5%	-0.3%	-5.0%
8	-2.5%	-0.3%	-4.6%
9	-2.6%	-0.2%	-4.5%
10	-2.7%	-0.2%	-5.3%
11	-2.8%	-0.4%	-5.3%
12	-3.3%	-0.9%	-6.7%

*Dependent Factors-Seasonal (Humidity, Temperature), Packaging, Geography/Location
** Inclusion of lasagna would increase the amount of average moisture loss









* Inclusion of lasagna would increase the amount of average moisture loss

2

Warehouse Storage Study

Average Weight Loss by Location

7/26/06 - 8/4/07

Cartons w/o Lasagna

Month	West Avg n=132	East Avg n-171	Central Avg n=132	Avg Net Wt Loss n=435
1	-0.7%	-0.5%	-1.4%	-0.9%
2	-1.4%	-1.1%	-2.0%	-1.5%
3	-2.1%	-1.8%	-2.6%	-2.2%
4	-2.7%	-2.4%	-3.1%	-2.7%
5	-2.8%	-2.8%	-3.4%	-3.0%
6	-3.6%	-2.9%	-3.6%	-3.4%
7	-3.1%	-2.9%	-3.5%	-3.2%
8	-2.8%	-2.9%	-3.5%	-3.0%
9	-2.9%	-2.8%	-3.4%	-3.0%
10	-3.6%	-2.8%	-3.4%	-3.3%
11	-2.9%	-3.2%	-3.6%	-3.2%
12	-3.6%	-3.9%	-4.2%	-3.9%

All Products w/o Lasagna

Month	West Avg n=240	East Avg n=171	Central Avg n=202	Avg Net Wt Loss n=613
1	-0.4%	-0.5%	-1.0%	-0.6%
2	-0.8%	-1.1%	-1.4%	-1.1%
3	-1.5%	-1.8%	-1.9%	-1.7%
4	-1.7%	-2.4%	-2.3%	-2.1%
5	-2.4%	-2.8%	-2.5%	-2.6%
6	-2.4%	-2.9%	-2.6%	-2.6%
7	-2.0%	-2.9%	-2.7%	-2.5%
8	-1.9%	-2.9%	-2.5%	-2.5%
9	-2.4%	-2.8%	-2.6%	-2.6%
10	-2.6%	-2.8%	-2.7%	-2.7%
11	-2.4%	-3.2%	-2.8%	-2.8%
12	-2.9%	-3.9%	-3.1%	-3.3%

Inclusion of lasagna would increase the amount of average moisture loss

Source data for charts on page 2

3

Warehouse Storage Study

Weight Loss Average by Product

7/26/06 - 8/4/07

Spaghetti

n=168

Month	Avg Net Wt (g)
0	465.1
1	462.0
2	459.5
3	457.4
4	453.6
5	452.9
6	452.9
7	452.3
8	451.7
9	452.7
10	451.1
11	452.3
12	448.9
Final Net Weight	448.9
Weight Loss	-18.2
% Lost	-4.1%

Penne

n=36

Month	Avg Net Wt
0	479.2
1	473.9
2	470.8
3	467.5
4	464.7
5	463.1
6	459.7
7	462.9
8	464.3
9	462.9
10	459.5
11	463.3
12	464.9
Final Net Weight	464.9
Weight Loss	-14.7
% Lost	-3.2%

Rigatoni

n=129

Month	Avg Net Wt
0	524.5
1	502.8
2	513.6
3	492.3
4	506.2
5	504.4
6	469.5
7	475.5
8	476.0
9	490.3
10	480.7
11	494.8
12	496.8
Final Net Weight	496.8
Weight Loss	-19.3
% Lost	-3.9%

Rotini

n=93

Month	Avg Net Wt
0	468.3
1	463.8
2	461.2
3	457.5
4	456.1
5	453.9
6	455.3
7	454.5
8	456.5
9	453.6
10	454.3
11	454.2
12	447.8
Final Net Weight	447.8
Weight Loss	-19.3
% Lost	-4.3%

4

L&R Agenda Item 260-3: Moisture Loss in Pasta
Frequently Asked Questions

1. **Why do inspectors need to consider moisture loss?**
   A lawful inspection must take account of moisture loss for any product where moisture loss occurs, such as pasta. Federal (and corresponding state) requirements mandate that "reasonable variations caused by loss or gain of moisture during the course of good distribution practice or by unavoidable deviations in good manufacturing practice" must be recognized before the jurisdiction can determine the accuracy of the net weight statement.

   The U.S. Supreme Court in the case of Jones v. Rath Packing Company held that the Federal Food, Drug, and Cosmetic Act "permits variations from stated weight caused by gain or loss of moisture" and therefore a manufacturer of food "is not subject to enforcement action for violation of the net weight labeling requirements if the label accurately states the net weight, with allowance for the specified reasonable variations" such as moisture loss.

2. **When must an inspector consider moisture loss when checking packaged pasta products?**
   Inspectors always must account for moisture loss for pasta because the product will always have the potential to lose moisture. Failure to account for moisture loss for hygroscopic products like pasta renders an inspection invalid. Federal and state law do not permit inspectors to issue a citation, order pasta products off-sale, or issue a civil penalty unless moisture loss has been accounted for by the inspector. This is a well-settled matter of law.

3. **Why should Handbook 133 be amended to address moisture loss for pasta?**
   The modest amendment to Handbook 133 would provide inspectors with critical guidance to ensure that pasta product package checking is done properly and lawfully. The industry petition was brought to the Conference because inspectors have mistakenly interpreted the lack of express guidance in Handbook 133 about moisture loss in pasta to mean that they are not required to consider moisture loss for these products. Of course, that is not the case.

4. **Why should the Conference create a special allowance for pasta? Will passage of this proposal open the door to a flood of similar amendments to Handbook 133?**
   The pasta industry is not seeking special treatment. The proposal would merely memorialize a well-established moisture loss allowance and assist inspectors in accounting for moisture loss among pasta products, as is the case for flour, dry pet food, meat, and poultry. Indeed, both NIST and FDA have proposed 3% as the appropriate gray area for pasta.

   Only a finite number of products are subject to moisture loss and the vast majority of packaged foods do not gain or lose moisture. The Conference should consider proposals from other industries that are able to amass appropriate data that supports a moisture allowance gray area.

5. **How does a moisture allowance work? Why should pasta manufacturers be given a 3% "break" instead of just over-packing?**
   Although referred to in shorthand as a "moisture allowance," it is important to recognize that the proposal before the Conference would establish a 3% "gray area." It is not a tolerance. If a sample is found to be less than the labeled weight but within the 3% threshold, the lot is in the "gray" or "no decision" area. This is an indication for inspectors that more information must be collected before lot compliance or noncompliance can be decided. In such situations, inspectors can elect to conduct further investigation to determine whether moisture loss is the basis for the product being short weight. This same method of inspection already exists for flour and pet food, and the modest amendment to Handbook 133 does not introduce a new concept or loophole that favors pasta products.

   The Supreme Court's ruling in Jones v. Rath Packing Company and subsequent legal precedent, affirms a uniform net weight compliance standard that regulates a manufacturer's conduct at the point-of-pack. Rath Packing recognizes that in a national marketplace companies are not required (nor is it feasible) to target

package weights by region and climate. Inherent in the Court's ruling is an understanding that companies are not required to over-pack to address moisture loss that may occur as the result of good distribution practices. The law does not sanction a requirement to target distribution regionally, nor would this approach be practicable for manufacturers to implement.

6. **Is moisture loss really unavoidable for pasta? Why can't you just change your packaging to prevent moisture loss?**
   Pasta is hygroscopic, which means that its moisture content does not remain constant after the product is manufactured. Depending on the relative humidity of the atmosphere, pasta will frequently gain or lose moisture even when good manufacturing and distribution practices are followed. The amount of moisture loss depends upon many factors including the shape of the noodles, the packaging material, the length of time it is in distribution, the retail sales environment, and environmental conditions.

   Pasta needs "breathability" throughout its life cycle in order to maintain quality because of its hygroscopic nature. Without flexible packaging, dissipating moisture would remain caught in the package. This could result in pasta that fails to cook properly or even could cause it to spoil if subject to extreme temperature changes.

7. **Why is 3% an appropriate level for the gray area?**
   The proposed value of 3% has consistently been recognized as an appropriate gray area for pasta products. The FDA and NIST each previously recognized 3% as an appropriate level for moisture loss in pasta. Additionally, the 3% level is supported by a published study conducted by North Dakota State University, commissioned by NPA, which was conducted in 1988 following the guidelines and input from FDA and NIST. More recent company-specific data also validates the findings of the North Dakota State University study and supports the 3% threshold. (Note that some of our data suggests the need for a higher threshold.) This value also is consistent with the gray areas already established in Handbook 133 for flour and pet food, which are similar in their formulations to pasta. The North Dakota State University study and confirming industry data have been presented to the Conference for its review and consideration.

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Report of the Specifications and Tolerances (S&T) Committee

Steve Giguere, Chairman
Augusta, Maine
Weights and Measures

300 INTRODUCTION

The S&T Committee (hereinafter referred to as the "Committee") submits its Final Report for consideration of the 97th National Conference on Weights and Measures (NCWM). This report contains the items discussed and the actions proposed by the S&T Committee during its Interim Meeting in New Orleans, Louisiana, January 22 - 25, 2012. The report addresses the items listed in Table A during the Annual Meeting, which was held July 22 - 26, 2012, in Portland, Maine. 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 report are identified in Table B. The headings and subjects apply to NIST Handbook 44, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, 2012 edition. The first three digits 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; **(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. Table C provides the Summary of Voting Results for each Voting Item.

During the Annual Meeting, 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 entertain any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

Committees may change the status designation of agenda items (Developing, Informational, Voting, and Withdrawn) up until the report is adopted, except that items which are marked Developing, Informational or Withdrawn cannot be changed to Voting Status. Any change from the Interim Report or from what appears on the addendum a sheet 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 **<u>underlining</u>** 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 will appear as appendix items.

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 provided that (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 at all possible, the posting will be done at least a day prior to the planned closed session.

Note: The policy of NIST is to use metric units of measurement in all of its publications; however, recommendations received by the NCWM technical committees have been printed in this publication as submitted. Therefore, the report may contain references to inch-pound units.

Subject Series List

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NIST Handbook 44 – General Code ..... 310 Series

Scales ..... 320 Series
Belt-Conveyor Scale Systems ..... 321 Series
Automatic Bulk Weighing Systems ..... 322 Series
Weights ..... 323 Series
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Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices ..... 332 Series
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Milk Meters ..... 335 Series
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Linear Measures ..... 352 Series
Odometers ..... 353 Series
Taximeters ..... 354 Series
Timing Devices ..... 355 Series
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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
AAR	Association of American Railroad	NCWM	National Conference on Weights and Measures
AES	Advanced Encryption Standard	NEWMA	Northeastern Weights and Measures Association
AREMA	American Railway Engineering and Maintenance-of-Way Association	NIST	National Institute of Standards and Technology
B	Basic Publication	NTEP	National Type Evaluation Program
BCS	Belt-Conveyor Scale	NTETC	National Type Evaluation Technical Committee
CC	Certificate of Conformance	OIML	International Organization of Legal Metrology
CWMA	Central Weights and Measures Association	OWM	Office of Weights and Measures
D	Document	P&SP	Packers and Stockyards Program
DOT	Department of Transportation	R	Recommendation
ECR	Electronic Cash Register	RMFD	Retail Motor Fuel Dispenser
FHWA	Federal Highway Administration	S&T	Specifications and Tolerances
GIPSA	Grain Inspection Packers and Stockyard Administration	SI	International System of Units
GPS	Global Positioning System	SMA	Scale Manufactures Association
IATR	International Association of Transportation Regulators	SWMA	Southern Weights and Measures Association
IEC	International Electrotechnical Commission	TC	Technical Committee
ISO	International Standardization Organization	USDA	U.S. Department of Agriculture
LMD	Liquid Measuring Devices	USNWG	U.S. National Work Group
MDMD	Multiple Dimensions Measuring Device	WIM	Weigh-in-Motion
MMA	Meter Manufacturers Association	WWMA	Western Weights and Measures Association

Acronym	Term	Acronym	Term
NACS	National Association of Convenience Stores		

Table C
Voting Results

Reference Key Number	*House of State Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
Consent Calendar: 320-4, 320-6, 321-2, 358-1, 359-1	34	0	41	0	Adopted
320-3	34	0	43	0	Adopted
321-1	34	0	43	0	Adopted
330-1 (Items 330-2 through 330-6 were consolidated into 330-1 and voted on as a single item)	31	0	43	0	Adopted
330-2					Consolidated into 330-1
330-3					Consolidated into 330-1
330-4					Consolidated into 330-1
330-5					Consolidated into 330-1
330-6					Consolidated into 330-1
336-1	34	0	42	0	Adopted
(Report on its Entirety Voice Vote)	Voice Vote				Adopted

Details of All Items
(In order by Reference Key)

320 SCALES

320-1 W S.1.7. Capacity Indication, Weight Ranges, and Unit Weights

(This item was withdrawn.)

Source:
Kansas Department of Agriculture (2012)

Purpose:
Uniform testing of commercial devices.

Item Under Consideration:
Amend NIST Handbook 44, 2.20 Scales 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 (excluding postal scales and weight classifiers) ***shall display and record a gross or net weight of the scale capacity and the applicable tolerance but*** *shall neither display nor record a gross or net weight in excess of scale capacity plus 9d. [Nonretroactive as of January 1, 1993]*

(Amended 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 weigh beams; nor (4) devices that indicate mathematically derived totalized values.

(Amended 1990, 1992, and 1995)

Background/Discussion:
Kansas has noted that software used with electronic-computing scales does not always allow the scales to indicate a weight value that is above marked scale capacity, even though there is an allowance making it permissible for the scales to display an overcapacity indication that is up to nine divisions greater than the capacity marked. That creates an inspection problem when the error in a computing scale, at or near capacity, is in the direction of overregistration by an amount greater than the programmed limit for the overcapacity indication. In this situation, the inspector cannot verify the scale error at capacity.

At the 2011Central Weights and Measures Association (CWMA) Interim Meeting, attendees representing the weighing industry asked how the software would know what the applicable tolerance is. They also inquired whether or not this item would be retroactive. Regulatory officials responded that:

- When testing a scale at capacity and the device is over registering, it may blank out and not allow the inspector to determine the error at capacity.

- This proposed amendment to paragraph S.1.7. would promote uniformity, and

- Provide for ease of testing.

The CWMA recommended the proposed language be changed to ***"shall display and record a gross or net weight of the scale capacity and the applicable maintenance tolerance."*** This proposal would facilitate the uniform testing of computing scales and allow the inspector to determine the error at capacity. CWMA forwarded the item to NCWM, recommending it as an Informational Item with the above amendment to the original proposal.

During the 2012 NCWM Interim Meeting, Ms. Henzler, Kansas Department of Agriculture, reported that Kansas inspectors had discovered some unattended scanner scales that "blanked out" when a capacity test load was applied to the load-receiving element. The overcapacity indication on the scales discovered by Kansas is controlled by software that causes the scales to "blank out" at an indication slightly over capacity (e.g., one or two divisions over capacity). Thus, when one of these scales is being tested, if it is overregistering (i.e., registering a value that is greater than the test load applied) by an amount to cause the indication to reach the point where the software blanks the scale when a capacity test load is applied, there is no way of knowing (at that particular test load) whether or not the scale is performing within acceptable tolerance limits. Ms. Henzler stated that she was aware that the test procedures could be modified to enable that determination be made. It was her view, however, that the modified procedures would be labor intensive and not likely applied by service technicians, who, in the State of Kansas, are permitted to perform official tests on scales. She also indicated that some service technicians may not have the necessary equipment to apply the modified procedures.

National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM) pointed out there are three critical verifications that officials need to make relative to testing an electronic-computing scale, manufactured as of January 1, 1993, at maximum test load:

1. The scale must be capable of displaying the nominal capacity marked on the device.

2. The scale must not indicate or record any values in excess of nominal capacity plus 9 d.

3. The scale must be within tolerance at the maximum test load (i.e., the maximum value the device is capable of displaying).

NIST, OWM has traditionally recommended a slight modification to test procedures in order to make it easy for an inspector to determine whether or not a scale is capable of displaying a value equal to nominal capacity and complying with paragraph S.1.7.(b). The following example procedures were provided: step (1) apply fractional weights in the amount of applicable tolerance; step (2) zero the scale; and step (3) conduct an increasing-load test to the nominal capacity of the scale. If the scale fails to display the nominal capacity with a nominal capacity test load applied due to overregistration, incrementally remove the fraction weights one division at a time until the scale displays nominal capacity. The amount of weight removed to cause the scale to display the capacity indication represents the amount of error in the scale. NIST, OWM noted that this simple modification to the procedures would enable an inspector to verify compliance with S.1.7., thus eliminating the need to modify a scale's (or electronic cash register's) software. Given the ease at which these procedures can be applied, consideration should be given as to whether or not the cost of modifying would warrant the proposed change.

NIST, OWM noted the following additional concerns should the committee decide to proceed with the proposal:

1. The proposed new text specifies "gross or net weight." NIST, OWM recommended that the proposed requirement should not apply to "net weight" indications. There is the potential to overload a scale using tare values above 5 % of the capacity of the scale.

2. The proposed new text specifies "shall display and record." If this proposal were to be adopted as written, all electronic computing scales manufactured as of January 1, 1993, would be required to be equipped or interfaced with a ticket printer.

3. The proposed new text would require the display and recording of "scale capacity and the applicable tolerance" that can be interpreted to mean that two separate values need to be displayed and recorded, the first being the value of nominal capacity, and the second being the applicable tolerance.

4. The proposed new text would require software on existing applicable computing scales to be modified since the proposed language is written as a nonretroactive requirement that would be applicable to devices manufactured after January 1, 1993, unless amended.

5. The proposed new text is not clear as to whether it is applicable to non-computing scales interfaced with Electronic Cash Registers (ECR) in a point-of-sale system since an ECR is a computing accessory used in conjunction to a non-computing scale in a point-of-sale system.

Mr. Darrell Flocken, Mettler-Toledo LLC speaking on behalf of the Scale Manufacturers Association (SMA), opposed the item, stating that the proposed changes were unnecessary and that the overcapacity indication should not be tied to device tolerance.

Mr. Calix, NCR Corporation and Mr. Grabski, Walmart Stores, Inc., also indicated their opposition to the item.

In discussing this item, the committee agreed that the test procedures used to verify whether or not an electronic-computing scale complies with paragraph S.1.7.(b) are well known, fairly simple to apply, and are already being consistently applied by field officials. The Committee considered whether service technicians would need additional equipment to enable them to apply those test procedures. The Committee concluded that the equipment needed to perform the modified procedures recommended by NIST, OWM would include that which service technicians should already possess in order for them to properly conduct an official test on a scale.

During the 2012 NCWM Annual Meeting Open Hearings, Mr. Flocken, speaking on behalf of the SMA, supported withdrawing the item.

No further action was taken by the Committee at the 2012 NCWM Annual Meeting since the Committee had previously agreed to "Withdraw" the item.

320-2 I S.6.4. Railway Track Scales and Appendix D – Definitions

Source:
Systems Associates, Inc., (2012)

Purpose:
Align NIST Handbook 44 with updated material in *AAR Scale Handbook*.

Item Under Consideration:
1) Amend NIST Handbook 44, Scales Code paragraph S.6.4. Railway Track Scales as follows:

S.6.4. Railway Track Scales. – A railway track scale shall be marked with the maximum capacity of each section of the load-receiving element of the scale. Such marking shall be accurately and conspicuously presented on, or adjacent to, the identification or nomenclature plate that is attached to the indicating element of the scale. ~~***The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity. The nominal capacity of a two section scale shall not exceed its rated section capacity.****~~ **The nominal scale capacity shall not exceed the lesser of;**

(a) The sum of the Weigh Module Capacities as shown in Table S.6.4., or;

(b) Rated Sectional Capacity (RSC) multiplied by the quantity of the Number of Sections (Ns) minus the Number of Dead Spaces (Nd) minus 0.5. As a formula this is stated as RSC x (Ns - Nd - 0.5),

(c) 640 000 lb; or

(d) The nominal capacity listed on the CC.

Table S.6.4. Railway Track Scale – Weigh Module Capacity	
Weigh Module Length (ft)	**Weigh Module Capacity (ton)**
< 5	**40**
5 to < 10	**80**
10 to < 15	**120**
15 to < 23	**160**
23 to < 29	**186**
29 to < 35	**212**
35 to < 40	**258**
40 to < 56	**284**

Note: The capacity of a particular module is based on its length and determined from corresponding capacity values specified in Table S.6.4.

~~*[*Nonretroactive as of January 1, 2002]*~~

(Amended 1988, 2001, ~~and~~ 2002**, and 20XX**)

2) Add the following definition for the term "Weigh Module" to NIST Handbook 44, Appendix D:

weigh module – The portion of a load-receiving element supported by two sections of the weighing element. The length of a module is the distance to which load can be applied. [2.20]

Background/Discussion:
The capacity of a railcar weighing system has historically been based on the capacity of the pivots or load cells supporting the scale section. As pivots were generally the weakest element, this was logical. With the introduction of load cell technology, the capacity of the section could far outreach the capacity of the weighbridge. Weighbridge design, based on the requirements of the *AAR Scale Handbook*, must be capable of supporting 80 000 pound axles on five-foot centers. With the introduction of combined short span weigh modules over multiple sections, the use of the section capacity to determine scale capacity provides both the opportunity for overloaded structures and/or the requirement to overdesign the section. The submitter stated that determining the nominal scale capacity based on both the section capacity and the structural capacity is the best solution. Additionally, a 640 000 lb limit assures these scales can be calibrated with 12.5 % of capacity using the conventional 80 000 lb test weight equipment.

The changes to the nominal capacity specification were developed by Committee 34 - Scales, of the American Railway Engineering and Maintenance-of-Way Association (AREMA) and approved, by unanimous vote, for inclusion in the *AAR Scale Handbook*.

At the 2011 CWMA Interim Meeting, members of the weighing industry reported that it is inappropriate to rate a scale's capacity based solely on the sectional capacity of the scale. One regulatory official questioned whether the capacities in Table S.6.4. should be listed in pounds. In addition to the proposed definition for weigh module, the CWMA noted it may also be appropriate to include a definition of dead spaces. CWMA believed there would be support for the item to align NIST Handbook 44 and the AAR Handbook. CWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 Western Weights and Measures Association (WWMA) Annual Meeting, Mr. Straub, Fairbanks Scales, Inc., supported the item as submitted. Mr. Cook, NIST, OWM stated that the definition of weigh module may be

confusing and suggested that the submitter include diagrams to NCWM S&T Committee illustrating some typical weigh module installations. The WWMA S&T Committee recognized that this proposal aligns NIST Handbook 44 with the updated material in the *AAR Scale Handbook*, and added that there remains some confusion around the use of the word "articulated" in the definition which could be clarified with illustrations. WWMA forwarded the item to NCWM, recommending it as a Developing Item until such time that the Committee receives diagrams that illustrate weigh module installations from the submitter.

At its 2011 Northeastern Weights and Measures Association (NEWMA) Interim Meeting, NEWMA forwarded the item to NCWM, recommending it as an Informational Item.

At the 2011 Southern Weights and Measures Association (SWMA) Annual Meeting, Mr. Oppermann, Weights and Measures Consulting, LLC, suggested that the reference to "single or articulated" are unnecessary and could be deleted. It doesn't matter how the module is put together. The SWMA S&T Committee also heard from Mr. Feezor, Scales Consulting and Testing, who noted that the term "articulated" refers to how the modules are connected. He offered to submit some drawings of how these are made in the field, and he noted that this could apply to more than just railway track scales. Mr. Straub, Fairbanks Scales, Inc., indicated support for the proposal. He stated that he had talked with the original submitter, Mr. Beitzel, Systems Associates, Inc., and suggested that perhaps diagrams from NCWM Publication 14 might be considered to help illustrate the use of the term "articulated." SWMA forwarded the item to NCWM, recommending it as a Voting Item with unanimous support for the following change to the definition, eliminating the phrase "single or articulate":

> **weigh module – The ~~single or articulated~~ portion of a weighing element supported by two sections. The length of a module is the distance to which load can be applied. [2.20]**

At the 2012 NCWM Interim Meeting, Mr. Cotsoradis, Flint Hills Resources questioned whether anyone had considered the impact that the item would have on existing scales considering that the new language proposed is retroactive.

Mr. Lewis, Rice Lake Weighing Systems, Inc., indicated that the proposal, if adopted, would affect two existing National Type Evaluation Program (NTEP) Certificate of Conformance (CCs) issued to Rice Lake Weighing Systems, Inc. Mr. Lewis questioned whether those CC's would need to be updated if the proposal was adopted and who would be responsible for the costs associated with those updates should they be required.

Mr. Flocken, speaking on behalf of the SMA, supported the item. However, he suggested that the word "articulated" be removed from the language in the definition originally proposed because it could be misunderstood and its removal would not have any impact on the requirement.

NIST, OWM stated that the SMA recommendation to delete the word "articulated" from the definition originally proposed would not change its meaning and agreed that it may facilitate a better understanding of the definition. Regarding use of the term "weighing element" in the proposed definition, NIST, OWM indicated that the term "load-receiving element" seemed more appropriate given the definition of the two terms in NIST Handbook 44 (i.e., load-receiving element and weighing element).

Similar to the question raised by Mr. Cotsoradis, NIST, OWM questioned whether adequate consideration had been given to the impact the proposal might have on existing equipment, especially equipment manufactured between the dates January 1, 2002, (the effective date of enforcement of the nonretroactive portion of the current paragraph proposed for deletion) and the date the proposed changes to the paragraph would take effect. Of particular concern is whether or not existing equipment would be able to comply with the changes being proposed. To that end, NIST, OWM provided the Committee a brief analysis of existing NTEP CC's for modular railway track scales. The analysis showed that the nominal capacity listed on the CC for some single module scales was greater than the lesser of the three values derived from the three bullets specified in the proposal. There were even more instances where the lesser value in the proposal exceeded the nominal capacity listed on the CC for module installations with and without dead spaces. NIST, OWM's analysis did not include all of the various configurations listed on the CC's. A related concern noted by NIST, OWM was whether anyone had considered the impact of the proposal relative to combination vehicle/railway track scales.

Should the Committee decide to proceed with the proposal, NIST, OWM suggested that the Committee consider adding a fourth bullet to the list of proposed nominal capacity considerations that includes the nominal capacity listed on the CC and that a note be added to proposed Table S.6.4. to make clear that module capacities are to be based on the length of the module and corresponding capacities specified in Table S.4. NIST, OWM offered the following proposed additions to the Committee in relation to these recommendations:

1. Add the following note to proposed Table S.6.4.:

   Note: The capacity of a particular module is based on its length and determined from corresponding capacity values specified in Table S.6.4.

2. Add a fourth bullet to the list of nominal capacity considerations that includes the nominal capacity listed on the CC:

   (a) the sum of weigh module capacities in the proposed table;

   (b) the results of a calculation using the rated section capacity, number of sections and number of dead spaces;

   (c) 300 000 kg (640 000 lb), or

   (d) the nominal capacity listed on the CC.

NIST, OWM also noted that the current version of the proposed language uses "ton" units in the proposed table and "lb" units in the proposed changes to paragraph S.6.4. It was suggested that the committee consider making the units consistent by either including both units for every value [e.g., 640 000 lb (320 ton)] or only a single unit. Note that the railroad industry has traditionally rated section capacity in tons and nominal capacity in pound units. Additionally, NIST, OWM noted that it will likely include equivalent International System of Units (SI) values in NIST Handbook 44 if this item is adopted.

Mr. Oppermann, Weights and Measures Consulting, LLC., suggested amending the first sentence in the definition of weigh module (originally proposed) to read as follows:

The portion of a load-receiving element supported by two sections of the weighing element.

Mr. Beitzel, Systems Associates, Inc., stated that he supported removal of the words "single or articulated" from the proposed definition of weigh module, but would be opposed to adding a fourth bullet "(d)" to reference the nominal capacity listed on the CC. Adding a reference to the nominal capacity on the CC would create a circular argument in that, if added, some might interpret that to mean that the nominal capacity of a scale cannot be increased beyond the value specified on the original CC, even if load cell capacity and the structural integrity of the weighbridge make possible an increase to the capacity. Subparagraph (d) would continue to limit the nominal capacity for the system. With respect to NIST, OWM's suggestion to the Committee to change the units of measure in proposed table S.6.4. from tons to pounds, there would be no problem as Nominal Capacity is generally represented in pounds on railway track scales.

Prior to the 2012 Interim Meeting, the Committee received a letter of support of this item as proposed from the Association of American Railroads (AAR).

The Committee considered the comments received during the Open Hearings and agreed with concerns for how the proposed new language would affect current equipment that is already in service.

In consideration of the analysis presented by NIST, OWM the Committee agreed with their suggestion to add a fourth bullet to the list of proposed nominal capacity considerations that include the nominal capacity listed on the CC. The Committee also agreed to add a note beneath proposed Table S.6.4. to make clear that the module capacities are to be based on the length of the module and corresponding capacities specified in the proposed table.

A final change agreed to by the Committee was to amend the definition originally proposed. All of the changes agreed to by the Committee are included in the Item Under Consideration. The 2012 S&T Committee designated this item as an Informational Item to allow time for additional information relative to these concerns and further analysis and comments on the amended proposal.

At the 2012 NCWM Annual Meeting Open Hearings, Mr. Flocken, speaking on behalf of SMA, stated that SMA supports the proposal as written.

The Committee also heard comments from Ms. Juana Williams, speaking on behalf of NIST, OWM. NIST, OWM noted that bullet (d) of the proposal was added by the Committee during the 2012 NCWM Interim Meeting after it was made known there existed at least one CC (and possibly more) for railway track scales with nominal capacities greater than the lessor of the values corresponding to bullets (a), (b), and (c), which created potential conflicts between the requirement as originally proposed and the information on some existing CCs.

During further analysis of this item, NIST, OWM recognized that information on CCs is sometimes amended. If the capacity specified on a CC issued for a railroad scale were changed, it could have an impact on the application of the proposed requirement; perhaps causing a device that once was compliant to be in violation. For this reason, OWM questioned whether bullet (d) in the Item Under Consideration should be included as one of the factors to be used in determining whether or not a device complies. If the Committee agrees with this concern, it might, as an alternative to adding bullet (d), consider dividing the Item Under Consideration into two parts and assigning different enforcement dates to those parts. For example, new equipment could be required to comply with the proposed new portion of the paragraph while equipment already in service could continue to have to comply with the existing paragraph. Should the Committee decide to divide the paragraph into two parts, it would be necessary to include the two struck out sentences in the Item Under Consideration with the existing (old) portion of the paragraph. OWM offered an example to show how the concerns described in the analysis of this item might be addressed in the language and proposed modifying the requirements to be retroactive in nature.

NIST, OWM also pointed out that the current version of the proposed language uses “ton” units in the proposed table and “pound” units in the proposed changes to paragraph S.6.4. The Committee may wish to consider making the units consistent by either using both units for every value [e.g., 640 000 lb (320 ton)] or only use a single unit. The railroad industry has traditionally rated section capacity in tons and nominal capacity in “pound” units. Additionally, OWM will likely include equivalent SI values in NIST Handbook 44 if this item is adopted.

Mr. Steve Beitzel, Systems Associates, Inc., commented that, as the original submitter, he supports the changes proposed by NIST, OWM to the item, including the proposed change to a retroactive status and the proposed change of the values in the table from tons to pounds. He also suggested that the definition for “Weigh Module” be further modified to delete the phrase “of the weighing element” at the end of the first sentence. Mr. Beitzel also agreed with NIST, OWM’s suggestion to delete subparagraph S.6.4.(d).

Mr. Rafael Jimenez, AAR Transportation Technology Center, stated that AAR supported the changes outlined by Mr. Beitzel, including those offered by NIST, OWM.

There were three positions posted on the NCWM 2012 Online Position Forum. Of those three, two supported the proposal and one was neutral to the proposal.

During its deliberations, the Committee agreed with NIST, OWM’s concern that if an NTEP CC corresponding to existing equipment were changed, that equipment may not be able to comply with proposed bullet (d). For this reason the Committee agreed that bullet (d) should be eliminated from the proposal. The Committee agreed with NIST, OWM’s suggested alternative to adding a fourth bullet, which was to divide the Item Under Consideration into two parts, assigning each a different enforcement date. The Committee also agreed to modify the proposed definition of “weigh module” by deleting the words “of the weighing element” from the proposed definition. In consideration of the number of changes agreed upon, the Committee recommended deleting the proposal under “Item Under Consideration” in NCWM Publication 16 and replacing it with the following:

> **S.6.4. Railway Track Scales.** – A railway track scale shall be marked with the maximum capacity of each section of the load-receiving element of the scale. Such marking shall be accurately and conspicuously

presented on, or adjacent to, the identification or nomenclature plate that is attached to the indicating element of the scale. ~~*The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity. The nominal capacity of a two section scale shall not exceed its rated section capacity.**~~

The nominal capacity marking shall satisfy the following.

(a) For scales manufactured from January 1, 2002, through December 31, 20XX:

(1) **The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity.**

(2) **The nominal capacity of a two section scale shall not exceed its rated section capacity.**

(b) For scales manufactured on or after January 1, 20XX, the nominal scale capacity shall not exceed the lesser of:

(1) **The sum of the Weigh Module Capacities as shown in Table S.6.4., or;**

(2) **Rated Sectional Capacity (RSC) multiplied by the quantity of the Number of Sections (Ns) minus the Number of Dead Spaces (Nd) minus 0.5. As a formula this is stated as RSC x (Ns - Nd - 0.5); or**

(3) **640,000 lb.**

~~*[*Nonretroactive as of January 1, 2002]*~~

(Amended 1988, 2001, ~~and~~ 2002**, and 20XX**)

Table S.6.4.M. **Railway Track Scale – Weigh Module Capacity**	
Weigh Module Length (m)	**Weigh Module Capacity (kg)**
< 1.5	**36 300**
1.5 to < 3.0	**72 600**
3.0 to < 4.5	**108 900**
4.5 to < 7.0	**145 100**
7.0 to < 9.0	**168 700**
9.0 to < 10.5	**192 300**
10.5 to < 12.0	**234 100**
12.0 to < 17.0	**257 600**
Note: The capacity of a particular module is based on its length and determined from corresponding capacity values specified in Table S.6.4.M.	

(Table Added 20XX)

Table S.6.4. **Railway Track Scale – Weigh Module Capacity**	
Weigh Module Length (ft)	**Weigh Module Capacity (lb)**
< 5	**80 000**

5 to < 10	**160 000**
10 to < 15	**240 000**
15 to < 23	**320 000**
23 to < 29	**372 000**
29 to < 35	**424 000**
35 to < 40	**516 000**
40 to < 56	**568 000**
Note: The capacity of a particular module is based on its length and determined from corresponding capacity values specified in Table S.6.4.	

(Table Added 20XX)

2) Add the following definition for the term "weigh module" to NIST Handbook 44, Appendix D:

weigh module - The portion of a load-receiving element supported by two sections. The length of a module is the distance to which load can be applied. [2.20]

Any additional letters, presentations, and data that was submitted for consideration for this item is located in the S&T Appendix A.

320-3 V N.3.1.2. Interim Approval

(This item was adopted.)

Source:
Systems Associates, Inc., (2012)

Purpose:
Align NIST Handbook 44 with updated material in *AAR Scale Handbook.*

Item Under Consideration:
Amend NIST Handbook 44, Scales Code paragraph N.3.1.2. Interim Approval as follows:

N.3.1. Minimum Test-Weight Load and Tests ~~Recommended Strain-Load Test~~ for Railway Track Scales

(Amended 1990 **and 2012**)

N.3.1.1. Initial and Subsequent Tests ~~Approval.~~ – The test-weight load shall be not less than 35 000 kg (80 000 lb). A strain-load test conducted up to the used capacity of the weighing system is recommended.

(Added 1990) **(Amended 2012)**

N.3.1.2. Interim Test ~~Approval.~~ – ~~A test-weight load of not less than 13 500 kg (30 000 lb) and a strain-load test up to at least 25 % of scale capacity may be used to return a scale into service following repairs.~~ An Interim Test may be used to return a railway track scale into temporary service following repairs that could affect the accuracy of the weighing system provided all of the following conditions are met:

(a) A test weight load of not less than 13 500 kg (30 000 lb) shall be used;

(b) A shift (section) test shall be conducted using a test-weight load of not less than 13 500 kg (30 000 lb);

(c) A strain-load test shall be conducted up to at least 25 % of scale capacity;

(d) All test results shall be within applicable tolerances; and

(e) The official with statutory authority shall be immediately notified when scales are repaired and placed in temporary service with an Interim Test. The length of temporary service following repairs is at the discretion of the official with statutory authority.

(Added 1990) **(Amended 2012)**

~~Note: The length of time the scale may be used following an interim test is at the discretion of the official with statutory authority~~.

~~(Added 1990)~~

Background/Discussion:
The interim approval for railway track scales was added to NIST Handbook 44 in 1990 to address the response time for positioning proper test weight equipment following a breakdown and subsequent repairs of a railcar weighing system. An interim approval is not appropriate under normal scale maintenance circumstances. In addition, returning a scale to service without requiring a section test could overlook a serious accuracy problem, especially when using 30 000 lb weights. As NIST Handbook 44 requires 80 000 lb of test weights for testing a railcar scale, any cost impact in limiting the scope of the interim test would be minimal.

The changes to the interim test specification were developed by Committee 34 - Scales, of the AREMA and approved, by unanimous vote, for inclusion in the *AAR Scale Handbook*.

At the 2011 CWMA Interim Meeting, members of the weighing industry stated that this proposal would strengthen the type of test conducted for an interim approval by requiring that a shift test be conducted during an interim approval. Regulatory officials voiced concerns that a calibration would be a repair that could affect the accuracy of the weighing system. Inserting the words "excluding calibration" between the words repairs and the start of the proposed language would help clarify that an interim approval is not meant to be used in cases where only calibration is being performed. CWMA forwarded the item to NCWM, recommending it as a Voting Item with the following amendments:

N.3.1.2. Minimum Tests for Interim Approval. – A test-weight load of not less than 13 500 kg (30 000 lb) and a strain-load test up to at least 25 % of scale capacity may be used to return a scale into service following repairs**, excluding calibration, that could affect the accuracy of the weighing system. A test for an Interim Approval shall include a shift (section) test using a test-weight load of not less than 13 500 kg (30 000 lb). All results shall meet applicable tolerances. The official with statutory authority shall be immediately notified when scales are repaired and placed in service with an interim test. The time period of temporary use is at the discretion of the official with statutory authority.**

~~Note: The length of time the scale may be used following an interim test is at the discretion of the official with statutory authority.~~

(Added 1990) **(Amended 20XX)**

At the 2011 WWMA Annual Meeting, there were no comments on this proposal at the Open Hearings. The WWMA S&T Committee agreed that the proposal provides additional clarification of the tests to be conducted during an interim approval of railroad track scales and when an interim approval test is required. WWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 NEWMA Interim Meeting, there was no opposition to this item. NEWMA forwarded the item to NCWM, recommending it as an Informational Item so that input from other regions may be considered.

At the 2011 SWMA Annual Meeting the S&T Committee heard comments from Mr. Straub, Fairbanks Scales, Inc., who supported the proposal. The Committee also heard comments from Mr. Feezor, Scales Consulting and Testing, who indicated that the definition has already been changed in the *AAR Handbook* and that this proposal would align NIST Handbook 44 with the *AAR Handbook*. He noted that the Interim Approval was intended to allow a scale to be returned to service until adequate test standards could be brought in by the railroad. There were no comments in opposition. SWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2012 NCWM Interim Meeting, the Committee received comments in support of the item from Mr. Beitzel, Systems Associates, Inc. Mr. Beitzel stated that adding the words "excluding calibration" would agree with the original intent of AREMA Committee 34, which was to allow someone to return an inoperable scale to service following repairs using 30 000 lb of test weight. It was not AREMA's intent to allow someone to put a scale back into service with only 30 000 lb of test weight if all they had done was break the seal and adjust accuracy (i.e., calibrate the scale). Mr. Beitzel added that 30 000 lb of test weight is an insufficient amount to calibrate a railway track scale. The railroads have designated a minimum of 80 000 lb of test weight be used to calibrate a railway track scale. Currently, paragraph N.3.1.2. does not require a person conducting an interim test to notify officials with statutory authority.

Mr. Feezor, Scales Consulting and Testing, stated that the AAR developed the proposed amendments to paragraph N.3.1.2. in an effort to prevent someone from putting a scale back into service with an insufficient amount of test weights. He indicated that the adjustment of calibration is not a repair, which reflects the heart of the problem. Scale service personnel, contracted to perform work under a scale maintenance agreement, are breaking security seals when they discover railroad scales out of tolerance. They're making calibration adjustments using only 30 000 lb of test weight and then return those scales back to service without notifying anyone. Either the words "excluding calibration" need to be included it needs to be stated that "a calibration is not a repair."

Mr. Flocken, speaking on behalf of the SMA, supported the item as written in the Item Under Consideration.

NIST, OWM indicated they had no issues with the item as originally proposed but believed that adding the words "excluding calibration," as suggested by the CWMA, created the potential that some might think a calibration can be conducted without regard to notifying the official with statutory authority and using a minimum amount of test weight to place the scale into service. NIST, OWM noted that the words "immediately notifying" could be modified to include a notification time frame to promote uniformity among railroads, service agencies and regulators (e.g., "shall be immediately notified within XX-hours, [X business days . . .]").

Prior to the 2012 NCWM Interim Meeting, the Committee received a letter of support of this item as proposed from the AAR.

The Committee considered the comments received during the Open Hearings and concluded that adding the words "excluding calibration" changes the intent of the proposal. The 2012 S&T Committee designated this item as a Voting Item as originally proposed.

The Committee originally considered the following changes to N.1.3.2. as shown in the Committee's 2012 Interim Report:

> **N.3.1.2. Minimum Tests for Interim Approval.** – A test-weight load of not less than 13 500 kg (30 000 lb) and a strain-load test up to at least 25 % of scale capacity may be used to return a scale into service following repairs **that could affect the accuracy of the weighing system. A test for an Interim Approval shall include a shift (section) test using a test-weight load of not less than 13 500 kg (30 000 lb). All results shall meet applicable tolerances. The official with statutory authority shall be immediately notified when scales are repaired and placed in service with an interim test. The time period of temporary use is at the discretion of the official with statutory authority**.
>
> ~~**Note: The length of time the scale may be used following an interim test is at the discretion of the official with statutory authority.**~~
>
> (Added 1990) **(Amended 20XX)**

At the 2012 NCWM Annual Meeting, the Committee received numerous comments on the proposed changes.

The Committee heard comments from Ms. Kristin Macey, who suggested changing the word "may" to "shall" in the first sentence of paragraph N.1.3.2.

NIST, OWM noted that there appeared to be some disagreement among those who proposed the changes to the paragraph about how the amended paragraph was to be applied. There seemed to be some question regarding the meaning of the word "repair" in the "Item Under Consideration" and whether or not an adjustment to the calibration of a scale would be considered a "repair."

Regarding the issue of whether an adjustment to the calibration of a scale would be considered a repair, several unanswered questions should be considered:

- Under what conditions would it be permissible for a service company to make an adjustment to the calibration of a railway track scale when using only 30 000 lb of test weight?

- What constitutes a "repair"?

NIST, OWM suggested that the U.S. Railroads and/or S&T Committee consider developing some examples to explain how the amended language applied, which may assist weights and measures officials and industry in consistently applying the requirements. NIST, OWM offered the following scenario and associated questions to possibly serve as a good starting point in explaining how the language would apply:

> Scenario: A scale service agency, under contract with a railway track scale owner, discovers the scale out-of-tolerance when testing it using 30 000 lb of test weight.
>
> Considering the changes proposed:
>
> 1. Given that the scale is "out-of-tolerance," would it be permissible for the technician to break the seal and make adjustments to bring the scale's accuracy closer to zero error?
>
> 2. Would it make any difference if the scale was "in tolerance" and the technician only wanted to break the seal to adjust accuracy closer to zero error?
>
> 3. Would it make any difference if the service technician had performed a thorough inspection of the scale and could not find any obvious problem(s) to cause it to be out of tolerance?

NIST, OWM suggested, should the Committee decide to move forward with the item, amending not only N.3.1.2., but also N.3.1. and N.3.1.1. to make clear the testing that is to be performed and the minimum amount of test weight required for Initial and Subsequent Tests in comparison to an Interim Test, which is only intended to temporarily return a railway track scale to service following repairs. NIST, OWM offered specific suggestions for modifying the language for the Committee to consider, noting that the suggested changes were intended to be editorial in nature.

Mr. Rafael Jimenez, AAR Transportation Technology Center, supported the changes proposed by NIST, OWM. Mr. Henry Oppermann, Weights and Measures Consulting, concurred with many of NIST, OWM's points. Mr. Lou Straub, Fairbanks Scales, Inc., suggested that the proposed N.1.3.2.(d) in OWM's proposal would better be presented as a separate note rather than a bullet point.

The Committee heard numerous comments regarding the use of the word "repairs." Mr. Oppermann noted that the reference to the term is ambiguous. Mr. Bob Feezor, Scales Consulting and Testing, commented that there is not universal agreement on the definition of the term and it is left to the official with statutory authority. Ms. Julie Quinn, Minnesota, commented that the CWMA has expressed concerns about the distinctions between calibrations and repairs since its 2011 Annual Meeting. Mr. Steve Beitzel, Systems Associates, Inc. further noted that in the Committee's 1990 Final Report, the original reference to "repairs" was actually to "emergency repairs."

The Committee also heard multiple comments agreeing that 30 000 lb isn't adequate to permanently place a scale back into service and that at least 80 000 lb is required. Many acknowledged that there is limited access to adequate test weight loads, particularly given schedule conflicts that limit the availability of the test units.

Mr. Flocken, speaking on behalf of SMA, indicated that SMA supports the item. Speaking on behalf of Mettler-Toledo, Mr. Flocken expressed concerns about adding the words "temporary service" because this may set a precedence that might overlap to other scales. He also cited similar concerns about the word "repair" and suggested caution in using the term, noting the lengthy discussions that took place within the NCWM during discussions of "repaired" and "remanufactured" equipment and the overlap into other device types.

There were two positions posted on the NCWM 2012 Online Position Forum; one of which supported the proposal and the other was neutral to the proposal.

After considering the many comments received, the Committee acknowledged that the term "repairs" appears in the current version of paragraph N.3.1.2. Minimum Tests for Interim Approval and in other paragraphs throughout Handbook 44. The Committee agreed that the intent of the term "repairs" was referencing emergency situations such as when a railway track scale is inoperable. The Committee received some indication that AREMA Committee 34 may be willing to assist the Committee in clarifying the circumstances under which an Interim Test would be appropriate.

The Committee considered the suggestion from Ms. Macey to modify the term "may" in the first sentence of N.3.1.2. to "shall." While the Committee understood the rationale for Ms. Macey's suggestion, Committee members believed that the word "shall" was not appropriate because an "Interim Test" is only permitted if there is no access to 80 000 pounds of weight. Using less weight than is normally required to return a scale to service is only permitted when there is no access to 80 000 lb.

The Committee agreed that the language suggested by NIST, OWM provided an alternative that was easier to read and apply and helped clarify the requirements for an Interim Test. The Committee considered Mr. Straub's suggestion to move N.1.3.2.(d); however, the Committee concluded that the subparagraphs under N.1.3.2. were all conditions necessary in order to conduct an Interim test. The Committee agreed to modify the proposal offered by NIST, OWM by: (1) adding a new subparagraph (a) and renumbering the subsequent subparagraphs; and (2) modifying the reference to "time period of temporary use" to "length of Interim Use." In summary, the Committee agreed to modify the "Item Under Consideration" as follows:

N.3.1. Minimum Test-Weight Load and Tests ~~Recommended Strain-Load Test~~ for Railway Track Scales.

(Amended 1990 **and 2012**)

N.3.1.1. Initial and Subsequent Tests ~~Approval.~~ – The test-weight load shall be not less than 35 000 kg (80 000 lb). A strain-load test conducted up to the used capacity of the weighing system is recommended.

(Added 1990) **(Amended 20XX)**

N.3.1.2. Interim Test ~~Approval.~~ – **~~A test weight load of not less than 13 500 kg (30 000 lb) and a strain-load test up to at least 25 % of scale capacity may be used to return a scale into service following repairs.~~An Interim Test may be used to return a railway track scale into temporary service following repairs that could affect the accuracy of the weighing system provided all of the following conditions are met:**

(a) A test weight load of not less than 13 500 kg (30 000 lb) shall be used;

(b) A shift (section) test shall be conducted using a test-weight load of not less than 13 500 kg (30 000 lb);

(c) A strain-load test shall be conducted up to at least 25 % of scale capacity;

(d) All test results shall be within applicable tolerances; and

(e) The official with statutory authority shall be immediately notified when scales are repaired and placed in temporary service with an Interim Test. The length of "Interim Use" is at the discretion of the official with statutory authority.

(Added 1990) **(Amended 2012)**

~~Note: The length of time the scale may be used following an interim test is at the discretion of the official with statutory authority~~.

~~(Added 1990)~~

During the voting session of the 2012 NCWM Annual Meeting, additional changes to the language in paragraph N.1.3.2. were proposed from the floor. Mr. Kurt Floren, Los Angeles County, California, suggested replacing the words "Interim Use" with the words "Temporary Service" in subparagraph N.1.3.2.(e). Mr. Doug Dieman, State of Alaska, agreed with the change proposed by Mr. Floren, and further suggested adding the words "following repairs" to the amendment proposed by Mr. Floren. Mr. Dieman recommended the phrase "Temporary Service following repairs" rather than the abbreviated "Temporary Service," suggested by Mr. Floren.

The Committee considered these proposed changes and agreed to amend subparagraph (e) by replacing the words "Interim Use" in subparagraph (e) with the words "Temporary Service following repairs" noting that the change is more consistent with existing language appearing in proposed paragraph N.3.1.2. Thus, subparagraph (e) was amended on the floor prior to vote to read:

(e) The official with statutory authority shall be immediately notified when scales are repaired and placed in temporary service with an Interim Test. The length of "Temporary Service" following repairs is at the discretion of the official with statutory authority.

No additional amendments were suggested or made to the language agreed upon by the Committee, and the Committee agreed to present the item for vote as shown in the "Item Under Consideration."

Any additional letters, presentations, and data that was submitted for consideration for this item is located in the S&T Appendix A.

320-4 VC UR.1.2. Grain Hopper Scales

(This item was adopted.)

Source:
Nebraska Department of Agriculture (2012)

Purpose:
Clarify that grain hopper scales shall be Class III

Item Under Consideration:
1) Amend NIST Handbook 44, Scales Code Table T.1.1. Tolerances for Unmarked Scales, as follows:

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Table T.1.1. Tolerances for Unmarked Scales

Type of Device	Subcategory	Minimum Tolerance	Acceptance Tolerance	Maintenance Tolerance	Decreasing-Load Multiplier[1]	Other Applicable Requirements
Vehicle, axle-load, livestock, railway track (weighing statically), crane, and hopper (other than grain hopper)		Class III L, T.N.3.1. (Table 6) and T.N.3.2.			1.0	T.N.2., T.N.3., T.N.4.1., T.N.4.2., T.N.4.3., T.N.4.4., T.N.5., T.N.7.2., *T.N.8.1.4.*[4], T.N.9.
Grain test scales	n ≤ 10 000 n > 10 000	Class III, T.N.3.1. (Table 6) and T.N.3.2. Class II, T.N.3.1. (Table 6) and T.N.3.2.			1.0	*T.N.8.1.4.*[4], T.N.9.
Railway track scales weighing in- motion		T.N.3.6. except that for T.N.3.6.2. (a), no single error shall exceed four times the maintenance tolerance.			1.0	*T.N.8.1.4.*[4], T.N.9.
Monorail scales, in-motion		T.N.3.8.			1.0	*T.N.8.1.4.*[4], T.N.9.
Customer-operated bulk-weighing systems for recycled materials		± 5 % of applied material test load. Average error on 10 or more test loads ≤ 2.5 %.			1.0	*T.N.8.1.4.*[4], T.N.9.
Wheel-load weighers and portable axle-load scales	Tested individually or in pairs[2]	0.5 d or 50 lb, whichever is greater	1 % of test load	2 % of test load	1.5[3]	*T.N.8.1.4.*[4], T.N.9.
Prescription scales		0.1 grain (6 mg)	0.1 % of test load	0.1 % of test load	1.5	*T.N.8.1.4.*[4], T.N.9.
Jewelers' scales	Graduated	0.5 d	0.05 % of test load	0.05 % of test load	1.5	*T.N.8.1.4.*[4], T.N.9.
	Ungraduated	Sensitivity or smallest weight, whichever is less				
Dairy-product test scale	Loads < 18 g 18 g load	0.2 grain 0.2 grain	0.2 grain 0.3 grain	0.2 grain 0.5 grain	1.5	*T.N.8.1.4.*[4], T.N.9.
Postal and parcel post scales designed/used to weigh loads < 2 lb	Loads < 2 lb	15 grain, 1 g, $^1/_{32}$ oz, 0.03 oz, or 0.002 lb	15 grain, 1 g, $^1/_{32}$ oz, 0.03 oz, or 0.002 lb	15 grain, 1 g, $^1/_{32}$ oz, 0.03 oz, or 0.002 lb	1.5	*T.N.8.1.4.*[4], T.N.9.
	Loads ≤ 2 lb	Table 5	Table 5	Table 5		
Other postal and parcel post scales		Table 5	Table 5	Table 5	1.5	*T.N.8.1.4.*[4], T.N.9.
All other scales **(including grain hopper)**	n > 5000	0.5 d or 0.05 % of scale capacity, whichever is less	0.05 % of test load	0.1 % of test load	1.5	T.N.2.5., T.N.4.1., T.N.4.2., T.N.4.3., T.N.5., T.N.7.2., *T.N.8.1.4.*[4], T.N.9.
	n ≤ 5000	Class III, T.N.3.1., Table 6 and T.N.3.2.			1.0	T.N.2, T.N.3., T.N.4.1., T.N.4.2., T.N.4.3., T.N.5., T.N.7.2., *T.N.8.1.4.*[4], T.N.9.

[1] The decreasing load test applies only to automatic indicating scales.
[2] If marked and tested as a pair, the tolerance shall be applied to the sum of the indication.
[3] The decreasing load test does not apply to portable wheel load weighers.
[4] *T.N.8.1.4. Operating Temperature, is nonretroactive and effective for unmarked devices manufactured as of January 1, 1981.*

(Table Added 1990; Amended 1992**,** ~~**and**~~ 1993**, and 2012**)

2) Amend NIST Handbook 44, Scales Code paragraph UR.1.2. Grain Hopper Scales as follows:

UR.1.2. Grain Hopper Scales. – <u>Hopper scales manufactured as of January 1, 1986 that are used to weigh grain shall be Class III and have a minimum of 2000 scale divisions</u>. The minimum number of scale divisions for a Class III Hopper Scale used for weighing grain shall be 2000.

3) Amend NIST Handbook 44, Scales Code Table 7a. Typical Class or Type of Device for Weighing Applications as follows:

Table 7a.
Typical Class or Type of Device for Weighing Applications

Class	Weighing Application or Scale Type
I	Precision laboratory weighing
II	Laboratory weighing, precious metals and gem weighing, grain test scales
III	All commercial weighing not otherwise specified, grain test scales, retail precious metals and semi-precious gem weighing, **<u>grain-hopper scales</u>**, 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
III L	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
IIII	Wheel-load weighers and portable axle-load weighers used for highway weight enforcement
Note: A scale with a higher accuracy class than that specified as "typical" may be used.	

(Amended 1985, 1986, 1987, 1988, 1992, and 1995, **<u>and 2012</u>**)

Background/Discussion:

NIST Handbook 44 Scales Code does not specifically state that grain hopper scales manufactured after 1986 shall be marked as Class III devices. There are only indirect references that give exceptions for grain hopper scales as being class III (e.g., the phrase "commercial weighing not otherwise specified" and "hopper [other than grain hopper]" in Tables T.1.1. and Table 7a.). The submitter stated there may be inconsistency among jurisdictions as to whether grain hopper scales are required to comply with Class III tolerances. This proposal would bring about uniformity among jurisdictions and be in accord with the original intent of the Committee. Some states may have difficulty requiring Class III tolerances on hopper scales for weighing grain if they have already allowed the use of Class III L tolerances on hopper scales used to weigh grain. If this concern is raised then perhaps this requirement should remain non-retroactive. If some jurisdictions have allowed Class III L hopper scales to weigh grain, it is an indication that the Committee's original intent of the user requirements and tolerances of a hopper scale used to weigh grain does require clarification offered by this proposal.

At the 2011 CWMA Interim Meeting, regulatory officials commented that Table 7a. already states that "all weighing not otherwise specified" would define a grain hopper as a Class III scale; indicating that the problem is already addressed. CWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2011 WWMA Annual Meeting, Mr. Doug Deiman, Alaska Division of Measurement Standards/CVE, suggested that a modification be made to Scales Code Table 7a. by adding "Grain Hopper Scales" to the list of typical Class III applications. He was also concerned that a Class III L vehicle scale weighbridge could be modified by removing the deck and adding hoppers, and could potentially be used to weigh grain. In its deliberations, the Committee considered Mr. Deiman's example as a modification of type and thus the conversion would not be covered by an NTEP CC. Mr. Cook, NIST, OWM reported that OWM tried to verify the exact problem that

initiated the proposal. One possibility is that the use of the word "typical" in the title of Table 7a. is not strong enough to ensure that Class III tolerance apply to Grain Hopper Scales. The item is not fully developed because the problem was not sufficiently demonstrated to justify a change to NIST Handbook 44. The WWMA S&T Committee believes that Table 7a. sufficiently addresses the concern and clearly states that Class III L Hopper scales are specifically excluded from weighing grain. The Committee notes that unmarked scales in Table T.1.1. considers Grain Hopper Scales as "all other scales" and that tolerances are based on NIST Handbook 44 Scales Code Table 6. for Class III devices which is identical to the wording in Table 7a. for scales marked with as a Class III device. The WWMA did not forward the item to NCWM and recommended further development by the submitter.

At the 2011 NEWMA Interim Meeting, NEWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2011 SWMA Annual Meeting, the S&T Committee did not believe it had enough information to make a decision on this issue. The justification provided in the proposal is not sufficient to clarify the issues that need to be resolved. The Committee noted that there are references in NIST Handbook 44 Scales Code to minimum numbers of divisions for Grain Hoppers. The Committee acknowledged that Table 7a. includes only "typical" applications and that additional changes might be warranted to clearly define the required parameters for grain hoppers. However, without additional information on the problem that needs to be resolved, the Committee is reluctant to offer any suggestions. Consequently, the Committee believes additional development is needed on this item before it is ready for consideration. SWMA forwarded the item to NCWM, recommending it as a Developing Item, provided that the original submitter agrees to further develop the item.

At the 2012 NCWM Interim Meeting, Mr. Lampmann, Nebraska Division of Weights and Measures, explained the events which led to the Division's submission of the proposal to amend paragraph UR.1.2. Mr. Lampmann explained that NTEP had recently evaluated a new hopper scale installed in the State of Nebraska and issued a CC based on that evaluation. That particular scale is marked with a III L accuracy class designation by the manufacturer. The State of Nebraska was not notified in advance of the evaluation, and it wasn't until later that the State discovered the scale being used to weigh grain; an application that the State had believed it necessary to use a Class III scale. Although it may not be appropriate to require "unmarked" hopper scales (i.e., those manufactured prior to 1986) to be marked Class III, Mr. Lampmann indicated that this proposal is an attempt to clearly state the appropriate accuracy class designation for grain hopper scales in NIST Handbook 44.

Mr. Lewis, Rice Lake Weighing Systems, Inc., voiced support of the proposal by commenting that although everyone present in the room is aware that a grain hopper scale must be Class III, not all their customers (grain dealers) share that same awareness.

NIST, OWM noted that the item, if adopted as originally proposed, would require all hopper scales used to weigh grain, including those manufactured prior to January 1, 1986, to be marked with a Class III accuracy class. Scales manufactured prior to January 1, 1986, are not currently required to be marked with an accuracy class designation (i.e., the date a new Scales Code was added to NIST Handbook 44, which classified scales into different accuracy classes). Thus, it would not be feasible or reasonable to require scales manufactured prior to 1986 to be marked with an accuracy class designation. Additionally, it would be inconsistent with the note that appears at the bottom of Table 7a. in the Scales Code to require grain hopper scales manufactured as of January 1, 1986, to be designated Accuracy Class III because the note makes it permissible to use a scale with a higher accuracy class than that specified in the table. For example, it would be permissible to use a Class II hopper scale for weighing grain. With respect to unmarked grain hopper scales, Table T.1.1. Tolerances for Unmarked Scales specifically excludes grain hopper scales from other hopper scale types (e.g., those used to weigh fertilizer, aggregate, etc.). Thus, grain hopper scales, by virtue of the fact that they are not specifically identified as one of the device types elsewhere in the table, fall into the category titled "All other scales."

NIST, OWM stated that their analysis of this item revealed that Tables 7a. and 7b. were added to the Scales Code in 1986 in an effort to provide guidance on how to apply General Code suitability requirements. As noted by the 1985 S&T Committee in their final report, "suitability" had been a subject of discussion probably since the beginning of weights and measures. NIST, OWM concluded that the word "Typical" appearing in Table 7a. was added by NCWM because the table was only intended to provide guidance, and recognized the fact that the suitability of a

commercial device depends on many factors, all of which must be considered on a case by case basis by the official conducting the inspection.

In consideration of these points, NIST, OWM offered the following alternative means of amending NIST Handbook 44 should the Committee agree to add further clarification that hopper scales manufactured as of January 1, 1986, used to weigh grain were intended to be designated Accuracy Class III.

- Amend Table T.1.1. Tolerance for Unmarked scales by adding the words "including grain hopper" after "All other scales" to read as "All other scales **(including grain hopper)**";

- Amend Table 7a. by adding "grain hopper scales" in the "Weighing Application" column for Class III devices; and

- Amend paragraph UR.1.2. to address scales manufactured after January 1, 1986. The following changes to UR.1.2. were suggested.

UR.1.2. Grain Hopper Scales. – ~~**The minimum number of scale divisions for a Class III Hopper Scale used for weighing grain shall be 2000.**~~ **Hopper scales manufactured as of January 1, 1986, and used to weigh grain, shall be designated Accuracy Class III and have a minimum of 2000 scale divisions.**

During the Committee work session, the question was raised as to whether a "grain hopper scale" and a "hopper scale used to weigh grain" were one in the same or different devices. After reviewing the definitions of "hopper scale" and "grain-hopper scale" in NIST Handbook 44 Appendix D, the Committee concluded that these terms are used interchangeably throughout the Scales Code to identify the same device. The Committee then considered whether or not it was the intent of NCWM to require hopper scales manufactured as of January 1, 1986, and used to weigh grain to be Class III. The Committee concluded that this was likely the intent of NCWM. The 2012 S&T Committee designated this item as a Voting Item with the amendments offered by NIST, OWM.

At their 2012 Annual Meetings, both NEWMA and CWMA supported this item as a Voting Item. The CWMA also noted that the proposal provides greater clarification of what is required with regard to accuracy class markings of a hopper scale used to weigh grain.

There were three positions posted on the NCWM 2012 Online Position Forum; two of which supported the proposal and the other was neutral to the proposal.

At the 2012 NCWM Annual Meeting, the Committee heard no additional comments on this item.

The Committee recommended the item be presented for vote as proposed.

320-5 I Appendix C – Units of Mass (ton)

Source:
Rice Lake Weighing Systems, Inc. (2012)

Purpose:
Establish uniform abbreviations for Short Ton and Long Ton

Item Under Consideration:
Amend the Units of Mass Table on page C-19 of NIST Handbook 44 Appendix C to recognize the abbreviation "tn" for (net or short) ton as follows:

Units of Mass	
1 assay ton[17] (AT)	29.167 grams
1 carat (c)	200 milligrams (exactly) 3.086 grains
1 dram apothecaries (dr ap or ℨ)	60 grains (exactly) 3.888 grams
1 dram avoirdupois (dr avdp)	$27^{11}/32$ (= 27.344) grains 1.772 grams
1 gamma (γ)	1 microgram (exactly)
1 grain	64.798 91 milligrams (exactly)
1 gram (g)	15.432 grains 0.035 ounce, avoirdupois
1 hundredweight, gross or long[18] (gross cwt)	112 pounds (exactly) 50.802 kilograms
1 hundredweight, gross or short (cwt or net cwt)	100 pounds (exactly) 45.359 kilograms
1 kilogram (kg)	2.205 pounds
1 milligram (mg)	0.015 grain
1 ounce, avoirdupois (oz avdp)	437.5 grains (exactly) 0.911 troy or apothecaries ounce 28.350 grams
1 ounce, troy or apothecaries (oz t or oz ap or ℥)	480 grains (exactly) 1.097 avoirdupois ounces 31.103 grams
1 pennyweight (dwt)	1.555 grams
1 point	0.01 carat 2 milligrams
1 pound, avoirdupois (lb avdp)	7000 grains (exactly) 1.215 troy or apothecaries pounds 453.592 37 grams (exactly)
1 micropound (µlb) [the Greek letter mu in combination with the letters lb]	0.000 001 pound (exactly)
1 pound, troy or apothecaries (lb t or lb ap)	5760 grains (exactly) 0.823 avoirdupois pound 373.242 grams
1 scruple (s ap or ℈)	20 grains (exactly) 1.296 grams
1 ton, gross or long **(lt)**[19]	2240 pounds (exactly) 1.12 net tons (exactly) 1.016 metric tons
1 ton, metric (t)	2204.623 pounds 0.984 gross ton 1.102 net tons
1 ton, net or short **(tn)**	2000 pounds (exactly) 0.893 gross ton 0.907 metric ton

FOOTNOTES:

[17] Used in assaying, the assay ton bears the same relation to the milligram that a ton of 2000 pounds avoirdupois bears to the ounce troy; hence the mass in milligrams of precious metal obtained from one assay ton of ore gives directly the number of troy ounces to the net ton.

[18] The gross or long ton and hundredweight are used commercially in the United States to only a very limited extent, usually in restricted industrial fields. The units are the same as the British "ton" and "hundredweight."

[19] The gross or long ton and hundredweight are used commercially in the United States to a limited extent only, usually in restricted industrial fields. These units are the same as the British "ton" and "hundredweight."

Background/Discussion:
The submitter of this item has discovered a difference between United States and Canadian abbreviation requirements that may impact manufacturers that sell products in both countries and NTEP type evaluations under the United States/Canada mutual recognition program. Most units of mass have an abbreviation for SI and U.S. customary units (e.g., kg, lb, g, oz). However, the same abbreviation, the lower case "t," is used to represent both the metric ton and the short ton (2000 lb). If an indicator is set up to display both SI and U.S. customary units, the operator or customer cannot know what units are is displayed if "t" is the only abbreviation that is acceptable for metric ton. Because of the limited space available on today's indicators, the words "short ton" or "long ton" are not always an option.

In the Canadian Lab Manual, Part 2, Section Appendix-2A in the table for abbreviations and symbols accepted in Canada, metric ton is abbreviated by "t" and ton (short ton) is abbreviated by "tn". In NCWM Publication 14, Appendix C in a table marked Acceptable Abbreviation/Symbols there is an abbreviation for short to as TN and long tons as LT. In keeping with the Canadian abbreviation, the Committee considered a request that NIST Handbook 44 be amended to use the lower case "tn" and "lt" as the abbreviations for short and long ton respectively.

At the 2011 CWMA Interim Meeting, CWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 WWMA Annual Meeting, Mr. Ripka, Thermo-Fisher Scientific, expressed concern for the impact that the proposed abbreviation changes would have on the substitution or replacement of existing terms on longstanding industry practices. Mr. Flocken, Mettler-Toledo, LLC, expressed similar concerns. He would support the proposal moving forward as an Informational Item. Mr. Cook, NIST, OWM reported that NIST Handbook 44 Appendix C (2011 Edition) uses the lower case "t" for both the U.S. customary short ton (2000 lb) on page C-6 and the metric ton (2204.623 lb) on page C-19. Additionally, NIST Special Publication 811, *Guide for the International Systems (SI)* doesn't use any abbreviation for U.S. customary tons and uses the lower case (t) for the metric ton. The Committee believes the proposal lacks specific direction whether to add or replace the existing abbreviations in NIST Handbook 44, Appendix C. Additionally, there was no proposed solution or suggested abbreviation for indicators with both U.S. customary and metric tons used in his example. WWMA forwarded the item to NCWM recommending it as a Developing Item.

At its 2011 SWMA Annual Meeting, the S&T Committee heard from Mr. Lewis, Rice Lake Weighing Systems, Inc. Mr. Lewis indicated that, based on opposition he had heard on his proposal to include an abbreviation for "long ton," he suggests removing that abbreviation from the proposal. Thus, the proposal would only include an abbreviation for "short ton." Mr. Flocken, Mettler-Toledo, LLC, noted that the Weighing Sector considered this and agreed to move this forward because of differences between the United States and Canadian requirements. Canada doesn't accept upper case "TN." Ms. Butcher, NIST, OWM noted during the Committee work sessions that NCWM Publication 14 includes an exception to the abbreviation for "short ton," with accepted designations of "ton" or "TN." Mr. Lewis indicated that the Weighing Sector agreed to modify NCWM Publication 14 to designate the abbreviation for short ton as "tn." There was support for the proposed abbreviation during the Open Hearings. Noting the proposed change would align the U.S. requirements with Canadian requirements, there were no indications that the proposed change would impact existing equipment. Mr. Flocken indicated that the same change is being proposed for NCWM Publication 14 scales checklists. The SWMA agreed with its Committee recommendation to delete the reference to "long ton" in the original submission as requested by the submitter. SWMA forwarded the item to NCWM, recommending it as a Voting Item after modifying the reference to "ton" on page C-6 of NIST Handbook 44, Appendix C to specify the unit "tn" as the abbreviation for "ton."

At the 2012 NCWM Interim Meeting, the original submitter, Mr. Lewis requested that the proposal in the Interim Agenda be modified to remove the reference to long ton and its associated proposed abbreviation "lt." Mr. Lewis indicated that the intent of the proposal is to align United States and Canadian requirements and noted that the abbreviation "tn" is an acceptable Canadian abbreviation for short ton.

Mr. Flocken, speaking on behalf of the SMA, suggested making the item Informational to allow for more discussion. He stated that SMA supports the abbreviation "tn" for short ton but not the long ton abbreviation "lt."

NIST, OWM stated that they agreed with the points raised during the 2011 WWMA Annual Meeting for continued development of the item.

Mr. Ripka indicated that several different references for ton (short) have been used with belt-conveyor scale systems over the years. For example, both lower case "t" and upper case "T" have been used to abbreviate short ton. He stated that although he was not opposed to the item, more work is needed to ensure that references are consistent throughout all of NIST Handbook 44.

The Committee considered the comments received during the Open Hearings and agreed with the recommendation to amend the Units of Mass table on page C-19 of NIST Handbook 44, Appendix C as shown in Item Under Consideration. The Committee agreed that additional work is needed on this item. The Committee asked the NIST Technical Advisors to undertake a review of the references in NIST Handbook 44, the Canadian requirements, and NCWM Publication 14, and identify any additional changes that might be needed to ensure consistency. Additionally, the Committee is seeking input from the community on the impact that this item might have on existing scales in the marketplace. The 2012 S&T Committee designated this item as an Informational Item.

Technical Advisors Note: After the 2012 NCWM Interim meeting had concluded, NIST, OWM in reviewing summary comments from the 2011 SWMA fall meeting, discovered an additional reference on page C-6 of Appendix C, NIST Handbook 44, that SWMA had identified as needing to be changed in order to be consistent with the change proposed in the Item Under Consideration. NIST, OWM suggests that the following change be made for future consideration of this item:

Amend the abbreviation "t" representing the "net" or "short" ton on page C-6 of NIST Handbook 44, Appendix C to "tn" as follows:

Avoirdupois Units of Mass[6]

[The "grain" is the same in avoirdupois, troy, and apothecaries units of mass.]

1 µlb	= 0.000 001 pound (lb)
$27^{11}/_{32}$ grains (gr)	= 1 dram (dr)
16 drams	= 1 ounce (oz) = 437½ grains
16 ounces	= 1 pound (lb) = 256 drams = 7000 grains
100 pounds	= 1 hundredweight (cwt)[7]
20 hundredweights	= 1 ton (tn) = 2000 pounds[7]

In "gross" or "long" measure, the following values are recognized:

112 pounds (lb)	= 1 gross or long hundredweight (cwt)[7]
20 gross or long hundredweights	= 1 gross or long ton = 2240 pounds

FOOTNOTES:

[6] When necessary to distinguish the **avoirdupois** dram from the **apothecaries** dram, or to distinguish the **avoirdupois** dram or ounce from the **fluid** dram or ounce, or to distinguish the avoirdupois ounce or pound from the **troy** or **apothecaries** ounce or pound, the word "avoirdupois" or the abbreviation "avdp" should be used in combination with the name or abbreviation of the **avoirdupois** unit.

[7] When the terms "hundredweight" and "ton" are used unmodified, they are commonly understood to mean the 100 pound hundredweight and the 2000-pound ton, respectively; these units may be designated "net" or "short" when necessary to distinguish them from the corresponding units in **gross** or **long** measure.

At its 2012 Annual Meeting, NEWMA supported the item as amended at the 2012 Interim Meeting. NEWMA questioned whether the wrong "Units of Mass" table was included in the NCWM S&T Committee's Interim Report.

At its 2012 Annual Meeting, CWMA recommended that the item remain Informational. The CWMA also recommended changing the abbreviation "t," which refers to a "short ton," to "tn" to avoid conflict with the recommended proposal. At that meeting Mr. Flocken supported "tn" as an acceptable abbreviation for "short ton," but does not support "lt" as the abbreviation for "long ton;" he also suggested that the abbreviation "lt" was erroneously left in the proposal.

At the 2012 NCWM Annual Meeting, the Committee acknowledged that the reference to "lt" is no longer under consideration. Mr. Flocken, speaking on behalf of SMA, reiterated the comments he made at the CWMA meeting and supported changing the item to "Informational."

Ms. Juana Williams, NIST, OWM shared technical input from NIST, OWM regarding the proposed changes. NIST, OWM noted that the 2011 NCWM Publication 14 Belt-Conveyor Scale Systems type evaluation criteria provides a table on page BCS-4 that indicates the U.S. short ton may be identified as "ton" or upper case "T;" the metric ton as lower case "t;" and the U.S. long ton as upper case "LT." The following abbreviations appear in the 2011 version of Pub 14 BCS systems type evaluation criteria:

Unit	Abbreviation
pounds	lb or LB
U.S. short ton	ton or T
U.S. long ton	LT
Metric ton	t
kilograms	kg

The abbreviation "T" for U.S. short ton in NCWM Publication 14 conflicts with the acceptable abbreviation for the U.S. short ton specified in Appendix C of NIST Handbook 44, which is "t." A search of the word "ton" in Appendix C of NIST Handbook 44 revealed that nowhere is upper case "T" used, although lower case "t" appears as an acceptable abbreviation for both the U.S. short (or net) ton (page C-6) and the metric ton (page C-19). OWM is concerned that officials applying paragraph G-S.5.6.1. might be inclined to reject an upper case "T" as an acceptable abbreviation for the U.S. short (or net) ton even though NCWM Publication 14 indicates that the upper case "T" is acceptable. Officials might also find it confusing if lower case "tn" were made an acceptable abbreviation for the U.S. short or net ton, given that the table on page BCS-4 of NCWM Publication 14 specifies lower case "t" as the acceptable abbreviation for the metric ton.

OWM noted that even if everyone were to agree on different acceptable abbreviations for the U.S. short or net ton, the U.S. long ton, and the metric ton, it is not likely that this would completely resolve all the confusion relating to the value of the ton in commercial transactions. The spelled-out version of the word "ton" is often used instead of its abbreviation to identify values displayed or recorded by a commercial device. Thus, unless the word "ton" is further qualified using an appropriate clarifying preface such as metric, short, net, or long, it's unclear as to which ton is being referenced when the word "ton" by itself is used to identify the unit of measure.

OWM suggested that should the Committee decide to move forward with the item, it consider changing the abbreviation "t" (which refers to 1 ton (short), beneath the heading "Avoirdupois Units of Mass" on page C-6 of the 2012 version of NIST Handbook 44) to "tn" to avoid conflict with the recommended proposal. OWM also noted that the abbreviation "lt" was erroneously left in the table.

There were three positions posted on the NCWM 2012 Online Position Forum; two of which were neutral to the proposal and the other in support of the proposal.

The Committee agreed that the "lt" abbreviation for "1 ton, gross or long" in the table on page S&T-20 of 2012 NCWM Publication 16 was erroneously left in the table from the original proposal and should be removed.

The Committee reiterated its request for input from the community on the impact that this item might have on existing scales in the marketplace and asked for input regarding additional changes that might be needed to the proposal prior to moving it forward.

The Committee recommended deleting the reference to "Long Ton" in the description of the "Purpose" of the item so that it reads as follows:

"**Purpose:** Establish uniform abbreviations for Short Ton."

The Committee also recommended deleting the reference to "lt" in the "Units of Mass" table in the "Item Under Consideration" so that the reference for "1 ton, gross" reads as follows:

1 ton, gross or long[19]

No additional changes were recommended by the Committee.

320-6 VC Appendix D – Definitions (Reference Weight Car)

(This item was adopted.)

Source:
Systems Associates, Inc. (2012)

Purpose:
Align NIST Handbook 44 with updated material in *AAR Scale Handbook*.

Item Under Consideration:
Replace the existing definition of "reference weight car" in NIST Handbook 44, Appendix D with the following:

reference weight car. – ~~**A railroad car weighed on a scale for temporary use as a mass standard over a short period of time (typically, the time required to test one scale) as part of a test train.**~~ **A railcar that has been statically weighed for temporary use as a mass standard over a short period of time, typically the time required to test one scale.**

Note: A test weight car that is representative of the types of cars typically weighed on the scale under test may be used wherever reference weight cars are specified.[2.20]

(Added 1991) **(Amended 2012)**

Background/Discussion:
The proposal would require that reference cars be weighed on a static scale and would remove the statement regarding being part of a train. For instance, Reference Weight Cars may be used in a belt scale test where the concept of a train doesn't exist. The proposed definition change was developed by AREMA Committee 34 – Scales and approved, by unanimous vote, for inclusion in the *AAR Scale Handbook*.

At the 2011 CWMA and NEWMA Interim Meetings, both associations forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 WWMA Annual Meeting, Mr. Straub, Fairbanks Scales, Inc., supported the item as submitted. There was no opposition. The WWMA S&T Committee recognized that this proposal aligns NIST Handbook 44 with the updated material in the *AAR Scale Handbook*. WWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 SWMA Annual Meeting, the S&T Committee heard one comment in support and no comments in opposition. The SWMA agreed with the Committee's comments that the modification will further align NIST Handbook 44 and the *AAR Handbook*. SWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2012 NCWM Interim Meeting, Mr. Flocken, speaking on behalf of the SMA, supported this item. NIST, OWM agreed that adding the words "statically weighed" improved the definition and made clear how reference weight cars are to be weighed. The Committee reviewed a January 7, 2012, letter from AAR in support of the proposal. The Committee agreed that the proposed changes improved the definition. The 2012 S&T Committee designated this item as a Voting Item.

At its 2012 Annual Meeting, the CWMA suggested the phrase "uncoupled on both ends" be added to the proposed new sentence to be consistent with AREMA requirements and supported the item, as modified, as a Voting Item.

At its 2012 Annual Meeting, NEWMA supported the item as written as a Voting Item.

At the Committee's 2012 NCWM Annual Meeting Open Hearings, Mr. Flocken, speaking on behalf of the SMA stated that SMA supports this item.

Ms. Juana Williams, speaking on behalf of NIST, OWM offered technical comments for the Committee to consider in its deliberation on this item. OWM noted that weighing a reference weight car, while the car is "coupled" on either end to another railcar or engine could result in binding/friction to the extent that the error and uncertainty in the reference weight car might well exceed the maximum allowable specified in NIST Handbook 44, Appendix A Fundamental Considerations. This section of the Fundamental Considerations specifies that the combined error and uncertainty of any standard used in testing commercial weighing and measuring equipment, when used without correction, must be less than one-third the applicable device tolerance.

OWM also commented that inserting only the word "uncoupled" into the new sentence proposed to be added to the definition of "reference weight car" implies that reference weight cars are to be weighed uncoupled on both ends. Adding the more descriptive phrase "uncoupled on both ends" as suggested by the CWMA removes all doubt concerning how the cars are to be weighed.

Ms. Julie Quinn, Minnesota, supported including the reference suggested by the CWMA.

Mr. Rafael Jimenez, AAR Transportation Technology Center, stated that AAR supports this item, but does not support the inclusion of the reference to "uncoupled on both ends" pending the results of additional testing. Mr. Steve Beitzel, Systems Associates Inc., supported the item, but does not support including procedures (including the statement "uncoupled on both ends") in the definition.

There were two positions posted on the NCWM 2012 Online Position Forum; both of which supported the proposal.

Although the Committee recognized the importance of proper testing procedures, it agreed that definitions are not the place for procedures to be specified. The Committee encouraged the collection of data by AAR and looks forward to reviewing that data when it becomes available.

The Committee recommended the item be presented for Vote with no changes.

Any additional letters, presentations, and data that was submitted for consideration for this item is located in the S&T Appendix A.

321 BELT-CONVEYOR SCALE SYSTEMS

321-1 V S.1.9. Zero Ready Indicator

(This item was adopted.)

Source:
U.S. National Work Group (USNWG) on Belt-Conveyor Scales (BCS) (2012)

Purpose:
Add a new device specification and user requirement to help ensure that a stable zero-balance condition is established prior to running material across a belt scale.

Item Under Consideration:
1) Add a new paragraph S.1.9. Zero Ready Indicator to NIST Handbook 44, Section 2.21., Belt-Conveyor Scale Systems Code to read as follows:

S.1.9. Zero Ready Indicator. - A belt conveyor scale shall be equipped with a zero ready indicator that produces an audio or visual signal when the zero balance is within ± 0.12 % of the rated capacity of the scale during an unloaded belt condition. The type of indication (audio or visual) shall be determined by the individual installation.
[Nonretroacvtive as of January 1, 2014]
(Added 2012)

2) Amend NIST Handbook 44, Section 2.21., Belt-Conveyor Scale Systems Code paragraph UR.3.2. Maintenance by adding a new subparagraph UR.3.2. (a) and renumbering subsequent subparagraphs as follows:

UR.3.2. Maintenance. – Belt-conveyor scales and idlers shall be maintained and serviced in accordance with manufacturer's instructions and the following:

(a) Zero Balance. – The zero balance condition of a belt-conveyor scale shall be maintained such that, prior to beginning any commercial transaction, with no load on the belt, the zero balance condition is within ± 0.12 % of the scales rated capacity.
(Added 2012)

Renumber subsequent subparagraphs as follows:

~~(a)~~**(b)** The scale and area surrounding the scale shall be kept clean of debris or other foreign material that can detrimentally affect the performance of the system.

~~(b)~~**(c)** There shall be provisions to ensure that weighed material does not adhere to the belt and return to the scale system area.

(Added 2004)

~~(c)~~**(d)** Zero-load tests and simulated load or material tests shall be conducted at periodic intervals between official tests and after a repair or mechanical adjustment to the conveyor system in order to provide reasonable assurance that the device is performing correctly. The minimum interval for periodic zero load tests and simulated load tests shall be established by the official with statutory authority or according to manufacturer recommendations.

No changes recommended for Change in Zero or Change in Factor (Reference) Tables

~~(d)~~**(e)** **Scale Alignment.** – Alignment checks shall be conducted in accordance with the manufacturer's recommendation when conveyor work is performed in the scale area. A material test is required after any realignment.

(Amended 1986 and 2000)

~~(e)~~**(f)** **Simulated Load Equipment.** – Simulated load equipment shall be clean and properly maintained.

~~(f)~~**(g)** **Zero Load Reference Information.** – When zero load reference information is recorded for a delivery, the information must be based upon zero load tests performed as a minimum both immediately before and immediately after the totalized load.

(Added 2002)

(Amended 2002, 2004, and 2009)

Background/Discussion:
The intent of the proposal is to: 1) provide an indication that the zero condition of the scale is within the specified requirements for accurate measurement, and 2) further clarify General Code paragraph G-UR.4.1. Maintenance of Equipment regarding a user's responsibility to maintain the scale in proper operating condition. It should be noted that a similar proposal first appeared on the 2009 S&T Committee's Agenda. The item was subsequently withdrawn at the request of the submitter in order to further develop the proposal addressing the USNWG concerns reported during their February 2009 NCWM Annual Meeting. Additional background information on this item can be reviewed in 2009 NCWM S&T Committee's Final Reports.

It is apparent to owners, manufacturers, and service agents associated with belt conveyor scale systems that a zero shift may occur that is readily observed on systems running at a "no-load" level of operation (particularly those equipped with automatic zero mechanisms). The USNWG on belt-conveyor scales has developed a recommendation that would require that an indication be present which indicates a zero condition during these low-flow periods when no material is being totalized by an integrator.

During the 2008 USNWG on Belt-Conveyor Scales meeting, the work group submitted a proposal to NCWM S&T Committee that would add a requirement to NIST Handbook 44 requiring belt-conveyor scales to include a means to provide the operator with an indication that the system is "ready" to operate. The recommended addition of paragraph S.1.6.1. would require an indication to notify an operator of an out-of-zero condition and also would define the limit of the width of zero for that device.

This indication would signify that the system had arrived at an acceptable stable zero condition with the belt running during periods when no totalization of material was taking place. The work group also acknowledged the need for an associated User Requirement that would provide guidance for an operator of the system in the event that the system failed to achieve this "ready" state.

During the February 2011 meeting of the USNWG, the work group agreed that additional effort should be expended to continue developing a requirement that will provide indication that an acceptable zero condition exists prior to any totalization operation. There was no consensus regarding specifics related to such a requirement such as: the

nature of this proposed indication and its visibility to the operator; the duration of time or length of belt travel needed to establish a zero condition; and the allowable limits that would be applied to any variation from the established zero condition. Further discussion was tabled on this item and the sub-group that was established to address this item agreed to further explore these issues and develop a draft proposal. The sub-group consisted of:

- Mr. Ian Burrell
- Mr. Todd Dietrich
- Mr. Bill Ripka
- Mr. Phil Carpentier
- Mr. Lars Marmsater
- Mr. Peter Sirrico
- Mr. Paul Chase

This sub-group met via e-mail and teleconference and developed draft proposals for both, a Specification Requirement (S.1.9. Zero Ready Indicator) and the associated User Requirement UR.3.2.(a), which has been submitted as a separate item.

The draft proposals were sent electronically to the entire USNWG on belt-conveyor scales, asking for review and comments by August 10, 2011. No additional comments were received from the members of the USNWG.

At the 2011 CWMA and NEWMA Interim Meetings, and the SWMA Annual Meeting, both associations forwarded the item to NCWM, recommending it as Voting Item.

At the 2011 WWMA Annual Meeting, Mr. Ripka, Thermo Fisher Scientific, provided the following comments and added that the Belt-Conveyor Scale USNWG has thoroughly discussed the topic of "zero" as it relates to a belt-conveyor scale condition prior to running material loads. Some of these discussions went beyond the "ready" topic and delved into some type of zero alarm. Responses to the alarm comments seem to agree that this is a separate issue and should be addressed at a different time. The USNWG considered the following in its development of this item.

The name of this feature/requirement.

In the initial proposal the term "zero balance" was used, and members of the work group preferred the terms: "Zero Ready" and "Scale Ready." The work group agreed that having a stable zero, within a predefined range, does not totally verify that the scale is ready. Thus, it was decided that we would use the term "Zero Ready" in the final proposal submitted to the regional S&T Committee for consideration.

Visibility to the operator.

The work group does not believe there is a need to clutter the code by specifying the indicator must be visible to the operator. General Code paragraph G-UR.3.3. Position of Equipment, states "A device or system equipped with a primary indicating element and used in direct sales, except for prescription sales, shall be positioned so that its indications may be accurately read and the weighing or measuring operation may be observed from some reasonable "customer" and "operator" position." It is within this General Code reference that the rate of flow limit indicator positioning is based (i.e., viewable by the operator) and the same requirements should hold true for the "Zero Ready" indicator.

Period to determine the "Zero" condition.

All testing criteria currently used for belt-conveyor scales base zero on full belt revolutions. The work group agrees the same basis should be used for this condition/indication. Paragraph N.3.1.1. Determination of Zero identifies: a "Zero-Load Test" as "a percentage of the full-scale capacity, or a change in a totalized load over a whole number of complete belt revolutions." The work group agreed not to redefine this during its discussions. There may be capabilities within belt profiling schemes that would be able to identify this condition in less than a revolution and the revised proposal allows for development of this or other technologies.

Location of specification.

Due to the methodology of indicating retroactive or non-retroactive in the handbook, the work group agreed that the new requirement should not be included in paragraph S.1.5. Rate of Flow Indicators and Recorders, which currently has a non-retroactive date of January 1, 1986. Changing this to a non-retroactive date of January 1, 20XX, could possibly put some old existing systems into a non-compliance condition. Therefore, the recommendation is to add the zero condition statement in a new section, numbered S.1.9. simply to keep the new requirement as a stand-alone item, and to eliminate the need to renumber the other items in this area.

Allowable limits.

There were many opinions regarding the amount of zero error allowed prior to the initiation of the "Zero Ready" condition. The initial proposal used 0.06 %. The team discussions continually referenced the 0.12 % value as allowed during the performance of a materials test. When "testing" a belt-conveyor scale, the zero is to be confirmed to be able to hold a zero condition for three consecutive tests within 0.06 %. This test proves zero stability of an empty system only (N.3.1.2. Test of Zero Stability). After a materials test load has been delivered, the scale is expected to remain within 0.12 %. This ensures that the materials load test has not been compromised or influenced by a zero shift (T.1.1. Tolerance Values – Test of Zero Stability). If the zero requires adjustment during the conduct of a materials test in excess of 0.18 %, the statutory authority may establish specific intervals for zero testing. This requirement does not restrict the zero range. It can perhaps be argued the allowable zero range during "use" is 0.18 %, or even 0.25 % - the tolerance of the device itself. While this may be a high value, we need to make changes in the handbook that do not conflict with other requirements already in place. After final discussion, the sub-team of the USNWG agreed that the value to be implemented in this proposal is 0.12 %.

The WWMA S&T Committee agreed with the recommendation and justification provided by the USNWG on belt-conveyor scales. WWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2012 NCWM Interim Meeting, Mr. Ripka spoke on behalf of the USNWG on Belt-Conveyor Scales. Mr. Ripka indicated that over the past two years a subcommittee of the USNWG had worked very hard to understand influences that affect zero to be able to recommend improvements to help ensure a BCS started on zero. The group initially developed a "Specification" requirement that provides easy to understand indication that a scale is ready to use. Mr. Ripka indicated that it was now time to move forward to the next step (i.e., to require users to start a commercial transaction only when the scale is in a ready to use zero balance condition).

Thermo Fisher Scientific supported this item as written.

Mr. Flocken, speaking on behalf of the SMA, supported the item as written.

NIST, OWM indicated that the language in the proposed user requirement doesn't necessarily require a BCS system operator to start a commercial transaction with the zero balance condition within ± 0.12 % of the scales rated capacity as is intended by the proposal. They offered the following suggested changes to the proposed user requirement to make the paragraph an enforceable requirement:

(a) Zero Balance. – The balance condition of a belt-conveyor scale shall be maintained such that, prior to beginning any commercial transaction, with no load on the belt, ~~a~~ the zero balance condition is within ± 0.12 % of the scales rated capacity ~~can be verified~~.
(Added 20XX)

(No changes recommended for Change in Zero or Change in Factor [Reference]) Tables)

(Renumber subsequent subparagraphs)

NIST, OWM noted that their suggested changes to proposed user requirement UR.3.2.(a) had been circulated to the USNWG on BCS systems as part of an alternative reorganization of the User Requirements proposed by NIST, OWM under agenda Item 321-2 and that members of the work group had supported those suggested changes.

The Committee considered the comments provided by Mr. Ripka, Thermo Fisher Scientific, and Mr. Flocken, Mettler-Toledo, LLC, in support of the original proposal and the proposed changes from NIST, OWM that had been supported by the work group. The Committee agreed that the changes suggested by NIST, OWM to the language originally proposed for UR.3.2.(a) were needed in order to make the paragraph an enforceable requirement and thus modified the original proposal accordingly. The 2012 S&T Committee designated this item as a Voting Item.

The Committee then considered the effect that this agenda item would have on agenda Item 321-2 should both be considered Voting Items at the NCWM Annual Meeting. The Committee concluded that Item 321-1 was intended as a stand-alone item to be voted on separately from Item 321-2. However, if agenda Item 321-1 were to be adopted by NCWM, the insertion of the new user requirement proposed under Item 321-1 would change the organization and some of the paragraph references in the user requirement restructuring proposed under Item 321-2. It was noted that NIST, OWM had suggested a further reorganization of the language in the User Requirements in Item 321-2. They circulated this language (including their suggested changes to UR.3.2. proposed under Item 321-1) to members of the USNWG on BCSs and indicated that they had supported this alternative proposal. The Committee decided that if Item 321-1 were adopted by NCWM, the user requirement proposed under Item 321-1 should be inserted into the alternative restructuring proposal and should be voted upon as part of Item 321-2.

At their 2012 Annual Meetings, NEWMA and CWMA supported the item as a Voting Item. NEWMA also acknowledged the need to renumber the paragraph should Item 321-2 pass.

In its 2012 Interim Report, the Committee proposed adding a new paragraph S.1.9. as follows:

> ***S.1.9. Zero Ready Indicator. – A belt conveyor scale shall be equipped with a Zero Ready indicator. Permanent means shall be provided to produce an audio or visual signal when the zero is within ± 0.12 % of the rated capacity of the scale during an unloaded belt condition. The type of indication (audio or visual) shall be determined by the individual installation.***
> ***[Nonretroactive as of January 1, 20XX]***
>
> **(Added 20XX)**

At the 2012 NCWM Annual Meeting, the Committee heard comments from Ms. Juana Williams, speaking on behalf of NIST, OWM who noted that adding a Specification requirement that defines a proper zero-load balance condition on a belt-conveyor scale system and an associated User Requirement that requires operators to start each commercial weighment with the scale at zero (i.e., in a proper zero-balance condition) would make the Belt Conveyor Scales Systems Code more consistent with other device codes in NIST Handbook 44 and likely improve the accuracy of the measurement process.

With regard to the proposed paragraph S.1.9. Zero Ready Indicator, NIST, OWM commented that the words "permanent means" seemed confusing. NIST, OWM suggested that the Committee consider whether or not the first two sentences might be consolidated into a single sentence which better describes how the zero-ready indicator is intended to operate and offered a suggestion for the Committee to consider.

Mr. Ripka supported the item with NIST, OWM's proposed changes and commented that he believed the remainder of the Belt Scale Work Group would also support the changes. Mr. Ripka also suggested establishing a nonretroactive date of 2014.

Mr. Flocken, speaking on behalf of SMA, supported the original proposal, noting that he would like to review NIST, OWM's proposal in more detail before commenting on it one way or the other.

A single position was posted on the NCWM 2012 Online Position Forum in support of the proposal.

Based on comments received and general support for NIST, OWM's proposed modifications, the Committee agreed to modify the proposed paragraph S.1.9. as shown in the "Item Under Consideration" above and to specify a nonretroactive date of 2014.

The Committee recommended no changes to Item 2) included in the "Item Under Consideration" and agreed to present both items for a vote.

321-2 VC UR.1. User Requirements

(This item was adopted.)

Source:
U.S. National Work Group on Belt-Conveyor Scales (2012)

Purpose:
Achieve a better organization and formatting of the User Requirement section, by renumbering and/or relocated paragraphs within this section.

Item Under Consideration:
Amend NIST Handbook 44, Belt-Conveyor Scales Systems UR. User Requirements section as follows:

UR. User Requirements

UR.1. ~~Use~~ Installation Requirements. – ~~A belt-conveyor scale system shall be operated between 20 % and 100 % of its rated capacity.~~

~~(Amended 2004)~~

~~UR.1.1. Minimum Totalized Load. Delivered quantities of less than the minimum test load shall not be considered a valid weighment.~~

UR.1.1. Protection from Environmental Factors. – The indicating elements, the lever system or load cells, and the load-receiving element of a belt-conveyor scale shall be adequately protected from environmental factors such as wind, moisture, dust, weather, and radio frequency interference (RFI) and electromagnetic interference (EMI) that may adversely affect the operation or performance of the device.

~~UR.1.2. Security Means. When a security means has been broken, it shall be reported to the official with statutory authority.~~

~~(Amended 1991)~~

UR.1.2. Conveyor Installation. – The design and installation of the conveyor leading to and from the belt conveyor scale is critical with respect to scale performance. The conveyor can be horizontal or inclined, but if inclined, the angle shall be such that slippage of material along the belt does not occur. Installation shall be in accordance with the scale manufacturer's instructions and the following:

(Amended 2002 and 2012)

Items (a) through (n) of UR.2.2. to be relocated beneath and become part of UR.1.2. Conveyor Installation. No other changes recommended for (a) through (n).

UR.1.3. Material Test. – A belt-conveyor scale shall be installed so that a material test can be conveniently conducted.
[Nonretroactive as of January 1, 1981]

UR.1.4. Belt Travel (Speed or Velocity). – The belt travel sensor shall be so positioned that it accurately represents the travel of the belt over the scale for all flow rates between the maximum and minimum values. The belt travel sensor shall be so designed and installed that there is no slip.

(Amended 2012)

UR.2. ~~Installation~~ Use Requirements.

~~**UR.2.1. Protection from Environmental Factors. – The indicating elements, the lever system or load cells, and the load-receiving element of a belt-conveyor scale shall be adequately protected from environmental factors such as wind, moisture, dust, weather, and radio frequency interference (RFI) and electromagnetic interference (EMI) that may adversely affect the operation or performance of the device.**~~

UR.2.1. Rate of Operation. – A belt-conveyor scale system shall be operated between 20 % and 100 % of its rated capacity.

~~**UR.2.2. Conveyor Installation. – The design and installation of the conveyor leading to and from the belt conveyor scale is critical with respect to scale performance. The conveyor can be horizontal or inclined, but if inclined, the angle shall be such that slippage of material along the belt does not occur. Installation shall be in accordance with the scale manufacturer's instructions and the following:**~~

**NIST Technical Advisor's note: Also delete items (a) through (n) since there were relocated to UR.1.2.*

~~**(Amended 2002)**~~

UR.2.2. Minimum Totalized Load. – Delivered quantities of less than the minimum test load shall not be considered a valid weighment.

~~***UR.2.3. Material Test. – A belt-conveyor scale shall be installed so that a material test can be conveniently conducted.***~~

~~***[Nonretroactive as of January 1, 1981]***~~

~~**UR.1.2.**~~**UR.2.3. Security Means.** – When a security means has been broken, it shall be reported to the official with statutory authority.

(Amended 1991)

~~**UR.2.4. Belt Travel (Speed or Velocity). – The belt travel sensor shall be so positioned that it accurately represents the travel of the belt over the scale for all flow rates between the maximum and minimum values. The belt travel sensor shall be so designed and installed that there is no slip.**~~

UR.2.4. Loading. – The feed of material to the scale shall be controlled to assure that, during normal operation, the material flow is in accordance with manufacturer's recommendation for rated capacity.

~~**U.R.3.4.**~~**UR.2.5. Diversion or Loss of Measured Product.** – There shall be no operation(s) or condition(s) of use that result in loss or diversion that adversely affects the quantity of measured product.

(Added 2005)

~~**U.R.3.3.**~~**UR.2.6. Retention of Maintenance, Test, and Analog or Digital Recorder Information**. – Records of calibration and maintenance, including conveyor alignment, analog or digital recorder, zero-load test, and material test data shall be maintained on site for at least the three concurrent years as a history of scale performance. Copies of any report as a result of a test or repair shall be mailed to the official with statutory authority as required. The current date and correction factor(s) for simulated load equipment shall be recorded and maintained in the scale cabinet.

(Added 2002)

(Amended 2012)

UR.3. ~~Use~~ Maintenance Requirements.

~~UR.3.1. Loading. The feed of material to the scale shall be controlled to assure that, during normal operation, the material flow is in accordance with manufacturer's recommendation for rated capacity.~~

UR.3.1. Scale and Conveyor Maintenance. – Belt-conveyor scales and idlers shall be maintained and serviced in accordance with manufacturer's instructions and the following:

(a) Scale Clearance. – The scale and area surrounding the scale …

(b) Weighed Material. – There shall be provisions to ensure that …

(c) Simulated and Zero-load Test Intervals. – Zero-load tests and simulated load or …

*** The tables under UR.3.2.(c) to be relocated beneath and become part of UR.3.1.(c). No other changes recommended for those tables. ***

(d) Scale Alignment. – Alignment checks shall be conducted …

(e) Simulated Load Equipment. – Simulated load equipment shall be …

(f) Zero Load Reference Information. – When zero load reference information is recorded …
(Amended 2002, 2004, 2009, **and 20XX**)

(Amended 2012)

UR.4. Compliance. – Prior to initial verification, the scale manufacturer or installer shall certify to the owner that the scale meets code requirements. Prior to initial verification and each subsequent verification, the scale owner or his agent shall notify the official with statutory authority in writing that the belt-conveyor scale system is in compliance with this specification and ready for material testing.
(Amended 1991)

NIST Technical Advisors note: No relocation or changes are proposed for paragraph UR.4. Compliance.

Background/Discussion:
This item comes from the recommendation of the NIST Technical Advisor to the USNWG on BCS and would:

1. Consolidate applicable operational user requirements into paragraph UR.1. User Requirements,

2. Change the title of paragraph UR.3. from "User Requirements" to "Maintenance," and

3. Consolidate applicable maintenance requirements into paragraph UR.3.

As the USNWG on Belt-Conveyor Scales developed new User Requirement, [UR.3.2.(a)] they recognized that many of the individual paragraphs within the User Requirements section were not appropriately located in the Belt-Conveyor Scales Code. They also recognized that paragraphs UR.1. and UR.3 were both titled "Use Requirements."

The draft proposal as shown was circulated to the entire USNWG by e-mail. The members of the work group were asked to respond with their support or comments based on this draft. All responses indicated support for the proposal as drafted.

At the 2011 CWMA and NEWMA Interim Meetings, and the SWMA Annual Meeting, both associations forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 WWMA Annual Meeting, Mr. Ripka, Thermo Fisher Scientific restated the reasons and history for this proposal to reorganize the User Requirements. There were no comments on this item. The Committee agreed with the justification and background information provided with the submission of this proposal and agreed this reorganization helps consolidate application User's Requirements. WWMA forwarded the item to NCWM recommending it as a Voting Item.

At the 2012 NCWM Interim Meeting, Mr. Ripka, speaking on behalf of the USNWG on BCS systems supported the item. He noted that the proposal doesn't change existing maintenance requirements and provides more meaningful headings to the requirements.

NIST, OWM offered an alternative restructuring proposal to improve the organization of the User Requirements in the BCS systems code beyond that being proposed. NIST, OWM's proposal would change the order of the User, Installation, and Maintenance requirements being proposed to be consistent with how similar requirements are organized in most other specific NIST Handbook 44 codes. The NIST Technical Advisor to the USNWG on BCS Systems distributed their alternative restructuring of the User Requirements to members of the USNWG prior to the 2012 NCWM Interim Meeting. It included the technical advisor's suggested changes to the user requirement being proposed under Item 321-1. USNWG members were polled and those responding supported submitting the NIST, OWM version to the S&T Committee for consideration.

The Committee considered the comments received during the Open Hearings and agreed replace the original proposal with the alternative arrangement that was approved by the USNWG. The 2012 S&T Committee designated this item as a Voting Item.

The Committee also agreed that, should agenda Items 321-1 and 321-2 both pass, the proposed language adopted for paragraph UR.3.2.(a) in agenda Item 321-1 would be renumbered to UR.3.1.(a) and the designations of the remaining subparagraphs in UR.3.1. would be revised.

At its 2012 Annual Meeting, the CWMA supported the proposed changes in the "Item Under Consideration" as a Voting Item and agreed that a reorganization of the paragraphs is appropriate and would make finding specific paragraphs in the code easier.

At the 2012 NCWM Annual Meeting, Ms. Juana Williams, NIST, OWM echoed the CWMA's comments and also heard support from Mr. Ripka and from Mr. Darrell Flocken, Mettler-Toledo, LLC, speaking on behalf of the SMA.

There was one position posted on the NCWM 2012 Online Position Forum, which was neutral to the proposal.

The Committee agreed that the proposed reorganization of the User Requirement paragraphs would be beneficial and recommended the item be presented for Vote with no changes, except unless Agenda Items 321-1 and 321-2 were both to pass when voted on by the Conference. If this were the case, the Committee, as previously noted, agreed the proposed language adopted for paragraph UR.3.2.(a) in agenda Item 321-1 would be renumbered to UR.3.1.(a) and the designations of the remaining subparagraphs in UR.3.1. would be revised.

Based on the comments received, and general support for the proposed changes, the Committee recommended no changes to the "Item Under Consideration" and presented it for a vote as written.

330 LIQUID MEASURING DEVICES

S&T Committee Note: Proposals under Items 330-1 through 330-6 of the Committee's 2012 Interim Agenda were consolidated by the Committee into a single Item 330-1. An explanation of the Committee's rationale is provided under Item 330-1.

330-1 V Unit Price Posting, Selection, and Display Requirements - S.1.6.4.1. Unit Price; S.1.6.5.4. Selection of Unit Price; S.1.6.6. Agreement Between Indications; S.1.6.7. Recorded Representations; S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided; UR.3.2. Unit Price and Product Identity; and UR.3.3. Computing Device

(This item was adopted.)

Source:
NCWM Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability (2012)

Purpose:
Update specifications to address current marketing methods for offering pricing discounts beyond simple cash/credit pricing and to establish a framework for "post-delivery" discounts offered after the delivery of fuel is complete.

Item Under Consideration:
Amend NIST Handbook 44, Liquid Measuring Devices Code paragraph S.1.6.4.1. as follows:

S.1.6.4.1. Unit Price.

(a) A computing or money-operated device shall be able to display on each face the unit price at which the device is set to compute or to dispense.

(b) ***Except for dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks),*** ~~***W***~~***w****henever a grade, brand, blend, or mixture is offered for sale from a device at more than one unit price, then all of the unit prices at which that product is offered for sale* ***shall meet the following conditions:***

(1) For a system that applies a discount prior to the delivery, all unit prices *shall be displayed or shall be capable of being displayed on the dispenser* ~~***using controls available to the customer***~~ ***through a deliberate action of the purchaser*** *prior to the delivery of the product. It is not necessary that all of the unit prices for all grades, brands, blends, or mixtures be simultaneously displayed prior to the delivery of the product.* ~~***This subsection shall not apply to fleet sales, other contract sales, or truck refueling sales (e.g., sales from dispensers used to refuel trucks).***~~
[Effective and nonretroactive as of January 1, 1991]

(2) For a system that offers post-delivery discounts on fuel sales, display of pre-delivery unit price information is exempt from (b)(1), provided the system complies with S.1.6.8.
(Added 2012)

Note: When a product is offered at more than one unit price, display of unit price information may be through the deliberate action of the purchaser: 1) using controls on the device; 2) through the purchaser's use of personal or vehicle mounted electronic equipment communicating with the system; or 3) verbal instructions by the customer.

(Added 2012)

(Amended 1989, ~~**and**~~ 1997**, and 2012**)

Amend NIST Handbook 44, Liquid Measuring Devices Code paragraph S.1.6.5.4. as follows:

S.1.6.5.4. Selection of Unit Price. – ~~***Except for dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), when a product or grade is offered for sale at more than one unit price through a computing device, the selection of the unit price shall be made prior to delivery using controls on the device or other customer-activated controls.***~~ A

system shall not permit a change to the unit price during delivery of product. **When a product or grade is offered for sale at more than one unit price through a computing device, the following conditions shall be met:**

(a) Except for a system only capable of applying a post-delivery discount(s), the selection of the unit price shall be made prior to delivery through a deliberate action of the purchaser to select the unit price for the fuel delivery.
[Nonretroactive as of January 1, 1991]

(b) For a system only capable of applying a post-delivery discount(s), the selection of the unit price shall be made through a deliberate action of the purchaser to select the unit price for the fuel delivery.

(Added 2012)

Note: When a product is offered at more than one unit price, selection of the unit price may be through the deliberate action of the purchaser: 1) using controls on the device; 2) through the purchaser's use of personal or vehicle mounted electronic equipment communicating with the system; or 3) verbal instructions by the customer.

(Added 2012)

The provisions in (a) and (b) do not apply to dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks).

(Added 2012)

(Added 1989) (Amended 1991, 1992, 1993, ~~**and**~~ 1996**, and 2012**)

[Technical Advisor's Note: During preparation of the 2013 edition of NIST Handbook 44 to reflect changes adopted by the NCWM, NIST technical advisors noted an error in the text style for a portion of S.1.6.5.4. as it appeared in NCWM Publication 16. A portion of the text that appears in the existing Handbook 44 paragraph S.1.6.5.4. was inadvertently shown in italic font, suggesting that the entire existing paragraph was Nonretroactive in nature. To correct this error and to remove ambiguity in the application of the paragraph to devices manufactured or installed on different dates, the paragraph that was adopted was reformatted and additional editorial revisions made. To ensure that those revisions did not change the intent of the changes proposed to and adopted by the NCWM, the revised paragraph was distributed to the NCWM S&T Committee as well as the members of the NCWM Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability for review and approval. The Technical Advisors received comments in support of the revisions from multiple members of the S&T Committee and the Task Group; no objections were received. The revised version of the paragraph is reflected in the language above.]

Amend NIST Handbook 44, Liquid Measuring Devices Code paragraphs S.1.6.6. as follows:

S.1.6.6. Agreement Between Indications.

(a) When a quantity value indicated or recorded by an auxiliary element is a derived or computed value based on data received from a retail motor fuel dispenser, the value may differ from the quantity value displayed on the dispenser, provided the following conditions are met:

(~~**a**~~**1**) all total money-values for an individual sale that are indicated or recorded by the system agree; and

(~~***b***~~***2***) *within each element, the values indicated or recorded meet the formula (quantity × unit price = total sales price) to the closest cent.*
[Nonretroactive as of January 1, 1988]

(b) When a system applies a post-delivery discount(s) to a fuel's unit price through an auxiliary element, the following conditions shall apply for computed values:

(1) the total volume of the delivery shall be in agreement between all elements in the system. (Added 2012)

(Added 1985) (Amended 1987, ~~and~~ 1988**, and 2012**)

Amend NIST Handbook 44, Liquid Measuring Devices Code paragraphs S.1.6.7. as follows:

S.1.6.7. Recorded Representations. *– Except for fleet sales and other price contract sales* ***and for transactions where a post-delivery discount is provided,*** *a printed receipt providing the following information shall be available through a built-in or separate recording element for all transactions conducted with point-of-sale systems or devices activated by debit cards, credit cards, and/or cash:*

(a) the total volume of the delivery;

(b) the unit price;

(c) the total computed price; and

(d) the product identity by name, symbol, abbreviation, or code number.

For systems equipped with the capability to issue an electronic receipt, the customer may be given the option to receive the receipt electronically (e.g., via cell phone, computer, etc.)
[Nonretroactive as of January 1, 1986]

(Added 1985) (Amended 1997 **and 2012**)

Add a new paragraph S.1.6.8. to NIST Handbook 44, Liquid Measuring Devices Code as follows:

S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. – Except for fleet sales and other price contract sales, a printed receipt providing the following information shall be available through a built-in or separate recording element that is part of the system for transactions involving a post-delivery discount:

(a) the product identity by name, symbol, abbreviation, or code number;

(b) transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount(s), including the:

(1) total volume of the delivery;

(2) unit price; and

(3) total computed price of the fuel sale;

(c) an itemization of the post-delivery discounts to the unit price; and

(d) the final total price of the fuel sale after all post-delivery discounts are applied.

For systems equipped with the capability to issue an electronic receipt, the customer may be given the option to receive the receipt electronically (e.g., via cell phone, computer, etc.).
(Added 2012)

Renumber current S.1.6.8. Lubricant Devices, Travel of Indicator to S.1.6.9.

Amend NIST Handbook 44, Liquid Measuring Devices Code paragraphs UR.3.2. as follows:

UR.3.2. Unit Price and Product Identity.

(a) The following information shall be conspicuously displayed or posted on the face of a retail dispenser used in direct sale:

(1) except for **unit prices resulting from any post-delivery discount and** dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), all of the unit prices at which the product is offered for sale; and

(2) in the case of a computing type or money-operated type, the unit price at which the dispenser is set to compute.

Provided that the dispenser complies with S.1.6.4.1. Display of Unit Price, it is not necessary that all the unit prices for all grades, brands, blends, or mixtures be simultaneously displayed or posted.

(b) The following information shall be conspicuously displayed or posted on each side of a retail dispenser used in direct sale:

(1) the identity of the product in descriptive commercial terms; and

(2) the identity of the grade, brand, blend, or mixture that a multi-product dispenser is set to deliver.

(Amended 1972, 1983, 1987, 1989, 1992, ~~**and**~~ 1993**, and 2012**)

Amend NIST Handbook 44, Liquid Measuring Devices Code paragraphs UR.3.3. as follows:

UR.3.3. Computing Device. – Any computing device used in an application where a product or grade is offered for sale at one or more unit prices shall be used only for sales for which the device computes and displays the sales price for the selected transaction.

(Added 1989) (Amended 1992)

The following exceptions apply:

(a) Fleet sales and other price contract sales are exempt from this requirement.

(b) A truck stop dispenser used exclusively for refueling trucks is exempt from this requirement provided that:

(1) all purchases of fuel are accompanied by a printed receipt of the transaction containing the applicable price per gallon, the total gallons delivered, and the total price of the sale; and

(Added 1993)

(2) unless a dispenser complies with S.1.6.4.1. Display of Unit Price, the **unit** price posted on the dispenser and the unit price at which the dispenser is set to compute shall be the highest **unit** price for any transaction which may be conducted.

(Added 1993)

(c) A dispenser used in an application where a price per unit discount is offered following the delivery is exempt from this requirement, provided the following conditions are satisfied:

(1) The unit price posted on the dispenser and the unit price at which the dispenser is set to compute shall be the highest unit price for any transaction.

(2) All purchases of fuel are accompanied by a printed receipt recorded by the system for the transaction containing:

a. the product identity by name, symbol, abbreviation, or code number,

b. transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount including the:

1. total volume of the delivery;

2. unit price; and

3. total computed price of the fuel sale prior to post-delivery discounts being applied,

c. an itemization of the post-delivery discounts to the unit price, and

d. the final total price of the fuel sale.

For systems equipped with the capability to issue an electronic receipt, the customer may be given the option to receive the receipt electronically (e.g., via cell phone, computer, etc.)

(Added 2012)

Background/Discussion:
At the 2012 NCWM Interim Meeting, the Committee considered six proposals from NCWM S&T Committee's Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability to modify the NIST Handbook 44 Liquid Measuring Devices Code to accommodate changes in marketing practices relative to price discounts at retail motor-fuel stations. These proposals were covered in the Committee's 2012 Interim Agenda under separate Items 330-1 through 330-6. After reviewing these items and the comments received during Open Hearings, the Committee agreed that the proposals were interdependent and should not be addressed individually. Consequently, the Committee consolidated Items 330-1 through 330-6 into the single Item 330-1. The Committee further modified the proposals to clarify how current requirements apply when a pre-delivery discount is offered and to include additional requirements for the operation of equipment that offers post-delivery discounts on motor fuel prices. Consolidated background information for these items and a summary of the Committee's conclusions are outlined below.

Proposed changes to paragraph S.1.6.4.1. Unit Price: Paragraph S.1.6.4.1. currently requires all possible unit prices to be posted or capable of being posted on the dispenser. In addition to the cash/credit unit prices that have been conventionally offered in retail fuel sales, some marketing practices now offer multiple different unit prices to customers both pre-delivery and post-delivery, depending on payment method, loyalty programs, services purchased, etc. Newer dispensers, or associated point-of-sale software, can allow for a large variety of final unit prices, depending on card type, loyalty programs, etc. There is no reason to display or provide unit price information to a customer who may not qualify for a certain discounted unit price that is being offered only to eligible customers.

The Committee modified the proposal to paragraph S.1.6.4.1. to ensure that the unit prices for any pre-delivery discounts, such as those given for the use of cash or debit card, would be posted for every customer to see, but also would allow for unit price discounts that take place only after the product is dispensed. The order of requirements for equipment that offers pre-delivery discounts and for currently exempted devices was reworked for clarity. A subparagraph was added to reference new requirements for systems that offer post-delivery discounts. Inserting the phrase ***"through a deliberate action of the purchaser"*** would allow for the selection of a unit price through the use of some form of electronic activation, such as a cell phone, or swipe card.

Proposed changes to paragraph S.1.6.5.4. Selection of Unit Price: These changes would allow for greater flexibility in how customers can select a unit price and accommodate new technology and marketing practices. The current language requires the purchaser to physically make contact with the device to select a unit price. The

proposed modifications would expand the requirement to allow a customer to use a personal electronic device such as a cell phone to select a unit price and would also recognize verbal instructions such as those given to a console operator for a particular payment method as acceptable methods for selecting the unit price. For systems that are only capable of applying a discount after the delivery (e.g., single unit price devices), the expanded requirement would apply retroactively. Changes to the unit price during delivery would still be prohibited.

Proposed changes to paragraph S.1.6.6. Agreement Between Indications: These changes would provide an exemption from the money values agreement requirement when the dispensing system offers discounts after delivery that result in total price indications that differ from that indicated on an auxiliary element.

Price discounts could be given through either:

1. the dispenser's roll back of the unit price, or

2. recalculation of the transaction at the lower unit price that would be performed by auxiliary equipment after, or post, delivery.

Roll back of unit prices prior to fuel delivery requires exact agreement of the total price displayed on the dispenser and the total price displayed on any auxiliary element. When a post-delivery discount is offered, a revised total price reflecting the post-delivery discount would be shown on the auxiliary display. This would result in a total price displayed on the auxiliary equipment that is different from that shown on the dispenser. A change is needed to paragraph S.1.6.6. as shown in the "Item Under Consideration" to recognize this situation while ensuring that, at a minimum, there is agreement in the total indicated and recorded volume between all the elements in the system.

Proposed changes to S.1.6.7. Recorded Representations and proposed addition of new paragraph S.1.6.8.: These changes could help to ensure that fuel dispensers provide receipts with sufficient information to allow customers to fully understand any post-delivery discounts and allow the use of electronic as well as printed receipts. Proposed new paragraph S.1.6.8., like paragraph S.1.6.7., would exempt certain types of sales, while specifying where a receipt must be generated and addressing information that must be recorded in post-delivery discount transactions.

Customer confusion can result when service station consoles apply post-delivery discounts and display total prices that are not reflected on the total price shown on dispenser. The confusion could be resolved if the dispenser's printed receipt showed the total price, volume, and unit price displayed on the dispenser at the end of the delivery along with an itemization of any additional "post-delivery" discounts that are applied following the delivery. An itemization of the post-delivery discounts on the receipt would enable the customer to verify that, particularly in the case where multiple discounts (for example, a unit price discount given for the purchase of an item in the convenience store along with a discount for purchasing a certain quantity of fuel) are given, all discounts to which they believe they are entitled have been applied. Combined with the printing of the information shown on the dispenser, this itemized information would allow the customer to reconstruct how the final total sale information, including all applied discounts, was calculated and to better understand and follow the transaction. Additionally, this information could be used by weights and measures officials and service station owners in the case of customer disputes to recreate transactions and ensure that all discounts for which the customer was eligible have been applied.

Proposed changes to S.1.6.7. also recognize that electronic receipts such as those delivered to computers or smart phones are making their way into the marketplace.

Proposed changes to UR.3.2. Unit Price and Product Identity: These changes would provide realistic requirements for displaying or posting unit prices in consideration of the discount marketing practices being offered to consumers.

Paragraph U.R.3.2. currently requires all unit prices at which the product is offered for sale to be capable of being posted while only making an exception to this requirement for fleet and price contract sales and truck refueling dispensers. The growing trend of post-delivery unit pricing in the form of rewards cards, car wash discounts, and

others, makes posting all of these unit prices impractical. Unit price discounts may apply only to certain customers using certain types of credit cards. A requirement to post all of these unit prices is also unrealistic.

The amendment would ensure that motor-fuel unit prices for pre-delivery discounts such as cash or debit card purchases are displayed on or adjacent to the dispenser. Any post-delivery discounts such as loyalty cards, car wash purchases, discounts based on volume of purchase, etc., would be exempt from any requirement to display each of the unit prices on the dispenser. After the product is dispensed, the unit price displayed on the pump would automatically revert to the highest unit price offered by the retailer. This would avoid confusion possibly caused when drivers pull up to a pump and see a unit price to which they are not entitled. Other proposals presented as part of this agenda item would ensure there are sufficient safeguards to provide both the customer and the operator with sufficient information about the transaction.

Proposed changes to UR.3.3. Computing Device: These changes would add a new exemption to the requirement for computing and displaying the total sale price for all unit prices available in a given application for a particular product or grade for applications where a discount is offered following the delivery. This new exemption (which is in addition to those already existing for fleet and other price contract sales and devices used exclusively for truck refueling) would only apply in such instances if: (1) the unit price posted on the dispenser and the unit price at which the device is set to compute are the highest unit price for any transaction; and (2) the customer is provided with a printed receipt containing adequate information about the transaction, including an itemization of the discounts, to allow the customer to verify all applicable discounts have been applied. This information would allow the customer to recreate their transaction, including the application of discounts, using the receipt provided by the dispenser. The proposed revisions would also allow electronic receipts to be provided in lieu of paper receipts.

The new exemption proposed in paragraph UR.3.3. recognizes that various methods of pricing fuel are coming to the retail market. In addition to discounts offered for cash or debit cards, new post-delivery discounts to unit prices are becoming more common. These include loyalty cards, discounts based upon the type of credit card used, discounts for car washes purchased, etc. In order for consumers to be confident that they are receiving all the discounts to which they are entitled, it is essential that the dispenser receipt display the original unit price and subtotal, the discounts that were applied to the original unit price, and the final total price that the customer is charged.

At the 2012 NCWM Interim Meeting, Ms. Williams, NIST, OWM, suggested some changes to the language to eliminate some observed gaps and also suggested that the committee consider developing definitions for some of the terminology being introduced. She encouraged the Committee to consider grouping Items 330-1 through 330-6 together into a single item, noting that the basis for proposing changes to some paragraphs hinges on related changes proposed to other paragraphs in this series of items. Ms. Williams also noted that, in analyzing the proposed changes and their impact on the marketplace, it is critical that the language be compared with actual examples of pricing scenarios and associated receipts to ensure that the proposed changes meet the needs of the weights and measures community and the marketplace. The task group had planned to do such an analysis using the numerous examples and receipts that were submitted by its membership. Ms. Williams encouraged the group to complete that task and encouraged others in the community to do the same. NIST, OWM offered the following general comments in writing to the Committee.

1. Any proposed device specifications should be examined to ensure that equipment currently offering pre-delivery discounts is not precluded from also offering post-delivery discounts.

2. Care should be taken to ensure that the provisions put into place in the 1990s to prevent customer confusion and facilitation of fraud are not circumvented.

3. The language should ensure that systems do not frustrate value comparisons prior to the delivery.

4. Language should be examined and strengthened if necessary to ensure that mathematical computations are based on dispenser indications and are mathematically correct. This will eliminate rounding errors that occur when determining an inferred volume based on the original total and unit prices (i.e., not allowing different quantity values between indicated and inferred quantities as proposed in paragraph S.1.6.6. Agreement Between Indications).

5. Add a definition(s) in NIST Handbook 44 such as "pre-delivery," "post-delivery discounts," etc. to lend clarity to the terminology used in these proposals and to make sure it is understood.

6. Any proposed language should be analyzed to ensure that there are no conflicts with NIST Handbook 130 Weights and Measures Laws and Regulations.

Mr. Humphreys, Chair of the Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability, thanked NIST, OWM for the comments and noted their recommendations are supported by the task group based on a poll that was taken. Mr. Humphreys encouraged the committee to review and accept those changes. He indicated that he believed it would be reasonable for the task group to complete a review of the receipts and examples by the July meeting.

Mr. Eichberger, National Association of Convenience Stores (NACS), emphasized the importance of adopting language that won't inhibit a retailer from offering a discount. Mr. Eichberger commented that the proposed language provides a good balance while giving the retailer the flexibility to offer a discount. He didn't believe NACS members would have a problem with the changes offered by NIST, OWM and also supported consolidating the items. Mr. Columbus, Steptoe and Johnson, LLP, representing SIGMA, a fuel marketers association, also spoke in support of the proposed changes. Mr. Johnson, Gilbarco, Inc., spoke in support of the recommendations by NIST, OWM. Mr. Johnson questioned the reference in paragraph UR.3.2. to the display of the unit price between transactions and suggested that the Task Group may need to clarify how the time limit requirements would be applied and interpreted for various types of transactions. Ms. Butcher, NIST Technical Advisor, suggested considering other Liquid Measuring Devices (LMD) Code paragraphs with similar references and mirroring them to clarify when a transaction is considered completed and to ensure that the customer has adequate time to observe the transaction information. Mr. Saunders, Virginia Department of Agriculture and Consumer Services, also expressed a concern about the time limit, citing customer complaints in instances where the information is not displayed long enough for the customer to observe the final details of the transaction. Others in the audience, including Mr. Carroll, Massachusetts Division of Standards, and Mr. Andersen, retired member, agreed that further examination by the task group of these references is warranted to ensure that the language is correct. Mr. Eichberger offered to research existing marketing practices relative to this point and report back to the task group. In response to Mr. Johnson's and Mr. Sander's questions, the Committee modified paragraph UR.3.2.(a) to include a generally accepted point at which a transaction is considered complete relative to termination of the delivery and settlement of payment.

The Committee agreed that Agenda Items 330-1 through 330-6 need to be consolidated into a single agenda item. After hearing support during the Open Hearings for the recommendations of the Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability as well as the additional changes proposed by NIST, OWM, the Committee agreed to the modified proposals as shown in the "Item Under Consideration" above. The Committee recognized the importance of assessing the proposed language against receipts and scenarios that are being encountered in the field to ensure that the proposed changes are appropriate. The Committee asked that the task group: (1) compare the examples of receipts and scenarios that were submitted to the task group to ensure that the proposed language provides for clear and understandable transactions; and (2) address the questions raised about the application of the requirements relative to the unit price display following a delivery. Additionally, the Committee asked that the regional weights and measures associations, regulatory officials, manufacturers, and device owners evaluate the proposed changes as they pertain to existing marketing practices. The 2012 S&T Committee designated this item as a Voting Item.

During Open Hearings at the 2012 NCWM Annual Meeting, the Committee heard suggestions to establish an effective date for the requirements, with suggestions of 2014 or 2015 as possibilities. However, the Committee saw no merit to establishing an effective date. The Committee noted that the current requirements in NIST Handbook 44 do not permit systems to offer post-delivery discounts. The changes proposed by the Task Group would establish the option for a system to be used to offer post-delivery discounts, provided the system meets certain requirements to provide the customer with information about how the discounts are applied. The Committee recognized that the criteria outlined by the Task Group includes important provisions that should be in place in order to take advantage of the option to offer post-delivery discounts and maintained that these are essential for all systems where post-delivery discounts are to take place. However, the proposed changes are permissive; thus, an effective date is unnecessary. A system is not required to meet the new requirement unless the device owner decides to offer post-delivery discounts.

The Committee considered suggested clarifications to the language offered by NIST, OWM. NIST, OWM suggested changes to paragraph S.1.6.7. to require clear identification of transaction information on the receipt. Additionally, NIST, OWM suggested changes to S.1.6.8. that would require information related to the fuel transaction to be grouped together and to clearly designate the required information on the receipt, with the goal of assisting the customer in interpreting the transaction information. NIST, OWM also provided examples of possible receipt formats that could be incorporated into guidance documents such as NCWM Publication 14. However, the Committee agreed that the proposed language is adequately clear as proposed and noted that any deficiencies that might be discovered in the language as it is implemented, can be identified and addressed in the future.

The Committee originally considered and proposed for voting in its 2012 Interim Report the following proposed changes to UR.3.2.:

UR.3.2. Unit Price and Product Identity.

(a) ~~**The following information**~~ **In the case of a computing type or money-operated type dispenser, the final unit price that includes any pre-delivery discounts and at which the device or system is set to compute** shall be conspicuously displayed or posted on the face of a retail dispenser used in direct sale~~:~~**. At the completion of a transaction, the displayed unit price shall revert to the highest unit price available. Additionally, any discounted prices may be posted on or adjacent to the dispenser. The completion of a transaction is defined as the time the delivery has been terminated and payment has been settled. The payment may be automatic if the delivery is to a pre-paid amount. If the sale is prepaid, the delivery is considered terminated after the "handle" is in the off position or after the nozzle has been returned to a designed hanging position.**

~~**(1) except for dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), all of the unit prices at which the product is offered for sale; and**~~

~~**(2) in the case of a computing type or money-operated type, the unit price at which the dispenser is set to compute.**~~

~~**Provided that the dispenser complies with S.1.6.4.1. Display of Unit Price, it is not necessary that all the unit prices for all grades, brands, blends, or mixtures be simultaneously displayed or posted.**~~

Note: Dispensers used exclusively for fleet sales, or other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), are exempt from paragraph U.R.3.2.(a).

(b) The following information shall be conspicuously displayed or posted on each side of a retail dispenser used in direct sale:

(1) the identity of the product in descriptive commercial terms; and

(2) the identity of the grade, brand, blend, or mixture that a multi-product dispenser is set to deliver.

(Amended 1972, 1983, 1987, 1989, 1992, ~~**and**~~ 1993**, and 2012**)

However, during the 2012 Annual Meeting, the Committee was made aware of a potential negative financial impact on device owners as a result of the proposed changes to UR.3.2. to require a reversion of the unit price to the highest unit price available. Even with a phase in period or grace period, older equipment may never be able to comply, including equipment that doesn't participate in post-delivery discounting. Consequently, the Committee recommended the changes to paragraph UR.3.2. as shown in the "Item Under Consideration." The remaining proposals in the "Item Under Consideration" were unchanged from the Committee's original proposal in the 2012 NCWM Publication 16.

330-2 V S.1.6.5.4. Selection of Unit Price

This item was consolidated with Item 330-1 as a result of action by the Committee at the 2012 Interim Meeting.

330-3 V S.1.6.6. Agreement Between Indications

This item was consolidated with Item 330-1 as a result of action by the Committee at the 2012 Interim Meeting.

330-4 V S.1.6.7. Recorded Representations

This item was consolidated with Item 330-1 as a result of action by the Committee at the 2012 Interim Meeting.

330-5 V UR.3.2. Unit Price and Product Identity

This item was consolidated with Item 330-1 as a result of action by the Committee at the 2012 Interim Meeting.

330-6 V UR.3.3. Computing Device

This item was consolidated with Item 330-1 as a result of action by the Committee at the 2012 Interim Meeting.

330-7 W UR.3.X. Nozzle Color for Retail Motor Fuel Dispensers

(This item was withdrawn.)

Source:
Missouri Department of Agriculture (2012)

Purpose:
Prevent accidental mis-fueling by establishing uniform fuel dispenser nozzle colors for product recognition.

Item Under Consideration:
The Committee considered a proposal to add the following paragraph to NIST Handbook 44, Liquid Measuring Devices Code:

UR.3.X. Nozzle Color for Retail Motor Fuel Dispensers.

(a) Diesel fuel nozzles shall be green in color and shall be used only for diesel fuel, and

(b) E85 fuel nozzles shall be yellow in color and shall be used only for E85.

Background/Discussion:

Missouri Weights and Measures Division receive numerous complaints each year related to the accidental mis-fueling of vehicles. Information received from many other states indicates the same problem exists nationwide.

If uniform colors were established for nozzles or nozzle covers, the same colors could be used for fill connections on storage tanks. If color codes were consistent for both fill openings and dispensing nozzles there would likely be far less contamination of fuel in storage tanks and damage to vehicles.

The submitter also noted that some diesel auto manufacturers now require a minimum of 23.63 mm (0.930 in) outside diameter for nozzle spout size. This diameter was a common size for all fuels prior to the introduction of unleaded gasoline.

The proposal would establish uniform fuel nozzle colors for product recognition on retail motor fuel dispensers to prevent accidental mis-fueling of passenger vehicles. The proposal would require yellow colored nozzle covers for E-85 and mid-level ethanol blends for flex-fuel vehicles and restrict the color yellow from use to identify other products. The proposal would also require green colored nozzle covers for diesel fuel and mid-level blends of diesel fuel and restrict the color green from use to identify other products. In the future, consideration could be given to establishing color codes for other products (e.g., gasoline, kerosene)

At the 2011 CWMA and NEWMA Interim Meetings and the 2011 SWMA Annual Meeting, the associations forwarded the item to NCWM, recommending it as a Developing Item. During the CWMA meeting, a number of regulatory officials supported for this item to promote uniformity. There was discussion at that meeting about over-regulating and whether the consumer would be aware of and pay attention to this color coding system. Industry members suggested that more lead time is needed on this requirement to allow for consumer education, and time to defray the costs associated with this change. Others expressed concern that this requirement would adversely affect certain brands. At the NEWMA meeting, many members noted they have received complaints on this issue and would support a standard to help the consumer more readily identify diesel is being selected. SWMA is amenable to considering a proposal to address the issue of mis-fueling; however, SWMA does not believe the proposal is complete as written and expressed concern that the proposal may not completely address the problems that lead to mis-fueling. In particular, they believe that nozzle size requirements should be considered.

At 2011 WWMA Annual Meeting, there was no testimony in support of the proposal. WWMA noted that the proposal doesn't prevent accidental mis-fueling and the potential number of colors for different grades and types of fuel products could be more confusing to customers. WWMA noted that a similar proposal was submitted to NCWM in 2002 and was ultimately withdrawn in 2003 due to lack of support. WWMA did not forward the item to NCWM since no new justification was provided.

At the 2012 NCWM Interim Meeting, Mr. Hayes, Missouri Department of Agriculture, spoke in support of the proposal and provided an amended version for the Committee to consider that would also reference nozzle size. Mr. Hayes noted that their jurisdiction handles numerous complaints and suggested that larger nozzle sizes may provide additional protections against mis-fueling. Mr. Columbus, NACS and SIGMA, opposed the proposal, citing concerns about the impact on companies that have invested significant costs in branding and station design and questioning whether the change would be effective in preventing mis-fueling. NIST, OWM pointed out that, as noted by the WWMA, a similar proposal had been considered by the Committee in the past and suggested that the Committee revisit those discussions to determine whether or not changes or new factors would warrant reconsideration of the issue. NIST, OWM also noted that the Committee should give careful consideration to whether this proposal would be overly restrictive with regard to businesses that have established color schemes associated with their brands, particularly given comments that indicate that color alone may not be effective in preventing mis-fueling. NIST, OWM noted that NIST Handbook 44 presently includes identity requirements and that amendments to that paragraph to require additional markings on the nozzle as to the product identity might offer a more reasonable alternative for clarifying product identity.

The Committee considered the comments from Open Hearings at the Interim Meeting suggesting that color coding of nozzles would not prevent accidental mis-fueling. The Committee considered additional amendments that were proposed during the Open Hearings to incorporate nozzle size requirements into the proposal. The Committee concluded that requiring either: 1) color coding of nozzles; or 2) nozzles of different sizes for different products offered for sale, wouldn't prevent accidental mis-fueling. Additionally, the Committee had concerns that size requirements could negatively impact consumers whose diesel-fueled vehicles may not accommodate nozzles with larger diameters. Consequently, the Committee designated this item as a Withdrawn Item.

331 VEHICLE-TANK METERS

331-1 I T.4. Product Depletion Test

Source:
Northeastern Weights and Measures Association (2009 – Developing Items Part 3.31. Vehicle-Tank Meters, Item 1.)

Purpose:
Enable more consistent application of the tolerances between older and newer meters and address an unintentional gap that allows an unreasonably large tolerance for smaller meters.

Item Under Consideration:
Amend NIST Handbook 44, Section 3.31. Vehicle-Tank Meter Code paragraph T.4. and the accompanying Table T.4. as follows: Note that this option was identified as "Option 2" in the Committee's 2011 Final Report and 2012 Interim Agenda.

T.4. Product Depletion Test. – The difference between the test result for any normal test and the product depletion test shall not exceed ~~**tolerance shown in Table T.4.**~~ **0.5 % percent of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated higher than 380 Lpm (100 gpm) or 0.6 % percent of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated 380 Lpm (100 gpm) or lower.** Test drafts shall be of the same size and run at approximately the same flow rate.

[Note: The result of the product depletion test may fall outside of the applicable test tolerance as specified in Table 1.]

Delete current Table T.4.

~~**Table T.4.**~~ ~~**Tolerances for Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters**~~	
~~**Meters Size**~~	~~**Maintenance and Acceptance Tolerances**~~
~~**Up to, but not including, 50 mm (2 in)**~~	~~**1.70 L (104 in^3)[1]**~~
~~**From 50 mm (2 in) up to, but not including, 75 mm (3 in)**~~	~~**2.25 L (137 in^3)[1]**~~
~~**75 mm (3 in) or larger**~~	~~**3.75 L (229 in^3)[1]**~~
~~**Based on a test volume of at least the amount specified in N.3. Test Drafts.**~~	

Background/Discussion:
This item was submitted to NEWMA at its 2008 Interim Meeting to propose an alternative to existing product depletion test tolerances which are based on the size of the meter. The alternatives presented by the original submitter propose basing tolerances on a percentage of maximum flow rate rather than meter size. The submitter noted that, while a nonretroactive marking requirement added in 2008 eliminates difficulties in determining meter size for newer metering systems, inspectors are still faced with difficulties consistently determining meter size for older systems, and those systems will likely remain in service for many years. Additionally, the submitter noted that the original proposal to base tolerances on meter size did not consider the possibility of smaller meters (e.g., down to ¼ inch diameter) being mounted on vehicles. Applying current tolerances to these smaller meters based on meter size would result in a 22.5 % relative error for one minute of flow during a product depletion test. Even a slightly larger, one-inch meter would have a relative error of 2.25 %. These tolerances seem inappropriately large. While the submitter noted that two-inch meters and three-inch meters are expected to comprise the largest number of vehicle-mounted meters, the current tolerances based on meter size provide an inappropriately large tolerance for smaller meters.

The Committee has agreed with the concept of basing the product depletion test tolerances on the marked maximum flow rate of the meter rather than on the marked meter size and has considered several proposals for modifying the tolerances since this item was introduced in 2008. Details of these proposals and associated discussion can be found in the Committee's 2009 to 2011 Final Reports (The Final Reports of the 94th, 95th, 96th, and 97th NCWM). While recognizing that one goal of the original proposal was to reduce what the submitter considered an unreasonably large tolerance for smaller meters, the Committee expressed concern about the impact the proposal would have on these meters based on comments from Meter Manufacturers Association (MMA), including comments during the 2011 NCWM Annual Meeting.

From 2009 to 2011, the Committee repeatedly requested data to support or oppose the proposals under consideration with little success. At the 2011 NCWM Annual Meeting, the Committee reiterated its need for data to evaluate the impact of any proposed tolerances changes. Following the meeting, NIST Technical Advisor, Ms. Butcher distributed a request on the NIST, OWM Director's list serve on behalf of the committee asking weights and measures jurisdictions to submit data.

At their fall 2011 Meetings, CWMA, SWMA, and WWMA encouraged the collection of data. Since work continues on this issue, all three associations recommended that the item be a Developing Item until data has been submitted and analyzed. SWMA also noted that there does not appear to be a clear preference for either of the two options presented in NCWM S&T Committee's 2011 Final Report; the SWMA heard that a third proposal may be under development by the MMA.

At the 2011 NEWMA Interim Meeting, it was suggested that there is not a lot of product depletion testing in the field. If the truck only has one tank, it makes the logistics of testing very difficult. NEWMA also noted that variations in product flow rate and clinging of product will also skew test results. Members believe it is much easier to ascertain product flow information from the ID plate rather than determine actual meter size with piping variations. NEWMA encouraged jurisdictions to forward any data to the S&T Committee NIST Technical Advisor.

At the 2012 NCWM Interim Meeting, the committee reiterated its position that tolerances for the product depletion test of a vehicle tank meter should be based on the marked maximum flow rate of the meter rather than meter size. The Committee considered the three options for modifying NIST Handbook 44, including two options presented in its 2011 Interim Agenda and a third option submitted by the MMA prior to the meeting. A summary of the three options is outlined in the following table. A second table illustrating examples of tolerances for common meter sizes and maximum flow rates is also included.

Summary of Product Depletion Tolerance Options Considered

	Marked Maximum Flow Rate or Meter Size	**Tolerance (% of Marked Max Flow Rate)**
Current	Up to but not including 2 in	104 in^3
	2 in up to but not including 3 in	137 in^3
	3 in and larger	229 in^3
Option 1:	All Maximum Flow Rates	0.5 %
Option 2:	Marked Max ≤ 100 gpm	0.6 %
	Marked Max > 100 gpm	0.5 %
Option 3:	Marked Max ≤ 60 gpm	0.8 %
	Marked Max > 60 gpm up to and including 100 gpm	0.6 %
	Marked Max > 100 gpm	0.5 %

Examples of Product Depletion Tolerance Options for Different Meter Sizes/Flow Rates					
Size (inches)	**Marked Maximum Flow Rate (gpm)**	**Current Tolerance**	**Option 1 (0.5 % max)**	**Option 2 (0.6 % max) (0.5 % max)**	**Option 3 (0.8 % max) (0.6 % max) (0.5 % max)**
1½	60 gpm	104 in^3	69 in^3	83 in^3	111 in^3
2	100 gpm	137 in^3	115 in^3	139 in^3	139 in^3
2	150 gpm	137 in^3	173 in^3	173 in^3	173 in^3
3	150 gpm	229 in^3	173 in^3	173 in^3	173 in^3
3	200 gpm	229 in^3	231 in^3	231 in^3	231 in^3
3	300 gpm	229 in^3	346 in^3	346 in^3	346 in^3
3	350 gpm	229 in^3	404 in^3	404 in^3	404 in^3

At the 2012 NCWM Interim Meeting Open Hearings, members of the MMA supported Option 3. Mr. Andersen, who originally proposed the item in 2008, pointed out that the tolerances in Option 1 were the same as those that apply prior to modifying the tolerance to be based on meter size.

Ms. Butcher, NIST Technical Advisor, reported that the Committee received product depletion test data from nine state and county weights and measures jurisdictions. She brought a copy of the raw data for examination by the Committee during its work sessions and also distributed a summary to the Committee as shown in the following two tables. She explained how the data was analyzed and noted that assumptions were made about meter size in some instances where meter size and/or maximum flow rate were not both provided. The first table summarizes for each jurisdiction the number of meters on which the product depletion test was conducted along with a comparison of the number that failed the current and proposed tolerances; the data includes both total meters for each option along with a breakdown of meters in three different flow rate categories. The second table provides a summary showing these totals for all jurisdictions combined.

Summary of Product Depletion Test Data Submitted by State and County Weights and Measures Jurisdictions as of January 1, 2012						
	Total Meters	**Failed Current Tolerance**	**Failed Option 1**	**Failed Option 2**	**Failed MMA**	**Marked Max**
Jurisdiction #1	67	0	2	1	1	---
	1	0	1	1	1	60 gpm
	53	0	1	0	0	100 gpm
	12	0	0	0	0	> 100 gpm
	1	0	0	0	0	??
Jurisdiction #2	9	0	0	0	0	No Data
Jurisdiction #3	288	21	33	22	20	---
	28	1	5	3	1	60 gpm
	228	17	25	16	16	100 gpm
	32	3	3	3	3	> 100 gpm

Summary of Product Depletion Test Data Submitted by State and County Weights and Measures Jurisdictions as of January 1, 2012						
	Total Meters	**Failed Current Tolerance**	**Failed Option 1**	**Failed Option 2**	**Failed MMA**	**Marked Max**
Jurisdiction #4	196	7	18	9	6	---
	14	0	3	3	0	60 gpm
	153	5	14	5	5	100 gpm
	29	2	1	1	1	> 100 gpm
Jurisdiction #5	134	7	12	7	7	---
	10	2	3	2	2	60 gpm
	72	4	8	4	4	100 gpm
	52	1	1	1	1	> 100 gpm
Jurisdiction #6	200	20	29	20	20	---
	0	0	0	0	0	60 gpm
	178	16	25	16	16	100 gpm
	22	4	4	4	4	> 100 gpm
Jurisdiction #7	196	13	14	13	13	---
	0	0	0	0	0	60 gpm
	150	11	12	11	11	100 gpm
	46	2	2	2	2	> 100 gpm
Jurisdiction #8	761	0	7	1	0	---
	103	0	1	1	0	60 gpm
	629	0	6	0	0	100 gpm
	29	0	0	0	0	> 100 gpm
Jurisdiction #9	71	26	26	20	20	No Data
Summary of All Jurisdictions	156	3	13	10	4	60 gpm
	1463	53	91	52	52	100 gpm
	222	12	11	11	11	> 100 gpm
	81	26	26	20	20	No Info.
Totals	**1922**	**94**	**141**	**93**	**87**	

The Committee expressed sincere appreciation to those jurisdictions that submitted data. The Committee discussed the data and the summaries. The Committee recognized that the data was not obtained under controlled conditions or as part of a structured survey or study; however, the data was extremely valuable in assessing the relative impact of the three options proposed. The Committee agreed that Option 2 represents a reasonable compromise between the original proposal and the MMA's proposal (designated Option 3 in the tables above). The Committee

acknowledged that this item has included multiple proposals up to this point and it is important to designate a single option for consideration by NCWM so this item can move forward. Consequently, the committee presented Option 2 for consideration. Because this item has included multiple proposals up to this point, the 2012 S&T Committee designated this item as an Informational Item and requested comments on the proposal as shown in the Item Under Consideration prior to moving the item forward as a Voting Item.

At its 2012 Annual Meeting, NEWMA expressed its support for moving this item ahead as a Voting Item in the next NCWM cycle. At its 2012 Annual Meeting, CWMA supported the item as "Informational."

At the 2012 NCWM Annual Meeting Open Hearings, Mr. Dmitri Karimov, Liquid Controls, speaking on behalf of the Meter Manufacturers Association, commented that, while MMA is aware that the Committee did not support MMA's proposed "Option 3," the MMA supports "Option 2" recommended by the Committee.

The Committee asks the Regional Weights and Measures Associations and industry for input regarding whether or not the proposed changes are ready for adoption in the next NCWM cycle.

336 WATER METERS

336-1 V S.3. Markings

(This item was adopted.)

Source:
Neptune Technology Group, Inc. (2012)

Purpose:
Add marking requirements for Utility Type Meters under NIST Handbook 44: Section 3.36. Water Meters.

Item Under Consideration:
Add the following to NIST Handbook 44, Section 3.36. Water Meters Code:

S.3. Markings

S.3.1. Location of Marking Information; Utility Type Meters. – All required markings, including those required by G-S.1. Identification, shall be either on the meter body or primary indicator. [Nonretroactive as of January 1, 2013]

(Added 2012)

Background/Discussion:
Utility water meters are type approved under the California Type Evaluation Program; however, they are not yet accepted for evaluation by NTEP. Water meter manufacturers have set precedence since 1982 for the marking requirements of utility water meters. This precedence has been upheld by California state and county inspectors since its inception without incidence or harm. In many utility-type meter installations, visibility of markings on the meter body can be quite limited, while visibility of markings on the primary indicator is usually substantially better.

The submitter also stated that marking requirements are needed in Water Meter Code of NIST Handbook 44 as outlined in the Item Under Consideration before NCWM can offer NTEP Certification of these devices. When water meters are accepted for NTEP certification, utility type water meter manufacturers could participate in the National Type Evaluation Technical Committee (NTETC) Measuring Sector and play a more active role in providing greater visibility and education to the industry regarding utility water meters and their use.

The following water meter manufacturer representatives expressed support for the proposal on behalf of their respective companies: Mr. Noel, Neptune Technology Group, Inc.; Mr. De Jarlais, Badger Meter, Inc.;

Mr. Leckman, Badger Meter, Inc.; Mr. Swanson, Sensus Metering; Mr. Koch, Master Meter, Inc.; and Mr. Watson, Elster AMCO Water.

At the 2011 WWMA Annual Meeting, Mr. Noel, Neptune Technology Group, Inc., spoke on behalf of the Water Meter Manufactures consisting of Badger Meter, Inc., Neptune Technology Group, Inc., Sensus Metering, Master Meter, Inc. and Elster Amco voicing their support of the item. WWMA received letters of support from the water meter manufacturers group. Mr. Hasmeyer of Alameda County, California, opposed the item based on the proposal allowing identification information located on an accompanying document. Based on comments received, the submitter proposed amendments to the item, removing the reference to supplemental documentation. WWMA forwarded the item as modified below to NCWM, recommending it as a Voting Item:

S.3. Markings

S.3.1. Location of Marking Information; Utility Type Meters [See also G-S.1. Identification, G-S.4. Interchange or Reversal of Parts, G-S.7. Lettering and G-UR.2.1.1. Visibility of Identification]

The markings may be either on the meter body or primary indicator. The manufacturer's name or trademark, the model designation, and identifying symbols for the model and serial numbers as required by G-S.1. Identification shall also be marked on the meter body or primary indicator.
[Nonretroactive as of January 1, 2013]

(Added 20XX)

At the 2012 NCWM Interim Meeting, Mr. Noel, Neptune Technology Group, Inc. spoke in support of the proposed marking requirement on behalf of Neptune and four other water meter manufacturers (including Badger Meter, Elster, Master Meter, and Sensus). The Committee also received letters of support from Mr. Koch, Master Meter, Inc., and Mr. Swanson, Sensus. Mr. Cooper, speaking on behalf of the MMA, expressed support for the proposal as modified by the WWMA. NIST, OWM suggested eliminating the references to the General Code requirements in the title of the paragraph, noting that the Introduction Section of NIST Handbook 44 clarifies that the General Code requirements also apply. Referencing specific paragraphs also creates the risk of inadvertently missing paragraphs that should be applied.

After considering the comments received, the Committee agreed to the alternative language proposed by the WWMA and also agreed that the General Code paragraph references in the bracketed portion of the item proposed are not needed. The Committee amended the proposed language accordingly and presented the following recommended language for a vote in its 2012 Interim Report:

S.3. Markings

S.3.1. Location of Marking Information; Utility Type Meters. - The markings may be either on the meter body or primary indicator. The manufacturer's name or trademark, the model designation, and identifying symbols for the model and serial numbers as required by G-S.1. Identification shall also be marked on the meter body or primary indicator.
[Nonretroactive as of January 1, 2013]

(Added 20XX)

At the 2012 NCWM Annual Meeting, the Committee heard comments from Ms. Kristin Macey, California, suggesting modifications to the proposed language to change the reference from "may" to "shall."

The Committee also heard comments from Mr. Noel who expressed support for the proposal and agreed with Ms. Macey's suggested change.

Mr. Dmitri Karimov, Liquid Controls, speaking on behalf of the Meter Manufacturers Association, stated that MMA supports the proposal.

Committee Chairman, Mr. Steve Giguere, Maine, reported that the Committee also received letters of support from Mr. Alex Watson, Elster AMCO, and Mr. Swanson.

The Committee recommends modifying the proposed paragraph in the "Item Under Consideration" in its Interim Report to read as shown in the "Item Under Consideration" above. The revisions made by the Committee include changing the word "may" to "shall" and consolidating the language to eliminate redundancies in the language.

Any additional letters, presentations, and data that was submitted for consideration for this item is located in the S&T Appendix B.

354 TAXIMETERS

354-1 D S.5. Provision for Security Seals

The 2012 S&T Committee designated this item as a Developing Item and moved it to Section 360 Developing Items as Item 360-5.

354-2 D Global Positioning Systems Applications for Taximeters

The 2012 S&T Committee designated this item as a Developing Item and moved it to Section 360 Developing Items as Item 360-6.

356 GRAIN MOISTURE METERS

356-1 I UR.3.4. Printed Tickets

Source:
Grain and Feed Association of Illinois (2012)

Purpose:
Change the mandatory printing of tickets from grain moisture meters to an "on demand at the time of transaction" printing and remove the requirement of printing the calibration version identification. Note that the Committee did not agree with proposed removal of the requirement to print the calibration version identification; this position is reflected in the version of the proposal currently under consideration by the committee.

Item Under Consideration:
Amend NIST Handbook 44, Grain Moisture Meter Code 5.56.(a) as follows:

UR.3.4. Printed Tickets.

(a) Printed tickets shall be free from any previous indication of moisture content or type of grain or seed selected.

(b) The customer shall be given a printed ticket **at the time of the transaction or as otherwise specified by the customer.** The printed ticket shall include the date, grain type, grain moisture results, ~~**and**~~ test weight per bushel**,** and calibration version identification**.** The ticket **information** shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~**and**~~ 2003**, and 20XX**)

Background/Discussion:
According to the submitter, the user requirement to provide a printed ticket for every single load is unrealistic in the country elevator industry. Traffic patterns at country elevators do not lend themselves to providing a printed ticket

to all customers and customers really don't want them. As the speed and capacity increases in the industry, outbound scales are being located at a distance from the inbound scale and the scale house where the moisture tester is located to alleviate traffic bottlenecks. When the outbound scale is located away from where the ticket is printed, the truck driver must circle back around to pick up the ticket, thus, causing logistical problems. In addition, since meters are sealed, inspected and required to have the correct calibration, there is no need for the calibration version identification to be printed on the ticket. Also, most customers are not going to know if it is the correct calibration version identification or not. There have been problems getting the information from the grain moisture meter to the grain accounting system – especially the calibration version identification. Some grain accounting systems have to be "hard coded" for calibration version identification which must be changed whenever the calibration changes. The change will be at an added cost for the industry.

When a consumer pays at a gas pump, they have the option of a receipt on demand at the time of transaction or not receiving a receipt. There would be a cost savings to moisture meter users as they would save on paper and filing space, and in the situation where the calibration version identification is "hard coded," there will be a cost savings of the expense to have the grain accounting software provider make those changes.

Since moisture meters are capable of printing the ticket, some would argue that they should just go ahead and print them and provide them to the customer. In addition, the requirement does not say when the ticket shall be given to the customer; thus, the printed tickets could be saved for weeks, months, or even years in case the customer had a concern at some point. Printing the calibration version identification ensures the correct calibration is being used.

The submitter proposed amendments to paragraph UR.3.4. Printed Tickets as follows:

UR.3.4. Printed Tickets.

(a) Printed tickets shall be free from any previous indication of moisture content or type of grain or seed selected.

(b) The customer shall be given a printed ticket **on demand at the time of the transaction** showing the date, grain type, grain moisture results, test weight per bushel, ~~**and calibration version identification**~~. The ticket **information** shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~**and**~~ 2003**, and 20XX**)

At the 2011 CWMA Interim Meeting, some jurisdictions opposed the proposal citing that it is a fundamental element of a point of sale transaction that there is either a witness to the transaction or that a receipt is made available. Others supported the item and recognized that many customers refuse to take the printed tickets. The CWMA believes that the calibration version identification is not necessary on the ticket since most jurisdictions are already verifying the calibrations version when the device is inspected. This proposal is not eliminating the opportunity for the seller to obtain a printed ticket. CWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 WWMA Annual Meeting, the Committee heard no comments on this item. The WWMA amended the proposal to make the language consistent with other codes such as 3.32. LPG and Anhydrous Ammonia Liquid-Measuring Devices Code paragraph UR.2.6. Ticket Printer: Customer Tickets. WWMA forwarded the modified version below to NCWM, recommending it as a Voting Item.

UR.3.4. Printed Tickets.

(a) Printed tickets shall be free from any previous indication of moisture content or type of grain or seed selected.

(b) The customer shall be given a printed ticket ~~**showing**~~ **at the time of the transaction or as otherwise specified by the customer. The printed ticket shall include** the date, grain type, grain moisture results, **and** test weight per bushel, ~~**and calibration version identification**~~. The ticket **information** shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~and~~ 2003**, and 20XX**)

At the 2011 NEWMA Interim Meeting there were no comments. Deferring to the expertise of the Grain Analyzer Sector, NEWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2011 SWMA Annual Meeting, Ms. Butcher, NIST Technical Advisor, noted that the proposed language submitted was slightly different from that discussed by the NTETC Grain Analyzer Sector and provided a summary corresponding to this item prepared by Ms. Lee, Grain Analyzer Sector Technical Advisor. Ms. Butcher also pointed out that WWMA proposed alternate language that is consistent with printed tickets requirements in other Codes. SWMA agreed that the customer should be given the option of receiving a printed ticket from a transaction and that the proposed changes would clarify the responsibility of the device user. SWMA preferred the option forwarded by WWMA since it mirrors existing language in other NIST Handbook 44 codes. SWMA forwarded the item to NCWM, recommending it as a Voting Item as revised by WWMA.

At the 2012 NCWM Interim Meeting, the Committee received comments in support of the alternative language submitted by the WWMA. NIST, OWM reported that the proposed language submitted to the regional weights and measures associations was different from that agreed to by the Grain Analyzer Sector at its August 2011 meeting. The Grain Analyzer Sector had specifically opposed deleting the phrase "calibration version identification." NIST, OWM also noted that not all grain moisture meters are Category 3 devices; consequently, calibration version identification information is a critical component on the printed receipt to reconstruct the basis for a sale and help officials to resolve complaints.

The Committee agreed that the version proposed by WWMA and SWMA was preferable since it mirrors similar language in other NIST Handbook 44 Codes. The Committee also agreed that, given the Grain Analyzer Sector's opposition to deleting the reference to "calibration version identification," this phrase should be retained in the paragraph. The Committee presented an amended version of the proposal. The Committee recognized that the regional associations were not aware of the Sector's position on the proposed deletion of the reference to the calibration version and that the submitter has not had an opportunity to review the significant changes from the original version. The 2012 S&T Committee designated this item as an Informational Item to allow additional opportunity for input.

In its 2012 annual report, NEWMA suggested that this item remain informational, noting little experience within NEWMA on grain moisture meters. The CWMA also supported the item remaining Informational, citing the need for additional input on the modifications to the proposal.

At the 2012 NCWM Annual Meeting, the Committee heard no additional comments during its Open Hearings. The Committee reiterates its request for input on the modifications to the proposal, particularly from the original submitter and any regional weights and measures association that has not had an opportunity to review the modifications. The Committee recommended no changes to the "Item Under Consideration."

358 MULTIPLE DIMENSION MEASURING DEVICES

358-1 VC N.1.3.4. Test Objects with Protrusions

(This item was adopted.)

Source:
Multiple Dimensions Measuring Device (MDMD) Work Group (2012)

Purpose:
Update the MDMD code based on the MDMD Work Group's clarification of irregularly shaped objects and protrusions.

Item Under Consideration:
Delete paragraph N.1.4.3.Test Objects with Protrusions:

> ~~**N.1.4.3. Test Objects with Protrusions. If the device is marked with a minimum protrusion dimension to be measured, a test object with protrusion shall be used to verify the marked limitation during type evaluation.**~~
>
> ~~**(Added 2008)**~~

Background/Discussion:
The MDMD Work Group determined that a "protrusion" is nothing more than the part or parts of an object that changes the object from a hexahedron shape to an irregularly shaped object. Therefore, no special test object is required for type evaluation and the reference to testing objects with protrusions as specified in N.1.4.3. Test Objects with Protrusions is unnecessary. If appropriate, the manufacturer is required to mark the unit with a "minimum protrusion size" as stated in Note 7 of Table S.4.1.b. and the irregularly-shaped object used during type evaluation will be configured to verify the manufacture's declared limitation.

At the fall 2011 regional meetings, the CWMA, WWMA, and SWMA forwarded the item to NCWM, recommending it as a Voting Item. At the WWMA meeting, Mr. Flocken, Mettler-Toledo, LLC commented on behalf of the MDMD Work Group, that the proposed deletion of N.1.4.3. will harmonize NIST Handbook 44 with Canadian requirements and other international recommendations for MDMDs regarding irregular shaped objects. SWMA received additional background from Mr. Flocken that the current MDMD Code includes requirements for hexahedrons (e.g., a six-sided box) and irregularly-shaped, non-hexahedrons (e.g., something other than a six-sided box such as a tailpipe). The code also includes provisions to address objects with "protrusions." However, the MDMD Work Group believes that objects with protrusions should be addressed the same way as irregularly shaped objects. Thus, the proposed change would simplify the requirements by reducing the types of objects addressed in the code to two categories: hexahedrons and non-hexahedrons.

At the 2011 NEWMA Interim Meeting, NEWMA forwarded the item to NCWM, recommending it as an Informational Item.

At the 2012 NCWM Interim Meetings, Mr. Flocken, Mettler-Toledo, LLC supported the item and echoed comments that he provided during the regional association meetings. NIST, OWM suggested that the Committee consider deleting the term "minimum protrusion size" from Table S.4.1.b. Note 7 to coincide with the proposal.

The Committee considered NIST, OWM's proposal to delete the term "minimum protrusion size" from Note 7 in Table S.1.4.1.b.; however, based upon a later recommendation from NIST, OWM to withdraw that proposal, the committee decided to maintain the item as originally proposed by the MDMD Work Group.

Hearing no opposition to the changes proposed by the MDMD Work Group and deferring to that group's expertise, the Committee agreed with the proposal to delete paragraph N.1.4.3. Test Objects with Protrusions from the MDMD Code. The 2012 S&T Committee designated this item as a Voting Item.

At their 2012 Annual Meetings, NEWMA and CWMA supported this item as a Voting Item.

At its Open Hearings during the 2012 NCWM Annual Meeting, the Committee heard comments from Darrell Flocken, speaking on behalf of SMA, supporting the proposed changes. Mr. Flocken reiterated that the proposed changes were essentially "housekeeping" in nature. The Committee is recommended no changes to the "Item Under Consideration."

359 ELECTRONIC LIVESTOCK, MEAT, AND POULTRY EVALUATION SYSTEMS AND/OR DEVICES – TENTATIVE CODE

359-1 VC Tentative Status of Code Section 5.59.

(This item was adopted.)

Source:
U. S. Department of Agriculture (USDA), Grain Inspection Packers and Stockyard Administration (GIPSA), Packers and Stockyards Program (P&SP) (2012)

Purpose:
Remove the Tentative Code status of Section 5.59., making it enforceable.

Item Under Consideration: Amend the title of NIST Handbook 44, Tentative Code 5.59. as follows:

Section 5.59. Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices ~~– 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 for Livestock, Meat, and Poultry Evaluation Systems and/or Devices. Officials wanting to conduct an official examination of a device or system are advised to see paragraph G A.3. Special and Unclassified Equipment.**~~

Background/Discussion:
Electronic livestock carcass evaluation equipment is used in livestock procurement to determine the value of the livestock being purchased. There is no independent, third party verifying the accuracy of these devices. In 2010, 106.9 million hogs weighing 21.8 billion pounds with a total value of $15.7 billion were commercially slaughtered. Of these, approximately 80 % were made on a carcass yield weight basis with an electronic carcass evaluation device. In 2010, 27 million steers and heifers weighing 34.6 billion pounds with a total value of $33 billion were commercially slaughtered. The use of electronic carcass evaluation devices in the beef industry is just beginning to take hold, so there is no data at this point that indicates the number of transactions in which carcass evaluation devices are being used commercially. Electronic carcass evaluation devices are also used to measure composition or quality constituents in individual cuts of meat for further sale to consumers. Studies have shown that improper use of electronic carcass evaluation equipment can change the value of livestock, meat and poultry. The impact of calibration, machine, and formula errors is unknown. The economic impact of the use of electronic livestock, meat and poultry evaluation equipment is very large. The revenues of livestock and poultry producers in every state are or will be affected by the use of these devices.

State and federal regulatory agencies are charged with protecting livestock, meat and poultry producers as well as the consumer in the marketing of livestock, poultry and meat food products. USDA, GIPSA, P&SP references NIST Handbook 44 in 9 C.F.R. 201.71(a) in its livestock, poultry and carcass weight scale programs to ensure that all scales are installed, maintained and operated to safeguard accurate weights. NIST Handbook 44 currently includes a tentative code for electronic carcass evaluation devices. Changing the status of the code from "tentative" to "permanent" would assist state and federal regulatory agencies in the enforcement of standards that would ensure compliance, accuracy and consistency across the country.

ASTM International, an organization that develops voluntary international standards, has established the F-10 Committee specifically to address electronic livestock, meat and poultry evaluation devices and systems. It developed several standards referenced in the tentative code. The F-10 Committee remains committed to continuing the development of new standards and the revision of current standards to assist the livestock industry as technology takes a larger role in the determination of value in livestock. Changing the status of the NIST Handbook 44 code to "permanent" would also support the efforts of this committee to ensure consistency and accuracy across the country.

At the SWMA 2011 Annual Meeting Mr. Ainsworth, USDA, asked the SWMA to consider moving this proposal forward to the NCWM S&T Committee as a Voting Item based upon the rationale provided in the background information. The SWMA heard no opposition to the proposed changes and acknowledged that there has been no negative feedback since the code was given tentative status several years ago. SWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2012 NCWM Interim Meeting, two states reported that their inspectors have no experience with this equipment and they expressed reservations about having enough knowledge about the equipment to consider the proposal or resources to train inspectors to test the equipment. One of those jurisdictions also questioned adoption of a code that would only meet the needs of one jurisdiction, albeit a federal government agency.

One state and two private sector representatives supported the proposal. They noted that, if NCWM is to fulfill its mission of being the organization that develops the legal metrology standards for the United States, it isn't wise to turn agencies away, particularly those that have experience working with the equipment in question and that have an immediate need for the standard. While there are sometimes risks in adopting requirements for new technologies and applications, at some point adoption of the requirements must proceed and consideration must be given to the expertise of the members of the work group that developed the standards and who have applied it thus far. NIST Handbook 44 is regularly revised to respond to changes in the commercial marketplace and the need for modifications in new areas of application

NIST, OWM reported contacting two state jurisdictions where this equipment is in use in large facilities in an effort to gather additional input on this item for the Committee. While these jurisdictions had not applied the code, Mr. Wilke, USDA GIPSA, reported that GIPSA applies the code to electronic carcass evaluation systems on a regular basis and is satisfied with the results obtained from its use. He also reported that new devices being manufactured have been found to comply with the requirements in the code.

After considering comments on this issue, the Committee acknowledged that, although there is no evidence that states have applied the tentative code, one regulatory agency, USDA GIPSA has applied the code on a regular basis and is requesting that the tentative status be lifted to allow enforcement of the code. The 2012 S&T Committee designated this item as a Voting Item.

At their spring 2012 Annual Meetings, NEWMA and CWMA supported the item as a Voting Item, noting that another regulatory agency needs the ability to enforce this code.

At 2012 Annual Meeting, Mr. Richard Suiter, Richard Suiter Consulting, referenced comments received by the committee from weights and measures jurisdictions who were concerned about not having the testing equipment or knowledge to test these devices. Mr. Suiter pointed out that Section 5.59. includes requirements for the device owner to provide traceable test standards, thus removing any burden on the jurisdiction to provide them. Mr. Suiter also noted that testing these devices may require an additional investment of time; however, the devices are typically located in facilities where other devices under weights and measures regulation are located and the amount of additional time required should not be significant.

The Committee also heard from Mr. Alan Christian, USDA, GIPSA Packers and Stockyards Program, who reiterated comments made by GIPSA at the 2012 Interim Meeting. He cited the importance of changing the status of the code to "permanent," noting that a vast number of producers are paid based, not only on the weight of the animal, but also on other quality factors. The lack of enforceable standards can result in significant harm to sellers who rely on the accuracy of these measurements for fair payment.

The Committee noted that there was one position, neutral to the proposal, posted on the NCWM 2012 Online Position Forum. The Committee maintained its support of the proposed change, recommending the removal of the "tentative" status from the code, with no change to the "Item Under Consideration."

360 OTHER ITEMS – DEVELOPING ITEMS

360-1 D International Organization of Legal Metrology (OIML) Report

Many issues before the OIML, the Asian-Pacific Legal Metrology Forum, and other international groups are within the purview of the Committee. Additional information on OIML activities will appear in the Board of Directors agenda and Interim and Final Reports and on the OIML website at www.oiml.org. NIST, OWM staff will provide the latest updates on OIML activities during the Open Hearings at NCWM meetings. For more information on specific OIML related device activities, contact the NIST, OWM staff listed in the table below. The list below of OIML projects only represents active projects.

NIST Office of Weights and Measures Staff Contact List for International Activities	
Contact Information	**Responsibilities**
Mr. John Barton –LMDP Phone: (301) 975-4002 Email: john.barton@nist.gov	• R 21 *Taximeters* • R 50 *Continuous Totalizing Automatic Weighing Instruments (Belt Weighers)* • R 60 *Metrological Regulations for Load Cells* • R 106 *Automatic Rail-weighbridges*
Mr. Kenneth Butcher –LMP Phone: (301) 975-4859 Email: k.butcher@nist.gov	• TC 6 *Prepackaged Products*
Dr. Charles Ehrlich –ILMP Phone : (301) 975-4834 Email : charles.ehrlich@nist.gov	• International Committee of Legal Metrology Member for the United States • V1 *International Vocabulary of Terms in Legal Metrology* • V2 *International Vocabulary of Basic and General Terms in Metrology* • B 3 *OIML Certificate System for Measuring Instruments* • B 6 *OIML Directives for the Technical Work* • B 10 *Framework for a Mutual Acceptance Arrangement on OIML Type Evaluations* • TC 3/SC 5 *Expression of Uncertainty in Measurement in Legal Metrology Applications, Guidelines for the Application of ISO/IEC 17025 to the Assessment of Laboratories Performing Type Evaluation Tests* • TC 3 *Metrological Control* • ISO/IEC *Guide to the Expression of Uncertainty in Measurement*
Mr. Richard Harshman –LMDP Phone: (301) 975-8107 Email: richard.harshman@nist.gov	• R 51 *Automatic Catchweighing Instruments* • R 61 *Automatic Gravimetric Filling Instruments* • R 76 *Non-automatic Weighing Instruments* • R 107 *Discontinuous Totalizing Automatic Weighing Instruments* (totalizing hopper weighers) • R 134 *Automatic Instruments for Weighing Road Vehicles In-Motion and Measuring Axle Loads*
Ms. Diane Lee –LMDP Phone: (301) 975-4405 Email: diane.lee@nist.gov	• R 59 *Moisture Meters for Cereal Grains and Oilseeds* • R 92 *Wood Moisture Meters – Verification Methods and Equipment* • R 121 *The Scale of Relative Humidity of Air Certified Against Saturated Salt Solution* • TC 17/SC 8 *Measuring Instruments for Protein Determination in Grains*

NIST Office of Weights and Measures
Staff Contact List for International Activities

Contact Information	Responsibilities
Mr. Ralph Richter –ILMP Phone: (301) 975-3997 Email: ralph.richter@nist.gov	• D 11 *General Requirements for Electronic Measuring Instruments* • R 35 *Material Measures of Length for General Use* • R 49 *Water Meters* (Cold Potable Water and Hot Water Meters) • R 71 *Fixed Storage Tanks* • R 80 *Road and Rail Tankers* (static measurement) • R 85 *Automatic Level Gauges for Measuring the Level of Liquid in Fixed Storage Tanks* • R 95 *Ship's Tanks* • R 117 *Measuring Systems for Liquids Other Than Water* (all measuring technologies) • R 118 *Testing Procedures and Test Report Format for Pattern Examination of Fuel Dispensers for Motor Vehicles* • TC 3/SC 4 *Verification Period of Utility Meters Using Sampling Inspections* • R 137 *Gas Meters* (all measuring technologies) • R 140 *Measuring Systems for Gaseous Fuel* (i.e., large pipelines) • ISO TC 30/SC 7 *Water Meters*
Dr. Ambler Thompson –ILMP Phone: (301) 975-2333 Email: ambler@nist.gov	• D 16 *Principles of Assurance of Metrological Control* • D 19 *Pattern Evaluation and Pattern Approval* • D 20 *Initial and Subsequent Verification of Measuring Instruments and Processes* • D 27 *Initial Verification of Measuring Instruments Using the Manufacturer's Quality Management System* • D 31 *General Requirements for Software Controlled Measuring Instruments* • R 34 *Accuracy Classes of Measuring Instruments* • R 46 *Active Electrical Energy Meters for Direct Connection of Class 2*
Ms. Juana Williams –LMDP Phone: (301) 975-3989 Email: juana.williams@nist.gov	• R 81 Dynamic Measuring Devices and Systems for Cryogenic Liquids • R 139 Compressed Gaseous Fuels Measuring Systems for Vehicles

List of Acronyms

B	Basic Publication	LMDP	Legal Metrology Devices Program
CIML	International Committee of Legal Metrology	P	Project
D	Document	R	Recommendation
ILMP	International Legal Metrology Program	SC	Subcommittee
LMP	Laws and Metrics Program	TC	Technical Committee

The WWMA and the SWMA support these issues and the related device activities as an Informational Item. At the 2011 NEWMA Interim Meeting it was noted that Dr. Ehrlich does a great job at annual and interim meetings explaining OIML issues. NEWMA supports the efforts of NIST to harmonize with OIML wherever possible to create a marketplace that reflects the global marketplace of today.

360-2 D G-S.1. Identification. – (Software)

Source:
2010 Carryover Item 310-3. This item originated from the NTETC Software Sector and first appeared on NCWM S&T Committee's 2007 agenda as Developing Item Part 1, Item 1.

Purpose:
Provide marking requirements that enable field verification of the appropriate version or revision for metrological software, including methods other than "permanently marked," for providing the required information.

Item Under Consideration:
Amend NIST Handbook 44, Section 1.10. General Code, G-S.1. Identification and G S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices as follows:

G-S.1. Identification. – All equipment, except weights**,** ~~**and**~~ separate parts necessary to the measurement process but not having any metrological effect, ***and software-based devices covered in G-S.1.1. Location of Marking Information****, shall be clearly and permanently marked for the purposes of identification with the following information:
[*Nonretroactive as of January 1, 20XX]

(Amended 20XX)

(a) the name, initials, or trademark of the manufacturer or distributor;

(b) a model identifier that positively identifies the pattern or design of the device;

(1) The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lowercase.
[Nonretroactive as of January 1, 2003]
(Added 2000) (Amended 2001)

(c) a non-repetitive serial number, except for equipment with no moving or electronic component parts ~~***and not built for purpose software-based software device***~~*;*
[Nonretroactive as of January 1, 1968]
(Amended 2003 **and 20XX**)

(1) The serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.
[Nonretroactive as of January 1, 1986]

(2) Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No., and S. No.).
[Nonretroactive as of January 1, 2001]

(d) the current software version or revision identifier for ~~***not built for purpose***~~ ***software-based electronic*** *devices;*
[Nonretroactive as of January 1, 2004]
(Added 2003) **(Amended 20XX)**

(1) The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.

[Nonretroactive as of January 1, 2007]

(Added 2006)

(2) *Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).*
[Nonretroactive as of January 1, 2007]

(Added 2006)

(e) *an NTEP CC number or a corresponding CC Addendum Number for devices that have a CC. The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.)*
[Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.

(Amended 1985, 1991, 1999, 2000, 2001, 2003, ~~**and,**~~ 2006**, and 20XX**)

G-S.1.1. Location of Marking Information for ~~Not Built For Purpose~~ all Software-Based Devices. *– For ~~not built for purpose,~~ software-based devices, either:*

(a) *The required information in G S.1. Identification. ~~(a), (b), (d), and (e)~~ shall be permanently marked or continuously displayed on the device; or*

(b) *The Certificate of Conformance (CC) Number shall be:*

(1) *permanently marked on the device;*

(2) *continuously displayed; or*

(3) *accessible through ~~an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to, "Help," "System Identification," "G S.1. Identification," or "Weights and Measures Identification."~~ one or, at most, two levels of access.*

(i) For menu based systems, "Metrology," "System Identification," or "Help."

(ii) For systems using icons, a metrology symbol "(M)", "(SI)," or a help symbol ("?," "i," or an "i" within a magnifying glass).

Note: For (b), clear instructions for accessing the information required in G S.1. (a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.
[Nonretroactive as of January 1, 2004]

(Added 2003) (Amended 2006 **and 20XX**)

Background/Discussion:
Among other tasks, the NTETC Software Sector was charged by the NCWM Board of Directors to recommend NIST Handbook 44 specifications and requirements for software incorporated into weighing and measuring devices, which may include tools used for software identification. During its October 2007 meeting, the Sector discussed the value and merits of required markings for software, including possible differences in some types of software-based

devices and methods of marking requirements. After hearing several proposals, the Sector agreed to the following technical requirements applicable to the marking of software:

1. The NTEP CC Number must be continuously displayed or hard-marked;

2. The version must be software-generated and shall not be hard-marked;

3. The version is required for embedded (Type P) software;

4. Printing the required identification information can be an option;

5. Command or operator action can be considered as an option in lieu of a continuous display of the required information; and

6. Devices with Type P (embedded) software must display or hard-mark the device make, model, and serial number to comply with G S.1. Identification.

In 2008, the Sector developed and submitted a proposal to the NCWM S&T Committee to modify G-S.1. and associated paragraphs to reflect these technical requirements. Between 2008 and 2011, this item appeared on the S&T Committee's main agenda and the Committee and the Sector received numerous comments and suggestions relative to the proposal. The Sector developed and presented several alternatives based on feedback from weights and measures officials and manufacturers. Among the key points and concerns raised during discussions over this period were how to address the following:

1. **Limited Character Sets and Space.** – How to address devices that have limited character sets or restricted space for marking.

2. **Built-for-Purpose vs. Not-Built-for-Purpose.** – Whether or not these should be treated differently.

3. **Ease of Access.** – Ease of accessing marking information in the field.

    - Complexity of locating the marking information

    - Use of menus for accessing the marking information electronically

    - Limits on the number of levels required to access information electronically

    - Possibility of single, uniform method of access

4. **Hard Marking vs. Electronic.** – Whether or not some information should be required to be hard marked on the device.

5. **Continuous Display.** – Whether or not required markings must be continuously displayed.

6. **Abbreviations and Icons.** – Establishment of unique abbreviations, identifiers, and icons and how to codify those.

7. **Certificate of Conformance Information.** – How to facilitate correlation of software version information to a CC, including the use of possible icons.

Further details on the alternatives considered can be found in the Committee's Final Reports from 2008 to 2011.

At the 2011 NCWM Interim Meeting, the S&T Committee concurred with the Software Sector Chair that this item is not ready to move forward as a Voting Item. The Committee recommended the sector review a number of specific comments and points (see the Committee's 2011 Final Report for details.)

At the 2011 NCWM Annual Meeting, the Committee heard support for the continued work of the Sector. The 2011 S&T Committee designated this item as a Developing Item to provide the Software Sector additional time to more fully develop the item. The Committee looked forward to considering the sector's future recommendations.

At the fall 2011 regional meetings, the regional weights and measures associations noted the importance of this work. All regional associations recommended that the item remain as a Developing Item to allow the Sector to further develop the issue.

360-3 D Part 2.20. Weigh-In-Motion Vehicle Scales for Law Enforcement - Work Group

Source:
NIST, OWM, Mr. Richard Harshman, on behalf of the U.S. Federal Highway Administration (FHWA) (2011)

Purpose:
Keep the weights and measures community apprised of work to develop standards for Weigh-In-Motion (WIM) scale systems and to encourage their participation in this work.

Item under Consideration:
This item is under development. Comments and inquiries may be directed to Mr. Rick Harshman, NIST, OWM at (301) 975-8107 or richard.harshman@nist.gov.

The FHWA is forming a USNWG to develop proposed standards that would apply to WIM scale systems used to screen or sort commercial vehicles for possible violations of legal roadway weight limits with the ultimate goal of bringing the proposed standards before the weights and measures community for possible inclusion in NIST Handbook 44. FHWA has been collaborating with NIST, OWM and the commercial vehicle enforcement community to identify industry experts, device users, regulatory officials, and others interested in participating in the work group. The work group plans to develop proposed specifications, tolerance, and other technical requirements applicable to WIM scale systems used in official use for the enforcement of law or for the collection of statistical information by government agencies.

Background/Discussion:

The nation's highways, freight transportation system, and enforcement resources are being strained by the volume of freight being moved and the corresponding number of commercial vehicles operating on its roads. Traditional, manual-based vehicle inspection activities simply cannot keep pace with anticipated truck volume increases. Current U.S. Department of Transportation (DOT) forecasts project freight volumes to double by 2035 and commercial vehicles to travel an additional 100 billion miles per year by 2020. WIM technology has been targeted by FHWA and Federal Motor Carrier Safety Administration to a technology capable of supporting more effective and efficient truck weight enforcement programs.

Several DOT efforts are underway and planned for the future to maintain adequate levels of enforcement that ensure equity in the trucking industry market and protection of highway infrastructure. Judicial support for enforcement decisions to apply more intense enforcement actions on specific trucks depends on support from the U.S. legal metrology community. Standards are needed in NIST Handbook 44 to address the design, installation, accuracy, and use of WIM systems used in a screening/sorting application. The implementation of a uniform set of standards will greatly improve the overall efficiency of the nation's commercial vehicle enforcement process.

Once adopted by the truck weight enforcement community, these requirements will enhance the accuracy of the nation's WIM scale systems, serve as a sound basis for judicial support of next-generation truck weight enforcement programs and result in fewer legally loaded vehicles being delayed at static weigh station locations, thus reducing traffic congestion and non-productive fuel consumption and improving the movement of freight on our nation's roadways.

At the 2010 CWMA Interim Meeting, a commenter said that WIM scales could be used for enforcement issues and evaluating or assessing fines to overweight trucks. Currently most of these scales are used for audit purposes only.

The Committee believes that the efforts to establish requirements for WIM scales has merit, and when fully developed, will assist in expediting commerce by not having to reweigh clearly legal highway vehicles while protecting roadways from vehicles that exceed legal highway load limits.

At the 2010 WWMA Annual Technical Conference, Mr. Langford, Cardinal Scales Manufacturing Co., stated that he is a member of the work group and supports adding language defining performance parameters of WIM devices for use in law enforcement. Mr. Langford added that the work group will consider other existing standards to help develop the language in NIST Handbook 44 (e.g., OIML Recommendation (R) 134 Automatic Instruments for Weighing Road Vehicles in Motion and Measuring Axle Loads). Mr. Floren, Los Angeles County Agricultural Commissioner/Weights and Measures, added that even though these devices are non-commercial they are covered under the scope of NIST Handbook 44 General Code Application paragraph G-A.1.(c) Commercial and Law Enforcement Equipment.

At the 2010 SWMA Annual Meeting, Mr. Langford supported the direction of this work group. Mr. Langford noted that these WIM scales are not currently used to levy fines, but rather to screen for overweight trucks. He noted that the work group is just getting started and that Cardinal Manufacturing Co. is looking forward to participating in this work. Mr. Gray, Florida Department of Agriculture and Consumer Services, questioned whether putting requirements for highway WIM devices in NIST Handbook 44 would obligate jurisdictions to conduct tests of these devices. While he doesn't oppose the inclusion of requirements in general, he questioned the availability of resources to accommodate the additional workload given the extreme budget restrictions many jurisdictions are facing. Ms. Butcher, NIST, OWM, noted that DOT reported that highway weight enforcement officials are concerned that the use of the scales in screening will be challenged without reference to a recognized standard. Since many of these agencies reference NIST Handbook 44, they believed that recognition of these devices in NIST Handbook 44 as law enforcement equipment would lend credibility and consistency to the design, use, accuracy, and application of this equipment.

The SWMA S&T Committee supported efforts of the work group. However, given some of the concerns and questions raised at the Open Hearings about resources for testing, the committee did not want to take a position on this issue until it has more information about the direction of the work group.

At the 2010 NEWMA Interim Meeting comments were heard supporting the formation of the work group but questioned what role existed for NCWM S&T Committee at this time.

At the 2011 NCWM Interim Meeting, Ms. Juana Williams, NIST, OWM, provided the following update on the progress of WIM standards development:

Purpose of the Project:
The FHWA's Office of Freight Management and Operations recognized a need to encourage uniformity in the design, testing, installation, and performance of WIM technology and subsequently encourage acceptance by prosecution agencies (administrative or judicial) regarding the validity of WIM technology's role in supporting commercial motor vehicle weight enforcement.

In response to this need and recognizing the credibility of having a standard included in NIST Handbook 44 because it lends integrity and is more recognizable in legal actions, the FHWA seeks to integrate WIM technology into the handbook. The FHWA recently contracted the services of the Texas Transportation Institute—The Texas A&M University System and Battelle (a private company) to begin this process. Additionally, a small oversight committee was formed by the FHWA, made up of three representatives from the FHWA, a NIST Technical Advisor, and a representative of a U.S. manufacturer of WIM equipment to validate that each contract deliverable is completed according to contract.

The intended application of the proposed new code is for screening purposes only (i.e., for screening/sorting commercial vehicles for possible violations of FHWA vehicle weight requirements). It is anticipated that as WIM technology continues to advance, this code may have a much broader application sometime in the future.

As a first step in this effort, the contracted team was tasked to develop an initial, detailed Project Work Plan intended to guide activities and establish lines of communication from project inception to project completion. This deliverable has been completed and was recently submitted to the FHWA Project Oversight Committee for consideration.

The next step will be to establish a work group from the WIM technology stakeholder community. This process is already underway and the WG will be comprised of representatives from state departments of transportation, state law enforcement agencies, weights and measures officials, WIM technology manufacturers and vendors, academic researchers, and others. The initial meeting of the work group is planned, although not yet scheduled, for the middle of February 2011. It is anticipated that a final draft code will be ready for consideration by NCWM in 2012.

Mr. Gray, commented that although he didn't have any issues regarding developing standards for WIM systems, he did not believe that inclusion of a new WIM code into NIST Handbook 44 was appropriate because the application of the proposed code was for screening purposes only.

Mr. Langford supported the development of the standard and stated that the "Application" section of the General Code not only applies to commercial equipment, but also equipment used in law-enforcement and for the collection of statistical information by government agencies. He also stated that it was too early to make a determination on how much work would be involved in the testing of WIM systems because the work group had yet to be formed.

At the 2011 NCWM Annual Meeting Mr. Rick Harshman, NIST, OWM, provided an update on the progress of the WIM Work Group.

At the 2011 WWMA Annual Meeting Mr. Cook, NIST, OWM, provided the following update on the activities of the WIM Vehicle Scales Work Group: Mr. Harshman is the NIST Technical Advisor to the work group and participated in the discussions and offered technical positions on the various items during its first meeting in July 2011. Mr. Harshman presented an overview of the process to develop the technical content of a new WIM code. He explained how NIST Handbook 44 was organized, and how requirements developed by the work group would fit into the various sections of a new NIST Handbook 44 code. He also provided an overview of the standards development process and discussed the benefits of the work group using a "straw man," which he has already created to develop the new draft code. Mr. Langford gave a presentation on the NIST Handbook 44 amendment process which detailed the various steps the work group would need to complete to add a new device code to NIST Handbook 44.

Several concerns and questions were raised by participants during a scheduled open discussion of the work group. The following are some of the more important concerns/questions discussed:

1. The application section of the code is critical. The types of WIM systems in which the code does and does not apply will significantly impact all other sections of the code.

2. What tolerance should be specified in the draft code? An important related question is: What degree of accuracy will the judicial system (courts) accept as being sufficiently accurate enough to screen commercial vehicles for possible overweight violations? The degree of accuracy required will have a large impact on the kinds of systems that get included or excluded in the application section of the code.

3. There needs to be a separation of requirements, i.e., those that apply to virtual weigh stations and those that apply to WIM systems installed at weigh stations having a static scale.

4. To adopt a draft code at the national level, two things must happen: 1) A legitimate test procedure is needed to enable states to test these systems, and 2) federal funding is needed to help cover the cost of testing.

5. Will NCWM Publication 14 type evaluation criteria be needed since these systems are not commercial and are unlike other devices typically covered by NIST Handbook 44?

Mr. Flocken, Mettler-Toledo, LLC, accepted the position as the WIM work group chair, and encouraged stakeholders to submit comments to the work group. These questions and concerns and others are to be discussed during the next meeting of the work group. The next meeting date has not yet been decided.

At the 2011 NEWMA Interim Meeting, it was suggested that resources may be too limited to enforce and conduct inspections on these devices once the code is developed. The NEWMA S&T Committee recognized, however, that the traffic at truck stops can be backed up and this technology would help to ease that problem. They would also be easier to set up than axle-load weighers. While the Committee heard some support for WIM scales, there are also questions. Would the WIM scales be located at permanent or temporary locations? Will fines be issued off of these scales? How often will the scales need to be tested? The Committee recommended continuing to collect data and comments on this new technology.

At the 2011 SWMA Annual Meeting, Mr. Flocken, Mettler-Toledo, LLC, reported that he has been appointed Chair of the USNWG and that the work group held its first meeting in July. He also noted that Mr. Harshman, NIST, OWM, prepared a draft code for the work group to consider as a starting point. Mr. Flocken has created a checklist that he proposes to distribute to the work group along with the draft code; he plans to ask work group members to complete the checklist as they review the code, identifying sections which they believe need additional work. He hopes that this review process can be completed by mid-December, after which time the work group will meet to review the input from members. Mr. Flocken noted that if the timing is appropriate, it may be possible to hold a work group meeting in conjunction with the NCWM Interim Meeting. Mr. Flocken will submit his proposed next steps to the FHWA's Project Oversight Committee for approval. He also asked that the community be patient while this work group gets underway and he will look forward to bringing specific proposals to the Committee as work progresses further. The Committee recognizes that this work is still in the developmental stages and agrees that additional time is needed before any proposals can be considered by the Committee.

At the 2012 Interim Meeting, Mr. Flocken, Mettler-Toledo, LLC, new chair of the Weigh-In-Motion Work Group provided an update on the standards development for WIM scale systems. Mr. Flocken reported that the work group held its first face to face meeting in July 2011 to launch the project, get participants involved, and discuss some of the more important tasks at hand. Mr. Harshman, Advisor to the work group, had prepared a draft code for participants of the work group to consider as a starting point. That draft code, as well as a checklist that Mr. Flocken created, had been distributed to participants of the work group. Participants were asked to complete the checklist as they reviewed the draft code, identifying sections which they believed needed additional work. Based upon the comments indicated on completed checklists that have been returned thus far, it was evident that participants of the work group have very diverse ideas concerning the standards that should go into a new draft code. For that reason, Mr. Flocken and Mr. Harshman met earlier during the week to talk about how best to proceed. They decided to arrange a teleconference meeting with members of the FHWA's Project Oversight Committee to seek guidance on the scope of the project. Mr. Flocken planned to schedule that conference within a few weeks following conclusion of the 2012 Interim Meeting. There is a mix of support and opposition to this project and Mr. Flocken requested that the community be patient. He looked forward to bringing specific proposals to the Committee as work progresses further.

At its 2012 Annual Meeting, NEWMA recommended that the status of this item remain as "Developing." NEWMA maintains a neutral position on this item and is awaiting further proposals from the WG. At its 2012 Annual Meeting, the CWMA did not take a position on this item. At both the NEWMA and CWMA meetings, Mr. Flocken, speaking as Chairman of the WIM Work Group, provided an update on the progress of the WG, noting that work has been delayed pending the resolution of funding issues within the FHWA.

At the 2012 NCWM Annual meeting, the Committee heard an update from the WG Chairman, Mr. Flocken, who noted that the WG had not been able to meet due to funding issues, but those issues have been resolved and the WG will now be able to move ahead with its work.

Mr. Steve Langford spoke as a member of the WG Oversight Committee. He apologized for the delays in being able to progress with this work, citing factors outside of the WG's control, but echoed Mr. Flocken's assurances that the work is once again progressing.

The Committee expressed its appreciation for updates on this issue and looks forward to further progress by the WG.

360-4 D Part 3.30. Price Posting and Computing Capability and Requirements for a Retail Motor-Fuel Dispenser (RMFD)

Source:
NIST, OWM and the Regional Associations (2008)

Purpose:
Review and update criteria in the LMD Code (Section 3.30.) related to price posting and computing capability of RMFDs to reflect current market practices.

Item under Consideration:
NCWM Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability developed specific proposals for modifying the LMD Code to address price posting and computing requirements for RMFDs. These proposals can be found under Item 330-1 of the Committee's agenda. Item 360-4 is being retained as a Developing Item pending any additional assignments that may be given by the Committee to the Task Group relative to the implementation of new code requirements that may be adopted. Comments or inquiries may be directed to NIST Technical Advisor, Ms. Juana Williams, at (301) 975-3989 or juana.williams@nist.gov.

Background/Discussion:
In the early 1990s, various sections of the LMD Code in NIST Handbook 44 were modified to address multi-tier pricing applications in instances where the same product is offered at different unit prices based on the method of payment (such as cash or credit) or other conditions of the sale. Since that time, marketing practices have evolved to include the addition of new practices, such as frequent shopper discounts and club member discounts. Numerous questions have been posed to NIST, OWM and weights and measures officials regarding the requirements for posting unit prices, calculation of total price, customer-operated controls, and other related topics, such as the definitions for associated terminology. It is clear from these questions that changes are needed to NIST Handbook 44 to ensure the requirements adequately address current marketplace conditions and practices. The Committee agreed that changes are needed to the LMD Code relative to these issues and, in 2010, established a task group to further develop this issue and present an alternative recommendation for its consideration.

Additional details on this item can be found in the Committee's 2008 to 2011 Final Reports.

The Committee notes that, should the proposed changes in Item 330-1 be adopted, the work of the Task Group may be completed. Should questions arise regarding the application of the proposed changes, the Committee hopes that it may call on individual members of the Task Group to assist in responding to those questions.

360-5 D S.5. Provision for Security Seals

This item originally appeared as Item 354-1 in the Committee's 2012 Interim Agenda.

Source:
Frias Transportation Infrastructure LLC (2012)

Purpose:
Allow for a more advanced and secure method of sealing a Taximeter.

Item Under Consideration:
Amend NIST Handbook 44, Taximeter Code as follows:

S.5. Provision for Security Seals. – Adequate provision shall be made to provide security for a taximeter. Security may be provided ~~either~~ by:

(a) Affixing security seals to the taximeter and to all other components required for service operation of a complete installation on a vehicle, so that no adjustments, alterations, or replacements affecting

accuracy or indications of the device or the assembly can be made without mutilating the seal or seals; ~~**or**~~

(b) Using a combination of security seals described in paragraph (a) and, in the case of a component that may be removed from a vehicle (e.g., slide mounting the taximeter), providing a physical or electronic link between components affecting accuracy or indications of the device to ensure that its performance is not affected and operation is permitted only with those components having the same unique properties**; or**

(c) Using a combination of security seals described in paragraph (a) and, (b) and, in the case of a component that is electronic data affecting accuracy or indications of the taximeter, providing a unique electronic security seal on the electronic data that is encrypted and protected by an audited authentication and authorization mechanism, so that no adjustments, alterations, or replacements affecting the component can be made without the authentication and authorization. (Encryption algorithm for electronic seals must meet NIST AES ADVANCED ENCRYPTION STANDARD.)

The sealing means shall be such that it is not necessary to disassemble or remove any part of the device or of the vehicle to apply or inspect the seals.

(Amended 1988, ~~**and**~~ 2000**, and 20XX**)

Background/Discussion:
The submitter of this proposal noted that, per the Taxicab Limousine and Paratransit Association in the United States, there are approximately 6300 companies operating 171 000 taxicabs. More than 80 % of these companies operate less than 50 vehicles while 6 % of taxicab operations have more than 100 vehicles in service. Taxicab companies provide work for 350 000 people and transport 1.4 billion passengers annually for purposes that primarily include business, travel, and community transportation. A vast majority of these taxicabs are required by a regulatory authority to have a sealed taximeter.

The last amendments made to NIST Handbook 44, Section 5.54. Taximeters paragraph S.5. were made in 1988 and 2000. Since then, much advancement have been made in the security of electronic data to eliminate the need for a physical security seal on a manual programming button used to program the way in which a taximeter can operate. Furthermore, the new technology without physical seals may remove the need for any programming buttons on the actual taximeter itself creating a more secure and tamper resistant device.

Use of a physical security seal allows the possibility for personnel who have access to such seals (like a taximeter shop) to compromised the seal and use incorrect programming of a taximeter resulting in unfair rates for the traveling public. By using an encrypted data packet that is sealed by an audited authentication and authorization mechanism, only certain personnel would be allowed to make such changes to a taximeter providing additionally for a complete audit trail of all changes. If inconsistent or flawed parameters were to be programmed to a taximeter one could assess who, when, and why such changes were made.

The removal and placement of physical seals along with programming of a taximeter can also be a tremendous burden on taxi drivers, taxi operators, as well as the taxpayer. Every time a rate change or fuel surcharge is approved by the regulatory body, the regulatory body must oversee the removal and replacement of new taximeter seals. Drivers and operators also face significant downtime while such changes are made to the taximeters. By using electronic seals the time it takes to change seals and program a taximeter would be reduced from 5 minutes to 10 minutes per car to seconds per car.

For the purpose of this proposal, the submitter made reference to NIST Advanced Encryption Standard (AES). AES (FIPS PUB 197) believes that the encryption algorithm for such a security seal on a taximeter should meet this standard.

The submitter also pointed out that Nevada is one of the only states that do not reference NIST Handbook 44 on Taximeters. To correct this problem, alternate language was introduced in the 2011 legislative session to allow for the electronic sealing of a taximeter. This bill was signed into law by the Governor of Nevada on June 16, 2011.

It is difficult to estimate cost savings accurately as every regulatory body that oversees the taxicab industry has different rules on operations. There are also differences in who owns or maintains the vehicle or equipment. This new way of sealing a taximeter would, however, allow for such an option by a regulatory body or an operator to install new equipment that would benefit all parties dependent on such rulemaking.

The submitter suggested the following benefits to stakeholders:

- Additional level of security for taximeter;
- Audit trail for all changes made to taximeter programming;
- Fast implementation of approved rate changes by regulatory bodies; (In some jurisdictions, operators or drivers may have to wait weeks to implement fuel surcharges because the process for changing rates and seals under current standards is time consuming.)
- Reduction in costly observational enforcement to industry; (Currently, the only way a regulator can determine if an operator has a broken seal or has tampered with a taximeter is through observational enforcement. An electronic seal would allow for real time reporting as to the condition of such a seal, as well as the programming of the taximeter.)
- Reduction in overcharges to customers by compromised drivers, and operators; and
- Allow for new more advanced ways of programming a taximeter and delivery of such programming onto a taximeter.

The submitter offered the following individuals as contacts. Additionally, a letter of support was presented by Mr. Daus, President of the International Association of Transportation Regulators (IATR) and former Commissioner of the NYC Taxi and Limousine Commission.

Chief Information Officer	**Chief Technology Officer**	**President of the IATR**
Mr. James Wisniewski Frias Transportation Infrastructure 5010 S Valley View Blvd Las Vegas, NV 89118 Phone: (702) 210-6176	Mr. Mike Pinkus Frias Transportation Infrastructure 5010 S Valley View Blvd Las Vegas, NV 89118 Phone: (702) 210-4896	Mr. Matthew W. Daus Windels Marx Lane and Mittendorf, LLP 156 West 56th St New York, NY 10019 Phone: (212) 237-1106

At the 2011 NEWMA Interim Meeting, it was noted that there is no prototype yet. The submitter explained that there is an electronic data component that is to be sealed. An official questioned how the data would get to the regulatory agency. Comments were made that a cloud-based system could be used. Officials were told that no physical seal is needed if this is implemented. An industry member commented that there should still be some type of security seal used. There would be a comfort level for consumers but not for weights and measures officials. Some questioned what would happen with regard to accessing the data if the company goes out of business. NEWMA recommends that this item be presented to the Taximeter Work Group being formed by NIST, OWM for further development. NEWMA did not forward the item to NCWM.

At the 2011 SWMA Annual Meeting, Mr. Wisniewski, Frias Transportation Infrastructure, recommended Developing status for this item. Mr. Wisniewski explained that NIST, OWM and NCWM are exploring the formation of a Taximeter Work Group to develop proposed changes to the code to reflect current technologies. He indicated that Frias Transportation Infrastructure plans to work with other manufacturers and regulators in the

taximeter community as well as NIST, OWM to further develop this issue through this work group. SWMA forwarded the item to NCWM, recommending it as a Developing Item, with the provision that the submitter will work with the Taximeter Work Group being and further develop the issue through that venue.

At the 2012 NCWM Interim Meeting, Mr. McGrath, Boston ISD Weights and Measure, expressed concerns about the lack of a physical security seal on taximeters. He cited difficulty tracking down drivers for the purposes of monitoring the use of adjustments and suggested withdrawing the item as presented. Ms. Macey, California Division of Measurement Standards, expressed concerns about the resources required to train inspectors to apply the standards referenced in the proposal and she does not believe the item is sufficiently developed as presented to go forward on the Committee's agenda. Ms. Williams, NIST, OWM, reported that a small group, including Mr. Barton, NIST, OWM, and herself, along with Mr. Nelson, California Division of Measurement Standards, Mr. Thompson, California Division of Measurement Standards, and Mr. Fishman, retired NY Bureau of Weights and Measures metrologist met to begin identifying areas of the code that need to be updated, including requirements relative to device security. Ms. Williams confirmed that NIST, OWM plans to establish a formal work group to examine issues such as these relative to updating the code to reflect current technology and practices. Citing the concerns raised by NEWMA and SWMA, Ms. Williams suggested that this item might be best undertaken by that work group.

The Committee agreed with the Open Hearing comments that this item needs additional work. The Committee supports the formation of the work group by NIST, OWM and looks forward to further development of this issue. The 2012 S&T Committee designated this item as a Developing Item.

At its 2012 Annual Meeting, the CWMA took no position on this item. At its 2012 Annual Meeting, NEWMA maintained a neutral position on this item and designated this item as "Developmental." Mrs. Tina Butcher, NIST OWM, reported that NIST has formed a work group on taximeters and that group held its first meeting in May. NEWMA looks forward to the work of the NIST Taximeter Work Group and any proposals that are generate from that group.

At the 2012 NCWM Annual Meeting, the Committee heard an update from Ms. Juana Williams, NIST OWM, regarding the formation of a NIST Work Group on Taximeters. Ms. Williams reported that NIST OWM issued a Federal Register notice in April 2012 announcing formation of a NIST US National Working Group (USNWG) on Taximeters. Mr. John Barton, NIST OWM, is the contact for this USNWG. Anyone interested in participating in the Work Group should contact Mr. Barton by e-mail at john.barton@nist.gov or by telephone at (301) 975-4002. The USNWG held a preliminary web-based meeting in May 2012 to establish the working structure, review the USNWG charter, and lay out tasks to be completed. NIST distributed proposed revisions to the existing Taximeters Code as a "straw man" for the USNWG to consider. The revisions were based on a meeting with NTEP laboratories and other legal metrology experts. Comments were due to Mr. Barton by June 30, 2102. After addressing the comments in the proposed revisions, Mr. Barton will distribute a revised draft to work group members and interested observers. The USNWG plans to hold its next meeting in September 2012.

The Committee expressed appreciation to NIST, OWM for the update and looks forward to future recommendations from the Work Group.

360-6 D Global Positioning Systems for Taximeters

This item originally appeared as Item 354-2 in the Committee's 2012 Interim Agenda.

Source:
Consumer Affairs Unit, City of Seattle (2012)

Purpose:
Amend NIST Handbook 44, Section 5.54. Taximeters to make it specifically apply to Global Positioning System (GPS) system applications used commercially to compute fares based upon distance and/or time measurements.

Item Under Consideration:
A specific proposal was not submitted.

Background/Discussion:
GPS system applications designed to compute fares based upon distance and/or time measurements are being introduced into the for-hire industry (e.g., taxicabs, limousines) in major U.S. cities. Regulatory officials need up-to-date technical standards to protect the consumer from being charged inaccurate fares. The absence of NCWM standards may encourage fraudulent practices by some users just as some taxicab drivers are known to use "zappers" on traditional electronic taximeters, or intentionally use the wrong rate (recent widespread problem in New York City and Los Angeles). The potential for fraud using computer programs and wireless technology was amply demonstrated by the "pulser" unit substitutions in retail motor-fuel dispensers at a very large number of gas stations in Los Angeles a few years ago. Section 5.54. Taximeters must be completely rewritten to reflect the new technology represented by "virtual taximeters." The test methods (i.e., measured mile, dynamometer) and tolerances are probably satisfactory but the remainder of Section 5.54. must be updated to account for "virtual taximeter "technology.

GPS system applications used commercially to compute fares based upon distance and/or time measurements are: (1) performing the same functions of traditional taximeters (e.g., computing distance and time charges, determining "crossover" speeds); (2) "virtual taximeters" replacing traditional ("black box") taximeters; and (3) substituting computer programs and wireless technology to replace electronic taximeters – just as electronic taximeters replaced mechanical taximeters some time ago. These "virtual taximeters" are the next generation of measuring devices employed by taxicabs – and now limousines. The "devices" consist of computer software that resides in a "black box" somewhere remote from the taxicab instead of inside the taxicab. However, the challenges for consumer protection remain (e.g., accuracy, security of calibration components and display of measurements at the point of sale where the decision to buy is made).

NCWM, as a standard-setting body, has three goals: (1) consumer protection; (2) uniformity of standards and enforcement; and (3) providing a level playing field for businesses to fairly compete. This proposal to amend NIST Handbook 44 is aimed at all of these goals. Producers of traditional taximeters meet NIST Handbook 44, Section 5.54. (e.g., Centrodyne), but their competitors selling GPS system applications used commercially to compute fares based upon distance and/or time measurements (e.g., Uber) do not meet any standards.

According to media coverage and product web sites, easily available by a search of the internet, new technology is being introduced to the taxicab and limousine industry for both dispatching and determining fares. There are several new applications for smart phones that dispatch a taxicab passenger based upon inputs from the taxicab computer dispatch system (e.g., Taxi Magic) but the passenger enters the taximeter fare on the smart phone application in order to pay electronically. The GPS system applications actually determine the fare based upon distance inputs from GPS such as Google Maps (e.g., Uber). Uber is active in San Francisco, New York, and Seattle.

New technology using GPS inputs and computer programming to measure distance and time in order to compute fares is growing very rapidly. If NCWM does not promptly begin to examine the GPS system applications (virtual taximeters) as measuring devices, then the consumer is not being protected and the taximeter industry will not be afforded a level playing field.

At the 2011 NEWMA Interim Meeting and 2011 SWMA Annual Meeting, both regions agreed that the issue should be taken up by a work group being formed by NIST, OWM and NCWM. SWMA further commented that the submitter should work with that work group and also noted that the use of technologies and devices such as GPS need to be reviewed and addressed by NIST Handbook 44 for applications (such as that described by the submitter) where they will be used to generate commercial measurements. NEWMA and SWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2012 NCWM Interim Meeting, NIST, OWM reported that NCWM and NIST had agreed that a work group is needed to review and revise the NIST Handbook 44 Taximeters Code to better reflect current technology and practices. After consultation with NCWM, NIST, OWM agreed to establish a work group and held a meeting of NTEP representatives and NIST, OWM representatives to identify areas of the code that require revision. Once a draft revision of the code (a "straw man") has been prepared, NIST, OWM will expand the work group by extending

an invitation for other interested parties, including regulators, manufacturers, and users to begin review and discussion of the draft.

NIST, OWM noted that this item on GPS-based systems needs additional work and review and suggested that the work group might further develop this issue. The Committee also heard from representatives of two jurisdictions who expressed concerns about the ability to regulate these systems to ensure that consumers have adequate information and the ability to do value comparisons. Both cited recent examples of numerous consumer complaints during New Year's Eve when fares were raised significantly. Conventional taximeters must to conform to the requirements of NIST Handbook 44 with regard to accuracy, operation, fare changes, and posting requirements. These systems are competing with conventional taximeter, yet changes in fare can be made at any time without any control by regulatory authority. An official acknowledged the advantages that such systems can bring for consumers and encouraged the work group in its efforts to establish requirements for these systems, stating that weights and measures requirements should not inhibit new technology. A retired official also encouraged the work group to take on these issues and urged the work group to carefully study these systems to ensure that appropriate safeguards are put into place to protect consumers without placing a significant cost burden on design of the equipment.

At the 2012 NCWM Interim Meeting, the Committee agreed with the comments that this item needs additional work and supported the formation of the Work Group by NIST, OWM. The Committee designated this item as a Developing Item.

At its 2012 Annual Meeting, CWMA received no comments on this issue and took no position on it.

At its 2012 Annual Meeting, NEWMA maintained a neutral position on this item and designated it as "Developing." Ms. Tina Butcher, NIST, OWM, reported that NIST has formed a work group on taximeters and that group will hold its first meeting in May. NEWMA looks forward to the work of the NIST Taximeter Work Group and any proposals that are generate from that group.

At the Committee's 2012 NCWM Annual Meeting Open Hearings, Ms. Williams, reiterated the comments offered by NIST, OWM on Item 360-5 and noted that these comments also apply to this item.

The Committee expressed appreciation to NIST, OWM for the update and looks forward to further development of this issue and future recommendations from the Work Group. Interested parties should contact Mr. John Barton, Legal Metrology Devices Program, NIST, OWM at (301) 975-4002 at john.barton@nist.gov.

Mr. Steve Giguere, Maine | Committee Chair
Mr. Mahesh Albuquerque, Colorado | Member
Mr. Brett Gurney, Utah | Member
Mr. Paul Moyer, Nebraska | Member
Mr. Kenneth Ramsburg, Maryland | Member
Mr. Ted Kingsbury, Measurement Canada | Canadian Technical Advisor
Ms. Tina Butcher, NIST, OWM | NIST Technical Advisor
Mr. Rick Harshman, NIST, OWM | NIST Technical Advisor
Ms. Juana Williams, NIST, OWM | NIST Technical Advisor

Specifications and Tolerances Committee

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Appendix A

NIST Handbook 44 – Section 2.20. Scales

Items:

320-2: S.6.4. Railway Track Scales
320-3: N.3.1.2. Interim Approval
320-6: Appendix D – Definitions (Reference Weight Car)

Table A
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Title of Contents	S&T – A Page
Transportation Technology Center, Inc	A3

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55500 DOT Road
P.O. Box 11130
Pueblo, Colorado 81001-0130

Rafael Jimenez
Senior Engineer
Engineering Services
Office/Fax: (719) 584-0691
e-mail: rafael_jimenez@ttci.aar.com

January 17, 2012

TO: Steve Giguere – Chairman S&T Committee
Tina Butcher – NIST Office of Weights and Measures
Don Onwiler – NCWM Executive Director

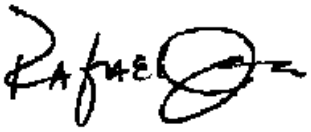
Association of American Railroads (AAR) supports the following items as presented in the Specifications and Tolerance (S&T) Committee agenda for the National Conference on Weights and Measures Interim meeting of January 2012:

Agenda Item 320-2: S.6.4 Railway Track Scales

Agenda Item 320-3: N.3.1.2 Interim Approval

Agenda Item 320-6: Appendix D – Definitions (Reference Weight Car)

Sincerely,



Rafael Jimenez
cc: Jim Grady – AVP Technical Services, Association of American Railroads
Dave Gogolin – Chairman, AREMA Committee 34 "Scales"
Steve Beitzel – President, Systems Associates, Inc.

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Appendix B

NIST Handbook 44 – Section 3.36. Water Meters

Item:

336-1: S.3. Markings

Table A
Table of Contents

Title of Contents	S&T - B Page
Elster	B3
Sensus	B4

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Elster AMCO Water, LLC.
1100 SW 38th Avenue
Ocala, FL 34474
United States

T +1 352 369 6500
F +1 352 368 1950

www.elsteramcowater.com

July 12th, 2012

Dear Mr Giguere,

Elster AMCO Water will not be able to send a representative to the 2012 NCWM Annual Meeting. However, please consider this letter as an indication of the company's full support for the Water Meter "markings" proposal:

Item 336-1 S.3. Markings

S.3. Markings

S.3.1. Location of Marking Information; Utility Type Meters.

The markings may be either on the meter body or primary indicator. The manufacturer's name or trademark, the model designation, and identifying symbols for the model and serial numbers as required by G-S.1. Identification shall also be marked on the meter body or primary indicator.
[Nonretroactive as of January 1, 2013]

If you have any questions regarding this matter, please do not hesitate to contact me on my direct telephone: 352-368-4652.

Kind Regards

Alex Watson
Sr. Product Manager
Elster AMCO Water, LLC.

Cc: George De Jarlais, Badger Meter
Cc: Andre Noel, Neptune
Cc: Scott Swanson, Sensus
Cc: Ron Koch, Master Meter

SENSUS

The Measure of the Future

7/12/2012

To: Mr. Steve Giguere, S&T Committee Chair

Sensus will not be able to send a representative to the meeting. In lieu of our presence, please accept this letter of support for the proposal presented before you by Mr. Andre Noel.
This item is:

Item 336-1 S.3. Markings

S.3. Markings
S.3.1. Location of Marking Information; Utility Type Meters [See also G-S.1. Identification, G-

The markings may be either on the meter body or primary indicator. The manufacturer's name or
trademark, the model designation, and identifying symbols for the model and serial numbers as required by
G-S.1. Identification shall also be marked on the meter body or primary indicator.
[Nonretroactive as of January 1, 2013]

Please feel free to contact me at 724-430-4059 to discuss this matter.

Thank you.

Scott Swanson | Manager, Customer Quality and Engineering Support
450 North Gallatin Avenue | Uniontown, PA 15401 USA
T: 724-430-4059 | F: 724-430-4080 | M:412-576-7338
scott.swanson@sensus.com| www.sensus.com

SENSUS

Report of the Professional Development Committee (PDC)

Mr. Stacy Carlsen, Committee Chair
Marin County, California

400 INTRODUCTION

The PDC (hereinafter referred to as the "Committee") submits this Final Report for consideration of the 97th National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during its Interim Meeting in New Orleans, Louisiana, January 22 - 25, 2012. The Committee conducted Open Hearings for the items in Table A during the Annual Meeting held July 22 - 26, 2012, in Portland, Maine. 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 first three digits 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; **(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. Table C provides the Summary of Voting Results for each Voting Item.

During the Annual Meeting, 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 entertain any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

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

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. 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 provided that (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 at all possible, the posting will be done at least a day prior to the planned closed session.

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

Subject Series List

Introduction ..... 400 Series
Education ..... 410 Series
Program Management ..... 420 Series

Table A
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Reference Key		Title of Item	PDC Page
400		**INTRODUCTION**	**1**
410		**EDUCATION**	**3**
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420		**PROGRAM MANAGEMENT**	**14**
420-1	I	Safety Awareness	14
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APPENDICES

Appendix A — Professional Certification Program Curriculum Work Plan A1
Appendix B — Draft Module – Weights and Measures Core Mathematics B1
Appendix C — Safety Incident / Accident Report C1

Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ADDIE	Analysis, Design, Development, Implementation, and Evaluation	NIST	National Institute of Standards and Technology
BOK	Body of Knowledge	OWM	Office of Weights and Measures
CWMA	Central Weights and Measures Association	PDC	Professional Development Committee
ISO	International Standardization Organization	RSA	Registered Service Agents
LPG	Liquefied Petroleum Gas	SME	Subject Matter Expert
NCWM	National Conference on Weights and Measures	SWMA	Southern Weights and Measures Association
NEWMA	Northeastern Weights and Measures Association	WWMA	Western Weights and Measures Association

Table C
Summary of Voting Results

Reference Key Number	*House of Senate Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
To Accept the Report	Voice Vote				Adopted

Details of All Items
(In order by Reference Key)

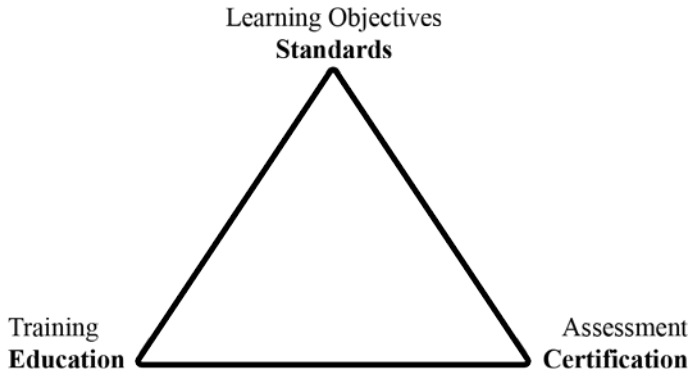
410 EDUCATION

410-1 I Professional Certification Program

Source:
Carryover Item 401-1 (This item originated from the Committee and first appeared on its Agenda in 2003 and has undergone continuing development.) The numbering change reflects harmonization in all NCWM reports. More information on the Committee's work is available at www.ncwm.net/content/ntp. Copies of reports from recent years are also available on the website under interim and annual meeting archives pages.

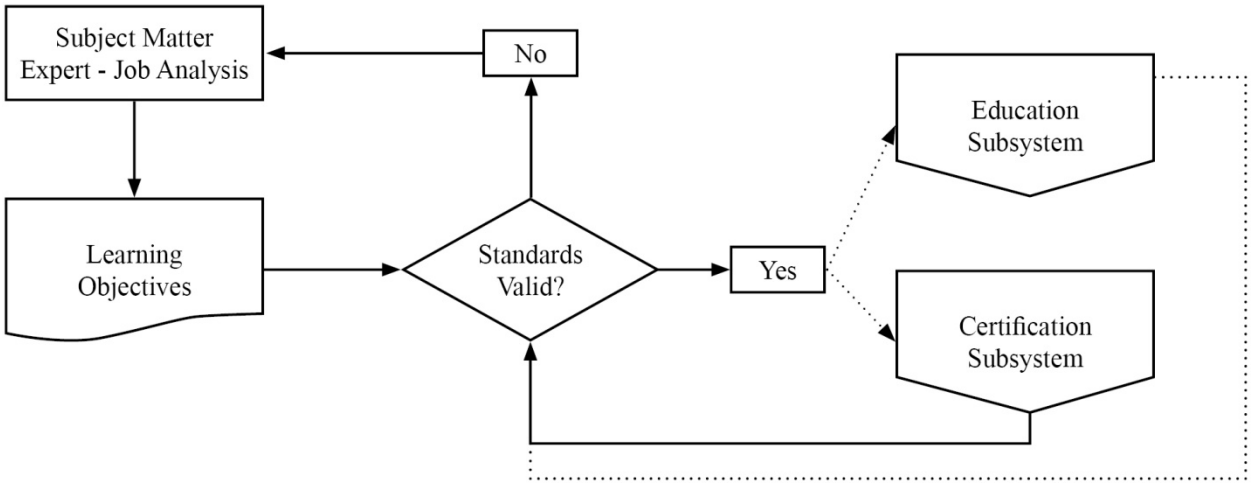
Background/Discussion:
It is important that users of the Professional Certification Program understand how the pieces fit together and form a coherent system. To illustrate the relationships the Committee can describe the system as a triangle of interdependent parts (see diagram below). The standards come in the form of goals with measureable learning objectives. The education part involves training provided to help the candidate reach the desired level of proficiency for each of the learning objectives. The certification involves an assessment of proficiency that measures whether or not the objectives have been met.

Certification Triangle

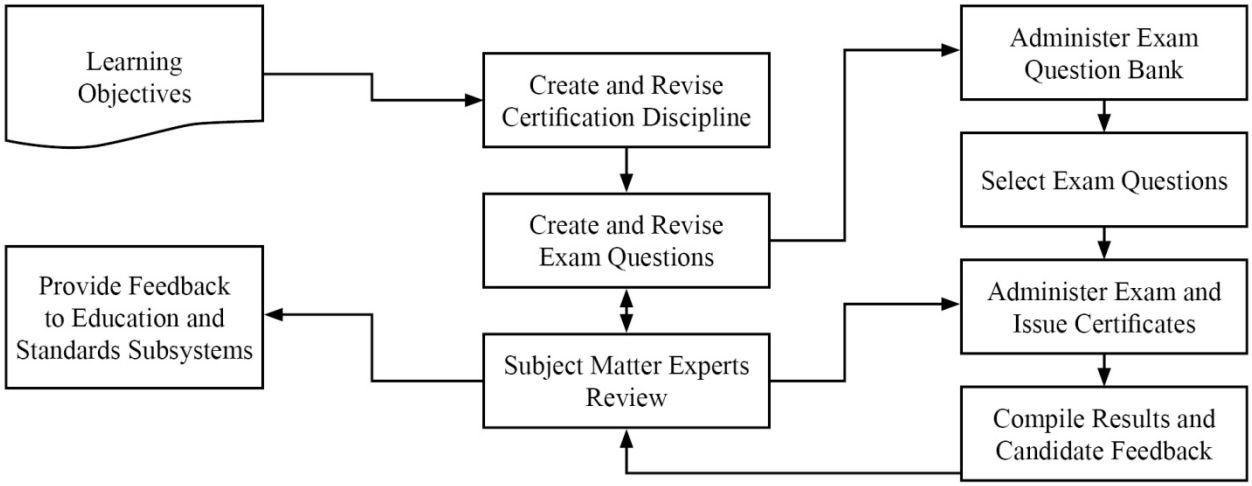


The Committee has until now focused attention on the standards and the certification pieces in the triangle as illustrated in the following flowcharts.

Standard Subsystem



Certification Subsystem



The Committee has described this work in a number of documents. In those documents, the committee is using terminology consistent with current usage in the education and certification field. The following important terms will be used throughout the Committee's work on the subject.

Body of Knowledge (BOK) – refers broadly to the knowledge and skills required to function as a weights and measures professional. The term may refer broadly to the entire scope of knowledge and skills required within the profession or in a more directed manner to any selected subset for which the particular person is responsible. The BOK describes what you expect the weights and measures professional to achieve as opposed to how weights and measures professional will achieve it. To make the BOK more manageable in administration of the Professional Certification Program, it will be subdivided into modules in a tree-like structure moving from general knowledge and skills to more specific areas.

Module – refers to a group of related subject materials within the BOK. The module contains the articulated learning objectives for the subject area. Each module is considered a single, self-contained course of study. However, a broader course may span multiple modules and specific training may include only part of a module or parts of multiple modules. The PDC has created a standard format to create modules for the Professional Certification Program. The Committee has also created the Curriculum Outline and work plans to help manage the work activities within the program to create the many modules necessary to cover the entire profession.

Learning Objective – refers to the articulation of expectations of performance in measureable terms. Learning objectives are stated using active terms to be precise and measureable. There are two types of learning objectives, a terminal objective and an enabling objective. Terminal objectives state broadly the expectation of performance. The enabling objectives state the specific parts or steps required to demonstrate competence. The PDC has developed a guide to writing the learning objectives for both terminal and enabling which include the active verbs associated with the cognitive levels in Bloom's Taxonomy. In training, the instructor will typically choose learning activities to explore each of the enabling objectives in an attempt to reach the terminal objective. In assessment, the questions will typically test for competence in each of the enabling objectives to demonstrate that the terminal objectives have been met.

Professional Certification – refers to verification of proficiency relative to all or part of the BOK for the profession as designated by the PDC for inclusion in a certification exam. The selected BOK includes all or part of specific modules and is documented in an exam description. Each of the modules, or combinations, is given a specific weighting in the design of the exam. After obtaining a passing score on the exam, the candidate is issued a certificate stating the competency standard has been met.

Curriculum – refers to the list of modules that are used to document the BOK (*see Appendix A*).

Bloom's Taxonomy – refers to a classification of levels of cognitive leaning widely used in the field of education. The levels are knowledge, understanding, application, analysis, integration, and evaluation. The active verbs used in the articulation of learning objectives define the cognitive level. In training, the learning activities are matched to the cognitive level. In assessment, the form of the question is also matched to the cognitive level. The use of Bloom's Taxonomy is described in detail in the *Body of Knowledge Model* document.

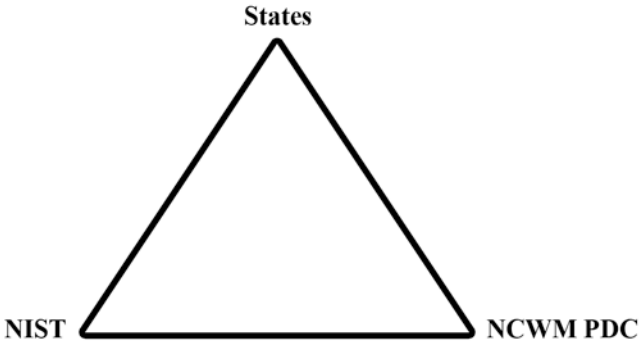
The PDC has prepared program documents that are available on NCWM website.

- The Curriculum Outline, which breaks the profession of weights and measures into component parts called modules.
- The Body of Knowledge Model, which explains how to create modules to document the learning objectives.
- The Modules developed thus far.
- The Certifications developed thus far.

Results of the Retail Motor Fuel Dispensing Systems exam indicate it will be very important as the program moves forward that trainers integrate the learning objectives into their materials and design courses in such a way that candidates will achieve the desired levels of learning. *See Item 401-2 Instructor Improvement*.

At the 2011 Interim Meeting, the committee addressed the need to build partnerships between the states, National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM), and NCWM. Each group has roles in relation to the Certification Triangle as shown in the diagram below.

Professional Certification Program
Applying Certification Triangle (Triumvirate Partnership)



States

- National Certified Workforce
- Assessment Tools and Certification Triangle Applied
- Student Meets Training Milestones
- Feedback to Trainer and Employee
- Value Exam Results = Recognition + Adult Learning
- Develop New Training Standards
- NCWM/NIST Regional Education and Training

NCWM PDC

- Website and Administer Professional Certification Program
- Enlist SMEs
- Learning Objectives and Standards
- Curriculum Work Plans, Discipline, Segments
- Write/Verify Exam Questions
- Exam Evaluation/Statistical Analysis

NIST

- Training and Education
- Instructor Improvement "ADDIE"
- State Instruction Support
- Technical Materials
- Train the Trainer Material
- Classroom and Field Training

At the 2012 Interim Meeting, the Committee received a comment from NIST, OWM that there is a need to provide an assessment tool to measure basic competence in fundamental subject areas such as NIST Handbook 44. They hope to partner with NCWM to administer those assessments using NCWM testing service. This would assure that participants at NIST, OWM sponsored training possess basic levels of proficiency in prerequisite materials so that instructors can deliver the primary material rather than spend time bringing all students up to the prerequisite level. The Committee agrees and believes this fits with ongoing efforts to create a BOK and an exam to assess competence in mathematics for the entry level inspector. This could also be a useful tool to any jurisdiction offering training in these basic areas. The Committee will call these baseline competency examinations defined as:

Baseline Competency Examination – refers to verification of proficiency relative to one of the basic modules in the BOK for the profession. After obtaining a passing score on the exam, the candidate is issued a certificate stating the competency standard has been met.

The initial modules under consideration for the basic competency examinations are:

- Module XX. Weights and Measures Core Mathematics
- Module 4.2. NIST Handbook 44 – Introduction to Device Control
- Module 4.3. Weighing Systems – General
- Module 4.4. Dynamic Volume Measuring Systems – General

The BOK document for the Core Mathematics module has been drafted and will be posted on the website and appears in Appendix B.

The professional certifications currently developed (or in development) are:

- Retail Motor Fuels – Certification available through NCWM;
- Basic Package Labeling/Checking;
- Small Capacity Scales; and
- Vehicle Tank Meters.

The Committee reported that 18 Subject Matter Expert (SME) volunteers are working on the Basic Package Labeling/Checking Exam and 20 SME volunteers are working on the Small Capacity Scales Exam. Those exams are nearing completion. Invitations will be sent shortly to NCWM members to solicit SME volunteers to work on the Vehicle Tank Meter Exam. The Committee noted that SME's are the backbone of the program but also that they have competing priorities. One consideration is the idea of doing this work using web meetings, one to brief and train SME's at the start of a project and one at the end to resolve any remaining issues with complex questions on the exam. The idea is to minimize the time commitment of our SME volunteers while maintaining high quality in our exams.

The PDC conducted a survey in November 2011 to evaluate priorities for future exam development, appropriate range of device capacities to include in the medium or large capacity scale modules, request feedback from people who had taken the Retail Motor Fuel Dispensing Systems Exam, appropriateness of our examinations for Registered Service Agents (RSAs), and potential problems in standardizing exams on the current NCWM standards.

The committee received 134 responses covering 25 states, approximately 80 % weights and measures and 20 % industry. Based on the responses the committee has selected the following subjects for priority development and will be requesting that the Board of Directors extend the Certification Coordinator's contract for these new projects:

- Medium Capacity Scales;
- Large Capacity Scales III and IIIL;
- Liquefied Petroleum Gas (LPG) and Anhydrous Ammonia Liquid; and
- Price Verification.

Survey questions on the Retail Motor Fuel Dispensing Systems Exam indicated that the majority were somewhat or very satisfied with the test taking experience, that the exam questions were appropriate to the basic level inspector, that the questions were straight forward and clearly written, and that they were able to finish in the allotted time. The only problems identified seemed to be related to computer connections and loading of graphics. NCWM staff worked with the testing service to mitigate these issues.

On the issue of using NCWM professional certifications for RSAs, the majority responded with interest in this area. The Committee worked with NCWM staff to solicit RSA volunteers to take the exam for free in order to obtain feedback. Volunteers who passed the exam would receive the formal certificate if they were members or if they pay the $75 testing fee as non-members. Four RSAs took the exam thus far and others are scheduled to take it. The Committee will gather additional data, evaluate the results and report at the Annual Meeting.

At the 2012 Interim Meeting, several state officials questioned the appropriateness of charging these volunteers for the certificate if they are non-members. They noted that the service agents invested considerable time in taking the exam so that those who passed could have been rewarded with a waiver of the fee. Mr. Onwiler, NCWM Executive Director, reported that the exam fee structure is controlled by the Board of Directors. The exam fee is waived for

members as a way to improve membership value. The exam has always been available to service agents, but this was a means of acquiring volunteers for data collection without making them pay fees as non-members. The Committee verified that participants were advised of the conditions when the volunteers were contacted. The Western Weights and Measures Association (WWMA) made a proposal in 2011 that NCWM consider a tiered membership that would allow for a group rate category or reduced fees for non-members presently employed in a weights and measures related field wishing only to take the examinations. The Committee will ask the Board to consider these comments.

On the subject of the use of the current NCWM standard as the basis of all exams, the feedback from the survey clearly indicated that this should not be a problem for most jurisdictions. Therefore, the Committee will develop all exams based on the current editions of NCWM standards.

Officials had concerns about preparing their workforce for taking the Retail Motor Fuel Dispensing Systems Exam. As the PDC proceeds in offering other certifications, the Committee wants jurisdictions and industry to feel supported and confident that the training they provide for their workforce will be comprehensive and will prepare their people to take the certification exams without providing them with the exam questions. The Committee, therefore, recommends better communication so they understand what tools are available to help them create their own comprehensive training programs. The critical viewpoint is that a professional has to be prepared to perform the job and not just prepared to take the exam. This is the age old question of training to the learning objectives (the BOK) or training to the exam. The Committee strongly believes that training has to focus on the BOK and not on the exam questions.

At the 2012 Annual Meeting, the Committee met with the Board to provide an update on progress and agree on priorities. The Certification Coordinator reported that two additional question banks for small capacity scales and package checking had passed the technical review and were submitted to NCWM Headquarters. He also reported that SME volunteers are now working on the Vehicle Tank Meter Exam, and he is expecting to start the search for SME volunteers for the medium and large capacity scale exams shortly after the Annual Meeting. NCWM Executive Director, Don Onwiler, reported that there has been a slight glitch in the system that must be corrected before two new the exams can be opened for use. This involves making sure that Headquarters controls the individual's access to exams. Each candidate gets access to initially take the exam and then can get a retest if they fail. The original process had given the candidate access to all exams using the same credentials. As soon as this is corrected, they will broadcast the availability of the two new exams.

The idea of accrediting the certification program was discussed. The Executive Director reported that he had been discussing the idea with the Institute for Credentialing Excellence (ICE) to see what parts of our program might be potential stumbling blocks. One area involves the SMEs who develop and vet the test questions. Our problem is that our SMEs are virtually all trainers within their jurisdictions and the vetting and training functions need to be separated. One possible avenue that we are pursuing is to restrict the access each SME has to the exam bank by only allowing them to review a part (~¼) of the test bank. The advice also suggested that SMEs be asked to sign over rights to the test questions and that NCWM seek to copyright its exams. The Committee and the Coordinator will continue to work with the Executive Director toward the goal of meeting the accreditation standards, and both the Coordinator and Headquarters will work on documenting procedures as a necessary step in that process. The Executive Director will continue to seek advice towards this long term project from ICE.

The Executive Director provided the Committee and the Board with the following statistics on the Retail Motor Fuel Exam.

		FY 2011	FY 2012
Number of Individuals taking the exam		76	128
Number of Organizations taking the exam		32	68
Number of Exams taken		189 Note(1)	Note (2)
Number of Certificates issued		45	79
Further Breakout	State Gov't		86
	Local Gov't		37
	Industry		5

Note 1. In the Beta testing phase several took the exam multiple times.
Note 2. Results unavailable yet for FY 12

The Committee and the Board agreed that priorities will remain on the Professional Certifications. The Committee will not be pursuing the competency exams. This will help focus efforts to get the exams out based on priorities established by the survey the Committee conducted.

The Committee understands that the SMEs are the critical part of our certification program. The Committee wants to recognize those that are contributing and also encourage others to volunteer on future projects (i.e., the medium and large capacity scale exams that will start soon). To this end, the Committee wants to express gratitude by giving recognition to the following who contributed to the package checking and small capacity scale exams.

Package Checking Basic
Butcher, Ken, NIST OWM
Chesser, Tim, AR
D'Arcy, Carlos, FL
Dillibaugh, John, PA
Feagan, Bruce, WA
Guerney, Brett, UT
Hicks, Tyler, OK
Johnson, Ray, NM
McGee, Robert, SC
Merritt, Kevin, ID
Miller, Rachelle, WI
Paquette, Marc, VT
Shultz, Steve, NV
Tubacki, Jeff, IL
Wilson, Peter, VA

Small Capacity Scales Class III
Chesser, Tim, AR
D'Arcy, Carlos, FL
Dillibaugh, John, PA
Feagan, Bruce, WA
Guerney, Brett, UT
Hicks, Tyler, OK
Johnson, Ray, NM
McGee, Robert, SC
Merritt, Kevin, ID
Miller, Rachelle, WI
Paquette, Marc, VT
Shultz, Steve, NV
Smith, Dan, AK
Stokes, John, SC
Tubacki, Jeff, IL
Wilson, Peter, VA

The Committee heard testimony from a number of individuals during the open hearings and appreciates the comments. In particular, the Committee is very pleased that states are starting to find ways to integrate our standards and the certifications in their programs. One state reported their efforts to mandate in regulation that Registered Service Agents get NCWM certification to demonstrate competence. Another is giving CEUs to county officials who obtain NCWM Certification. Others are using the exam results to evaluate their training efforts. One jurisdiction is using NCWM certifications in labor relations to demonstrate that retention and promotion decisions are being based on an unbiased third party assessment. The CWMA is considering whether it might be possible to use the NCWM exam in their reciprocal testing program for RSAs.

One state director reported that he had his entire staff take the RMFD exam. He provided some valuable feedback that the Committee and the Coordinator will consider. One involved making clear which versions of the handbooks are being used in the exams. He also reported that candidates taking the exam wanted to learn about which questions they got wrong. He also wanted the Committee to look at extending the Certification Program to accredit the overall weights and measures program.

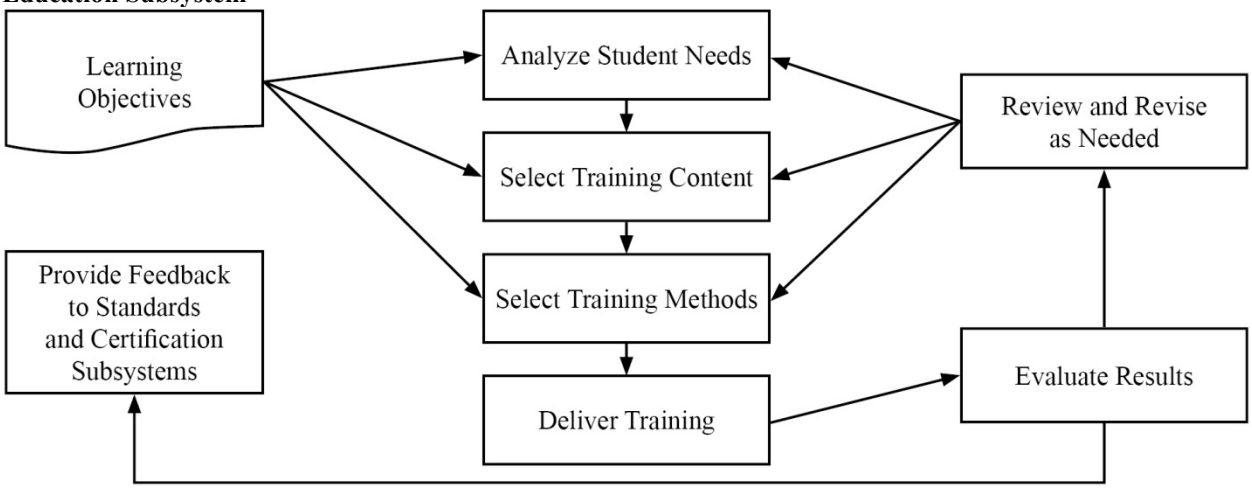
The Committee understands the concern about the wrong answers, but maintaining the integrity of the test precludes us from giving that kind of specific feedback on the exam. At the end of the exam, the candidate is provided with the pass/fail on each segment of the exam and the final score. The candidate is also provided with the option of designating the e-mail address where the results will be sent. Thus, the results could go to a supervisor or the director. The Committee is considering avenues to provide feedback that will help states identify potential weaknesses in their training programs. Again, the Committee wants to divert the focus from the test back to ensuring mastery of the learning objectives in the BOK. To that end, the Committee is considering providing general statistics on each part of the exam so that a jurisdiction or company could compare their staff's results with the composite of all those who took the exam. There is a further fear that providing detailed feedback on specific learning objectives, where exam results showed low scoring, would then divert the focus from the broad objectives of the BOK.

410-2 I Instructor Improvement

Source:
Carryover Item 401-3 (This item originated from the Committee and first appeared on its agenda in 2003.)

Background/Discussion:
Prior to the 2010 Annual Meeting, Ms. Georgia Harris, NIST, OWM, provided the Committee with reference material on teaching methods and assessment of training success. Distilling the essence of these materials, the Committee believes that instructors need training in more than just the technical material; they need training in setting the learning objectives, developing the training materials with those objectives in mind, selecting training methods that incorporate adult learning styles, and evaluating the effectiveness of their training.

Education Subsystem

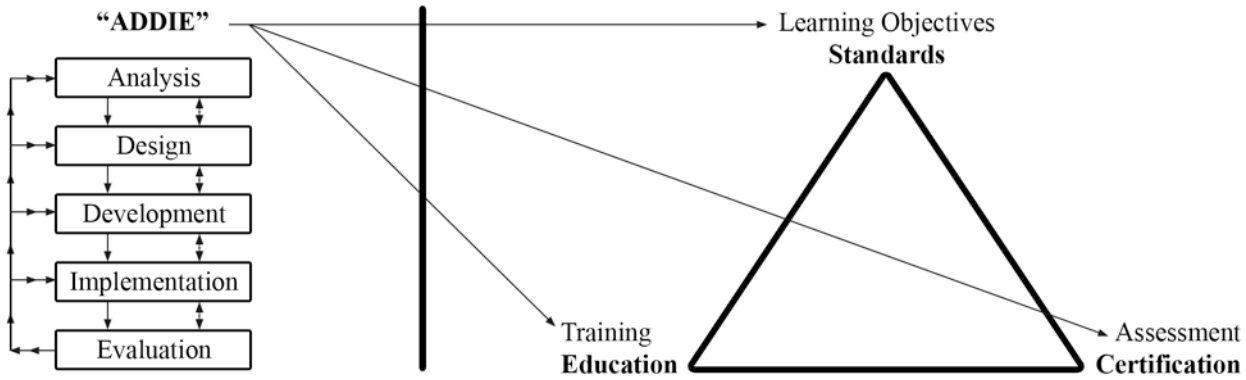


The chart below covers three levels of learning objectives and relates them to (1) the training activities most likely to be successful and (2) the best methods for assessing the success of the training. The curriculum segments state the learning objectives using verbs similar to those in the bottom row of the table. These drive both the training activities required to promote adult learning and the assessment tools appropriate to measure success at that level.

Assessments	Multiple Choice	Multiple Choice	Practical Examples Short Answer
Training Activities	Lecture Videos Examples	Discussion Review Learner Presentation	Exercises Simulations Demonstrations
Cognitive Levels	**Knowledge**	**Comprehensive**	**Application**
	Define Relate List	Restate Discuss Describe Identify	Employ Apply Use Illustrate

NIST, OWM has expressed a strong interest in collaborating with NCWM in efforts to educate instructors in adult learning techniques and relating them to the learning objectives in NCWM curriculum. The Committee will be posting NIST, OWM material on converting technical content to training material on the PDC training resources web pages. The importance of pre-training analysis and post-training evaluation cannot be overestimated. Failure to include these steps often leads to failure of training efforts.

Professional Certification Program
Systems Approach to Training Evaluation



The Committee is calling on the states and other training developers to implement the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model in their training preparations and post training evaluation. Everyone needs to participate in the development of new BOK modules and then encourage their trainers to use existing BOK modules in their training plans.

The Committee encourages members to also look at the presentation on *A Complete Training Program* prepared by Ms. Carol Hockert, NIST, OWM. The presentation outlines ways to develop training programs and improve instruction of weights and measures material. It can be found at: ncwm.net/sites/default/files/meetings/annual/2012/PDC%20docs/2012_Pub16_PDC_A_Complete_Training_Program_Presentation.pdf.

At the 2012 Interim Meeting, advisors from NIST, OWM reported that they are using NCWM BOK in preparing new training initiatives. They are stressing adult learning techniques, particularly focusing on the use of hands-on training as the most popular and effective training tool. This ties in closely with the new baseline competency exams discussed in Item 410-1. NIST, OWM is using these exams to ensure students in NIST sponsored training courses are competent in prerequisite course materials prior to taking training. They reported that they are already drafting questions for the baseline competency exams. They see significant efficiencies in using NCWM testing services for this purpose since they are already in place.

Ms. Hockert, NIST, OWM, recommended a basic math prerequisite for persons taking Metrology or other related weights and measures courses sponsored by NIST. The math exam would allow trainees to demonstrate entry level math skills and make the training process more efficient and effective. One official discussed the California licensing requirement of a college degree which requires a certain number of math courses and asked if this would satisfy the need for the math prerequisite. Several California officials expressed concern about the Professional Certification Program replacing existing state licensing programs, and if adopted it might require amendment of existing state statutes. Because math competency is an essential skill for weights and measures work, the Committee recommends that the PDC include in its scope the development of an exam to demonstrate basic math competency before taking the Fundamentals of Metrology or other training courses at NIST.

At the 2011 Southern Weights and Measures Association (SWMA), it was stated that we should consider training state trainers on adult learning techniques as well as subject matter. No further recommendations were made.
At the 2012 Annual Meeting, the Committee stressed instructor improvement. The Committee reviewed the importance of using the NCWM learning objectives and the ADDIE model in training. This stresses the importance of training to the goals in the BOK and not training to pass the test. If the training is appropriate and has been delivered effectively, the employee should have no problem passing a fair exam. The end is not a certificate on the wall, but rather a competent inspector. In other words,

JOB SUCCESS = EXAM SUCCESS

Ms. Hockert, NIST, OWM, stressed that good training requires a partnership between the trainee, trainer, and the supervisor. The Committee agrees that buy-in from all levels is critical to training success.

410-3 I Recommended Topics for Conference Training

Source:
Carryover Item 401-5 (This item originated from the Committee and first appeared on its agenda in 2003.)

Background/Discussion:
The Board of Directors has charged the Committee with recommending appropriate topics for the technical sessions at future Annual Meetings. The Board of Directors asked the PDC to review and prioritize possible presentations and submit those to NCWM Chairman. The Chairman will coordinate with NCWM staff to secure presenters and schedule the sessions.

The PDC continues to carry the following list and recommends these topics for possible training seminars, roundtables, or symposia for presentation at NCWM meetings:

- Marketplace Surveys;
- Alternative Fuels Issues (Fuel Volatility, Ethanol Blending, and Biodiesel Blend);
- Ergonomics (including Proper Lifting Techniques, Back and Stress Techniques, and Office Ergonomics);
- Public Relations (specifically dealing with aggressive/angry people) (recommended by the SWMA);
- General Safety Issues (recommended by the WWMA);
- Defensive Driving (recommended by the WWMA);
- Administrative Civil Penalty Process (recommended by the WWMA);
- Price Verification (recommended by the WWMA);
- Customer Service (recommended by the WWMA);

- Ethics (recommended by the CWMA);
- Moisture Loss;
- Economic Justification of Weights and Measures Programs;
- Demonstrating the Value of Enforcement Programs;
- Documenting Investigations for Court Proceedings;
- Training the Trainer in Adult Learning Methods;
- Honing Presentation Skills; and
- Emerging Issues.

The PDC asked for suggestions for future training or recommendations on how to prioritize suggestions already on the list. Based on the needs identified in the first two items (401-1 and 401-2), the Committee would like to recommend that the regional associations and NCWM consider offering training for trainers on how to identify learning objectives, and design training materials that integrate interactive activities and adult learning styles. NIST has a 1.5-hour course on taking technical material and turning it into a course for adult learners, which may be appropriate to fill this need.

The following is a list of recent presentations, available at www.ncwm.net/content/annual-archive:

- An Overview of Unit Pricing in the United States (Mr. David Sefcik, 2011);
- Grocery Unit Pricing in Australia (Mr. Ian Jarratt, 2011);
- Grocery Unit Pricing in Canada (Mr. Ian Jarratt, 2011);
- The U.S. Hydrogen Measuring System: The Turning Point? (Ms. Kristin Macey, 2011);
- Corrosion in Ultra Low Sulfur Diesel Underground Storage Systems (Mr. Prentiss Searles and Ms. Lorri Grainawi, 2010);
- Risk-Based Inspection Schemes (Mr. Henry Oppermann, 2010);
- Diesel Exhaust Fluid (DEF) (Mr. Gordon Johnson and Mr. Randy Moses. 2009);
- Fuel Volatility and Ethanol Blending (Mr. Jim McGetrick, 2009);
- Investigative Techniques (Mr. Michael Cleary, 2009);
- Automatic Temperature Compensation (ATC) Field Test Procedures;
- Elements of an Effective Safety and Health Program (Mr. Dan Whipple, 2008);
- Analyzing Temperature Compensation Data (Mr. Henry Oppermann and Mr. Steven Malone, 2007);
- The Great Temperature Compensation Debate (Mr. Ross Andersen, 2007);
- NIST Handbook 44 Scale Code Tare Changes (Mr. Steve Cook).

The Committee discussed the benefits of, and avenues to, sharing training resources within the weights and measures community, including a training events calendar, a repository of presentations, lesson plans, videos, and other valuable training tools. The Committee believes the Associate Membership Committee funds may be well used in this area.

The Committee further recommends the following training topics be scheduled for the 2012 Annual Meeting:

- Economic Justification of Weights and Measures Programs;
- Training the Trainer in Adult Learning Techniques; and
- How to Conduct and Analyze a Marketplace Survey.

These topics are in keeping with the Chairman's theme, "Taking Measure of our Worth", and ongoing efforts in training at NIST, OWM.

420 PROGRAM MANAGEMENT

420-1 I Safety Awareness

Source:
Carryover Item 402-1 (This item originated from the Committee and first appeared on its agenda in 2003.)

Background/Discussion:
In the past, the Committee's responsibility extended to the identification of safety issues in the weights and measures field and included efforts to increase safety awareness. Jurisdictions are encouraged to send their safety reports and issues to their regional safety liaison, who in turn will forward them to the PDC. Below is a list of the Regional Safety Liaisons.

Central Weights and Measures Association (CWMA):
Ms. Julie Quinn, Minnesota Weights and Measures Division

Northeastern Weights and Measures Association (NEWMA):
Mr. Michael Sikula, New York Bureau of Weights and Measures

Southern Weights and Measures Association (SWMA):
Mr. Steve Hadder, Florida Department of Agriculture and Consumer Services

Western Weights and Measures Association (WWMA):
Mr. Douglas Deiman, Alaska Division of Measurement Standards/CVE
The Committee will continue asking the regions to prepare articles for the NCWM Newsletter and has revised the schedule as follows for future issues. The Committee plans to notify the Regional Safety Liaisons as their assignment date approaches.

CWMA	2013, Issue 1	February	January 18, 2013
NEWMA	2013 Issue 2	May	April 16, 2013
SWMA	2013, Issue 3	September	July 16, 2013
WWMA	2014, Issue 1	February	January 18, 2014
CWMA	2014, Issue 2	May	April 16, 2014

Email all articles to NCWM headquarters at info@ncwm.net.

The Committee would like to thank those persons who submitted safety related articles to NCWM Newsletter. In particular, the Committee recognizes the contributors for the 2011 NCWM Newsletters.

- Consumer Tips for Proper Gasoline Handling, 2011 Issue 1 (Mr. Steve Hadder, FL)
- Vehicle Safety Issues for Weights and Measures Inspector, 2011 Issue 2 (Mr. Douglas Deiman, AK)
- Controlling the Risk of Solitary Workers, 2011 Issue 2 (Mr. Brett Gurney, UT)
- Incident Reports Improve Safety, 2011 Issue 3 (Ms. Julie Quinn, MN)

The Committee asks for suggestions for safety articles that people would like to see in future newsletters or safety issues that need to be addressed immediately. The PDC reminds regional associations to check the submission deadlines for their upcoming article assignments. Send completed articles to NCWM headquarters by the submission deadline.

The PDC received a request during the work session that the publication dates be kept current in this ongoing item. At the 2011 CWMA Interim Meeting, it was noted that the CWMA PDC developed an Incident/Accident Report (Appendix C) to be used for people to send in reports in a systematic way. The purpose was to make it easier for people to report incidents and accidents, and also to count the types and causes of incidents and accidents so we can learn from them. The Committee recommends including this report as an appendix so other regions can consider its use as well. It should be added to the CWMA website so people can download and use it. It was recommended that the Committee should concentrate on safety issues rather than on counting incidents as many jurisdictions will not submit the reports.

At the 2012 Annual Meeting, the Committee heard a request that there could be a benefit in compiling the safety articles from the NCWM Newsletters on the website to make them more accessible. The NCWM currently provides access to the past editions of the NCWM Newsletter on the website but you would have to search each edition individually to find an individual article. The Committee will consider that suggestion and consult with Headquarters on a solution.

420-2 I PDC Publication

Background/Discussion:
The Committee is updating the PDC pages on the website, and will make a concerted effort to update relevant documents and get them posted to the website so that interested parties can easily find and utilize the materials. The three main sections of material include:

1. **Committee Active Working Documents** – includes active documents describing the developing professional certification program, the curriculum plan, BOK documents currently under development and open for comment (i.e., prior to release of a certification exam, program guidelines and administrative procedures);

2. **Professional Certification Documents** – includes the certification exam shopping page, exam descriptions, related BOK documents, aids to taking the certification exams; and

3. **Committee Archives** – includes an archive of historical documents that provide insight into the evolution of the Committee since inception and evolution of the Professional Certification Program. Interested parties should also refer to meeting archives at www.ncwm.net/content/meeting-archive.

In addition, the Committee believes it is vital to move forward with a more formal set of administrative procedures for running a credible certification program. The Committee will make efforts to continue the work of Mr. Sikula, New York, at the request of the Board of Directors, to document our procedures following International Standardization Organization (ISO) 17024 Guidelines for Certification Bodies. The Board of Directors is also considering alternative ANSI standards. The Committee will be working with the Board on this project. NCWM management has ultimate responsibility for contracting with the testing service, policy issues, and staffing (both headquarters staff and the Certification Coordinator). The Committee expects to deal primarily with the technical details and the practical issues of developing the BOK and the certification exams.

Mr. Stacy Carlsen, Marin County, California | Committee Chair
Ms. Cheryl Ayer, New Hampshire | Member
Ms. Kristin Macey, California | Member
Ms. Julie Quinn, Minnesota | Member
Mr. Dale Saunders, Virginia | Member
Mr. Steven Grabski, Wal-Mart Stores, Inc. | Associate Membership Representative
Mr. Ross Andersen | Certification Coordinator

Professional Development Committee

Appendix A

Professional Certification Program Curriculum Work Plan

Revised January 2010

Segment/Subject
Level 1/Level 2/Level 3

1. Fundamentals of Weights and Measures
- 1.1. Introduction to Weights and Measures Programs
- 1.2. Weights and Measures Laws and Regulations
- 1.3. Field Standards and Test Equipment
- 1.4. State Program Scope and Overview
- 1.5. Enforcement Powers

2. Weights and Measures Administration
- 2.1. Fundamentals of Weights and Measures Administration (Commercial System, Powers and Duties, etc.)
- 2.2. Administration Functions (Personnel, Management, Budget, Safety, etc.)
- 2.3. Legislation and Regulations (Legal Considerations, Interaction with Legislature, Stakeholders, Industry, etc.)
- 2.4. Regulatory Control (Device Inspection, Commodities, Complaints)
- 2.5. Laboratory Metrology Administration (Purpose of Laboratory, Responsibilities of Metrologist, NIST Expectations for Recognition of Laboratory, Quality System, Training Requirements, etc.)
- 2.6. Public Relations and Communications (Publicity, Public Relations, Communications)

3. Laboratory Metrology
- 3.1. NIST Basic Metrology
- 3.2. NIST Intermediate Metrology
- 3.3. NIST Advanced Metrology

4. Device Control Program
- 4.1. Safety Considerations
- 4.2. NIST Handbook 44 – Introduction to Device Control
- 4.3. Weighing Systems, General
  - 4.3.1. Static Electronic Weighing Systems, General
  - 4.3.2. Static Mechanical and Hybrid Weighing Systems, General
  - 4.3.3. Dynamic Weighing Systems, General
  - 4.3.4. Precision Weighing Systems Class I and II
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4.5. Static Volume Measuring Systems – General
- 4.5.1. Liquid Measures
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4.6. Other Measuring Systems
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- 4.6.2. Wire and Cordage Measuring Systems
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- 4.6.4. Timing Devices
- 4.6.5. Weights
- 4.6.6. Multiple Dimension Measuring Systems

4.7. Quality Measuring Systems
- 4.7.1. Grain Moisture Meters
- 4.7.2. NIR Grain Analyzers
- 4.7.3. Carcass Evaluation Systems

5. Market Practices, Laws and Regulations (NIST Handbook 130) and Commodities (NIST Handbook 133)

5.1. Safety Considerations – Market Practices, NIST Handbook 130, NIST Handbook 133

5.2. NIST Handbook 130 – Laws and Regulations
- 5.2.1. NIST Handbook 130 – General Provisions
- 5.2.2. Packaging and Labeling Regulations
- 5.2.3. Method of Sale Regulations
- 5.2.4. Quality of Automotive Fuels and Lubricants
- 5.2.5. Price Verification

5.3. NIST Handbook 133 – Package Net Contents Control
- 5.3.1. Commodities – General
- 5.3.2. Packages Labeled by Weight, Standard and Random
- 5.3.3. Packages Labeled by Weight, Special Commodities
- 5.3.4. Packages Labeled by Volume (Volumetric and Gravimetric Testing)
- 5.3.5. Packages Labeled by Volume, Special
- 5.3.6. Packages Labeled by Length/Area/Thickness
- 5.3.7. Packages Labeled by Count
- 5.3.8. Other Package Types

5.4. Test Purchases

5.5. E-Commerce

Note: Initial Verification has been intentionally been left off this listing and will be addressed later.

Appendix B

Draft Module – Weights and Measures Core Mathematics

Overview and Scope:
This module sets standards for core mathematical skills that are an integral part of every weights and measures official's repertoire. The module is geared toward specific concepts related to understanding of numerical information, interpreting device indications, graphs, and charts, and performing a range of mathematical operations that are commonly used in weights and measures work, both in the field and the laboratory.

Prerequisites:

- None

Objectives and Competencies:

1. Expressing and Interpreting Numerical Values

A weights and measures professional should be capable of expressing and interpreting numerical data in various forms. To demonstrate this, the professional can:

1.1. Express and interpret real numbers, both positive and negative, as integer or decimal
1.2. Express and interpret numbers in scientific notation
1.3. Express and interpret numbers with exponential powers or roots
1.4. Express and interpret numbers as fractions or mixed numbers (integer with fraction)
  1.4.1. Know basic fraction nomenclature (numerator, denominator, etc.)
  1.4.2. Know nomenclature of common ($^{X}/_{Y}$) and binary fractions ($^{X}/_{2^n}$)
1.5. Interpret analog indications
  1.5.1. Interpret analog readings, both for single unit and combination unit (e.g., lb and oz)
  1.5.2. Interpret readings of an analog device using a vernier scale
  1.5.3. Interpolate readings between graduations to less than one scale division (e.g., to ½, ¼, or $^{1}/_{5}$ division)
  1.5.4. Calculate the number of analog divisions for combination unit indicators
1.6. Express or interpret numerical data in graphs and tables
  1.6.1. Interpret information from existing graphs and tables
  1.6.2. Interpolate values at intermediate points on a graph or table
  1.6.3. Create bar, line or scatter graphs from data tables
  1.6.4. Organize date in a table
1.7. Interpret measurement units in customary and SI
  1.7.1. Interpret customary units of measure (understand meaning and be able to discern which of two values is larger or smaller)
  1.7.2. Interpret the SI prefixes and suffixes used in measurement units (understand meaning and be able to discern which of two values is larger or smaller)

2. Performing Basic Operations on Real Numbers

A weights and measures professional should be able to perform basic mathematical operations on real numbers. To demonstrate this, the professional can:

2.1. Add or subtract real numbers correctly
2.2. Multiply and divide real numbers correctly
2.3. Calculate percentages of related real numbers correctly
2.4. Calculate prices after discounts correctly
2.5. Calculate exponential functions of real numbers (powers and roots)
2.6. Calculate expressions resulting from multiple, mixed operations on real numbers correctly
  2.6.1. Calculate expressions organized by parentheses
  2.6.2. Calculate simple expressions without parentheses using algebraic notation (e.g., $1 + 2 \times 3 - 6 = 1 + (2 \times 3) - 6 = 1$)
  2.6.3. Apply the associative property (e.g., $(5 + 2) + 1 = 5 + (2 + 1)$)
  2.6.4. Apply the distributive property (e.g., $2 \times (1 + 3) = (2 \times 1) + (2 \times 3)$)
2.7. Convert measurement units to other units (e.g., convert lb to oz or kg to g, and lb to kg or L to gal)
2.8. Discuss and employ the basic principle of significant digits when expressing numerical data

2.8.1. Explain the basic principle of significant digits
2.8.2. Interpret relative accuracy of numbers expressed with and without a +/- notation or with an uncertainty value
2.8.3. Express real numbers with the correct number of significant digits (e.g., 1,245,427 or 2.3589127 with three significant digits is 1,250,000 or 2.36 respectively)
2.8.4. Express the results of simple operations of two numbers with different numbers of significant figures correctly (e.g., 1.27 × 345.37 = 438.6199 = 438 result is limited to three significant digits because 1.27 has three)

3. Rounding and Truncating Numerical Values

A weights and measures professional should be able to correctly round or truncate numerical values and know when it is appropriate to round or truncate. To demonstrate this, the professional can:

3.1. Round values correctly
3.1.1. Apply five up/four/down rounding to a real number
3.1.2. Apply the NIST Handbook 44 odd/even rule to rounding of real numbers
3.1.3. Verify correct rounding in applications, both with and without mathematical agreement to one-half cent (e.g., count 3 for $1 expressed without agreement as 1 @ $0.34, 2 @ $0.68, and 3 @ $1.00 or weight 3 lb for $1 expressed with agreement as 1 lb @ $0.33, 2 lb @ $0.67 and 3 lb @ $1.00)
3.1.4. Apply rounding rules correctly in multistep calculations (i.e., only rounding at the end)
3.1.5. Describe when it is appropriate to round vs. truncate values (e.g., conversion of measurement units)
3.2. Truncate values correctly
3.2.1. Describe when it is appropriate to truncate vs. round values (e.g., calculating tolerances, calculating NGW in package checking)

4. Performing Basic Operations on Fractions

A weights and measures professional should be able to perform basic mathematical operations on common fractions and mixed numbers. To demonstrate this, the professional can:

4.1. Convert improper fractions to mixed numbers or mixed numbers to improper fractions (e.g., $^{7}/ = 1^{3}/_{4}$ or $2^{5}/_{8} = {}^{21}/_{8}$)
4.2. Convert common fractions and mixed numbers to real numbers correctly (e.g., 2¼ = 2.25)
4.3. Find the least common denominator of two common fractions
4.4. Convert a fraction to its equivalent using the least common denominator
4.5. Reduce a common fraction to its simplest form (e.g., $^{4}/_{16} = ¼$)
4.6. Add and subtract two common fractions or mixed numbers correctly
4.7. Multiply or divide two common fractions or mixed numbers correctly
4.8. Calculate a power of a common fraction (e.g., $(^{1}/_{7})\ 2 = {}^{1}/_{49}$)

5. Perform Advanced Operations on Real Numbers

A weights and measures professional should be able to perform selected advanced mathematical operations on real numbers. To demonstrate this, the professional can:

5.1. Multiply complex expressions correctly (e.g., $2 \times (1 + 3x) = 2 + 6x$)
5.2. Apply the distributive property to factor complex expressions (e.g., $(2x + 2y) = 2 \times (x + y)$)
5.3. Calculate basic statistical functions on numerical data
5.3.1. Find median value of a data set
5.3.2. Calculate mean or average of a data set
5.3.3. Find the range of a data set
5.3.4. Calculate the standard deviation of a data set
5.4. Interpret a logarithmic scales on a graph

Contributor: 10/5/11 – Initial Draft – Mr. Ross Andersen, Certification Coordinator

Appendix C

Safety Incident/Accident Report

This form can be used to report any accidents or near misses to your regional safety coordinator. The purpose of this form is to share information between weights and measures programs which will help the programs identify hazards faced by their employees, and find ways to eliminate or mitigate those hazards. Please make sure that you omit any names or other identifying information in order to protect the privacy of all parties involved.

1. Date of incident/accident:

2. Describe how the incident/accident occurred:

3. Check all injury types that resulted from this action:

- ☐ Soft Tissue (strains, sprains, etc.)
- ☐ Eye Injury
- ☐ Burns
- ☐ Vehicle Related Injury
- ☐ Other/Unlisted (Please describe in the space below.)
- ☐ Slips, Trips, Falls
- ☐ Cuts, Bruises, Abrasions
- ☐ Chemical Exposure
- ☐ Loss of Body Part

4. Describe in as much detail as privacy considerations allows, the injuries selected above.

5. Check all hazardous conditions present at the time of the incident/accident:

- ☐ Defective Materials/Equipment
- ☐ Slippery Conditions/Poor Footing
- ☐ Personal Protective Equipment Unavailable
- ☐ Inadequate Clearance
- ☐ Inadequate Lifting Aids or Technique
- ☐ Electrical Hazard
- ☐ Natural Hazard
- ☐ Other/Unlisted (Please describe in the space below.)
- ☐ Improper Design or Construction
- ☐ Improper or Inadequate Clothing
- ☐ Unable to Secure/Warn or Lock/Block
- ☐ Inadequate Ventilation
- ☐ Hazardous Method or Procedure
- ☐ Chemical Hazard
- ☐ Traffic Hazard

6. Describe in as much detail as privacy considerations allow, the hazardous conditions selected above.

7. Check all unsafe acts which contributed to the incident/accident:

- ☐ Improper Lifting
- ☐ Failure to Shut-off or Unplug Equipment
- ☐ Improper Use of Equipment
- ☐ Improper Use of Body Parts
- ☐ Inattention to Footing/Surroundings
- ☐ Unsafe Speed
- ☐ Standing Beneath Suspended or Swinging Loads
- ☐ Failure to Use Personal Protective Equipment
- ☐ Horseplay
- ☐ Failure to Secure/Warn or Lock/Block
- ☐ Using Hands Instead of Tools
- ☐ Alter or Disable Safety Mechanisms
- ☐ Unsafe Posture
- ☐ Driving Errors

- ☐ Unsafe Mixing of Materials
- ☐ Unsafe Placement of Equipment/Materials
- ☐ Other/Unlisted (Please describe in the space below.)

8. Describe in as much detail as privacy considerations allow, the unsafe acts selected above.

9. Check all other contributing factors which may apply:

- ☐ Lack of Policy/Procedures
- ☐ Safety Rules Not Enforced
- ☐ Hazards Not Identified
- ☐ Personal Protective Equipment Not Provided
- ☐ Insufficient Employee Training
- ☐ Insufficient Supervisor Training
- ☐ Inadequate Supervision
- ☐ Inadequate Workplace Inspection
- ☐ Unrealistic Schedule
- ☐ Poor Process Design
- ☐ Other/Unlisted (Please describe in the space below.)

10. Describe in as much detail as privacy considerations will allow, the other factors selected above.

11. Please describe any conditions, actions, or other factors which mitigated this incident and kept the consequences from being more severe than they were.

12. Please describe any immediate corrective actions taken to prevent additional incidents/injuries.

13. Please describe any preventative actions you are taking to reduce or eliminate similar hazards in the future.

14. Please check the boxes which apply to the person completing this report:

- ☐ I was one of the people involved in the incident/accident
- ☐ I witnessed the incident/accident
- ☐ I investigated the incident/accident
- ☐ I heard the incident/accident through some other means. (Please describe in the space below.)

Report of the National Type Evaluation Program (NTEP) Committee

Mr. Tim Tyson, Committee Chair
Kansas Weights and Measures

500 INTRODUCTION

The NTEP Committee (hereinafter referred to as the "Committee") submits its Final Report for the consideration of the 97th National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during its Interim Meeting in New Orleans, Louisiana, January 22 - 25, 2012. The report addressed the items in Table A during the Annual Meeting held July 22 - 26, 2012, in Portland, Maine. 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. 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 Technical Committee (NTETC) Sectors and a majority vote of the NTEP Committee. The first three digits 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; **(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. Table C provides the Summary of Voting Results for each Voting Item.

During the Annual Meeting, 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 entertain any requests from the floor to remove specific items from the consent calendar to be discussed and voted upon individually.

Committees may change the status designation of agenda items (Developing, Informational, Voting, and Withdrawn) up until the report is adopted, except that items which are marked Developing, Informational or Withdrawn cannot be changed to Voting Status. Any change from the Interim Report 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 NTEP 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 non-retroactive are printed in ***bold faced italics***. Additional letters, presentations, and data may have been part of the Committee's consideration will appear as appendix items.

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 provided that (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 at all possible, the posting will be done at least a day prior to the planned closed session.

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

Subject Series List

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International ..... 510 Series

Activity Reports ..... 520 Series

Conformity Assessment Program ..... 530 Series

Other Items – Developing Items ..... 500 Series

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
B	Basic Publication	NCWM	National Conference on Weights and Measures
CC	Certificate of Conformance	NIST	National Institute of Standards and Technology
CIML	International Committee of Legal Metrology	NTEP	National Type Evaluation Program
CTT	Conformity to Type	NTETC	National Type Evaluation Technical Committee
DoMC	Declaration of Mutual Confidence	OIML	International Organization of Legal Metrology
IV	Initial Verification	OWM	Office of Weights and Measures
MAA	Mutual Acceptance Arrangement	R	Recommendation
MC	Measurement Canada	SC	Technical Subcommittee
MDMD	Multiple Dimension Measuring Devices	TC	Technical Committee
MRA	Mutual Recognition Arrangement	VCAP	Verification Conformity Assessment Program
MTL	Manufacturers' Testing Laboratories		

Table C
Summary of Voting Results

Reference Key Number	***House of Senate Representatives***		***House of Delegates***		***Results***
	Yeas	***Nays***	***Yeas***	***Nays***	
To Accept the Report	Voice Vote				Adopted

Details of All Items
(In order by Reference Key)

510 INTERNATIONAL

510-1 I Mutual Recognition Arrangement (MRA)

Background/Discussion:
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 19, 2011, NCWM Chairman, Mr. Tyson, and MC President, Mr. Johnston, signed a renewal MRA that combines the weighing and measuring devices into one document and provides for continued cooperation between the two organizations and continuation of the beneficial partnership. The new MRA will be effective for five 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).

The Committee continues to work with MC to explore the possibility of expanding the scope to include Multiple Dimension Measuring Devices (MDMD) and higher capacity scales. Technical obstacles have prevented inclusion of both MDMD and higher capacity scales for now, but NTEP and MC remain committed to continuing to discuss expansion. NTEP also requested that tests conducted at manufacturers' premises under the supervision of an NTEP evaluator be included in the scope of the MRA. MC expressed the desire to keep these evaluations outside the scope of the MRA for scales, load receiving elements, and electronic weight indicating elements.

MC, NTEP, and all of 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.

510-2 I Mutual Acceptance Arrangement (MAA)

Background/Discussion:
Information regarding the International Organization of Legal Metrology (OIML) MAA can be found at **www.oiml.org/maa**. NCWM has signed the OIML MAA Declaration of Mutual Confidence (DoMC) for Recommendation (R) 60 Load Cells as a utilizing participant. A utilizing participant is a participant that does not issue any OIML Certificate of Conformance (CC) nor OIML Test Reports or Test Reports under a DoMC but which utilizes the reports issued by issuing participants.

The OIML Technical Subcommittee (SC) for Technical Committee (TC) 3/SC 5 *Conformity Assessment* made revisions to the following OIML Basic Publication (B) documents:

- OIML B 3, *OIML Certificate System for Measuring Instruments*; and

- A combined revision of OIML B 10-1, *Framework for a Mutual Acceptance Arrangement on OIML Type Evaluations*, and OIML B 10-2, *Checklists for Issuing Authorities and Testing Laboratories carrying out OIML Type Evaluations*.

At the January 2011 Interim Meeting, the Committee reviewed four items related to the revisions of B 3 and B 10: (1) housekeeping revisions to document B 3; (2) housekeeping revisions to B 10; (3) revisions to B 10 that would incorporate provisions under which manufacturers' test data would be accepted under the MAA; and (4) a resolution of compromise whereby countries may voluntarily accept manufacturers' test data. The Committee recommended that the Board of Directors authorize the U.S. representative to vote YES on items (1) and (2), NO on item (3), and YES on item (4) with a qualifying statement that the United States would not accept any MAA certificates based on manufacturers' test data. The Board of Directors voted to support all of the recommendations from the NTEP Committee.

A Meeting of the Committee on Participation Review for R 60 and R 76 was held September 21 - 23, 2011, in Braunschweig, Germany. Dr. Charles Ehrlich, National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM); Mr. John Barton, NIST, OWM; and Mr. Jim Truex, NCWM attended the meeting.

The International Committee of Legal Metrology (CIML) Preliminary Ballots on B 3 and B 10 closed in July 2011 without any negative votes, and a final CIML vote was held at the CIML Meeting in Prague, Czech Republic, in October 2011. Both B 3 and B 10 passed the CIML vote. International comments on a new document entitled *The Role of Measurement Uncertainty in Conformity Assessment Decisions in Legal Metrology* have been received and the Secretariat is using them to develop the 2nd Committee Draft.

The CIML, noting the report of TC 3/SC 5 on the issue of the acceptance of manufacturers' test results within a DoMC under the MAA, and recalling its Resolution no. 20 at the 43rd CIML Meeting, decided that Issuing Participants may request the registration of Manufacturers' Testing Laboratories (MTLs) under a DoMC, provided that the conditions agreed by TC 3/SC 5 and laid down in a respective amendment to, or revision of, OIML B 10 are met, and that after this amendment to, or revision of, OIML B 10, MAA Type Evaluation Reports that contain test results from MTLs may be accepted by Participants on a voluntary basis.

The CIML approved as a new work item for OIML TC 3/SC 5:

- the amendment to, or the revision of, OIML B 10 Framework for a MAA on OIML Type Evaluations MAA to include appropriate conditions for the registration of MTLs under a DoMC.

The CIML also decided that the registration of MTLs under a DoMC remains excluded from the scope of the MAA until this amendment to, or revision of, OIML B 10 is approved. TC 3/SC 5 voted in May 2012, to approve a 2nd Committee Draft (CD) of an Amendment to OIML B 10 that would permit, on a strictly voluntary basis, the use of test data from MTLs in the MAA. The United States (NTEP) supported this 2nd CD with the provision that the use of manufacturer test data was clearly identified on the MAA test report because NTEP cannot use manufacturer test data towards issuance of an NTEP certificate. The CIML will likely vote on this at its October 2012 Meeting in Bucharest, Romania.

An OIML Meeting to discuss Conformity to Type (CTT) was held June 29 - 30, 2011, in Utrecht, Netherlands. NCWM was invited to the meeting to give a presentation about the Verification Conformity Assessment Program (VCAP) initiative. NCWM Executive Director, Mr. Onwiler, made the presentation for NCWM. Dr. Ehrlich, NIST, OWM, forwarded a *Report on OIML Utrecht Seminar on Conformity to Type* to NCWM. The CIML, noting the written report of the seminar on *Conformity to Type* held in the Netherlands, June 2011, and noting the oral report and presentation by the CIML member for New Zealand, Mr. O'Brien, on the outcome of the follow-up CTT Seminar held in Prague on October 10, 2011, approved the establishment of a new subcommittee of TC 3, to be

titled *Conformity to Type*. The subcommittee shall undertake, as a work item, the development of a guidance document on the "scope for pre-market surveillance activities focused on the conformity assessment of measuring instruments to give assurance that manufactured (or production) instruments meet their approved type." The responsibility for the Secretariat of the new subcommittee was assigned jointly to New Zealand and the International Bureau of Legal Metrology.

The Committee and NCWM Board of Directors were invited to review the reports and make comments.

During 2011, 10 NTEP certificates for load cells were issued under the MAA. All to date have been tested by the National Measurement Institute in the Netherlands. Eight more certificates for load cells have been issued through July 2012. The NTEP Administrator reviewed the test data and drafted the CCs.

520 ACTIVITY REPORTS

520-1 I NTEP Participating Laboratories and Evaluations Reports

Background/Discussion:
During the 2011 Annual Meeting, Mr. Truex, NTEP Administrator, updated the Committee on NTEP laboratory and administrative activities.

The NTEP weighing and measuring laboratories held a joint meeting March 28 - April 1, 2011, in Annapolis, Maryland. The NTEP weighing laboratories met again in August 2011 prior to the meeting of the NTETC Weighing Sector in Sacramento, California, and the NTEP measuring laboratories met once more in October 2011, prior to the NTETC Measuring Sector meeting in Norfolk, Virginia.

NTEP Administrator, Mr. Truex, reported to the Committee that incoming applications remain comparable to normal. He reported there is no backlog concern for measuring devices and the brick and mortar weighing labs at this time. Updated NTEP laboratory statistics will be provided to the membership at NCWM Interim Meeting.

2012 NTEP Meetings:

• NTETC Belt-Conveyor Sector	February 22 - 23, 2012	St. Louis, Missouri
• NTETC Software Sector Meeting	March 20 - 21, 2012	Columbus, Ohio
• NTEP Laboratory Meeting	April 2 - 5, 2012	Columbus, Ohio
• NTETC Grain Analyzer Sector	August 22 - 23, 2012	Kansas City, Missouri
• NTETC Weighing Sector	August 28 - 29, 2012	Annapolis, Maryland
• NTETC Measuring Sector	October 5 - 6, 2012	Louisville, Kentucky

The Committee announced plans to conduct a survey of NTEP customers and NTEP laboratories regarding customer service. The board plans to use the results of the survey to form a continuous improvement plan for NTEP. A small work group (WG) was formed to get the project started. The resulting draft was presented to the board during the 2011 Annual Meeting in Montana. With any survey, the challenge is to develop a document that is concise enough that customers will respond, while also providing a meaningful set of data. The survey was released to active Certificate of Conformance (CC) holders. The NCWM Board of Directors reviewed the survey results in October 2011.

During the Annual Meeting, it was reported that the New York brick and mortar NTEP laboratory for weighing devices will soon be reopening. A new laboratory complex is nearing completion, and the New York evaluator is

scheduled to undergo training at another NTEP laboratory. The NTEP Committee realizes the other weighing laboratories worked very hard to pick up the workload while the New York laboratory was off line and commends the labs for keeping the backlog at a minimum and completing evaluations in a timely manner.

The Committee reviewed NTEP statistics through June 2012. The latest statistics are included in this report as Appendix F.

520-2 I NTETC Sector Reports

Background/Discussion:
The NTEP Committee is happy to report that all NTETC Sector reports continue to be available to members at the time *NCWM Publication* 15 was published and is committed to ensuring that electronic versions of Sector reports are available with *NCWM Publication* 15 in the future. Please note that the Sector reports will only be available in the electronic version of *NCWM Publication* 15 on the NCWM website.

NTETC Belt-Conveyor Scale Sector:
The NTETC Belt-Conveyor Scale Sector met February 23 - 24, 2011, in St. Louis, Missouri. A final draft of the meeting summary was provided to the Committee prior to the 2012 NCWM Interim Meeting for review and approval (see Appendix A).

The next meeting of the NTETC Belt-Conveyor Scale Sector is scheduled for February 22 - 23, 2012, in St. Louis, Missouri. For questions on the current status of sector work or to propose items for a future meeting, please contact the Sector Technical Advisor:

Technical Advisor
Mr. John Barton
NIST, OWM
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899
Phone: (301) 975-4002
Fax: (301) 975-8091
E-mail: john.barton@nist.gov

NTETC Grain Moisture Meter and NIR Protein Analyzer Sectors:
The NTETC Grain Moisture Meter and NIR Protein Analyzer Sectors held a joint meeting in Kansas City, Missouri, August 24 - 25, 2011. A draft of the final summary was provided to the Committee prior to the 2012 NCWM Interim Meeting for review and approval (see Appendix B).

The next meeting of the NTETC Grain Moisture Meter and NIR Protein Analyzer Sectors is scheduled for August 22 - 23, 2012, in Kansas City, Missouri. For questions on the current status of sector work or to propose items for a future meeting, please contact the Co-Technical Advisors:

Co-Technical Advisor
Mr. Jack Barber
JB Associates
10349 Old Indian Trail
Glenarm, IL 62536
Phone: (217) 483-4232
Fax: NA
E-mail: barber.jw@comcast.net

Co-Technical Advisor
Ms. G. Diane Lee
NIST, OWM
100 Bureau Drive, MS 2600
Gaithersburg, MD 20707
Phone: (301) 975-4005
Fax: (301) 975-8091
E-mail: diane.lee@nist.gov

NTETC Measuring Sector:
The NTETC Measuring Sector met October 21 - 22, 2011, in Norfolk, Virginia. A draft of the final summary was provided to the Committee prior to the 2012 NCWM Interim Meeting for review and approval (see Appendix C).

The next meeting of the NTETC Measuring Sector is scheduled to be held in October 5 - 6, 2012, in conjunction with the Southern Weights and Measures Association's 2012 Annual Meeting. For questions on the current status of sector work or to propose items for a future meeting, please contact the Sector Technical Advisor:

Technical Advisor
Mr. Marc Buttler
NIST, OWM
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899
Phone: (301) 975-4615
Fax: (301) 975-8091
E-mail: marc.buttler@nist.gov

NTETC Software Sector:
The NTETC Software Sector met March 15 - 16, 2011, in Annapolis, Maryland. A final draft of the meeting summary was provided to the Committee prior to the 2012 NCWM Interim Meeting for review and approval (see Appendix D).

The next meeting of the NTETC Software Sector is scheduled for March 20 - 21, 2012, in Columbus, Ohio. For questions on the current status of sector work or to propose items for a future meeting, please contact the Sector Co-Chairs and/or the NTEP Administrator:

Co-Chair
Mr. James Pettinato
FMC Technologies Measurement Solutions, Inc.
1602 Wagner Avenue
Erie, PA 16510
Phone: (814) 898-5250
Fax: (814) 899-3414
E-mail: jim.pettinato@fmcti.com

NTEP Administrator
Mr. Jim Truex
NCWM
1135 M Street, Suite 110
Lincoln, NE 68508
Phone: (740) 919-4350
Fax: (740) 919-4348
E-mail: jim.truex@ncwm.net

NTETC Weighing Sector:
The NTETC Weighing Sector met August 31 - September 1, 2011, in Sacramento, California. A final draft of the meeting summary was provided to the Committee prior to the 2012 NCWM Interim Meeting for review and approval (see Appendix E).

The next NTETC Weighing Sector meeting is scheduled for August 28 - 29, 2012, in Annapolis, Maryland. For questions on the current status of sector work or to propose items for a future meeting, please contact the Sector Technical Advisor:

Technical Advisor
Mr. Rick Harshman
NIST, OWM
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899
Phone: (301) 975-8107
Fax: (301) 975-8091
E-mail: richard.harshman@nist.gov

The NTEP Committee reviewed all 2011 NTETC Sector reports during the Interim Meeting. Reports of the Belt-Conveyor Scale, Grain Moisture Meter and NIR Protein Analyzer, Software and Weighing Sectors were approved in their entirety. The report of the Measuring Sector was approved except for agenda items 4 and 6, which were not deemed consensus conclusions and were returned to the sector for consideration.

530 CONFORMITY ASSESSMENT PROGRAM

530-1 I Conformity Assessment Program

Background/Discussion:
The Conformity Assessment Program was established to ensure devices produced after the device has been type evaluated and certified by NTEP continue to meet the same requirements. This program has three major elements: 1) Certificate Review (administrative); 2) Initial Verification (inspection and performance testing); and 3) Verified Conformity Assessment (influence factors). This item is included on the Committee's agenda to provide an update on these elements.

Certificate Review:
Certificates are constantly under review by NTEP staff and laboratories. Many active certificates are amended annually because of manufacturer submission for evaluation or issues reported by the states pertaining to information on the certificate. When the devices are re-evaluated and certificates are amended, the information is reviewed and necessary steps are taken to assure compliance and that accurate, thorough information is reported on the certificate.

In an effort to keep certificate information up to date, the Committee continues to offer an opportunity for active certificate holders to update contact information that is contained in the "Submitted By" box on certificates. This is offered during the payment period of their annual maintenance fee. Many CC holders have taken advantage of the opportunity.

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 has been developed. The Committee wanted to have a simple form, perhaps web based for use by the state and local regulators. The form has been approved by the Committee and distributed to the states. A completed form can be submitted via mail, e-mail, fax, or online. The form is available to regulatory officials who are members of NCWM at **www.ncwm.net/content/initial-verification-report**.

VCAP:
NCWM has been concerned about production meeting type and protecting the integrity of the NTEP CC since the inception of NTEP. Load cells traceable to NTEP certificates have been selected for the initial assessment effort. All holders of NTEP CCs for load cells have been notified.

The Board reconfirmed its belief that conformity assessment is vital to NTEP's continued success and will be implemented. VCAP Audit Reports for manufacturers with load cell certificates were due no later than May 2011. VCAP Audit Reports for private label certificate holders were due no later than November 2011.

NCWM decided to require a systems audit checklist that is to be completed by an outside auditor and submitted to NCWM per Section 2.5 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.net/content/checklists**. Additionally, the Committee developed a new NCWM Publication 14, administrative policy to distinguish between the requirements for parent NTEP certificate holders (S.1.c.) and private label certificate holders. The requirements in S.1.d. track the private label checklist requirements; traceability to parent NTEP CC, traceability of the private label cell 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.

During the 2011NCWM Annual Meeting Open Hearings, the Committee announced that the next device category under consideration is weighing/load receiving elements, 2000 lb capacity and less using load cells that are not traceable to their own NTEP certificate. The Committee heard comments from several manufacturers pertaining to

VCAP and the next device category. The Committee expects there will be additional questions and is considering the need to form a VCAP Committee to discuss the issues. However, the Committee wanted to have a better understanding of the specific questions and concerns. Certificate holders and other interested parties were encouraged to submit written questions to the NTEP Committee so decisions could be made regarding the need for a VCAP Committee and, if needed, the make-up of the group.

The Committee received two letters and a list of questions. The Committee made plans to review and develop answers to the questions in a timely manner.

VCAP audits for load cells were due in 2011. As a result of VCAP, 24 load cell certificates, involving 12 different certificate holders were changed to "inactive" status. The Committee reconfirmed its commitment to VCAP and decided to move forward with the next device category. The following compliance timeline was developed for weighing/load receiving element CC holders with active certificates using non-NTEP load cells. The Committee encourages affected certificate holders to start the process immediately.

NCWM / NTEP VCAP Compliance Timeline Weighing/Load Receiving Element, 2000 lb Capacity and Less Using Non-NTEP Load Cells					
January 2012 – Ongoing	**July 2012 – November 2013**	**July 2012 – May 2014**	**July 2012 – November 2013**	**December 2013**	**June 2014**
• NTEP to review and refine VCAP procedures • NTEP answers incoming questions • NTEP notifies active CC holders of VCAP requirements	• Parent CC holders to put VCAP QM system in place • CC holder to have audit conducted by Certified Body • Submit audit report to NCWM/NTEP	• Private Label CC holders to put VCAP QM system in place • CC holder to have audit conducted by Certified Body • Submit audit report to NCWM/NTEP	• NTEP evaluates incoming audit reports • NTEP contacts CC holders not meeting VCAP requirements to encourage compliance	• NCWM declares CCs inactive if Parent CC holder fails to comply with VCAP	• NCWM declares CCs inactive if Private Label CC holder fails to comply with VCAP

During the Annual Meeting, it was reported that 21 weighing element certificate holders (43 active NTEP CCs) have been identified and all have been notified. The following disclaimer has been advertised and communicated by NCWM: "NCWM is working to identify all active certificates for weighing elements 2000 lb capacity and less, using on-NTEP load cells. As a courtesy, certificate holders are being notified of VCAP requirements and the established time line. Please note that the NCWM Board of Directors does not consider it to be NCWM's responsibility to notify all certificate holders and affected certificates. Certificate holders are responsible for reviewing their active NTEP certificates and compliance with VCAP."

The Committee is working to answer questions that have recently been submitted pertaining to VCAP in a very timely manner. Reoccurring questions involve the five remaining device types under the VCAP umbrella. When will these remaining device types be added to the VCAP program? Will they be added all at one time or only a single device type every two to three years?

The Committee is very carefully considering possible options. With each device type added to the VCAP, the administrative overhead of NTEP increases proportionately. At the present time, additional device types cannot be added until increased capacity within NTEP administration is achieved. The NCWM Board is currently reviewing alternatives to this increase in capacity. When the time comes, an option under consideration is for all remaining device types to be added at one time. There is no formally accepted schedule for completion of this effort. The NCWM Board and NTEP Committee are requesting input from the stakeholders and other NCWM members.

540 OTHER ITEMS – DEVELOPING ITEMS

540-1 D NTEP Contingency Plan

Source:
NTEP Committee

Purpose:
The NTEP Contingency Plan was created to keep NTEP operating and to ensure that NTEP services are available at an adequate level including an appropriate number of laboratories and personnel (evaluators) to maintain viable support for NTEP services, including MRAs, MAAs, and potential to be an R 76 Issuing Participant.

Item Under Consideration:
The NTEP Committee discussed contingency planning for continuity of NTEP operations. With the state of today's economy, one of the NTEP-authorized labs could close due to government budget cuts. How would NTEP maintain workflow? Are there additional states interested in applying to become an NTEP field lab or an NTEP brick-and-mortar lab? The Committee will continue to discuss these issues during a long-range planning session and welcomes comments from the membership.

Background/Discussion:
The Committee continues to consider whether NCWM should:

1. Employ NTEP evaluators to conduct testing at manufacturers' facilities;

2. Have evaluators under contract to conduct testing at manufacturers' facilities;

3. Employ NTEP evaluators or have evaluators under contract to assist the state NTEP laboratories;

4. Have a brick-and-mortar NTEP laboratory and NTEP evaluators; or

5. Use a private third party laboratory to conduct NTEP evaluations.

The Committee has heard testimony expressing support and concerns pertaining to the options. Several stated that the Committee should consider adding OIML MAA participation as a Utilizing Participant to the list. Others have urged the Committee to continue working on the idea of NCWM NTEP evaluators, an NCWM NTEP lab, and keeping all options open. One member asked the Committee to consider accepting manufacturer compliance data in lieu of hiring NTEP contractors. Another suggestion from the floor was to consider strengthening and utilizing IV as part of the NTEP process. A representative of a state brick-and- mortar NTEP laboratory asked the Committee to move cautiously forward and not destroy the state NTEP labs. He expressed concern that the establishment of an NCWM NTEP brick-and-mortar lab could lead to significant legal complications for the states.

The Committee reiterated to the membership that, at this time, the preferred course of action would be the option of evaluators under contract. The Committee recognizes the commitment that the states with NTEP laboratories have made over the years and would only resort to contingency measures in the event of a severe loss of state lab resources. Labs are handling current demands without a need for contingency measures. The Committee is updated on the status of the participating laboratories, personnel, and backlog on a quarterly basis and will continue to keep NTEP contingency a top priority.

Mr. Tim Tyson, Kansas | Committee Chair
Mr. Kurt Floren, Los Angeles County, California | Chairman
Mr. Stephen Benjamin, North Carolina | Chairman-Elect
Mr. Brett Saum, San Luis Obispo County, California | Member
Mr. James Cassidy, City of Cambridge, Massachusetts | Member

Mr. Jim Truex, NCWM Headquarters | NTEP Administrator

National Type Evaluation Program

Appendix A
National Type Evaluation Technical Committee (NTETC)
Belt-Conveyor Scale (BCS) Sector Meeting Summary

February 23 - 24, 2011
St. Louis, Missouri

INTRODUCTION

The charge of the Belt-Conveyor Scale (BCS) Sector (herein after referred to as "Sector") is important in providing appropriate type evaluation criteria based on specifications, tolerances and technical requirements of NIST Handbook 44, Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices, Sections 1.10. General Code and 2.21. Belt Conveyor Scale Systems. The Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, Technical Policy, Checklists and Test Procedures for national type evaluation.

The BCS Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of the National Conference on Weights and Measures (NCWM) Specifications and Tolerances Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

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.

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.

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
BCS	Belt-Conveyor Scale	NTETC	National Type Evaluation Technical Committee
CC	Certificate of Conformance	OIML	International Organization of Legal Metrology
NCWM	National Conference on Weights and Measures	OWM	Office of Weights and Measures
NIST	National Institute of Standards and Technology	R	Recommendation
NTEP	National Type Evaluation Program	USNWG	U.S. National Work Group

Details of All Items
(In order by Reference Key)

CARRY-OVER ITEMS

1. Report from the 2011 NTEP Committee on Changes to NCWM Publication 14

Review of changes adopted in 2011 edition of NCWM Publication 14, Weighing Devices.

Background/Discussion:
Several changes to NCWM Publication 14, *Weighing Devices, Belt-Conveyor Scales* were recommended by the Sector during the February 2010 NTETC BCS Sector Meeting and are noted in the 2010 Sector Meeting Summary. These amendments were recommended to reflect changes to the 2010 edition of NIST Handbook 44 requirements in the BCS Scale Code (2.21.) and subsequently adopted into the following sections in NCWM Publication 14, *Weighing Devices, Belt-Conveyor Scales*.

- **Section 1, paragraph 1.8.**
  The change to this section was made to reflect the amendments to NIST Handbook 44, 2.21. paragraph S.1.3.1. Value of the Scale Division in 2009 and paragraph N.2.3. Minimum Test Load in 2008.

  Code Reference: S.1.2., S.1.3.1.
  1.8. The scale division shall be in increments of 1, 2, or 5 times 10k where k is an integer **and shall not be greater than 0.125 % ($^{1}/_{800}$) of the minimum totalized load.**

  1.8.1. Verify that the value of the scale division is protected by an acceptable security means (e.g., physical seal or audit trail).

- **Section 13, Field Test Procedure**
  These changes provided clarification on the minimum required number of test runs to be performed during an official test. Although exceptions for the required number of test runs are permitted for routine field testing on systems that operate at one flow rate only, the note added to the 2011 edition of NCWM Publication 14 specifies that those sites which operate at only a single rate of flow are not appropriate for use in conducting a type evaluation.

Field Performance Test of the Belt-Conveyor Scale
N.2.1. Initial Verification. – A belt-conveyor scale system shall be ~~**tested at the normal use flow rate, 35 % of the maximum rated capacity, and an intermediate flow rate between these two points. The system may also be tested at any other flow rate that may be used at the installation. (Added 2004)**~~ **verified with a minimum of two test runs at each of the following flow rates:**

(a) Normal use flow rate;

(b) 35 % of the maximum rated capacity; and

(c) An intermediate flow rate between these two points.

Note: The test site selected for permanence testing shall be capable of testing over a range of flow rates. Any site where the belt-conveyor scale system is limited to a single flow rate will not be considered acceptable.

- **Section 13, Field Test Procedure**
These changes in NIST Handbook 44, 2.21. are editorial in nature and were made primarily to reflect the consolidation of the paragraphs previously numbered as N.3.1.2. Initial Stable Zero and N.3.1.3. Test of Zero Stability into one paragraph now numbered N.3.1.2. Test of Zero Stability within the 2010 edition of NIST Handbook 44. The consolidation was recommended to eliminate redundancy within these paragraphs and was accomplished with only minor wording changes. These changes also resulted in the paragraph previously numbered N.3.1.4. Check for Consistency of the Conveyor Belt along Its Entire Length to be renumbered as N.3.1.3.

N.3.1.~~3~~2. Test of Zero Stability. – The conveyor system shall be run to warm up the belt and the belt scale shall be zero adjusted as required. A series of zero-load tests shall be carried out **immediately before conducting the simulated-load or materials test** until three consecutive zero-load tests each indicate an error which does not exceed ± 0.06 % of the totalized load at full scale capacity for the duration of the test. No adjustments can be made during the three consecutive zero-load test readings.
(Added 2002) (Amended 2004 **and 2009**)

N.3.1.~~4~~3. Check For Consistency of the Conveyor Belt Along Its Entire Length. – After a zero-load test with flow rate filtering disabled, the totalizer shall not change more than plus or minus 3.0 scale divisions (± 3 d) from its initial indication during one complete belt revolution.
(Added 2002) (Amended 2004)

- **Section 6, Zero-Setting Mechanism**
This change was made to reflect the addition of new paragraph S.3.1.1. in NIST Handbook 44, 2.21.

Code Reference: S.3.1. and S.3.1.1.
The zero-setting mechanism may be either a manual or automatic mechanism. In either case, the range of the zero-setting mechanism is limited to ± 2 % of the rated capacity of the scale. If a greater adjustment is needed, the access to the adjustment must be through some security means. An audio or visual signal shall be given when the automatic and semi-automatic zero-setting mechanisms reach the limit of adjustment of the zero-setting mechanism. The zero-setting mechanism must be constructed such that the zero-setting operation is done only after a whole number of belt revolutions (a minimum of 3 revolutions or a time period equivalent to the time required to deliver 1000 d of load). The completion of the zero-setting operation must be indicated. The low-flow lockout must be deactivated for this test.

For systems that record the zero load reference at the beginning and end of a delivery, the range of zero-setting mechanism shall not be greater than ± 5 % without breaking the security means.

6.4. The completion of the automatic zero-setting operation must be indicated.

6.4.1. Verify that any changes in the zero reference are indicated and/or recorded.

Conclusion:
Mr. Truex, NTEP Administrator, reviewed these amendments to update sector members on changes to NCWM Publication 14. No further discussion took place.

2. Update to NCWM Publication 14 Belt-Conveyor Scale Checklist

Status report on draft proposal for amending NCWM Publication 14, *BCS Checklist*.

Background/Discussion:
Prior to the February 2009 BCS Sector Meeting, Mr. Ripka, Chair, provided a draft NCWM Publication 14, *BCS Checklist* with technical policies on the substitution of Master Weight Totalizers along with other minor editorial suggestions for review. Among the suggested changes that were included in this draft were proposed amendments to the procedures involving testing semi-automatic and automatic zero-setting mechanisms. The sector members suggested that it be used on a trial basis by NTEP laboratories when evaluating manufacturer's replacement instruments scheduled to undergo NTEP evaluation. This trial-use would serve to evaluate the checklist and to identify any gaps or necessary changes. During the meeting Mr. Ripka, Thermo-Fisher Scientific, stated that his company would possibly have an instrument that could be submitted in the near future for NTEP evaluation, allowing this checklist to be used on a trial basis.

At the February 2010 BCS Sector Meeting, the members were informed that there had been no instruments submitted to date for NTEP evaluation that would serve to demonstrate the usefulness of the checklist. Mr. Marmsater, Merrick Industries, Inc. indicated that his company is also expecting to have a device ready to submit for type evaluation soon. The possible use of the checklist during an evaluation on this instrument would be discussed at the 2011 BCS Sector meeting.

Conclusion:
At the 2011 NTETC BCS Sector Meeting, the members were informed that to this point, there still have not been any applications submitted that would allow the use of the checklist. Mr. Marmsater, Merrick Industries, Inc. indicated that his company still expects to have an instrument ready to submit in the near future for type evaluation. No additional comments or actions were discussed at this time.

3. Develop a List of Sealable Parameters for BCS Systems

Status report on the adoption of list of sealable parameters to be included for use in NTEP evaluations of belt-conveyor scales.

Background/Discussion:
A list of device features and parameters which were identified by the Sector as items that should be protected by some form of security seal was developed during the 2009 NTETC BCS Sector Meeting. This list was to be forwarded to NTEP laboratories for use on a trial basis. Comments and recommended amendments from the NTEP evaluators would then be forwarded to the sector work group for further development. The listing could then be amended if needed and a recommendation be made to the NTEP Committee for its adoption into NCWM Publication 14.

Conclusion:
The implementation of this list of sealable parameters is subject to the review by NTEP evaluators, as listed under the previous agenda (update of the amended NTEP evaluation checklist). Since no manufacturer's instruments have been made available at this time for the trial use of the proposed checklist or the list of sealable parameters, no further actions or discussion were justified at this time. The Sector was informed that a trial application and review of both items will be performed when the opportunity arises.

NEW BUSINESS

Note: Discussion of the following item may be related to a similar agenda item addressed during the February 23 - 24, 2011, meeting of the U.S. National Work Group (USNWG) for BCS that preceded the NTETC BCS Sector Meeting. Additional background information may be found in the USNWG 2011 Meeting Summary.

4. Linearization Feature for BCS

Draft new test procedures for the evaluation of linearization correction features.

Background/Discussion:

Manufacturers and service agents of BCS have voiced support for the use of electronic instruments equipped with a linearity correction feature (i.e., multiple point calibrations) to reduce span errors that deviate from a linear pattern. This contrasts with reported prohibition of this type feature by certain weights and measures regulatory authorities. Some sector members have asked for clarification from the National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM) on the use of this type of feature and whether it is (or should be) permitted within current U.S. standards.

The NIST Technical Advisor informed the Sector during the February 2011 NTETC BCS Sector Meeting that there is no basis for excluding the use of a linearity correction within NIST Handbook 44 that would serve as justification to prohibit its use. In addition, there are numerous NTEP Certificates of Conformance (CC) for weighing devices that include this type of feature under the listing of standard features and options for that device. The sector members were asked if they favored the development of testing procedures to evaluate linearization correction features for inclusion in NCWM Publication 14. Sector members were also asked whether or not the ability to enable/disable the feature should be a sealable parameter. Initial discussion among the Sector revealed the majority favored the development of test procedures to assist evaluators in the examination of BCS equipped with linearization correction features.

Sector member Mr. Burrell, Control Systems Technology Pty, Ltd., raised concerns however regarding the nature of any test procedures that would be published, thus revealing proprietary information about a specific feature included in the device's programming. Other sector members raised the question of whether or not it would be sufficient to simply require that the ability to enable or disable any linearization feature to be a sealable parameter and that the manufacturer would need to work closely with the NTEP laboratories and evaluators to ensure that this type of feature would be examined properly. Mr. Barton, NIST Technical Advisor added that it would seem appropriate to develop testing procedures that would, at a minimum ensure that the existence of this feature within a device would not allow the device to be used in a fraudulent manner.

Mr. Truex, NTEP Administrator, stated that the NTEP evaluator must be informed by the device manufacturer of any feature that has metrological significance so that feature may be evaluated. Mr. Truex added that he believes this type of feature should be tested in a laboratory environment and probably not in a field environment.

The possibility of developing test procedures of a generic nature so as to avoid revealing sensitive technical, proprietary details about any particular instrument was discussed among the Sector. Those members who represent manufacturers at the meeting agreed that draft test procedures could be developed. They stated that the procedures could be drafted to be sufficient enough to provide an evaluator with instructions on thoroughly testing a device, but not extensive enough to expose sensitive information about the device if these test procedures are published.

Another point raised by Mr. Burrell, Control Systems Technology Pty, Ltd., was whether or not devices that are currently covered under an active CC that includes linearization correction features would need to be revaluated if and when testing procedures relative to a linearization feature are developed and published in NCWM Publication 14. Other manufacturers within the group expressed their belief that it would be necessary for devices equipped with this feature to undergo at least a partial revaluation if and when the test procedures were adopted into NCWM Publication 14.

Conclusion:
Manufacturers attending the NTETC BCS Sector Meeting agreed to participate in a sub-group formed to develop a draft of test procedures for recommendation to the NTEP Committee. This sub-group will also consider the scope for the application of any newly developed test procedures (i.e., whether the test procedures will be applied retroactively to devices that have already received NTEP approval). The sub-group includes the following members:

- Mr. Bill Ripka, Thermo Fisher Scientific
- Mr. Peter Sirrico, Thayer Scale/Hyer Industries
- Mr. Lars Marmsater, Merrick Industries, Inc.
- Mr. Ian Burrell, Control Systems Technology Pty, Ltd.

The sub-group will continue work on developing test procedures through correspondence and will offer the first draft for review by the entire USNWG by April 30, 2011.

5. Conveyor Belt Profiling

Draft new NCWM Publication 14 procedures for evaluation of belt profiling (belt mapping) feature.

Note: Discussion of the following item may be related to a similar agenda item addressed during the February 23 - 24 NTETC BCS Sector Meeting of the USNWG for BCS that preceded the NTETC BCS Sector meeting. Additional background information may be found in the USNWG 2011 Meeting Summary.

Background/Discussion:
This method of establishing a zero-condition for a totalization operation enables the belt-conveyor scale to synchronize the application of an individual tare weight values associated with distinct segments of the belt to the movement of those belt segments over the scale portion of the conveyor. If this alternative to averaging the weight of segments of the belt carcass is used there may be a need to establish a procedure to evaluate its effectiveness, to ensure that it functions as intended, and is maintained during operation of the BCS.

NIST, OWM has received inquiries seeking guidance on whether this type of feature is permitted under U.S. standards. It is also being reported by some members of the USNWG on BCS that some regulatory field officials will not issue an approval for devices equipped with this feature when it is not listed as a standard feature or option on the NTEP CC.

Current NIST Handbook 44 and International Organization of Legal Metrology (OIML) Recommendation (R) 50 (Continuous totalizing automatic weighing instruments [belt weighers]) requirements were developed for systems that average the weight of belt segments by continuously weighing the belt as it passes over the scale portion of the conveyor. The draft revision of OIML R 50 however, does include terminology that explicitly recognizes the belt profiling feature as a means of establishing and maintaining a zero condition. The current draft of R 50 also addresses the need to verify the performance of the synchronization of belt segment weights with the travel of belt segments over the weighing device.

At the February 2011 NTETC BCS Sector Meeting, the Sector was asked to determine the need for including this feature within U.S. standards and procedures (NIST Handbook 44 and NCWM Publication 14) as well.

During the February 2011 NTETC BCS Sector Meeting, the members were asked to consider if there is there is a need for procedures to evaluate the effectiveness of belt profiling and to ensure that correct operation is maintained during totalization. A majority of sector members voiced their opinion that this feature should receive some level of evaluation, and that at a minimum the ability to enable or disable the belt profiling feature should be protected by a form of security seal.

Mr. Chase, Chase Technologies, Inc. stated that profiling should not be viewed as an independent function but that it is more appropriately classified as a subset of Automatic Zero Tracking. Automatic Zero Tracking features are already required to be protected through a type of security seal.

Mr. Barton, NIST Technical Advisor, asked the sector members if the need exists to develop type evaluation test procedures to verify that the function of the belt profiling feature will be effective throughout a range of changing conditions that the belt-conveyor scale system may be subject to. The members generally acknowledged that its performance could be a concern and that changes in environmental conditions affecting characteristics of the belt (i.e., elasticity, length) must be compensated for.

Mr. Ripka, Chair stated that clarification is needed to provide direction for the use of the proposed NIST Handbook 44 requirement pertaining to conveyor belt consistency (N.3.1.3.) in association with the belt profiling feature. The proposed draft of N.3.1.3. will require that the condition of the conveyor belt be maintained so that excessive deviation from an established zero condition is controlled. Mr. Ripka asked the sector members for their position on whether the requirement pertaining to belt consistency would be applied to the system before or after a belt profiling feature is placed in operation. While there were no definitive responses, it was acknowledged that the use of both types of zero maintenance controls may be redundant and further consideration is needed.

Conclusion:
While there was no consensus reached within the Sector on whether test procedures are needed to evaluate this feature while the device is under type evaluation, it was agreed that belt profiling is a metrologically significant feature. In addition, the sector members felt that at a minimum, the activation of this feature should be required to be protected by a form of security seal.

Mr. Barton, NIST Technical Advisor, suggested that the belt profiling is a matter that is best understood and applied by belt-conveyor scale manufacturers. For that reason, it may be preferable to have the analysis and necessary action(s) for the consideration of belt profiling features taken on by the same sub-group formed under the previous agenda item. That sub-group's members agreed to work outside of the time constraints of the BCS Sector Meeting to develop a draft for test procedures deemed necessary to evaluate a belt profiling feature in use with a device submitted for type evaluation. The sub-group includes the following members:

- Mr. Bill Ripka, Thermo Fisher Scientific
- Mr. Peter Sirrico, Thayer Scale/Hyer Industries
- Mr. Lars Marmsater, Merrick Industries, Inc.
- Mr. Ian Burrell, Control Systems Technology Pty, Ltd.

A draft of test procedures developed by the sub-group is expected to be made available for review by the entire membership of the Sector by April 30, 2011.

6. Provision for Sealing

Should NCWM Publication 14, *BCS Checklist and Test Procedures*, Section 1.1. include NIST Handbook 44, G-S.8. as a code reference for sealing a device?

Background/Discussion:

The first paragraph of NIST Handbook 44 General Code requirement G-S.8. Provision for Sealing Electronic Adjustable Components is nearly identical to that of NIST Handbook 44 BCS Code paragraph S.5. Provisions for Sealing.

Paragraph S.5. differs, however, in that it does not include references for automatic or semi-automatic calibrations mechanisms whereas G-S.8. includes a second paragraph in the requirement addressing automatic or semi-automatic calibrations. Since automatic or semi-automatic calibrations mechanisms are incorporated into belt-conveyor scale systems the Sector should address this inconsistency.

The work group had no initial comments regarding this item. Mr. Barton, NIST Technical Advisor suggested that a draft amendment for NIST Handbook 44 Belt-Conveyor Scale Code, paragraph S.5., be developed and then circulated among the members of the USNWG on BCS by way of e-mail. The work group members can then review the draft and respond with comments electronically. If the recommendation is favored, the need to protect access to an automatic/semi-automatic calibration feature will need to be included as part of type evaluation procedures in NCWM Publication 14. The sector members agreed to review the draft recommendation and provide any comments on it.

Conclusion:
Mr. Barton, NIST Technical Advisor, will draft language for the inclusion of a second paragraph amending NIST Handbook 44, 2.21. paragraph S.5. to recognize the need to protect access to automatic/semi-automatic calibration feature by way of a security seal. This draft will be circulated among members of the USNWG on BCS and the NTETC BCS Sector for their review. The draft will be circulated by April 30, 2011. A final draft will be developed based on comments received and submitted for approval by the Specifications and Tolerances Committee.

7. Clarification of Guidelines Used for the Selection of Instruments for Type Evaluation

Parameters used for classification of devices as part of a type or "family" of manufacturer's model design.

Background/Discussion:
During the February 2010 NTETC BCS Sector Meeting, the sector members acknowledged that the existing language in NCWM Publication 14 BCS Sections A through G is vague and that it would be useful for criteria used in the selection of instruments to undergo evaluation as representative of a certain type or family to be further defined.

The existing language categorizes devices by the number of weigh idlers used for the weighing portion of the belt-conveyor and, a 10:1 ratio based on the size, loading and speed of the belt/weighbridge.

Mr. Barton, NIST Technical Advisor, offered some examples of additional requirements for a suitable representative device:

- One that includes all possible interfaces (communication ports, remote calibration, etc.);
- Similar or the same type of load cell or load receptors (should there be a limited capacity range for substitution load cells or for load cells listed on the CC?);
- Single speed or variable speed operation;
- Method of zero calibration and maintenance; and
- Other metrological features such as those found listed in the Sector's proposed table of "Belt-Conveyor Scale Features and Parameters" (See 1.b. above) such as:
    - Selection of measurement units;
    - Division value, d; and
    - Range of over capacity indications.

Mr. Burrell, Control Systems Technology Pty, Ltd., questioned the usefulness of categorizing instruments in families and supported this view by stating that most if not all devices that are sold by his company are designed and constructed specifically to suit the needs of each individual customer.

Mr. Ripka, Thermo Fisher Scientific, informed the Sector that the options which are programmable through an electronic control instrument that limit the range of operation are not a significant consideration for this classification process. Mr. Ripka stated that it is the design structure of the system components rather than programmable options which will be most meaningful in providing a means to categorize BCS systems. The justification for his belief is that it is the design and construction of the structural elements of the system that will determine loading capacity and capability of a BCS.

Mr. Burrell, Control Systems Technology Pty, Ltd., also stated that it is his belief that a 10:1 ratio currently used to classify devices as types or families is simply an arbitrary figure and that there should be more latitude allowed. Mr. Truex, NTEP Administrator, stated that the 10:1 ratio was selected out of the necessity to establish a basis for criteria and that the same ratio is used for many other type of devices.

Mr. Barton, NIST Technical Advisor, suggested that if the design and construction is the prime consideration, then perhaps the BCS manufacturers would be the most logical sources for drafting specific criteria to be used to show the commonality between devices and therefore considered as belonging to the same type or family.

Conclusion:
Mr. Burrell, Control Systems Technology Pty, Ltd., and Mr. Ripka, Thermo Fisher Scientific, agreed to work on developing additional specific criteria and that they would have a draft to offer the Sector by August 1, 2011, for review. Mr. Burrell also recommended that Mr. Chase, Chase Technologies, Inc. be included in the development of the draft. Mr. Chase agreed to participate in developing this draft.

ATTENDANCE

John Barton
NIST, Office of Weights and Measures
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899-2600
(301) 975-4002
john.barton@nist.gov

Ian Burrell
Control Systems Technology Pty, Ltd
37 Stanley Street
Peakhurst, NSW 2210
Australia
+61 295844500
iburrell@controlsystems.com.au

Paul Chase
Chase Technology, Inc.
502 Erie Avenue
Crosby, MN 56441
(218) 545-2356
mjc@crosbyironton.net

Rick Harshman
NIST, Office of Weights and Measures
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899-2600
(301) 975-8107
richard.harshman@nist.gov

Ken Jones
California Division of Measurement Services
6790 Florin Perkins Road
Suite 100
Sacramento, CA 95828
(916) 229-3052
kjones@cdfa.ca.gov

Lars Marmsater
Merrick Industries, Inc.
10 Arthur Drive
Lynn Haven, FL32444
(850) 271-7829
lars@merrick-inc.com

Al Page
Montana Highlands
2316 Canyon Drive
Billings, MT 59102
(406) 861-0534
awp8866@gmail.com

Randall Phillips
Southern Company Services
2550 Goodsprings Road
Parrish, AL 35580
(205) 257-7910
rmphilli@southernco.com

Bill Ripka
Thermo Fisher Scientific
501 90th Ave NW
Minneapolis, MN55433
(800) 445-3503
bill.ripka@thermofisher.com

Peter Sirrico
Thayer Scale / Hyer Industries
91 Schoosett Street
Pembroke, MA02359
(781) 826-8101 x328
psirrico@thayerscale.com

James Truex
National Conference on Weights and Measures
88 Carryback Drive
Pataskala, OH 43062
(740) 919-4350
jim.truex@ncwm.net

Appendix B

National Type Evaluation Technical Committee (NTETC) Grain Analyzer Sector Meeting Summary

August 24 - 25, 2011
Kansas City, Missouri

INTRODUCTION

The charge of the NTETC Grain Analyzer Sector (herein after referred to as "Sector") is important in providing appropriate type evaluation criteria based on specifications, tolerances and technical requirements of NIST Handbook 44, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, Sections 1.10. General Code, 5.56.(a) and 5.56.(b) Grain Moisture Meters, and 5.57. Near-Infrared Grain Analyzers. The Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, *Technical Policy, Checklists, and Test Procedures* for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors, and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

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***.

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.

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
AOCS	American Oil Chemists Society	NTEP	National Type Evaluation Program
ASP	Analytical Standards Program	NTETC	National Type Evaluation Technical Committee
CC	Certificate of Conformance	OCP	Ongoing Calibration Program
CWMA	Central Weights and Measures Association	OIML	International Organization of Legal Metrology
GAC		OWM	Office of Weights and Measures
GIPSA	Grain Inspection, Packers and Stockyards Administration	S&T	Specifications and Tolerances Committee
GMM	Grain Moisture Meter	SMA	Scale Manufactures Association
HRW	Hard Red Winter	SQT	Soybean Quality Traits
ISU	Iowa State University	TW	Test Weight
NCWM	National Conference on Weights and Measures	UGMA	Unified Grain Moisture Algorithm
NIR	Near Infrared	USB	United Soybean Board
NIST	National Institute of Standards and Technology	USDA	United States Department of Agriculture

Details of All Items
(In order by Reference Key)

1. Report on the 2011 NCWM Interim and Annual Meetings

The 96th Annual Meeting of NCWM was held July 17 - 21, 2011 in Missoula, Montana.

No Grain Moisture Meter (GMM) or Near Infrared (NIR) Grain Analyzer items appeared in the S&T Committee Interim Report for consideration by NCWM at the 2011 Annual Meeting.

Mr. Truex, NTEP Administrator, reported that 31 states were in attendance, down slightly from last year, but sufficient for a quorum. Although there were no items specifically directed to GMMs and NIR Grain Analyzers, there were three items of interest to the Sector:

1. S&T Item 310-1 – Provision for Sealing Electronic Adjustable Components: No changes were made to NIST Handbook 44, but the S&T Committee recommended language to be added to NCWM Publication 14. This item was placed on the S&T Consent Calendar and was subsequently adopted by voice vote. See Agenda Item 5.

2. S&T Item 310-2 Software – The NTETC Software Sector agreed to change the status of this item from Information to Developing because the item lacks enough information for full consideration and a full proposal has yet to be developed. See Agenda Item 6.

3. NTEP Committee Item 500-7 NCWM Publication 14, *Administrative Policy* – The Committee amended several sections of NCWM Publication 14, *Administrative Policy* to make it clear that the manufacturers/Certificate of Conformance (CC) holders are obligated to meet current NIST Handbook 44 requirements, regardless of when the devices covered by the NTEP certificate(s) were evaluated and the certificate was issued. Refer to the NTEP Committee Item 500-7 in the *Reports of the 96th National Conference on Weights and Measures* (2011).

2. Report on NTEP and Ongoing Calibration Program (OCP) (Phase II) Testing

Ms. Brenner, Grain Inspection, Packers and Stockyards Administration (GIPSA), briefed the Sector on NTEP Grain Analyzer (Phase I) activity. One meter is currently in the laboratory for grain moisture and test weight per bushel evaluation. Type evaluation is nearing completion and she estimated that there should be activity on a CC within the next few weeks. If there are seven meters in Phase II for 2012, the cost to each manufacturer would go from the present $8750 per type (with six meters) to $10,175 per type (with seven meters). With eight meters in the program the cost per type climbs to $12,185. The costs for 2011 have already been set at $8750 per type.

Ms. Brenner also reported that annual GMM calibration reviews were completed on schedule and updated CCs were issued for six device types. Seven device types are presently enrolled in the OCP (Phase II) for the 2011 harvest.

3. Review of OCP (Phase II) Performance Data

At the NTETC Grain Analyzer Sector's August 2005 Meeting it was agreed that comparative OCP data identifying the Official Meter and listing the average bias for each NTEP meter type should be available for annual review by the Sector. Accordingly, Ms. Brenner, GIPSA, presented data showing the performance of NTEP meters compared to the air oven. This data are based on the last three crop years (2008–2010) using calibrations updated for use during the 2011 harvest season.

There are still two meters that have not been in the program for the required three years, so data is shown for only four of the six meters. Next year's data should include data from one more meter. Only the GAC2100 has been identified on the comparisons. It is identified as "Official Meter". The remaining three instruments were randomly assigned numbers 1, 2 and 3, or, in the case of sunflowers, where only three meters have a sunflower calibration, A and B.

Note: The 2008-2010 GMM Phase II comparison graphs were distributed with the August 2011 NTETC Grain Analyzer Sector Agenda. Until completion of NCWM Interim Meeting, held in January 2012, they can be downloaded from NCWM web site at: ncwm.net/content/grain-analyzer-docs.

After that time, all NTETC Grain Analyzer Sector Meeting documents will be moved to NCWM web site Meetings Archive Folder.

4. Proposed Changes to NCWM Publication 14 to Address Issues Associated with the Expanded Grain Temperature Ranges of New Technology

Background/Discussion:
The recent introduction of GMMs utilizing a 149 MHz measurement frequency has made it possible to make accurate grain moisture measurements over a wider range of temperatures than were previously possible with the lower measurement frequencies used in older instruments. This has led to manufacturers requesting certification of wider grain temperature ranges and greater differences between instrument (room) and grain temperature. The type evaluation tests in the present GMM Section of NCWM Publication 14 do not adequately assess performance over these wider temperature ranges. Although the 149 MHz measurement frequency makes it possible to measure grain moisture at temperatures significantly below the freezing point of water, the acceptable accuracy of grain measurements below 0 °C has an upper moisture limit that will have to be specified.

Dr. Pierce, United States Department of Agriculture (USDA), GIPSA Technical Services Division, expressed concern that the Sector had not considered the ramifications of what might happen with an ambient temperature of 38 °C (100.4 °F). With a permissible difference of grain below ambient of 42 °C, the grain could be as low as − 4 °C. The meter would still be able to test frozen grain without an out of limits error.

Others pointed out that this applied only to grain types that have been listed on the CC with 42 °C room to grain temperature, provided the moisture is at or below 20 %. It was generally believed that meters that had passed a test with grain 42 °C below a room temperature of 22 °C would also pass a test with grain 42 °C below a room temperature of 38 °C.

Dr. Pierce recommended that the intermediate cold temperature should be near the freezing point. It was pointed out that before meters were submitted for testing frozen grain, manufacturers specified a ΔT_C that resulted in cold test temperatures of either 0 °C or 2 °C and that these temperatures had been accepted as "intermediate" temperatures when the testing was extended to frozen grain. In the ensuing discussion it was generally agreed that a single intermediate cold temperature should not be forced on manufacturers.

The original recommendation was amended as shown below to incorporate these suggestions:

> If room temperature minus ΔT_C -Extreme is less than ~~**–10**~~ **0** °C an additional test will be conducted with **an intermediate cold** grain temperature ~~**equal to room temperature minus one half $\Delta T_{C\text{-Extreme}}$**~~ **specified by the manufacturer**.

This modification required corresponding modifications to the original recommendations in 4(a), 4(b), and 4(c) that were shown in the Agenda. With these modifications the Sector agreed by consensus that the changes described in 4(a), 4(b), 4(c), and 4(d) below be included in the next edition of NCWM Publication 14.

A draft version of this meeting summary was circulated to the Sector Chair, NTEP Administrator, the National Institute of Standards and Technology (NIST) Technical Advisor, and representatives of the NTEP Participating Laboratory. Ms. Brenner, GIPSA, replied with a recommendation to add the sentence, "The intermediate cold grain temperature specified by the manufacturer should be the temperature used for grains that will not be tested when frozen" to the wording shown above to reflect the intent to limit the intermediate cold temperatures to those cold temperatures used before meters were tested for frozen grain. Mr. Truex, NTEP Administrator, ruled that this addition to the Background/Discussion portion of Item 4, and the corresponding additions to Items 4(a) and 4(c) could be considered editorial in nature and would not require a committee ballot. The final recommendation is shown below:

> If room temperature minus $\Delta T_{C\text{-Extreme}}$ is less than ~~**–10**~~ **0** °C an additional test will be conducted with **an intermediate cold** grain temperature ~~**equal to room temperature minus one half $\Delta T_{C\text{-Extreme}}$**~~ **specified by the manufacturer**. **The intermediate cold grain temperature specified by the manufacturer should be the temperature used for grains that will not be tested when frozen.**

Conclusion:
Make the following changes and additions to the GMM chapter of the 2011 edition of NCWM Publication 14 to address the expanded grain temperature ranges of new technology:

4.a. Proposed Changes to Test Procedures and Tolerances:

II. Sample Temperature Sensitivity
Testing is required to verify that accurate results are provided when the sample and instrument are at different temperatures. This will be referred to as the sample temperature sensitivity test. The sample temperature sensitivity test will be conducted using corn, Hard Red Winter (HRW) wheat, and soybean samples. Tests will be conducted with the instrument at room temperature and the sample temperature varying from room temperature plus ΔT_H to room temperature minus $\Delta T_{C\text{-}Extreme}$ where ΔT_H is the magnitude of the manufacturer specified maximum difference for grain above room temperature and $\Delta T_{C\text{-}Extreme}$ is the magnitude of the manufacturer specified maximum difference for grain below room temperature. **If room temperature minus $\Delta T_{C\text{-}Extreme}$ is less than 0 °C an additional test will be conducted with an intermediate grain temperature specified by the manufacturer. The intermediate cold grain temperature specified by the manufacturer should be the temperature used for grains that will not be tested when frozen.**

In no case will room temperature plus ΔT_H be allowed to exceed 45 °C ~~**but, ΔT_H need not equal ΔT_C**~~ **and in no case will room temperature minus $\Delta TC\text{-}_{Extreme}$ be allowed to be less than – 20 °C.** For purposes of these tests, room temperature will be defined as 22 °C ± 2 °C.

Two (2) samples will be selected from each of three 2 % moisture intervals for each of the three grains - corn, HRW wheat, and soybeans. Three analyses will be made for each grain sample at each of the ~~**three**~~ test temperatures. The overall bias for the 18 observations (2 samples × 3 moisture intervals × 3 replicates) run at the **Extreme Cold, Cold (if required), and Hot** temperature**s** must agree with the room temperature results within the following tolerances:

Corn	0.45
Wheat	0.35
Soybeans	0.35

Note: When changes are made in corn, soybeans, or hard red winter wheat calibrations, the Sample Temperature Sensitivity Test will have to be repeated unless spectral or other such "raw" data are available from an earlier Sample Temperature Sensitivity Test performed by the NTEP Laboratory on the same device type. When such "raw" data are available, the manufacturer will be required to predict performance at each temperature using the new calibration. If no "raw" data are available and the manufacturer can show that the temperature compensation factor (or factors) are unchanged and are independent of other calibration parameters, the Sample Temperature Sensitivity Test will not have to be repeated. For performance limits, test instructions, and testing requirements applicable to the "other 12" NTEP grains (e.g., grains other than corn, soybeans, and hard red winter wheat), see Appendix D.

4.b. Proposed Changes to Appendix A – Laboratory Performance and Test Procedures:

TEST: Sample Temperature Sensitivity

Equipment Needed: Thermometers and Environmental Cabinet

Temperature: Instrument = 22 °C ± 2 °C
Sample = 22 °C ± 2 °C (± manufacturer specified temperature difference (T))
Sample(s) Required: HRW-2 Each
Moisture: 10 % to 12 %
12 % to 14 %
14 % to 16 %

Sample(s) Required: Soybeans-2 Each

Moisture: 10 % to 12 %
12 % to 14 %
14 % to 16 %
Sample(s) Required: Corn-2 Each
Moisture: 12 % to 14 %
14 % to 16 %
16 % to 18 %

Separate Sample Required for Each **Model**: Yes
Separate Sample Required for Each **Instrument**: No

General Information:
In the following Test Procedure, the temperature equal to room temperature minus $\Delta T_{C\text{-}Extreme}$ will be referred to as "Extreme Cold," and the intermediate cold temperature specified by the manufacturer will be referred to as "Cold." Room Temperature plus ΔT_H will be referred to as "Hot." For purposes of these tests, room temperature will be defined as 22 °C ± 2 °C.

Test Sequence:
1. Power on instruments.

2. Analyze the HRW 10 % to 12 % room temperature sample 3 times on each instrument, *see example.*

Analyses	Replicate	Instrument
1	1	1
2	1	2
3	2	1
4	2	2
5	3	1

3. Repeat step 2 for the second sample.

4. Repeat steps 2 to 3 for the 12 % to 14 % samples.

5. Repeat steps 2 to 3 for the 14 % to 16 % samples.

6. Place the **HRW** samples in the Environmental cabinet set at ~~**22 °C – ΔT**~~ **Extreme Cold**.

7. Repeat steps 2 to 5 for the room temperature Soybean samples, **and place them in the Environmental Cabinet.**

8. Repeat steps 2 to 5 for the room temperature Corn samples**, and place them in the Environmental Cabinet.**

9. After all of the samples have equilibrated to ~~**22 °C – ΔT**~~ **Extreme Cold** for at least 4 hours, remove the first HRW sample from the cabinet. After checking the sample temperature, make the first analysis of HRW 1 on instrument 1. Samples must be within ± ½ °C of the target temperature.

10. Return HRW 1 to the cabinet. Run HRW 2 on instrument 2.

Note: The sample cell on each instrument is given a minimum of 10 minutes to equilibrate to room conditions before the next sample is analyzed. ***Each sample is to be checked for temperature before it is analyzed. Samples must be within 0.5 °C of the desired test temperature at time of analysis, and samples are to be reconditioned to the test temperature after each analysis.***

11. In order to efficiently analyze the samples, run all of the odd numbered samples on instrument 1 and all of the even numbered samples on instrument 2 starting with HRW then soybeans and ending with corn. By the time the last corn sample has been analyzed, the HRW samples should be reconditioned to the target temperature. Run the odd numbered samples on instrument 2 and the even numbered samples on instrument 1 to complete the replicate 1 analysis. Repeat until all samples have been analyzed 3 times on each instrument. *See Preferred Test Sequence*.

Note: Approximately 1½ to 2 hours will be required to complete the first test cycle. Depending upon sample size, it may be necessary to wait until samples are within ± ½°C of the target temperature before completing the second test cycle for Replicate 1.

12. After all the **Extreme** ~~e~~**C**old analyses are performed, allow the samples to equilibrate to room temperature for at least 4 hours.

13. Repeat steps 2 to 5 (Room 2) for the room temperature HRW samples.

14. Place the **HRW** samples in the Environmental ~~e~~**C**abinet set at ~~**22 °C + AT**~~ **Cold**.

15. Repeat steps 13 to 14 for the room temperature Soybean samples**, and place them in the Environmental Cabinet.**

16. Repeat steps 13 to 14 for the room temperature Corn samples**, and place them in the Environmental Cabinet**.

17. After all of the samples have equilibrated to ~~**22 °C + AT**~~ **Cold** for at least 4 hours, run the ~~**hot**~~ **Cold** samples using the same test sequence used for the **Extreme** ~~e~~**Cold** samples.

18. After all the ~~**hot**~~ **Cold** analyses are performed, allow the samples to equilibrate to room temperature for at least 4 hours.

19. Repeat steps 2 to 5 (Room 3) for the room temperature HRW samples.

20. Place the HRW samples in the Environmental Cabinet set to Hot.

2~~0~~**1**. Repeat step 19 for the room temperature Soybean samples**, and place them in the Environmental Cabinet**.

2~~1~~**2**. Repeat step 19 for the room temperature Corn samples**, and place them in the Environmental Cabinet**.

23. After all the Hot analyses are performed, allow the samples to equilibrate to room temperature for at least 4 hours.

24. Repeat steps 2 to 5 (Room 4) for the room temperature HRW samples.

25. Repeat step 24 for the room temperature Soybean samples.

26. Repeat step 24 for the room temperature Corn samples.

Preferred Test Sequence		
Cycle	**Instrument 1**	**Instrument 2**
1	HRW 1	HRW 2
	HRW 3	HRW 4
	HRW 5	HRW 6
	SOY 1	SOY 2
	SOY 3	SOY 4
	SOY 5	SOY 6
	CORN 1	CORN 2
	CORN 3	CORN 4
	CORN 5	CORN 6
Cycle	**Instrument 1**	**Instrument 2**
2	HRW 2	HRW 1
	HRW 4	HRW 3
	HRW 6	HRW 5
	SOY 2	SOY 1
	SOY 4	SOY 3
	SOY 6	SOY 5
	CORN 2	CORN 1
	CORN 4	CORN 3
	CORN 6	CORN 5

The two cycles need to be repeated twice to complete the three replicates of all samples on both instruments.

Note: If the intermediate Cold temperature is not required, eliminate steps 13 through 19 above and use the results of steps 19 to 22 (Room 3) for (Room 2).

4.c. Proposed Changes to Appendix E - Sample Temperature Sensitivity

(for grains/oil seeds other than corn, soybeans and hard red winter wheat)

This Appendix specifies the procedure for conducting the sample temperature sensitivity test on NTEP grains/oilseeds other than corn, soybeans, and hard red winter wheat. Tests will be conducted with the instrument at room temperature and sample temperature varying from room temperature plus ΔT_H to room temperature minus $\Delta T_{\underline{C\text{-}Extreme}}$ (where ΔT_H is the manufacturer specified difference above room temperature for the grains in Section II, and $\Delta T_{\underline{C\text{-}Extreme}}$ is the manufacturer specified difference for below room temperature for those grains.) **If room temperature minus $\Delta T_{\underline{C\text{-}Extreme}}$ is less than 0 °C an additional test will be conducted with an intermediate grain temperature specified by the manufacturer. The intermediate cold grain temperature specified by the manufacturer should be the temperature used for grains that will not be tested when frozen.**

In the following Test Procedure, the temperature equal to room temperature minus $\Delta T_{\underline{C\text{-}Extreme}}$ will be referred to as "Extreme Cold," and the intermediate cold temperature specified by the manufacturer will be referred to as "Cold." Room Temperature plus $\Delta T_{\underline{H}}$ will be referred to as "Hot." For purposes of these tests, room temperature will be defined as 22 °C ± 2 °C.

A device submitted for this test must be capable of transmitting, via its communications interface, "raw" data as well as date, grain type, predicted moisture result, and calibration version identification and recording in Standard Data Format on 3.5 inch diskette all the information listed in Appendix C. If the device itself does not include the necessary keyboard or disk drive, the manufacturer must supply a personal computer and the necessary software to build a file as described in Appendix C.

Note: *Two (2) samples are to be selected from each of three 2 % moisture intervals for each grain type for which the test is to be performed. Two analyses will be made for each grain sample at each of the* ~~***three***~~ *test temperatures. The overall bias for the 12 observations (2 samples × 3 moisture intervals × 2 replicates) run at the* ***Extreme Cold, Cold (if required), and Hot*** *temperature*~~***s extremes***~~ *must agree with the room temperature results within the tolerances listed in the accompanying table.*

Test Procedure:

1. Analyze the room temperature samples on the test instrument (Room 1).

2. Condition samples to the ~~**cold**~~ **Extreme Cold** temperature and run them on the instrument under test ~~**cold**~~ **Extreme Cold**.

Note: *Each sample is to be checked for temperature before it is analyzed. Samples must be within 0.5 °C of the desired test temperature at time of analysis, and samples are to be reconditioned to the test temperature after each analysis. The sample cell on the instrument under test is to be given a minimum of 10 minutes to equilibrate to room conditions between sample analyses.*

3. Bring the samples to room temperature, and run the samples on the instrument under test (Room 2).

4. Condition the samples to the ~~**hot**~~ **Cold** temperature and run them on the instrument under test ~~**hot**~~ **Cold**, observing the precautions in the note following step 2.

5. Repeat step 3 to obtain another set of room temperature results (Room 3).

6. **Condition the samples to the Hot temperature and run them on the instrument under test Hot, observing the precautions in the note following step 2.**

7. **Repeat step 3 to obtain another set of room temperature results (Room 4).**

Note: If the intermediate Cold temperature is not required, eliminate step 4 above and use the results of step 3 (Room 2) for step 5 (Room 3).

EXTREME COLD BIAS = Extreme Cold - ((Room 1 + Room 2) / 2)
COLD BIAS = Cold - ((Room ~~1~~**2** + Room ~~2~~**3**) / 2)
HOT BIAS = Hot - ((Room ~~2~~**3** + Room ~~3~~**4**) / 2)

Note: *When changes are made in any of the "other 12" calibrations, the Sample Temperature Sensitivity Test will have to be repeated unless spectral or other such "raw" data are available from an earlier Sample Temperature Sensitivity Test performed on the same device type by the NTEP Laboratory. When such "raw" data are available, the manufacturer will be required to predict performance at each temperature using the new calibration.*

Moisture Ranges and Tolerances for Sample Temperature Sensitivity (for the "Other 12" NTEP grains)

Grain Type	Moisture Range for Test	Tolerance Limit (Bias at Extreme Cold, Cold, and Hot Temperatures ~~Extremes~~)
Durum Wheat	10 % – 16 %	0.35
Soft White Wheat	10 % – 16 %	0.35
Hard Red Spring Wheat	10 % – 16 %	0.35
Soft Red Winter Wheat	10 % – 16 %	0.35
Hard White Wheat	8 % – 14 %	0.35
Sunflower Seed (Oil)	6 % – 12 %	0.45
Grain Sorghum	10 % – 16 %	0.45
Two-Rowed Barley	10 % – 16 %	0.35
Six-Rowed Barley	10 % – 16 %	0.45
Oats	8 % – 14 %	0.45
Long Grain Rough Rice	10 % – 16 %	0.45
Medium Grain Rough Rice	10 % – 16 %	0.45

4.d. Proposed Changes to GMM Checklist

1. Indicating Elements, Recording Elements and Recorded Representations

Code Reference: S.1.3. Operating Range

1.10. The operating range shall specify the following:

1.10.3. The ambient temperature range over which the meter may be used is specified and moisture results are neither displayed nor printed outside this range. ☐ Yes ☐ No ☐ N/A

1.10.4. The temperature range for each grain or seed for which the meter is to be used is specified and moisture results are neither displayed nor printed outside this range. ☐ Yes ☐ No ☐ N/A

1.10.4.1. If a grain or seed has multiple temperature ranges each intended for use over a different moisture range, the moisture ranges are specified for each temperature range, and moisture results are neither displayed nor printed if outside the applicable moisture or temperature ranges. ☐ **Yes** ☐ **No** ☐ **N/A**

5. Item 310-1 Provision for Sealing Electronic Adjustable Components

Background/Discussion:
This item originated from the Southern Weights and Measures Association and first appeared on the S&T Committee's 2008 agenda.

NTEP evaluators inspected some devices that could be sealed in an "adjustment" mode which would allow the user to make adjustments without breaking a physical security seal. NTEP started receiving an increasing number of reports that users and service agents were not following the instructions in the user's manuals for these devices, thus rendering the method of sealing ineffective.

The purpose of the original submitter's proposed changes were intended to clarify what is considered an effective method of sealing metrological features, and what information is required to be indicated and recorded when a device is in a metrological adjustment mode.

The 92nd through 96th NCWM S&T Committees, regional weights and measures associations, NTETC Sectors, and other interested parties have considered several proposals intended to address this issue. Throughout these deliberations, it became apparent that a single interpretation of G-S.8. was needed and should be distributed to the NTEP laboratories so that type evaluation procedures for sealing could be reviewed and, if necessary, amended.

The 2010 S&T Committee agreed with comments that no changes were needed to paragraph G-S.8. Consequently, the Committee developed an amended proposal in its 2010 Committee Report, and recommended that the amended proposal be given Informational status to allow interested parties sufficient time to analyze and comment on the most recent language.

The NTETC Weighing Sector and Scale Manufacturers Association (SMA) both recommended that the item be withdrawn, believing that type evaluation procedures have been amended in applicable sections of NCWM Publication 14 to address the issues of incorrectly applying the requirements in G-S.8.

Although the S&T Committee agreed with the comments to withdraw this item, it was concerned that its interpretation would be overlooked in the future if the item was Withdrawn. The Committee agreed to remove the language originally proposed in its 2011 NCWM Interim Meeting Agenda and proposed revised language for consideration as a Voting Item. The Committee further recommended that NTETC Sectors consider adding the language to the applicable "Philosophy for Sealing" appendices in NCWM Publication 14.

The proposed language was made a Voting Item for the 2011 NCWM Annual Meeting. After discussing the comments from the 2011 NCWM Annual Meeting Open Hearings and the proposed changes from NIST, Office of Weights and Measures (OWM), the Committee modified the Item Under Consideration to read as follows:

> **Item Under Consideration:**
> **The current language in paragraph G-S.8. states: "A device shall be designed with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism."**
>
> **Thus, for parameters protected by physical means of security, once a physical security seal is applied to the device, it should not be possible to make a metrological change to those parameters without breaking that seal. Likewise, for parameters protected by electronic means of security, it should not be possible to make a metrological change to those parameters without that change being reflected in the audit trail. Since this philosophy addresses provisions for protecting access to any metrological adjustment, the philosophy should be applied consistently to all electronic device types.**

See the 2008 NCWM Annual, 2009 and 2010 Interim and Annual Reports for additional background information.
The "Item Under Consideration" was placed on the S&T Consent Calendar and was adopted by the 96th Annual Conference.

This item is a carryover from the 2009 NTETC Grain Analyzer Sector Meeting (Agenda Item 9) and again in 2010 (Agenda Item 5). At the Sector's August 2011 meeting, Mr. Truex, NTEP Administrator, notified the Sector that he will add the modified "Item Under Consideration" as shown above to Appendix B of the GMM Chapter of the 2011 edition of NCWM Publication 14 and to Appendix A of the NIR Grain Analyzer Chapter of the 2011 edition of NCWM Publication 14. Sector action would not be required on items 5(d) and 5(e).

5.a. Proposed Changes to NIST Handbook 44, Table S.2.5., Section 5.56.(a)

Background/Discussion:
Table S.2.5. Categories of Device and Methods of Sealing that appears in §5.56.(a) of NIST Handbook 44 lists acceptable methods of sealing for various categories of GMMs. When the Sector first recommended adding the table to NIST Handbook 44 at their September 1996 meeting, the concept of making a change to a GMM from a remote site involved information "…sent by to the device by modem (or computer)." In 2011, this concept has expanded to include the ability of the measuring device to accept new or revised sealable parameters from a memory chip, external computer, network, or other device plugged into a mating port (e.g., USB port) on the measuring device or connected wirelessly to the measuring device.

All of the GMMs in Categories 3, 3a, and 3c of Table S.2.5. use an electronic method of sealing, and most of them also offer access to the configuration mode thorough a keyboard entered password. In this mode, sealable parameters can also be changed locally through the keyboard. Category 3 of Table S.2.5. currently includes the following requirement:

> When accessed remotely for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.

The Sector agreed by consensus that the following changes to Table S.2.5. of §5.56.(a) of NIST Handbook 44 should be forwarded to the S&T Committee for consideration:

- Add a note to Table S.2.5. to recognize the expanded scope of "remote capability".

- Delete "remotely" from the second paragraph of Category 3 requirements that begins, "When accessed remotely …" to make it clear that the requirements of Category 3 apply whether accessed manually using the keyboard or accessed by remote means.

- Add the modified second paragraph of Category 3 requirements to Categories 3a and 3b to make it clear that these requirements apply to all the subcategories of Category 3.

The proposed changes to Table S.2.5. are shown below as Item Under Consideration.

The Sector also agreed that contingent upon acceptance of Item Under Consideration the changes to the GMM Chapter of NCWM Publication 14 shown in Agenda Items 5(b) and 5(c) should be made.

Item Under Consideration NIST Handbook 44:

Table S.2.5. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *A device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for remote configuration.*	*The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.*
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *When accessed* ~~***remotely***~~ *for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring 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 (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants). 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 twenty-five (25) 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.)*
Category 3a: *No remote capability, but operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc.) in normal operation.* ***When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.***	*Same as Category 3*
Category 3b: *No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password).* ***When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.***	*Same as Category 3*
Note: In addition to the definition of remote configuration capability as defined in Appendix D of HB44, as used in this table, "remote configuration capability" also includes the ability of the measuring device to accept new or revised sealable parameters from a memory chip, external computer, network, or other device plugged into a mating port (e.g., USB port) on the measuring device or connected wirelessly to the measuring device. **(Added 201X)**	

[*Nonretroactive as of January 1, 1999* ***and January 1, 20XX***]

(Amended 1998 and 20XX)

Note: Zero-setting and test point adjustments are considered to affect metrological characteristics and must be sealed. (Added 1993) (Amended 1995 and 1997)

5.b. Proposed Changes to NCWM Publication 14, GMM Appendix C, Table S.2.5.

Changes shown below are contingent upon acceptance of Item Under Consideration.

Table S.2.5. 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 (000 to 999) and one for configuration parameters (000 to 999.) If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.
Category 2:	Remote configuration capability, but access is controlled by physical hardware. Device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for remote configuration.	The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters; one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999.) If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.
Category 3:	Remote configuration capability, access may be unlimited or controlled through a software switch (e.g. password.) When accessed ~~**remotely**~~ for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measure 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 (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants.) 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 twenty-five (25) 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.)*
Category 3a:	No remote capability, but operator is able to make changes that affect the metrological integrity of the device (e.g. slope, bias, etc.) in normal operation. **When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measure mode.**	Same as Category 3

Categories of Device	Method of Sealing
Category 3b: No remote capability, but access to metrological parameters is controlled through a software switch (e.g. password.) **<u>When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measure mode.</u>**	Same as Category 3

[Non-retroactive as of January 1, 1999]

*(Amended 1998 **<u>and 20XX)</u>***

5.c. Proposed Changes to NCWM Publication 14, GMM Checklist

Changes shown below are contingent upon acceptance of Item Under Consideration.

2. Design of Measuring Elements

~~For Category 3 Devices:~~

2.10.5. If a measurement is in process when the device is accessed ~~**remotely**~~ for the purpose of modifying sealable parameters, the measurement is either: ☐ Yes ☐ No ☐ N/A

- Terminated Before Results can be Displayed or Printed. **OR**
- Completed Before Entering the Configuration Mode

2.10.6. When accessed ~~**remotely**~~ for the purpose of modifying sealable parameters, the device clearly indicates that it is in the configuration mode and is not capable of operating in the measure mode. ☐ Yes ☐ No ☐ N/A

5.d. Proposed Changes to NCWM Publication 14, GMM Appendix B

Appendix B
Philosophy for Sealing
Typical Features to be Sealed
Principles for Determining Features to be Sealed
The need to seal some features depends upon:

- The ease with which the feature or the selection of the feature can be used to facilitate fraud. **AND**
- The likelihood that the use of the feature will result in fraud not being detected.
-

5.e. Proposed Changes NCWM Publication 14, NIR Appendix A

Appendix A
Philosophy for Sealing
Typical Features to Be Sealed
Principles for Determining Features to Be Sealed
The need to seal some features depends upon:

- The ease with which the feature or the selection of the feature can be used to facilitate fraud. **AND**

- The likelihood that the use of the feature will result in fraud not being detected.

  Features or functions which are routinely used by the operator as part of device operation, such as selecting the grain calibration to be used, are not sealable parameters and shall not be sealed.

5.f. Proposed Changes to NCWM Publication 14, NIR Checklist

NIR Grain Analyzers use an electronic method of sealing similar to those of GMMs, and most of them also offer access to the configuration mode thorough a keyboard entered password. In this mode, sealable parameters can be changed locally through the keyboard. The Sector agreed that contingent upon acceptance of Item Under Consideration the NIR Check List of NCWM Publication 14 should be modified to delete "remotely" from section 4 Design of NIR Analyzers, paragraph 4.9.16 as shown below.

4. Design of NIR Analyzers

~~**For Category 3 Devices:**~~

4.10.7. If a measurement is in process when the device is accessed ~~**remotely**~~ for the purpose of modifying sealable parameters, the measurement is either: ☐ Yes ☐ No ☐ N/A

6. Item 310-2: G-S.1. Identification. – (Software)

Source:
2010 Carryover Item 310-3. This item originated from the NTETC Software Sector and first appeared on the S&T Committee's 2007 agenda as Developing Item Part 1, Item 1.

Background/Discussion:
This proposal is intended to amend the identification marking requirements for all electronic devices manufactured after a specified date by requiring that metrological software version or revision information be identified. Additionally, the proposal will list methods, other than "permanently marked," for providing the required information.

After the 2008 NCWM Annual Meeting, the S&T Committee received the NTETC Software Sector's Proposal to amend G S.1. Identification and/or G S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices in the Committee's 2008 Interim Report. The proposal listed "acceptable" and "not acceptable" methods for presenting:

- NTEP CC Number

- Make

- Model

- Serial Number

- Software Version / Revision Number

At the 2009 NCWM Interim Meeting, SMA commented that it has consistently opposed having different requirements between embedded and downloadable/programmable software-based devices. The SMA added that it continues to support the intent of the proposal and will continue to participate in the NTETC Software Sector discussions to develop alternate proposals for the marking of software-based devices. Several weights and measures

officials expressed concerns that the proposed language does not specify how the identification information is to be retrieved if it is not continuously displayed, noting this could result in several ways to access the information (e.g., passwords, display checks, or dropdown menus). The SMA added that the identification location information on the NTEP CC will become outdated anytime a manufacturer changes the way the information can be retrieved. The SMA suggested that a limited number of methods to access the identification information be developed and specified as the only acceptable methods to retrieve identification information. This would make it easier for the inspector to verify the required identification information.

This item remained Informational to allow NCWM members to further study the proposal in order to develop a consensus on the format for Table G S.1. Identification in the NTETC Software Sector's 2009 Meeting Summary.

During the 2011 NCWM Annual Meeting Open Hearings, the S&T Committee heard from NIST, OWM relative to whether or not the status of this item should be changed from Informational to Developing in order to provide the NTETC Software Sector additional time to more fully develop the item.

The S&T Committee discussed the comments offered by NIST, OWM and the SMA. After considering those comments, the Committee agreed to change the status of this item from Informational to Developing because the item lacks enough information for full consideration and a full proposal has yet to be developed.

Conclusion:
The NTETC Grain Analyzer Sector had no comments other than those previously submitted. See GS August 2010 Meeting Summary, Agenda Item 6.

7. Other Software Requirements That May Impact Grain Analyzers

The items under this heading are mostly excerpts from the NTETC Software Sector's March 2010 Meeting Summary intended to keep NTETC Grain Analyzer Sector Members informed of developmental software requirements that may impact grain analyzers. For additional information, see the complete NTETC Software Sector 2011 Meeting Summary. This meeting summary was not available at the time of the NTETC Grain Analyzer Sector Meeting. No action was taken on this item at the August 2011 Sector meeting.

7.a. Identification of Certified Software

> *Note: This item is now partially covered by the provisional proposal to make G-S.1.(d) applicable to software-based electronic devices and by adding the following new sub-subparagraph G S.1.(d)(3):*
>
> "The version or revision identifier shall be directly and inseparably linked to the software itself. The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software."

Also, the NTETC Software Sector recommends the following information be added to NCWM Publication 14 as explanation/examples:

- Unique identifier must be displayable/printable on command or during operation, etc.
- At a minimum, a version/revision indication (1.02.09, rev 3.0 a, etc.). Could also consist of/contain checksum, etc. (crc32, for example).

NTETC Software Sector Conclusions:
The item needs additional discussion and development by the NTETC Software Sector. Outstanding questions:

- If we allow hard-marking of the software identifier (the Sector has wavered on this in the past), does the above wording then imply that some mechanical means is required (i.e. physical seal) to "inseparably link" the identifier to the software?
- Do we still have to be able to display/print the identifier if it is hard-marked?

7.b. Software Protection/Security

Background/Discussion:
The NTETC Software Sector derived a trial NCWM Publication 14 checklist based on the International Organization of Legal Metrology (OIML) checklist to verify that the software adequately protected against fraudulent modification as well as accidental or unintentional changes. The checklist has been distributed to current NTEP laboratories for use on a trial basis for new type approval applications.

1. Devices with Embedded Software TYPE P (aka built-for-purpose)

1.1. Declaration of the manufacturer that the software is used in a fixed hardware and software environment. **AND** ☐ Yes ☐ No ☐ N/A

1.2. Cannot be modified or uploaded by any means after securing/verification. ☐ Yes ☐ No ☐ N/A

Note: It is acceptable to break the "seal" and load new software, audit trail is also a sufficient seal.

1.3. The software documentation contains:

1.3.1. Description of all functions, designating those that are considered metrologically significant. ☐ Yes ☐ No ☐ N/A

1.3.2. Description of the securing means (evidence of an intervention). ☐ Yes ☐ No ☐ N/A

1.3.3. Software Identification ☐ Yes ☐ No ☐ N/A

1.3.4. Description how to check the actual software identification. ☐ Yes ☐ No ☐ N/A

1.4. The software identification is:

1.4.1. Clearly assigned to the metrologically significant software and functions. ☐ Yes ☐ No ☐ N/A

1.4.2. Provided by the device as documented. ☐ Yes ☐ No ☐ N/A

2. Personal Computers, Instruments with PC Components, and Other Instruments, Devices, Modules, and Elements with Programmable or Loadable Metrologically Significant Software TYPE U (aka not built-for-purpose)

2.5. The metrologically significant software is:

2.5.1. Documented with all relevant (see below for list of documents) information. ☐ Yes ☐ No ☐ N/A

2.5.2. Protected against accidental or intentional changes. ☐ Yes ☐ No ☐ N/A

2.6. Evidence of intervention (such as, changes, uploads, circumvention) is available until the next verification / inspection (e.g., physical seal, Checksum, CRC, audit trail, etc. means of security). ☐ Yes ☐ No ☐ N/A

3. Software with Closed Shell (no access to the operating system and/or programs possible for the user)

3.7. Check whether there is a complete set of commands (e.g., function keys or commands via external interfaces) supplied and accompanied by short descriptions. ☐ Yes ☐ No ☐ N/A

3.8. Check whether the manufacturer has submitted a written declaration of the completeness of the set of commands. ☐ Yes ☐ No ☐ N/A

4. Operating System and/or Program(s) Accessible for the User

4.1.	Check whether a checksum or equivalent signature is generated over the machine code of the metrologically significant software (program module(s) subject to legal control Weights and Measures jurisdiction and type-specific parameters).	☐ Yes ☐ No ☐ N/A
4.2.	Check whether the metrologically significant software will detect and act upon any unauthorized alteration of the metrologically significant software using simple software tools (e.g., text editor).	☐ Yes ☐ No ☐ N/A

5. Software Interface(s)

5.1. Verify the manufacturer has documented:

5.1.1.	The program modules of the metrologically significant software are defined and separated.	☐ Yes ☐ No ☐ N/A
5.1.2.	The protective software interface itself is part of the metrologically significant software.	
5.1.3.	The functions of the metrologically significant software that can be accessed via the protective software interface.	☐ Yes ☐ No ☐ N/A
5.1.4.	The parameters that may be exchanged via the protective software interface are defined.	☐ Yes ☐ No ☐ N/A
5.1.5.	The description of the functions and parameters are conclusive and complete.	☐ Yes ☐ No ☐ N/A
5.1.6.	There are software interface instructions for the third party (external) application programmer.	☐ Yes ☐ No ☐ N/A

The laboratories again indicated they had not had a chance to utilize the checklist. The list was reviewed and some minor modifications to the checklist text were incorporated as shown above.

NTETC Software Sector Conclusion:
Work is ongoing on this item with the intent that it eventually be incorporated as a checklist in NCWM Publication 14; again the labs are requested to try utilizing this checklist for any evaluations on software-based electronic devices.

7.c. Software Maintenance and Reconfiguration

Background/Discussion:
The NTETC Software Sector agreed that the two definitions below for Verified Update and Traced Update were acceptable.

Verified Update: A Verified Update is the process of installing new software where the security is broken and the device must be re-verified. Checking for authenticity and integrity is the responsibility of the owner/user.

Traced Update: A Traced Update is the process of installing new software where the software is automatically checked for authenticity and integrity, and the update is recorded in a software update log or audit trail.

The NTETC Software Sector also worked towards language proposed for defining the requirements for a Traced Update (currently considered as relevant for NCWM Publication 14):

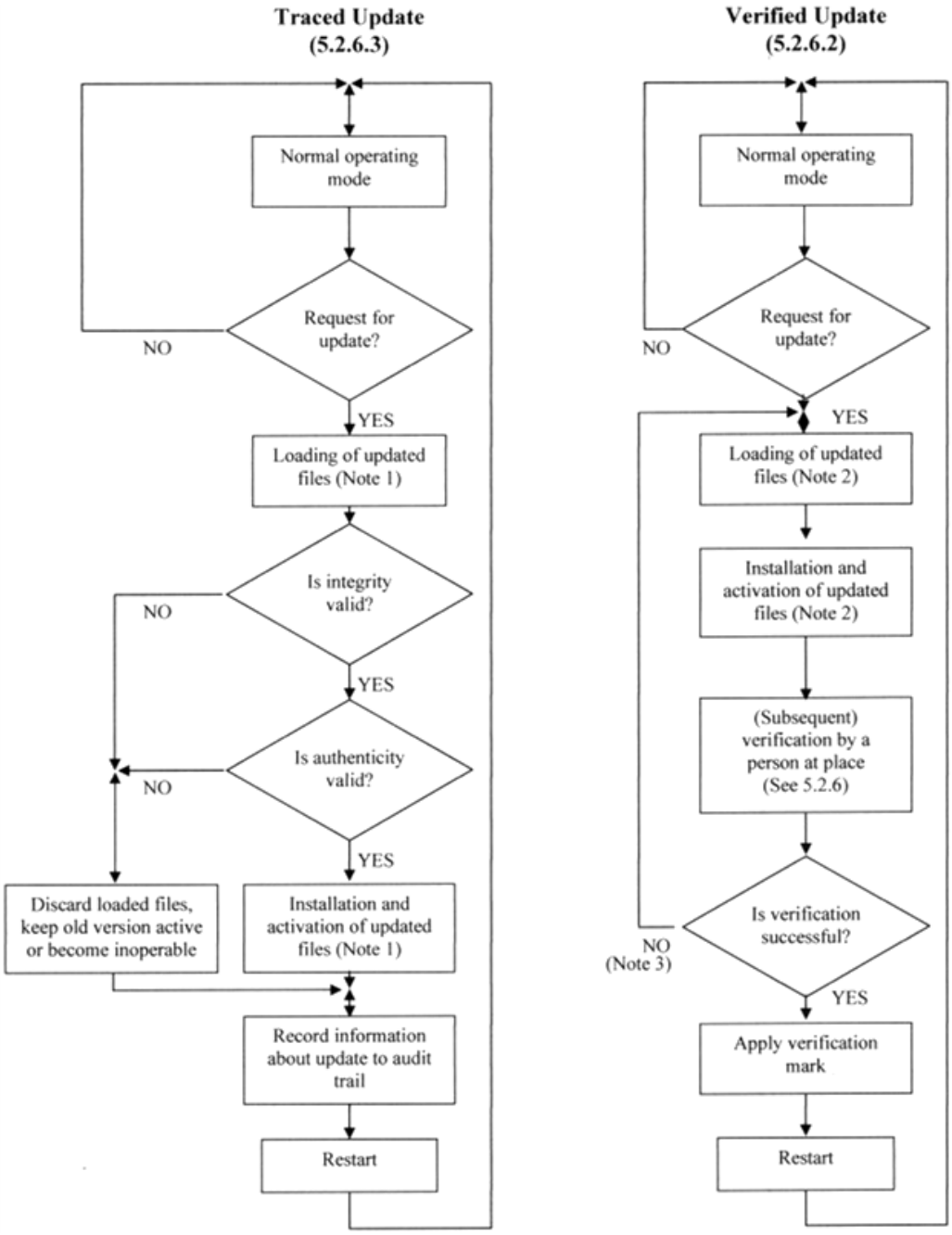
For a Traced Update, an event logger is required. The logger shall be capable of storing a minimum of the 10 most recent updates. An entry shall be generated for each software update.

Use of a Category 3 audit trail is required for the Traced Update. If software update is the only loggable event, then the Category 3 audit trail can be limited to only 10 entries. A log entry representing a software update shall include the software identification of the newly installed version.

NTEC Software Sector Conclusions:
The general consensus of the Sector after considering feedback from external interested parties is that a new G-S.9. with explicit requirements [for Metrologically Significant Software] is not necessary (nor likely to be adopted by NCWM) and that this requirement belongs in NCWM Publication 14 lists of sealable parameters rather than in NIST Handbook 44; that is:

The updating of metrologically significant software shall be considered a sealable event.

Additional work is to be done to further develop the proposed text toward inclusion in NCWM Publication 14.
At its August 2009 NTETC Grain Analyzer Sector Meeting the Sector questioned the need for a definition of "Traced Update". The Traced Update was initially intended to cover cases in Europe where the National Body controls a network of devices and wants to update all the devices simultaneously from a central location. Denmark and France do this with NIR Grain Analyzers. Even though individual states may still require that a device updated via a "Traced Update" must be "returned to service" by a registered serviceperson before it can be used, the Sector may want to consider adopting "Traced Update" requirements for all Category 3 Grain Analyzers. The device is still subject to later inspection by state weights and measures personnel. By designing to the requirements for "Traced Update", states might be encouraged to allow devices updated to those requirements to be returned to service without requiring a visit by a registered serviceperson.



Software Update Procedure – from OIML D 31:2008 (E)
Notes:

1. In the case of a Traced Update updating is separated into two steps: "loading" and "installing/activating." This implies that the software is temporarily stored after loading without being activated because it must be possible to discard the loaded software and revert to the old version, if the checks fail.

2. In the case of a Verified Update, the software may also be loaded and temporarily stored before installation but depending on the technical solution loading and installation may also be accomplished in one step.

3. Here, only failure of the verification due to the software update is considered. Failure due to other reasons does not require re-loading and re-installing of the software, symbolized by the NO-branch.

8. Test Weight per Bushel Acceptance and Maintenance Tolerances

Source:
Mr. Adkisson, Grain and Feed Association of Illinois

Background/Discussion:
The Sector first considered this issue at its March 1996 meeting. At the 1997 NTETC Grain Analyzer Sector Meeting, the Sector agreed that priority should be given to drafting changes to the Grain Moisture Code to specify field test methods and reasonable tolerances. A draft of proposed changes to the Code was reviewed by the Sector at its March 1998 meeting. Action to forward the draft to the S&T Committee on was deferred pending receipt of feedback from the grain trade on the acceptability of the proposed tolerances and feedback from weights and measures members on a sampling of field test results applying those tolerances. Committee Ballot 84-03 to add the proposed changes to NIST Handbook 44, Section 5.56.(a), was issued on August 18, 1998, with ballots due for return by September 10, 1998. The TW tolerances proposed at that time are shown below:

Test Weight per Bushel	
Type of Grain or Seed	**Acceptance and Maintenance Tolerance**
Corn	**1.1 lb per bushel**
Sorghum, soybeans, and all wheat classes	**0.6 lb per bushel**
Barley, oats, rice, sunflower, and all other small cereal grains and oil seeds	**0.9 lb per bushel**

Most of the sector members agreed with the need for criteria but were not in agreement with the tolerances.
In a written comment accompanying his ballot, Professor Hurburgh, Iowa State University (ISU), suggested that the proposed tolerances had not been calculated correctly and were not discriminating enough. Professor Hurburgh submitted an analysis of variances in test weight per bushel measurements based on data collected by the Grain Quality Laboratory at ISU. For corn, he proposed a tolerance of 0.80 pounds per bushel, setting it at plus or minus two standard deviations relative to the reference. His calculations assumed:

- A root mean square difference (RMSD) of 0.55 lb/bu (each sample tested once in standard quart cup and once in meter)

- A standard error (precision) of 0.3 for corn (and 0.15 for other grains) for both cup and meter

The corn columns in the following table illustrate the method used by Professor Hurburgh in his calculations. The rest of the table has been filled in to show suggested tolerances for the remaining grains at both 95.4 % and 99.7 % confidence levels. *Editor's note: The grain groupings shown in the table represent the original groupings suggested prior to the Sector's 1999 meeting. The groupings in the present code are the groupings adopted at the Sector's September 1999 meeting.*

	Single Test on drop in cup and one in meter			**Calculated for Replicated Tests 10 drops in cup and 3 in meter**		
	Corn	Sorghum, Soybeans, Wheat (all classes)	Barley, Oats, Rice, Sunflower, and all other small cereal grains and oil seeds	Corn	Sorghum, Soybeans, Wheat (all classes)	Barley, Oats, Rice, Sunflower, and all other small cereal grains and oil seeds
Cup Standard Deviation (precision/repeatability)	0.3000	0.1500	0.1500			
Meter Standard Deviation (precision/repeatability)	0.3000	0.1500	0.1500			
Variance due to Cup precision/repeatability (SD^2 for Cup precision)	0.0900	0.0225	0.0225	0.0090	0.0023	0.0023
Variance due to Meter precision/repeatability (SD^2 for Meter precision)	0.0900	0.0225	0.0225	0.0300	0.0075	0.0075
Other Variances (calculated so sum of variances equals the total below)	0.1225	0.0450	0.1150	0.1225	0.0450	0.1150
Total variance ($RMSD^2$)	0.3025	0.0900	0.1600	0.1615	0.0548	0.1248
RMSD (for Single Test conditions this is obtained from test data)	0.55	0.30	0.40	0.40	0.23	0.35
Tolerance 1 (lb/bu) (2x RMSD)	1.10	0.60	0.80	0.80	0.46	0.70
Tolerance 2 (lb/bu) (3xRMSD)	1.65	0.90	1.20	1.20	0.69	1.05
Originally Proposed Tolerance (lb/bu)				1.10	0.60	0.90

At the Sector's September 1999 meeting, maintenance tolerances of ±0.8 pounds per bushel for corn and oats; ± 0.5 pounds per bushel for all classes of wheat; and ± 0.7 for soybeans, barley, rice, sunflower, and sorghum were proposed for further study. Although several members opposed adopting the proposed tolerances and groupings for the following reasons: 1) difficult to meet the proposed tolerance for wheat; 2) difficult to obtain samples for field test; and 3) not discriminating enough for corn, they agreed to consider them for further study.

States agreeing to participate in a field evaluation of the proposed tolerances and test methods included:

- Arkansas
- Illinois
- Nebraska
- North Carolina
- Maryland
- Missouri

In late September 2000, the USDA/GIPSA sent one portion of a HRW standardizing sample to each of the participating state laboratories. Participating laboratories verified that the quart kettle used in their standard Test Weight (TW) per bushel apparatus met the requirements in GIPSA's volume test procedures. They also verified that the apparatus was set up according to GIPSA standards before testing the HRW standardizing samples. With the

exception of one state, the test weight apparatuses were within GIPSA's tolerance. GIPSA has since worked with the state to correct the test weight apparatus that was out of tolerance.
To obtain base-line performance data on the standard quart kettle test method for corn and soybeans, GIPSA sent corn and soybeans samples to the participating laboratories prior to the 2002 NTETC Grain Analyzer Sector Meeting. Tests were run on each state's standard quart kettle TW apparatus and on any NTEP model Grain Moisture Meter with TW capability that the state had in its laboratory.

	Quart Kettle Method Test Weight per Bushel Test Results for Participating State Grain Moisture Labs with GIPSA Measurements as Reference			
	Corn		**Soybeans**	
	Bias (pounds per bushel) (avg. of 3 replicates)	Individual Lab Precision (pounds per bushel) (3 replicates)	Bias (pounds per bushel) (avg. of 3 replicates)	Individual Lab Precision (pounds per bushel) (3 replicates)
State 1	0.23	0.06	0.13	0.06
State 2	− 0.60	0.00	− 0.50	0.00
State 3	0.07	0.06	0.00	0.00
State 4	0.27	0.06	0.27	0.06
State 5	− 0.07	0.06	− 0.13	0.06
State 6	0.30	0.00	0.07	0.06
Avg Bias*	0.16	---	− 0.07	---
SDD of Overall Bias*	0.16	---	0.15	---
* the data from State 2 was not included in Avg Bias and SDD of Overall Bias				

With the exception of State 2 that reported results significantly lower than the reference for both corn and soybeans, the results indicate that in a laboratory setting the quart kettle method can achieve accuracies (based on the average of three readings) that are approximately one-half to one-third the proposed maintenance tolerances of ±0.8 pounds per bushel for corn and ± 0.7 pounds per bushel for soybeans.

The same set of samples used for the Quart Kettle Method tests were used to test NTEP grain moisture meters located in state moisture labs and in the ongoing calibration maintenance program at GIPSA. (Note: Some of the meters located in state moisture labs may have been used as Field Standards). For both NTEP and State Laboratory meters, the bias on NTEP meters using TW calibrations that had been standardized met the proposed tolerance requirements for corn and soybeans with one exception. The exception, with an error at least seven times greater than meters of the same type, was judged to be an isolated case, most likely indicating the need for service, as results for nine other meters of like type were well within the proposed tolerance limits. Consistent biases on the majority of meter models with TW calibrations that had not been standardized suggest that with proper standardization, these models would also meet the proposed tolerance requirements. The laboratory TW results (from both NTEP and state laboratories) for GMM's are summarized below.

Test Weight per Bushel Test Results
for
Grain Moisture Meters in Participating State Grain Moisture Labs and at the NTEP Laboratory
with
GIPSA Quart Kettle Measurements as Reference

Model	Number of Meters Tested	Corn		Soybeans	
		Average Bias (pounds per bushel)	SDD (pounds per bushel) Based on 3 Replicates per Meter	Average Bias (pounds per bushel)	SDD (pounds per bushel) Based on 3 Replicates per Meter
Model 1	2	− 0.35	0.21	0.08	0.12
Model 2	9*	− 0.29	0.17	− 0.04	0.16
Model 3	3	− 1.14	0.21	− 0.66	0.07
Model 4	2	− 1.12	0.40	− 0.37	0.38
Model 5	2	− 1.48	0.35	− 1.35	0.07
* net of 1 outlier					

Dr. Pierce, GIPSA, remarked that the repeatability of the meters was impressive, especially in light of the fact that the SD between two inspectors at GIPSA is typically 0.25 pounds per bushel for official inspections. This translates to 0.5 pounds per bushel at a 95 % confidence level.

One sector member noted that the samples used for the initial tests were fairly dry (corn: approximately 13.3 % and soybeans: approximately 10 %). The use of low moisture samples, plus the fact that the samples were also clean and free of foreign material and broken kernels may have contributed to the excellent results obtained in the initial lab tests. Official TW determinations by GIPSA, for most large grains, are obtained prior to removal of dockage and foreign material.

It was also pointed out that TW measurements on high moisture samples are not reliable. In normal years, TW will increase as a grain samples loses moisture. The grain kernel tends to shrink somewhat as it dries. In fact, the volume reduction is normally greater, percentage wise, than the reduction in mass due to drying. As a result, TW (weight per unit volume) increases. The surface condition of high moisture corn may also contribute to additional variance in the packing density as the sample is loaded into the test kettle or test cell of a GMM.

A field test was also conducted on a sampling of TW capable NTEP grain moisture meters. Participating laboratories obtained their own samples for this test. Each participating laboratory was to make an initial determination of the test weight per bushel of each sample portion with the standard quart kettle apparatus before sending it to the field. Tests were to be run on TW capable NTEP grain moisture meters and on the kettle test weight apparatus used at each commercial location selected for field-testing. Kettle tests at each location were to be made by the operator who normally made test weight per bushel determinations for commercial transactions. No instruction was to be given to the operator on how to perform the test. The participating laboratory was to make a final determination of test weight per bushel when the sample was returned to the laboratory. Data was to be collected on no more than twenty instruments per grain sample.

In August 2002, field data were received from Illinois, Missouri, Nebraska and Arkansas. The results are summarized below. The Sector noted that TW errors were essentially the same for both GMM's with TW capability and for the various kinds of stand-alone TW apparatus currently in use in the field. The results for corn and soybeans were especially encouraging considering that most of the field GMM's had not been adjusted for optimum performance on TW.

Biases reported by Arkansas were significantly greater (and all negative with respect to their reference) than those reported for wheat and soybeans by other states on both GMM devices and on kettle test weight apparatus. The

Arkansas weights and measures representative said that he would review the data to see if a cause for this difference could be determined.

Field Evaluation – Bushel Test Weight
Hard Red Winter Wheat and Soft Red Winter Wheat
State Quart Kettle Apparatus as Reference

State	Grain Moisture Meters		TW Apparatus	
	SDD (pounds per bushel) Based on 3 replicates per meter	Average Bias (pounds per bushel) with respect to reference sample	SDD (pounds per bushel) Based on 3 replicates per device	Average Bias (pounds per bushel) with respect to reference sample
All Participating States	0.47	− 0.47	0.31	− 0.23
Illinois	0.43	− 0.52	0.50	0.02
Missouri	0.26	− 0.55	0.32	− 0.31
Nebraska	0.29	− 0.02	0.23	− 0.19
Arkansas (net of 1 outlier)	0.45	− 0.92	0.23	− 0.36

Field Evaluation – Bushel Test Weight
Soybeans
State Quart Kettle Apparatus as Reference

State	Grain Moisture Meters		TW Apparatus	
	SDD (pounds per bushel) Based on 3 replicates per meter	Average Bias (pounds per bushel) with respect to reference sample	SDD (pounds per bushel) Based on 3 replicates per device	Average Bias (pounds per bushel) with respect to reference sample
All Participating States	0.85	− 0.10	0.64	0.06
Illinois	0.40	− 0.09	0.41	0.25
Missouri	0.32	0.66	0.20	0.36
Nebraska	0.52	− 1.19	0.56	− 1.04
Arkansas (net of 1 outlier)	0.85	− 0.10	0.64	0.06

Field Evaluation – Bushel Test Weight
Corn
State Quart Kettle Apparatus as Reference

State	Grain Moisture Meters		TW Apparatus	
	SDD (pounds per bushel) Based on 3 replicates per meter	Average Bias (pounds per bushel) with respect to reference sample	SDD (pounds per bushel) Based on 3 replicates per device	Average Bias (pounds per bushel) with respect to reference sample
All Participating States	0.55	0.05	0.61	− 0.27
Illinois	0.60	0.33	0.46	0.37
Nebraska	0.38	− 0.18	0.37	− 0.59

In early 2007, an outreach study was conducted to determine which jurisdictions were inspecting GMMs for accuracy in test weight per bushel TW determination. Of the six states responding four had been inspecting GMMs for TW for several years. None of the four reported any problems with procedures or tolerances. South Carolina, then in its fourth year of inspecting for TW, reported a decline in meters rejected for TW indications. Initial rejection rate for TW was 47.57 %. The 2006 inspection year yielded a rejection rate of 12.27 %, while tests thus far in 2007 showed a rejection rate of 2.83 %.

The submitter believes that test weight tolerances are too tight for field operation of GMMs at country grain elevators in Illinois. Some manufacturers have also expressed concern over the large number of GMM Field Test failures due to exceeding NIST Handbook 44 TW Acceptance and Maintenance Tolerances.

The submitter has recommended that NIST Handbook 44 TW tolerances be increased by 50 %.

Table T.3.
Acceptance and Maintenance Tolerances Test Weight per Bushel

Type of Grain or Seed	Tolerance (pounds per bushel)
Corn, oats	~~**0.8**~~ **1.20**
All wheat classes	~~**0.5**~~ **0.75**
Soybeans, all barley classes, all rice classes, sunflower, sorghum	~~**0.7**~~ **1.05**

As an alternative solution, the submitter has suggested allowing GMMs to print (and display) "approximate test weight." See Agenda Item 12.

Conclusion:
Mr. Adkisson, Grain and Feed Association of Illinois, cited problems his industry is having regarding TW. GMMs that have failed TW during field inspection are sent to the manufacturer for repair. When the meters are returned, the reports indicate that no problems have been found. There are also situations where a meter has failed TW.

When the state inspector subsequently tested the elevator's quart kettle it matched the meter, but it didn't match the state inspector's sample. This is particularly frustrating for the country elevators in Illinois that are using the GMM TW only as a screening tool.

Mr. Cunningham, Illinois Department of Agriculture, outlined the care being used to select and measure TW samples used in field inspection. Field inspectors carry two portions of each TW sample. The second portion can be compared to the first portion if any results are suspect. He was of the opinion that this was more a problem of meters in the field not being consistent within any one brand.

Ms. Eigenmann, DICKEY-john Corporation, referred the Sector to a USDA study that listed critical factors in the use of the standard quart kettle and the resultant errors if not used properly. Improperly used, the "standard method" isn't so standard.

The NTEP laboratory collects TW data on two meters of each of the models in the NTEP Laboratory. That data is provided to the manufacturers (or CC holders). The question was raised as how that data translates to a host of field instruments. The two manufacturers represented at the Sector meeting outlined their instrument standardization procedures. Mr. Kaeding, Perten Instruments, Inc. reported that the strike-off device is the biggest source of TW variation between individual instruments. He suggested that even for a single grain type on a single instrument TW results may be sample dependent.

Professor Hurburgh, Iowa State University, described the procedure he has used with two groups of elevators to align their GMMs for TW on corn. Five to ten samples with some range of TW are passed around to all the instruments in their system. Typically, the results from the initial tests are within plus or minus one pound per bushel of the overall average TW of that population of instruments. Bias and skew adjustments are then made on

each of the instruments so they all read to the mean TW. At that point the problem is solved. He stressed that GMMs don't read the same on TW when they first are placed in the field whatever the cause may be.

In response to a question, "If not used in trade, how is TW used?" One sector member pointed out that TW is a major factor in trading wheat (there are 5 TW dependent U.S. grades for wheat). Professor Hurburgh, Iowa State University, said that the general practice, at least for corn, (nobody knows how soybean TW is used) is if the TW (by meter) gets low enough to engender discounts, then the discount itself will be assessed by a quart kettle reading…perhaps even on a composite sample. The meter's TW reading goes into the inventory record that is used in several internal operations: calculation of stored grain volume and a calculation to estimate storageability (time). Note: There are also 5 TW dependent U.S. grades for corn, but in normal years corn TW is typically several lbs/bu higher than the 56 lb/bu minimum for U.S. No. 1 Corn.

Professor Hurburgh, Iowa State University, also explained that the grain dealer has a greater interest having the correct TW reading than the farmer has, because the TW reading is used to establish volume in storage on measure-up inspections. At $7.00 per bushel corn TW is the biggest factor of error on the inventory balance.

Professor Hurburgh, Iowa State University, objected to increasing TW tolerances as this would only cover up the problems. What was needed was an investigation of the whole system of calibrating meters, then translating that calibration into the field, and then keeping it that way. The whole system has some issues that can be fixed.

He suggested that the Sector re-form a task force on TW and ultimately lay out a procedure that would improve TW both for the user and for the inspection function. Until then, suspend inspecting meters for TW until there's a better way to translate the standard into practice. Pending resolution of the issues involved, continue to use the meters, but mandate use of the standard Quart Kettle if a discount is involved.

Professor Hurburgh, Iowa State University, agreed to head a task force to study the whole TW system (including the economic impact) and to recommend solutions to the issues that need fixing. Other task force members:

- Mr.Jeff Adkisson – Grain and Feed Association of Illinois
- Ms. G. Diane Lee – NIST, OWM
- Ms. Cassie Eigenmann – DICKEY-john Corporation
- Mr. Ivan Hankins – Iowa Deptartment of Agriculture/Weights and Measures
- Mr. Tim Kaeding – Perten Instruments, Inc.
- Mr. Karl Cunningham – Illinois Department of Agriculture

The Sector decided to postpone action on the issue of tolerances until the TW task force has studied the issue and has recommended action.

9. Report on OIML TC 17/SC 1 R 59 Moisture Meters for Cereal Grains and Oilseeds

Background/Discussion:
This item was included on the NTETC Grain Analyzer Sector's agenda to provide a summary of the activities of OIML TC 17/SC 1. In October 2008, the Secretariat of TC 17/SC 1 was jointly allocated to China and the United States. The Co-Secretariats (China and the United States) are working closely with an International Work Group to revise OIML R59 *Moisture Meters for Cereal Grains and Oilseeds*. The 5 CD of OIML R 59, revised to comply with OIML's Guide Format for OIML Recommendations and to incorporate tests for the recommended disturbances of OIML D 11 General Requirements for Electronic Measuring Instruments, was distributed to the subcommittee in February 2009. Comments to R 59 5 CD were received from 10 countries including the United States. A

preliminary R 59 6 CD addressing those comments was discussed at the September 28 - 29, 2010, TC 17/SC 1 meeting in Orlando, Florida.

Ms. Lee, NIST, OWM, briefed the Sector on the September 2010 meeting. The meeting was attended by representatives from Australia, International Bureau of Legal Metrology (BIML), Canada, China, Germany, Japan, and the United States. Attending for the United States:

- Ms. Cathy Brenner, USDA, GIPSA
- Ms. Cassie Eigenmann, DICKEY-john Corporation
- Ms. G. Diane Lee, NIST, OWM
- Dr. Richard Pierce, USDA, GIPSA
- Mr. Richard Cantrill

Twelve items were included in the review of the preliminary 6 CD that included all the United States comments to R 59 5 CD:

1. Efforts to Establish Recognized Traceability Under the CIPMA MRA for "Moisture in Grain" Measurements
2. Printed Results
3. Description of Instruments
4. Reference Conditions for Performance Tests
5. Verification
6. Level Indicating Means
7. Minimum Sample Size
8. Definition for Error Shift
9. Software
10. Harmonizing the OIML Moisture and Protein Recommendation
11. Revisions to Test Report Forms for Consistency with Laboratory Calibration Worksheets
12. Detailed Review of Comments to R 59 CD 5

Decisions made on the three items of most interest to the United States include:

- Printed Results – The existing language for recording elements in 5 CD will remain unchanged. The working group agreed that since a number of counties have varying requirements for printers that the existing language in OIML R 59 CD 5 which states that "the meter may be equipped with a communication interface that permits interfacing with a recording device" allows the instrument to connect to a printer if this is required by the national responsible body.

- Software – Germany reviewed the current draft to determine if additional changes are required to comply with OIML D 31 and provided a list of items to be considered for inclusion in the draft OIML R 59.

- Minimum Sample Size – The requirements for Minimum Sample Size in 5 CD will remain the same. The purpose of the minimum sample size 100 g or 400 kernels or seeds is to ensure that accurate results can be obtained when testing non-homogeneous samples. A statement is also included that the national authorities may determine otherwise.

Ms. Lee, NIST, OWM, reported that there is a proposal on the international front to do a study of moisture measurement methods with the apparent purpose of establishing a universal standard method "internationally accepted by competent authorities in the field of moisture measurements in grains and cereal." During the TC 17/SC 1 meeting Mr. Magana, BIML, gave an overview of a discussion paper titled, *Efforts to Establish Recognized Traceability Under the CIPMA MRA for 'Moisture-in-Grain' Measurements*. The Sector recalled that previous attempts to establish a universal standard method for measuring moisture in grain had failed. One member speculated as to whether or not the debates on selecting a single international reference method might be made to devalue the United States grain crops. The U.S. reference method for grain moisture determination is lower than the ICC method. Attempts to change the reference method were made years ago but received much opposition from industry.

USDA and NIST, OWM are preparing a formal response to address the necessity to maintain the U.S. standard air-oven method for determining grain/oilseed moisture. The U.S. grain standards, domestic grain trade, and control/evaluation of grain inventory are all based on this air-oven method.

10. Report on OIML TC 17/SC 8 Protein Measuring Instruments for Cereal Grain and Oil Seeds

Background/Discussion:
This item was included on the Sector's agenda to provide a summary of the activities of OIML TC 17/SC 8. Subcommittee SC 8 was formed to study the issues and write a working draft document *Measuring Instruments for Protein Determination in Grains*. Australia is the Secretariat for this subcommittee. A TC 17/SC 8 meeting was hosted by NIST, OWM in September 2007 to discuss the 2 CD. Discussions on 2 CD dealt mostly with maximum permissible errors and harmonization of the TC 17/SC 8 Recommendation for protein with the TC 17/SC 1 Recommendation for moisture. The Secretariat distributed a 2 CD of the document in February 2010. A meeting of TC 17/SC 8 was held September 2010 in Orlando, Florida. At the September meeting comments to the Recommendation on Protein Measuring Instruments for Cereal Grain and Oil Seeds 2 CD were reviewed. It was agreed at this meeting that two instruments will be submitted for OIML type approval. This agreed change and other changes from the September 2010 meeting will be included in 3 CD.
Other changes agreed to at the September 2010 Meeting:

- Reference method instruments (e.g. Dumas or Kjeldahl instruments) will be removed from scope of the document.

- TC 17/SC 8 and TC 17/SC 1 will not attempt to merge type evaluation tests for the protein measuring instrument and the moisture meter due to potential differences in sample set requirements.

- Mutual acceptance of test results is possible for the influence and disturbance tests that are less dependent on the grain-specific calibrations. Member states are expected to facilitate mutual acceptance by harmonizing with the model tests.

- Due to regional and seasonal variation in the grain samples used for calibration and testing, countries are unlikely to accept the accuracy, repeatability and reproducibility tests conducted by another country (i.e., where foreign produce is developed as test samples).

- The full protein measuring range specified by the country will be tested for accuracy, repeatability and reproducibility.

- Detailed design of the tests including the number of test samples and how the test results are pooled to obtain the mean absolute error, SD, SDD and SDDI will be left to the national authorities.

- Some guidance on the minimum number of samples to be used across the full protein measuring range will be provided, e.g., min 45 samples distributed randomly over the full range.

Ms. Lee, NIST, OWM, reported that since the United States has an established system for protein measuring devices, the United States is trying to incorporate what has been done in the NTEP program for protein. Progress toward that goal should be noticeable in 3 CD when it is released.

11. Proficiency Testing

Source:
Ms. Johnson, American Oil Chemists Society (AOCS)

Background/Discussion:
At the 2009 NTETC Grain Analyzer Sector Meeting, Professor Hurburgh, Iowa State University, urged the representatives from the AOCS to prepare a proposal so that the collaborative (air-oven) study could be conducted on an on-going basis rather than on an ad hoc basis. He cautioned that the proposal would have to include corn and wheat as well as soybeans.

Several years ago the AOCS in conjunction with the United Soybean Board (USB) established the AOCS-USB Soybean Quality Traits (SQT) Analytical Standards Program (ASP), a system of verification of analytical measurements. This program provided the infrastructure for the generation of reliable analytical results at all levels of the soybean industry by establishing industry-wide acceptance of analytical methods and protocols and their implementation under internationally accepted quality management standards. The AOCS has proposed the addition of an air-oven/grain moisture meter proficiency testing series to their ASP. Proficiency testing is a continuous program, samples are sent out in regular intervals (e.g., two to four times per year). Participants are able to join on a continuous basis.

Ms. Johnson, AOCS, proposed an air-oven/GMM proficiency testing series designed specifically to address the needs of GMM manufacturers and states maintaining a grain moisture laboratory. AOCS would administer the program, oversee distribution of samples, compile results, perform statistical analysis of results, and distribute a report to participants. AOCS does not collect the samples. This is subcontracted to suitable providers. AOCS does not have laboratories. Since GIPSA is a certified laboratory already participating in the SQT program, GIPSA air-oven results could be reported for comparison if desired.

At a previous meeting, the Sector decided that a program that included distribution of two samples each of corn, wheat (preferably of one type), and soybeans per year would be adequate. A final report by mid-July is desirable, so sample distribution would have to take place in early spring (March – April).

Conclusion:
Ms. Johnson, AOCS, presented details of the proposed Air-Oven and Moisture Meter Proficiency Testing Program designed specifically for the NTETC Gain Analyzer Sector for review by the Sector. The proposal included provisions for collecting moisture meter results in addition to air-oven results on the program samples. Several sector members objected to including moisture meter results stressing that this was not intended to be "backdoor Phase II program". Testing moisture meter calibrations is an activity requiring a large number of samples. Two samples per grain are not adequate to assess meter performance. The Sector decided that the program should focus solely on the standard GIPSA air-oven method.

Program Details:

- Samples – Soybeans 2, Corn 2, Hard Red Winter Wheat 2

- Cost to Participants - $100.00/year

Schedule:

- Samples (6) ship on the 15th of February
- Samples must be tested within five business days with results due by 15 March
- Reports will be posted on www.SoybeanQualityTraits.org by 1 May
- Detailed Participant Instructions will be provided to each participant

The Sector endorsed the proposal with the exclusion of instrument results.

12. Printed Ticket User Requirements

Source:
Mr. Adkisson, Grain and Feed Association of Illinois

Purpose:
The submitter believes that NIST Handbook 44 User Requirements for Printed Tickets, as specified in section 5.56.(a), paragraph UR.3.4.(b) are not realistic for country elevators. Traffic patterns at country elevators do not lend themselves to providing a printed ticket to all customers. Many customers, in fact, do not want them. In addition, since meters in Illinois are inspected and are required to be using the correct calibration, there is no need for the calibration version identification to be printed on the ticket.

Item Under Consideration:
Mr. Adkisson, Grain and Feed Association of Illinois, has proposed that GMMs be allowed to print [and display] "approximate test weight," and that NIST Handbook 44, section 5.56.(a), paragraph UR.3.4.(b) be modified as shown:

UR.3.4. Printed Tickets.

(b) **If requested** ~~T~~**t**he customer shall be given a printed ticket showing the date, grain type, grain moisture results, **and actual or approximate** test weight per bushel~~.~~**, and calibration version identification.** The ticket shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~**and**~~ 2003**, and 20XX**)

Background/Discussion:
The Sector heard objections to including "actual or approximate" test weight in light of the Sector's decision to form a task force to study the whole TW system and to recommend solutions to the issues that need fixing (see Agenda Item 8). Mr. Truex, NTEP Administrator, agreed that "actual or approximate" would be difficult words to get approved. He pointed out that this issue was really not something that the Sector has to decide, because it wasn't an NTEP issue. He suggested that it be submitted through the Central Weights and Measures Association (CWMA) that would be meeting in September. Mr. Hankins, Iowa Department of Agriculture/Weights and Measures, agreed to submit the issue to the CWMA.

Mr. Pierce, USDA, GIPSA, pointed out that an unsuccessful attempt had been made in 1994 to delete the portion of paragraph UR.3.4. stipulating that the customer receive a ticket. At the 1994 NCWM Annual Meeting, the S&T Committee maintained the position that the system should print the information; the information should not be handwritten or printed with a device separate from the grain moisture measuring system. The Committee had not received sufficient justification to warrant reversing the decision made by NCWM in 1993. They decided that this item should remain Informational to allow an opportunity for additional information to be submitted; however, they warned that the item would be withdrawn from the Committee's 1995 agenda unless additional information was provided to support making changes to this paragraph. See *Report of the 79th NCWM*, 1994, Report of the S&T

Committee, Item 356-6, UR.3.4. Printed Tickets. Note: Item 356-6 did not appear in the *Report of the 80th NCWM*, 1995.

The Sector generally agreed that modification of UR.3.4.(b) to make a printed ticket available upon request was more likely to be accepted by the S&T Committee citing "Pay at the Pump" credit/debit card transactions where the customer is given the choice of whether or not to have a receipt printed. The Sector was not in favor of eliminating "calibration version identification" believing that this is important information in the event that the ticket is ever questioned.

The Sector developed the following language for the submission to CWMA:

UR.3.4. Printed Tickets.

(b) ~~**The customer shall be given a printed ticket showing.**~~ **A printed ticket shall be made available to the customer upon request at the time of transaction.** **The printed ticket shall show** the date, grain type, grain moisture results, test weight per bushel, and calibration version identification. The ticket **information** shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~**and**~~ 2003**, and 20XX**)

13. Next Sector Meeting

The next NTETC Grain Analyzer Sector Meeting is tentatively planned for Wednesday, August 22 and Thursday, August 23, 2012, at the Chase Suites by Woodfin at KCI in Kansas City, Missouri. Sector members are asked to hold these days open pending confirmation of availability of facility, determination of agenda items, exact meeting times, and meeting duration. Final meeting details will be announced by early June 2012.

If you would like to submit an agenda item for the 2012 meeting, please contact any of the following persons by June 1, 2012:

- Mr. Jim Truex, NTEP Administrator, at jim.truex@ncwm.net
- Ms. G. Diane Lee, Co-Technical Advisor, at diane.lee@nist.gov
- Mr. Jack Barber, Co-Technical Advisor, at barber.jw@comcast.net

14. Unified Grain Moisture Algorithm – Update

At the 2010 NTETC Grain Analyzer Sector Meeting, Dr. Funk, USDA FGIS QARD QCT Branch, made a presentation entitled, *Future Direction of Moisture Measurement Technology*. In that presentation he offered a proposed timeline for choosing and implementing a new moisture technology that offers improved accuracy, better stability over time and crop conditions, easier calibration development, reduced support cost, and that provides competition (it can be duplicated by any manufacturer). At the 2011 NTETC Grain Analyzer Sector Meeting he brought the Sector up-to-date on the progress made since the Sector's 2010 meeting.

Significant Milestones Since the Sector's Last Meeting:

- August 2010 – The GIPSA Executive Management Team decided to pursue adoption of new Official moisture measurement technology.
- June 2011 – The Grain Inspection Advisory Committee recommended that GIPSA continue to go forward with the evaluation and adoption of the 149 MHz technology as the new official standard for grain moisture measurement.

Projected Timeline for Implementing the New Technology:

- July 2011 - January 2012
- Collect calibration data for new technology.
- Conduct additional "green" grain tests to quantify effects.
- Develop detailed criteria and test processes for determining? (UGMA)-compatibility.
- Verify consistency among UGMA-based moisture meters.
- February 2012
- Finalize technology decision.
- May 2012
- Develop and validate calibrations for officially-inspected gain types.
- May 2013
- Implement new technology for initial grains.
- September 2013 and later
- Implement new technology for other grains.

Implications for NTETC Grain Analyzer Sector

- Calibration review and modifications for official moisture system may be significantly reduced upon adoption of UGMA as Official moisture technology.
- Phase II testing may be reduced or eliminated after current 5-year agreement expires.
- Official approval of UGMA-compatible instruments may be based on confirmation of UGMA-compatibility rather than extensive moisture tests.
- NTEP certification of UGMA-compatible instruments might be similarly simplified.

Following Dr. Funk's presentation to the NTETC Grain Analyzer Sector, he conducted a question and answer session. Some of the questions and his responses are shown below:

Question:
This is very significant work. I hope USDA is getting a royalty on this.

Answer:
No, all this is in the public domain. GIPSA decided to make it freely available to anybody wanting to use it.

Question:
How did the? (GAC) get chosen to replace the Motomco?

Answer:
After the 1990 Farm Bill, GIPSA set up a process by which we could choose a new official meter. The first "gate" we set up was that the new official meter must be NTEP certified. Once we had a reasonable pool of NTEP-certified meters, we developed a set of performance criteria and a bid selection process that became the basis of procurement. The GAC 2100 was the successful bidder.

Question:
In the future will there be an opportunity for another company to become the standard of choice?

Answer:
It's not limiting to say we have two manufacturers here. In the future I expect to see more. The idea is that for official inspection consistency is the name of the game. If you're using fundamentally different technologies they are all measuring different things. The error (difference between instrument types) on a sample-by-sample basis may be 1.4 times as great as the error of any one of the instruments relative to the air-oven. So having multiple types of instruments in the system is not tenable because of the inconsistencies it generates from market point to market point. What we have done in this instance from the very beginning is to provide the means for multiple manufacturers to provide equivalent instrumentation. We are limiting competition in one sense (by restricting it to 149 MHz UGMA technology), but we are saying that instruments from different manufacturers are going to have to give equivalent results and use the same calibrations.

Question:
How is this technology able to measure frozen grain, and is it able to measure as accurately within normal moistures?

Answer:
At the higher frequency of the new technology, if you plot the dielectric constant of wet sand as a function of temperature, you will find that the dielectric constant decreases slowly with decreasing temperature (from hot to cold) linearly until it reaches the freezing point—at which time it plunges abruptly downward and remains constant. A plot of the dielectric constant of moderately moist grain decreases as the temperature decreases, but when it reaches the freezing point it continues to decrease. The question is, under what conditions the grain continues to decrease linearly instead of dropping sharply. The answer is, as long as the grain is at a moisture level below the level where it contains freezable water it will exhibit linear behavior. That moisture level is around 20 % for cereal grains, a little below 20 % for soybeans, and for other oil seeds such as canola or sunflower it is down to below 15 % or even to 10 %. The fact is, there is a linear function there that is not destroyed by freezing if you limit the conditions. You can't test 30% moisture cereal grain at − 10 °C and get reasonable results. What you see if you do that is 20 % moisture. Anything, whether it is 21 %, 25 %, or 40 %, what you will see is 20 %, because that water which is above that 20 % threshold just freezes out and is invisible. As long as the moisture is below that threshold level, you can trust the results (if the temperature measurement is accurate and the temperature correction function is appropriate).

Question:
In the past, what we have done in the code has always been non-retroactive? That means, if we continue with that policy, that existing meters will stay in the field, and more than likely they will be in the field for 30 years. If government Phase II support goes away, who supports the existing meters?

Answer:
I'm not saying it will go away, only that it could go away. GIPSA is heavily supporting Phase II both with an annual contribution of $30,000 plus full support of the sample gathering and testing that is required to maintain the calibrations for the official meter. (In addition, NIST, OWM contributes $30,000 per year.) With budgets going the way they are, activities (such as Phase II testing) that are not clearly required to support the official system may not survive, unless manufacturers or other sources are willing to fully support them.

After Dr. Funk concluded his presentation and question and answer session, the Sector heard additional questions and concerns related to the possible discontinuance of Phase II for GMMs. These included:

- How will manufacturers of existing non-UGMA GMMs and NIR instruments keep their NTEP CCs active?

- How will NIR instruments that aren't yet designed be certified?
- Why are NIR protein, oil, and etc. calibrations not checked the same as moisture calibrations?
- What are the additional implications of abandoning Phase II?
- What are the additional implications to the GMM Chapter of NCWM Publication 14?
- What are the additional implications to the NIR Grain Analyzer Chapter of NCWM Publication 14?

These issues will have to be a carryover to the 2012 NTETC Grain Analyzer Sector Meeting.

ATTENDANCE

Jeff Adkisson
Grain and Feed Association of Illinois
3521 Hollis Drive
Springfield, IL 62711
(217) 787-2417
jeffa@grai.org

Karl Cunningham
Illinois Department of Agriculture
801 Sangamon Avenue East
Springfield, IL 62702
(217) 785-8301
karl.cunningham@illinois.gov

Jack Barber
JB Associates
10349 Old Indian Trail
Glenarm, IL 62536
(217) 483-4232
barber.jw@comcast.net

Cassie Eigenmann
DICKEY-john Corporation
5200 Dickey-john Road
Auburn, IL 62615
(217) 438-2294
ceigenmann@dickey-john.com

Cathy Brenner
USDA GIPSA
10383 North Ambassador Drive
Kansas City, MO 64153-1394
(816) 891-0486
cathleen.a.brenner@usda.gov

Andrew Gell
FOSS North America
8091 Wallace Road
Eden Prairie, MN 55344
(952) 974-9892 x300
agell@fossnorthamerica.com

Randy Burns
Arkansas Bureau of Standards
#1 Natural Resources Drive
Little Rock, AR 72203
(501) 219-6307
randy.burns@aspb.ar.gov

Ivan Hankins
Iowa Department of Agriculture
Weights and Measures
2230 South Ankeny Boulevard
Ankeny, IA 50023
(515) 725-1493
ivan.hankins@iowaagriculture.gov

Richard Cantrill
AOCS
2710 South Boulder Drive
Urbana, IL 61802
(217) 693-4830
richard.cantrill@aocs.org

Tony Herrin
Cardinal Scale Manufacturing Company
203 E. Daugherty
Webb City, MO 64870
(417) 673-4631
therrin@cardet.com

Thomas Hughes
Missouri Department of Agriculture
1616 Missouri Boulevard
Jefferson City, MO 65109
(573) 751-9487
tom.hughes@mda.mo.gov

Charles Hurburgh
Iowa State University
1541 Food Science, ISU
Ames, IA 50014
(515) 294-8629
tatry@iastate.edu

Patricia Jackson
USDA, GIPSA, FGIS, TSD
10383 N. Ambassador Drive
Kansas City, MO 64153-1394
(816) 891-0450
patricia.j.jackson@usda.gov

Amy Johnson
AOCS/Soybean Quality Traits Program
2710 South Boulder Drive
Urbana, IL 61801
(217) 693-4820
amyj@aocs.org

Tim Kaeding
Perten Instruments, Inc.
6444 S Sixth Street Road
Springfield, IL 62712
(217) 585-9440
tkaeding@perten.com

G. Diane Lee
NIST, Weights and Measures Division
100 Bureau Drive MS 2600
Gaithersburg, MD 20707
(301) 975-4405
diane.lee@nist.gov

Abdulla Mubarak
Cargill, Inc.
1400 South Blount St
Raleigh, NC 27603
(919) 899-6613
abdulla_mubarak@cargill.com

Rich Pierce
USDA, GIPSA Technical Services Division
10381 North Ambassador Drive
Kansas City, MO 64153
(816) 891-0430
richard.o.pierce@usda.gov

Jim Rouse
Iowa Crop Improvement Association
4611 Mortensen Road
Suite 101
Ames, IA 50014
(515) 294-6921
rouse@iastate.edu

Jim Truex
National Conference on Weights and Measures
1135 M Street, Suite 110
Lincoln, NE 68508
(740) 919-4350
jim.truex@ncwm.net

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Appendix C

National Type Evaluation Technical Committee (NTETC) Measuring Sector Meeting Summary

October 21 - 22, 2011
Norfolk, Virginia

INTRODUCTION

The charge of the NTETC Measuring Sector (herein after referred to as "Sector") is to provide appropriate type evaluation criteria based on specifications, tolerances and technical requirements of NIST Handbook 44, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices,* Sections 1.10. General Code and all portions of Section 3 including codes for Liquid Measuring Devices, Vehicle Tanks Meters, Liquid Petroleum Gas and Anhydrous Ammonia Measuring Devices, Cryogenic Liquid Measuring Devices, Milk Meters, Water Meters, Mass Flow Meters, and Carbon Dioxide Liquid Measuring Devices. The Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, *Technical Policy, Checklists, and Test Procedures* for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors, and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

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***.
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.

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
AWWA	American Water Works Association	NTEP	National Type Evaluation Program
CC	Certificate of Conformance	NTETC	National Type Evaluation Technical Committee
CIML	International Committee of Legal Metrology	OIML	International Organization of Legal Metrology
CNG	Compressed Natural Gas	OWM	Office of Weights and Measures
CTEP	California Type Evaluation Program	RMFD	Retail Motor Fuel Dispensers
DEF	Diesel Exhaust Fluid	S&T	Specifications and Tolerances Committee
LMD	Liquid Measuring Devices	SWMA	Southern Weights and Measures Association
NCWM	National Conference on Weights and Measures	USNWG	U.S. National Work Group
NIST	National Institute of Standards and Technology	VTM	Vehicle Tank Meter

Details of All Items
(In order by Reference Key)

CARRY-OVER ITEMS

1. Add Testing Criteria to NTEP Policy U Evaluating Electronic Indicators Submitted Separate from a Measuring Element

Source:
California NTEP Lab – Carryover from 2007-2010 NTETC Measuring Sector Agendas

Background/Discussion:
At its 2007 NTETC Measuring Sector Meeting, the Sector heard that Section U. of the NTEP Technical Policy in NCWM Publication 14 allows for testing an indicator separate from a measuring element. However, specific test criteria had not been developed for this section. The Sector heard a recommendation to develop and add specific criteria for testing an indicator separate from a measuring element for this section. From 2007 to 2010, the California NTEP laboratory worked to develop a checklist, but had received limited input on the drafts. At the 2010 NTETC Measuring Sector Meeting, Mr. Reiswig, California Division of Measurement Standards, presented a list of the areas of the draft checklist that specifically needed further attention and review. The Sector reviewed these items and agreed that Mr. Reiswig should continue developing the checklist for Electronic Indicators Submitted Separate from a Measuring Element.

The Sector identified five points that require further development and input from industry in order to finalize the checklist. The Sector also identified a list of people who might be able to provide additional input. The Sector agreed that Mr. Reiswig should forward the latest draft of the checklist along with the five areas requiring specific attention to the people listed in the original work group and to the list of possible contacts identified by the Sector. Mr. Reiswig should ask for their assistance in reviewing and commenting on the checklist, noting that input on the five areas would be of particular help.

The Sector heard a report from Mr. Ingram, California Division of Measurement Standards, on the status of the checklist. Mr. Ingram reported that Mr. Reiswig has changed positions within California Department of Food and Agriculture and that Mr. Ingram would represent the State of California at the 2011 NTETC Measuring Sector Meeting. Mr. Ingram noted that not much additional input had been received and the checklist has not changed since the Sector had last seen it in March of 2010 because of such limited feedback. Mr. Frailer, Maryland Department of Agriculture asked if the checklist had been used in California, to which Mr. Ingram replied that some of the checklist tests had been applied on systems with temperature compensation in California. Mr. Ingram recommended that the work group be re-formed to complete the draft checklist initiated by Mr. Reiswig and also the associated changes to reflect the use of simulated pulses proposed in NCWM Publication 14, Technical Policy T. Testing Required for Electronic Indicators Used with Measuring Elements.

Mr. Miller, FMC Technologies Measurement Solutions, Inc., inquired if the National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM) would be able to complete the work. Ms. Butcher, NIST, OWM, pointed out that, while NIST, OWM is certainly willing to assist in advancing the work along, the checklist is at a stage where what is most needed is careful consideration by the stakeholders that would be most affected by the checklist. Several industry members suggested that a deadline for comments should be set to facilitate moving the item forward on a predictable timeline. Mr. Keilty, Chair noted that there are several sections in the current draft that are highlighted. Mr. Ingram explained that these represent sections where Mr. Reiswig still had open questions or concerns about the applicability and validity of those items. Mr. Keilty stated that he did not see any problems with anything he had seen so far, but that he did not believe the checklist would be ready to be incorporated into NCWM Publication 14 until the highlighted areas had been reviewed and validated by the stakeholders.

Mr. Keilty pointed out that the Sector had agreed at its 2010 NTETC Measuring Sector Meeting that the item had merit and should remain on the agenda. Mr. Miller commented that testing of electronic indicators is currently done, but that the checklist is needed to establish uniformity in how and what tests are applied in these cases. He stated that he believed the Sector would need someone to drive the issue in order to complete the checklist and volunteered to lead a work group. Two NTEP laboratory representatives volunteered to review and comment on the final product of the work group.

The Sector then discussed the scope of work needed to complete the checklist, noting that all the sections left highlighted by Mr. Reiswig should be resolved. Mr. Katalinic, North Carolina Department of Agriculture, commented that the work group should also address the five specific points that the Sector had listed during the 2010 NTETC Measuring Sector Meeting. The Sector revisited these points and made some clarifications to them, as noted in the decision below.

Mr. Keilty proposed a timeline with the first review in one to two months to allow the laboratories time to review the results and comment such that exact language would be ready for inclusion in NCWM Publication 14 before NCWM Interim Meeting in January.

Conclusion:
The Sector agreed that additional work is needed to finalize the checklist. Mr. Miller, FMC Technologies Measurement Solutions, Inc., volunteered to serve as Chair of the work group and Mr. Buttler, NIST, OWM will assist as needed and monitor progress of work.

Electronic Indicators Checklist Work Group members are: (*Established at the October 21 - 22, 2011, NTETC Measuring Sector Meeting)*

Chair:
Mr. Rich Miller, FMC Technologies Measurement Solutions, Inc.

Members:

- Mr. Dmitri Karimov, Liquid Controls
- Mr. Michael Keilty, Endress + Hauser Flowtec AG USA

Review and Comment:

- Mr. Michael Keilty, Endress + Hauser Flowtec AG USA
- Mr. Allen Katalinic, North Carolina Department of Agriculture

NIST Technical Advisor

- Mr. Marc Buttler, NIST, OWM

The work group is asked to address the highlighted sections of the draft checklist along with the following points and submit the finished checklist to the two laboratory representatives listed above for review and comment.

1. A minimum of 10 000 pulses must be collected. To ensure that there will be a change in the displayed indication for each pulse received, the electronic indication should be scaled such that the value of the smallest indicated division should equate to less than or equal to the value associated with one input pulse.

2. It is important to validate whether ± 1 pulse is an appropriate tolerance, taking into consideration applicable International Organization of Legal Metrology (OIML) requirements.

3. The number of different temperature inputs and API gravity values that would need to be tested to adequately verify the temperature compensation function of an electronic indicator must be determined. Spot checking of three random tables at three different temperatures would be adequate to verify an indicator's temperature compensation feature is functioning properly.

4. The work group should add a step in the checklist for checking multi-point calibration along with associated guidance. This guidance should emphasize the necessity of working with the manufacturer of each device in order to set up tests to properly check multipoint calibration using simulated pulses.

5. Addressing various different input signal formats including pulses, analog, and digital communication will be challenging. Analog (4 - 20 mA) input devices are to be excluded from the scope at this time. The work group is asked to address pulse (frequency) signals in the final version of the checklist and is asked to consider whether or not to also include digital communications.

Appendix A contains the draft checklist. Below are the proposed revisions to Technical Policy T.

Many different kinds of electronic indicators are available for liquid measurement. Gas pumps, vehicle tank meters, and wholesale meters are common applications used. In some cases, the same indicator can be used in multiple applications. Below are some guidelines and test procedures to be incorporated into Publication 14 to allow the manufactures to pretest to and to make uniform the testing for the NTEP labs for this technology.

T. Testing required for Electronic Indicators used with Measuring Elements.
If the indicator and measuring element are built into the system as a whole device then they are approved as a system and listed as a single device on the certificate.

If the indicator or measuring element are separable and can be used with other approved and compatible equipment then the following needs to be considered:
If the Electronic Indicator and Measuring Element both have a CC then the two do not need evaluation provided new features that would have a metrological effect have not been added to the existing equipment. Even though they both have a CC they still need compatibility verification i.e. approved and compatible. This can be verified at the local level of compliance.

If neither the Electronic Indicator or Measuring Element do not have a CC then full testing will be performed as per Pub 14 permanence testing for Electronic Indicating Element (20 - 30 days of significant use) and Measuring Element (through put).

If the Electronic Indicator does not have a CC but the Measuring Element has a CC then the Register will go through the 20 - 30 day permanence test.

If the Electronic Indicator has a CC but the Measuring Element does not then the measuring element will go through the associated through put as per the permanence for that particular technology.

Upon verification of the local authority, the NTEP lab may allow the local authority to conduct one phase of the evaluation, at the NTEP labs direction and control.

Testing considerations for the electronic indicator:
1. Multi-point Calibration:

Some of the newer indicators have the optional single point or multi-point calibration. Multi-point calibration associates multiple meter calibration factors with different flow rates. Meter field testing at the local level is usually at the maximum and minimum flow ratings of the meter. Without the ability to print or view the multi-point parameters a meter could be calibrated with an intentional erroneous factor and could go undetected. The only other way would be to test at random flow rates and depending on the number of calibration points fraud could still be undetected; i.e., a meter factor that would allow an out of tolerance error for a delivery flow rate other than customary test flow rates.

Some manufactures have provided a method for weights and measures to view or print the calibration information without having to break any seals. This viewing or printing capability should be incorporated into NCWM Publication 14 (maybe NIST Handbook 44 too?) as a tool for W/M to be able to detect the possibility of fraud on these systems. It would also allow for manufactures to be aware of this and build this into their systems that have multi-point calibration.

2. **Tests for temperature compensation:**
   a. **Temperature test at cold temperature and verify correction.**
   b. **Temperature test at hot temperature.**
   c. **Temperature test at field site temperature.**
   d. **List temperature range tested and type of probe tested on certificate.**
3. **Tests for pulser/encoder rotation speed:**
   a. **Induce pulses and/or frequency at maximum to determine limitations of device.**
   b. **Induce pulses and/or frequency at minimum to determine limitations of device.**
   c. **List limitations on certificate.**
4. **Tests for power failure: Indicators are capable of operating on different voltages. May want to consider weighing device testing for electronic indicators and information listed on certificate.**
   a. **Test through AC voltage range**
   b. **Test through DC voltage range**
   c. **Power failure**
5. **Tests for computation, if capable.**
   a. **Test below $.999/gal.**
   b. **Test above $1.00/gal.**
   c. **Test above $2.00/gal.**
   d. **Test at maximum unit price capability.**
6. **Tests for agreement of indications between indicator and totalizer if a totalizer is provided.**

2. Development of Water Meters Checklist

Source:
Mr. Noel, Neptune Technology Group, Inc. – Carryover from 2010 Measuring Sector Agenda

Background/Discussion:
At its 2010 NTETC Measuring Sector Meeting, the Sector heard that utility type water meter manufacturers are receiving requests for NTEP Certificate of Conformance (CCs) from State weights and measures jurisdictions.

There is no NTEP checklist for utility-type water meters. However, utility-type water meters covered by NIST Handbook 44, Section 3.36. are evaluated under the California Type Evaluation Program (CTEP).
During the 2010 NTETC Measuring Sector Meeting, the Sector agreed to establish a work group to further develop the draft NTEP checklist. The Water Meters Checklist Development Work Group consisted of the following members:

- Mr. Andre Noel, Neptune Technology Group, Inc.
- Mr. Dan Reiswig, California Division of Measurement Standards

In developing the checklist, the work group was asked to:

1. Identify areas in NIST Handbook 44 Section 3.36. Water Meters Code where changes might be appropriate to update the criteria to reflect current technology and practices. For example, more specific audit trail criteria may need to be added to the Water Meters Code.
2. Forward any proposed changes to NIST Handbook 44 to NCWM S&T Committee via the established NCWM process by preparing and submitting NCWM Form 15 to the regional weights and measures associations and NTETC Measuring Sector.
3. Consider any differences between American Water Works Association (AWWA) standards and NIST Handbook 44 and consider recommendations for aligning the two documents where that makes sense.
4. Copy the NTETC Measuring Sector Chair, Mr. Keilty, and NIST Technical Advisor, Mr. Buttler, on communications to the work group.
5. Copy the U.S. point of contact for OIML R 49, Mr. Richter, NIST, OWM, with any proposed drafts.
6. Distribute a subsequent draft for review by the Sector by the January 2011 NCWM Interim Meeting.
7. Distribute a final draft for review by the Sector at least a month prior to the fall 2011 NTETC Measuring Sector meeting.

At its 2011 NTETC Measuring Sector Meeting, the Sector heard a report from Mr. Noel, Neptune Technology Group, Inc., on the progress of the checklist and status of action items from the 2010 NTETC Measuring Sector Meeting. Mr. Noel reported that multiple manufacturers who are all members of AWWA had compared AWWA and NIST Handbook 44 standards. Based on that review, this work group has developed and submitted a proposal to modify NIST Handbook 44 to further harmonize the two standards. Mr. Noel stated that the work group believes there will always be some differences, but manufacturers are committed to working with state and county weights and measures officials to identify and gradually eliminate differences. On October 11, 2011, Mr. Noel forwarded a draft Water Meters Checklist to Mr. Buttler, NIST Technical Advisor, who coordinated posting of the document as attachment #6 to the 2011 NTETC Measuring Sector Agenda. Mr. Buttler reported that he also forwarded the draft checklist to Mr. Richter, NIST, OWM, who is the U.S. point of contact for OIML R 49.

Mr. Noel explained that only the content beginning on page 13 of the draft Water Meter Checklist would need to be included if it was decided to incorporate the checklist into the Liquid Measuring Devices (LMD) section of NCWM Publication 14. The rest of the information on the first 12 pages would only be needed if the Water Meter Checklist were to be added as a completely separate section.

Ms. Butcher, NIST, OWM, requested an explanation of the rationale behind the statement in the proposed permanence test requirements that "Flow rates during throughput testing are not to exceed 50 % of the manufacturer's rated maximum flow rate." Mr. Noel responded that it was related to California laboratory testing criteria and that AWWA standards state that, for permanence, continuous flow should be half of its maximum. Ms. Butcher stated that the requirement did not seem logical as compared to test site selection criteria for other meters because it implies that the meter will not pass if it has been run from 50 % to 100 % of the stated limit. In assessing

the suitability of a given site for permanence testing, NTEP typically considers whether or not flow rates that can be achieved at a site are reflective of the range requested on the CC. For example, given a meter with a rated minimum flow of 20 gpm and maximum flow of 100 gpm, if a company picked a site that never got above 30 gpm, one might question whether or not the site would be adequate to demonstrate sustained performance over the rated flow range. Mr. Noel explained that the meter could still be tested for performance within tolerance up to the maximum rate; it was only the flow rate during the accumulation of the required throughput that was intended to be limited to 50 % of maximum rated flow. He also pointed out that throughput flow rates for other device types undergoing type evaluation are typically under the control of the equipment owner and that there is no stated requirement about the flow rate at which the throughput must be accumulated. He further noted that water meters are somewhat unique in that throughput during type evaluation is often under the control of a state laboratory. This difference is cited as the reason that a statement about the throughput flow rate is even necessary. The Sector went on to discuss whether to add a note identifying AWWA as the source of the 50 % constraint on permanence throughput flow rate and decided, if captured in the NTETC Measuring Sector Summary it isn't necessary to add a note to NCWM Publication 14.

The Sector discussed the application of the special tolerance for water meters. It was noted that the far right column of Table T.1. of Section 3.36. Water Meters in NIST Handbook 44 is labeled as "Tolerance for Special Tests Conducted at the Minimum Flow Rate." Mr. Noel explained that the application of the special tolerance only at the minimum flow rate for water meters is in harmony with AWWA standards. It was also noted that for LMD there is a difference between the calculation stated in NCWM Publication 14 Technical Policy B. Tolerance Application for the lowest flow rate for a normal test ([50 % of the rated maximum flow rate + the rated minimum flow rate]/2) and the calculation stated in NIST Handbook 44 Section 3.30. Liquid-Measuring Devices paragraph N.4.1. Normal Tests. for the lowest flow rate considered to be a normal test (flow rates below one-half of the sum of the maximum discharge flow rate and the rated minimum discharge flow rate). Mr. Buttler, NIST Technical Advisor, noted that, according to item 1.B) in the 1998 NTETC Measuring Sector Summary, the addition of the 50 % multiplier to the maximum rated flow rate in the calculation in NCWM Publication 14 is intentional. The purpose of the more restrictive criteria is to demonstrate during type approval testing that a device of the same type will comply with NIST Handbook 44 in the most conservative case wherein the maximum discharge rate of the device in a given application may be as low as 50 % of the device's rated maximum flow rate.

The Sector noted that there exist differences between the criteria stated under the heading Normal Test Tolerances in Technical Policy B. Tolerance Application from the LMD section of NCWM Publication 14 and the requirements in NIST Handbook 44. Certain sections of the code in NIST Handbook 44 define the criteria for applying normal test tolerances differently than Technical Policy B. Two examples were discussed. The first example was in Section 3.36. Water Meters where the heading "Tolerance for Special Tests Conducted at the Minimum Flow Rate" appears in the farthest right column of Table T.1. Accuracy Classes and Tolerances for Water Meters. The second example was in Section 3.37. Mass Flow Meters where the criteria for Normal Tests in N.6.1. includes "Any additional tests conducted at flow rates down to and including the rated minimum discharge flow rate." The Sector agreed that Technical Policy B. in NCWM Publication 14 must be revised to acknowledge these and any other exceptions in NIST Handbook 44.

Conclusion:
The Sector modified the draft checklist in order to incorporate it into the LMD section in NCWM Publication 14. The four checklist items in the draft under the heading Additional Checklist and Test Procedures for Water Meters were renumbered as items 44 through 47 so that they could be appended after the highest number item (43) currently in the LMD checklist. The Sector also agreed to propose Paragraph L. Laboratory Evaluation and Permanence Tests for Utility Type Water Meters as originally presented. All other information in the draft Water Meter Checklist was removed, as it is redundant to content already contained in the LMD section of NCWM Publication 14. This was done to prepare the proposal as an addendum to the LMD section instead of as a separate stand-alone checklist.
The Sector unanimously agreed to recommend the modified proposal as shown in Appendix B to the NTEP Committee for incorporation into NCWM Publication 14 as checklist items 44 through 47. The proposed language for Paragraph L. Laboratory and Permanence Tests for Utility Type Water Meters is below:

L. Laboratory Evaluation and Permanence Tests for Utility Type Water Meters
All new-design meters are subject to a permanence test. NTEP reserves the right to require a permanence test based on the results of the initial examination.

Initial Examination

1. **All meters of the new type installed at the type evaluation location are subject to evaluation. At least three meters of the same model must be tested.**

2. **At least three meters will be chosen for throughput testing on water. The minimum number of tests to be conducted for each of these meters will include the following:**

   - **Three tests at the maximum flow rate**
   - **Three tests at the intermediate flow rate**
   - **Three tests at the minimum flow rate**

3. **All meters must perform within acceptance tolerance.**

4. **Repeatability - When multiple tests are conducted at approximately the same flow rate, each test shall be within the applicable tolerances and the range of test results shall not exceed the following values:**

   a. **0.6 percent for tests conducted at Normal Flow Rates**

   b. **2.0 percent for tests conducted at Intermediate Flow Rates**

   c. **4.0 percent for tests conducted at Minimum Flow Rates**

Subsequent Examination

1. **Following the period of use, the tests listed above are to be repeated. All results within the range of flow rates are to be included on the certificate of conformance provided the results are within the applicable tolerances.**

2. **The examination will be conducted as applicable:**

   - **200,000 gallons for throughput testing for mechanical changes of metrological significance**
   - **Flow rates during throughput testing are not to exceed 50 % of the manufacturers rated maximum flow rate**

3. **Three tests at maximum, intermediate and minimum flow rate will be made on the throughput meters. Only one test at each flow rate needs to be performed on any remaining meters.**

4. **Repeatability – When multiple tests are conducted at approximately the same flow rate, each test shall be within the applicable tolerances and the range of test results shall not exceed the following values:**

   a. **0.6 percent for tests conducted at Normal Flow Rates**

   b. **2.0 percent for tests conducted at Intermediate Flow Rates**

To acknowledge the exceptions between NIST Handbook 44 and the method of applying normal test tolerances stated in Technical Policy B. Tolerance Application, the Sector also unanimously agreed to send a proposal to amend Technical Policy B. such that the text under the heading of "Normal Test Tolerances" would read as follows:

"For the purpose of calculating tolerances, **unless otherwise specified in Publication 14 (e.g. utility-type water meters and mass flow meters)**, normal tests conducted in an NTEP evaluation may be performed at any flow rate down to:" […with the rest of the existing content remaining unchanged].

3. Development of Hydrogen Gas-Measuring Devices Checklist

Source:
NIST, OWM - Carryover from 2010 Measuring Sector Agenda

Background/Discussion:
At the July 2010 NCWM Annual Meeting, NCWM members voted to add a tentative code for commercial hydrogen gas-measuring devices to NIST Handbook 44. Since the majority of states require an NTEP CC for commercial weighing and measuring devices, offering NTEP CCs for these devices would facilitate the acceptance of these devices in the commercial marketplace and assist states in their assessment of these devices.
At its 2010 NTETC Measuring Sector Meeting, the Sector established a work group to develop a draft Hydrogen Gas-Measuring Devices Checklist for the Sector to consider. The Hydrogen Gas-Measuring Devices Checklist Work Group consists of the following members:

Work Group Chair: Mr. Michael Keilty, Endress + Hauser Flowtec AG USA

- Mr. Dennis Beattie, Measurement Canada
- Mr. Mike Gallo, CLEANFUEL USA
- Mr. Norman Ingram, California Division of Measurement Standards
- Mr. Dan Reiswig, California Division of Measurement Standards
- Mr. John Roach, California Division of Measurement Standards
- Mr. Van Thompson, California Division of Measurement Standards
- Ms. Juana Williams, NIST, OWM
- Mr. Marc Buttler, NIST, OWM

Following the Measuring Sector meeting, the work group held a series of seven teleconferences from March through September and completed their task to develop a draft checklist. The U.S. National Work Group (USNWG) for the development of Commercial Hydrogen Measurement Standards reviewed the checklist during September and October.

Mr. Keilty, Endress + Hauser Flowtec AG USA, reported that the work group had completed its work on the draft checklist for Hydrogen Gas-Measuring Devices and requested that the Sector forward the draft to the NTEP Committee with a recommendation to add it to NCWM Publication 14. The checklist is needed in order to respond to pending requests for NTEP evaluation and CC's on hydrogen gas-measuring devices. Some members of the Sector asked whether NTEP can issue a CC for hydrogen measuring devices while NIST Handbook 44, Section 3.39. Hydrogen Gas-Measuring Devices has "Tentative Code" status. Mr. Truex, NTEP Administrator, responded that any NTEP CC issued under a tentative code is provisional, but is still an official CC. The only difference being that when the status of the code is changed from tentative to permanent, a device covered by a provisional CC may need to undergo additional evaluation to demonstrate compliance with any additional requirements that may have been added to the code. If no additional requirements are added when the tentative status of the code is changed, then any existing provisional certificates would automatically be upgraded to full certificates.

Mr. Truex asked if the checklist should be added to the LMD section of NCWM Publication 14 or as a new, separate section. Mr. Buttler, NIST Technical Advisor, recommended locating the new checklist in the LMD section of NCWM Publication 14; this proposal was based on the observation that the Compressed Natural Gas (CNG) checklist is located in the Mass Flow Meter portion of the LMD checklist now and it would be best to keep these similar entities together. Mr. Truex agreed.

The Sector discussed how to address the need for guidance on permanence testing and field evaluation methods. Mr. Ingram, California Division of Measurement Standards, Mr. Buttler, NIST, OWM, and Mr. Keilty, Endress + Hauser Flowtec AG USA, recommended referencing the existing Section I. Field Evaluation and Permanence Tests for Mass Flow Meters to leverage the existing information developed for CNG meters in order to address this need for hydrogen gas-measuring devices. After reviewing Section I, the Sector agreed that all the information was pertinent and appropriate to hydrogen with the exception of the sub-section on "Testing for Volume Units Only or to Add Volume Units to Existing Certificates." The Sector agreed to reference Section I. for hydrogen gas-measuring devices until other guidelines specific to hydrogen are developed.

Mr. Truex, NTEP Administrator, stated that there are stakeholders that have an immediate need for the checklist and that he supports adding it in the LMD section and the addition of the reference to Section I. of the field evaluation and permanence tests.

Conclusion:
The Sector unanimously agreed to send a proposal to the NTEP Committee to include new checklist items in the LMD Checklists and Test Procedures as shown in Appendix C to this summary. The Sector further agreed to include the following note, as also shown in Appendix C, to the beginning of the checklist:

> "Refer to Section I. Field Evaluation and Permanence Test for Mass Flow Meters (All topics with the exception of "Testing for Volume Units Only or to Add Volume Units to Existing Certificate") for test procedures."

Mr. Buttler, NIST Technical Advisor, noted that in anticipation that the Water Meter checklist from Agenda Item 2 is adopted as items 44-47 in the LMD section of NCWM Publication 14, Mr. Keilty, Endress + Hauser Flowtec AG USA, and Mr. Buttler have updated the numbering shown in Appendix C to reflect the item range from 48 to 58.

NEW ITEMS

4. Product Families Table – Include Water on Existing NTEP CC's

Source:
Mr. Karimov, Liquid Controls

Background/Discussion:
Mr. Karimov, Liquid Controls, noted that flow meters are approved to very tight tolerances on aggressive liquids such as acids, alcohols, glycols and their mixtures with water and liquid fertilizers. Many of these liquids are water-based such as liquid fertilizers and glycol/water mixtures. Water is a significantly less aggressive fluid and has a higher NIST Handbook 44 tolerance than other liquids.

A note at the end of the Product Families Table in NCWM Publication 14 allows water to be used as a test product in the fuels product family. Despite this, NCWM Publication 14 requires separate tests on water in order to add water to the NTEP CC for PD and turbine meters.

The Sector was asked to consider adding the following note at the bottom of the Product Families Table of NCWM Publication 14. This note would allow the "water" family (or specific liquids from the water family) to be added to an NTEP CC without additional testing based on approvals for certain other products:

> **The water family (in its entirety or partially) can be included on an NTEP CC based on an approved product or range of products with similar metrological characteristics (specific gravity, conductivity, and**

viscosity – as applicable to the relevant meter technology) unless materials constituting the measuring element are known to deteriorate in contact with water.

Mr. Karimov, Liquid Controls, explained that he has submitted this item to address applications where his customers would like the ability to measure large quantities of water (using larger meters than standard utility meters) and he does not feel that a device type that is already approved on other similar products should be required to undergo evaluation with water in order to be approved for water.

Mr. Ingram, California Division of Measurement Standards, stated that California has tested devices using water as a test medium. Mr. Keilty, Endress + Hauser Flowtec AG USA, added that mass meters are also often tested using water.

Mr. Oppermann, Weights and Measures Consulting, LLC pointed out that OIML R 117 is for fluids other than potable water and asked why the OIML standard for potable water R 49 is held separate from other codes. Ms. Butcher, NIST, OWM, explained that the Water Meters Code in NIST Handbook 44 was developed to address utility-type and batching meters, but is not limited to those types of water meters. She went on to point out that the LMD Code in NIST Handbook 44 specifically excludes water meters. Mr. Frailer, Maryland Department of Agriculture, added that, unlike the LMD Code, the Vehicle Tank Meter (VTM) Code and the Mass Flow Meters Code do not exclude water. Requirements already exist for devices that measure water and fall under those codes. Mr. Buttler, NIST Technical Advisor, mentioned that water is defined as a separate product category in NCWM Publication 14 Technical Policy C. Product Families for Meters.

The Sector discussed various different fluids, comparing properties and tolerances.

Mr. Karimov, Liquid Controls, described a case where a device has approval for use as a VTM delivering Diesel Exhaust Fluid (DEF), which is a water based solution. He would like to add stationary water meter approval for that device with no further testing. Mr. Karimov pointed out that there are two issues preventing this expanded approval. The first issue is the need for further testing to add water; he feels this additional testing is unnecessary because the device has already been demonstrated to perform on DEF, which is largely composed of water. Mr. Karimov hopes to address this issue with the note he proposes to add to NCWM Publication 14. The second issue involves the exclusion of water meters from the Application Section of the LMD Code. Even though the tolerances in the Water Meters Code are larger than those in the LMD Code, a meter that has already been tested for applications covered by the LMD Code must still meet the specific flow rate range requirements defined by meter size in the Notes Section of the Water Meters Code to receive approval in stationary water applications.

Mr. Karimov, Liquid Controls, pointed out that a note in NCWM Publication 14 Product Families Table states that "Water and a product such as Stoddard solvent or mineral spirits may be used as test products in the fuels, lubricants, industrial, and food-grade liquid oils product family." Given this note, he asked why devices tested on these types of products would not also be approved for water without having to specifically test with water. Mr. Buttler, NIST Technical Advisor, had researched the origin of the note, tracing it back to the 2005 NTETC Measuring Sector Meeting. During that meeting, there were multiple proposals developed for a Product Families Table, and a work group was formed that developed the table overnight, including this note. There is no clear discussion in the Sector summary for that year on the note. Mr. Buttler contacted Mr. Suiter, Richard Suiter Consulting, and the NIST Technical Advisor at that time, and learned that the intent was to recognize that water and Stoddard solvent were being used commonly in industry to eliminate the danger of testing with hazardous fluids and to permit the use of water as a substitute test medium in those instances. Mr. Keilty asked the Sector if the note should be removed because of the confusion it causes. Mr. Miller, FMC Technologies Measurement Solutions, Inc., disagreed, stating that this would disallow the common practice to use safe fluids in the laboratory. All agreed to keep the note.

Mr. Keilty, Endress + Hauser Flowtec AG USA, pointed out that it is very common to perform testing on water in a controlled environment before testing in field applications to add new products to an approval. It was unclear to him why Mr. Karimov, Liquid Controls, would want approval for water without testing on water. Mr. Karimov replied that the reason he has proposed this new note is to give the NTEP Measuring Laboratories legal authority to make a judgment call on whether to allow water approval on a device based on the performance of the device on other fluids.

There was discussion about the metrological impacts of differences in materials of meter construction compared to the metrological impacts of changing fluid product material. Mr. Andre Noel, Neptune Technology Group, Inc., asked if it is necessary to change calibration from DEF to water. Mr. Karimov, Liquid Controls, replied that the calibration must be changed from application to application. Mr. Allen Katalinic, North Carolina Department of Agriculture, pointed out that water expands when it freezes, unlike some other products. There was further discussion about how different types of water have different potential effects on permanence testing results. Mr. Noel suggested that the proposed note should apply to potable and tap water only because of the increased potential for material compatibility issues with distilled and deionized water. Mr. Karimov proposed that the NTEP Measuring Laboratories should have legal authority to decide whether certain water products could be included without testing based on the lab's understanding of the metrological and material compatibility of the meter and the types of water involved in an evaluation. Mr. Noel stated that when the requirements are left open, different manufacturers may receive different approval for the same testing.

Mr. Noel, Neptune Technology Group, Inc., pointed out that different products, such as milk, have different system requirements. Ms. Butcher, NIST, OWM, agreed that there are other code requirements specific to milk and noted that, in the case of adding fluids that have code requirements that were not examined during previous type evaluations, compliance of the device with the new code requirements would have to be evaluated. Ms. Butcher added that when a meter application is covered by two different codes, the evaluating laboratory must evaluate the device by applying all the requirements from both codes. Product family categories already indicate by their groupings what products have similar metrological characteristics and code requirements. Mr. Karimov, Liquid Controls, replied that he believes the groupings are imperfect now.

Ms. Butcher, NIST, OWM, requested a clarification in terms of the intended quantity or magnitude of the word "similar" as it appears in the proposed note. Mr. Karimov, Liquid Controls, replied that "similar" is intended to mean that the value of the critical characteristic property for the meter technology (e.g., viscosity for PD meters) for the proposed type of water would need to be identical to, or within the range of the physical property values of previously tested and approved products.

Conclusion:
Mr. Keilty, Endress + Hauser Flowtec AG USA, confirmed with the Sector that there had been sufficient discussion on the item and called for a vote. Mr. Karimov, Liquid Controls, requested that the wording of the proposed note be amended to include "- as determined by NTEP" in the parenthetical qualifying term for "water family." The vote was, thus, on a proposal to add a note to the end of the Product Families Table that would apply to all technologies as follows:

> **The water family (in its entirety or partially – as determined by NTEP) can be included on an NTEP CC based on an approved product or range of products with similar metrological characteristics (specific gravity, conductivity, and viscosity - as applicable to the relevant meter technology) unless materials constituting the measuring element are known to deteriorate in contact with water.**

The results of the vote are as follows:

- In favor: 9
- Opposed: 3
- Abstain: 1
- Note: Two of the three laboratories were opposed to the item.

The item and the voting results will be forwarded to the NTEP Committee. Mr. Truex, NTEP Administrator, informed the Sector that the NTEP Committee typically does not view voting results as consensus when a majority of the laboratories do not support an item.

5. Product Families Table – Change Test Requirements for Turbine Meters from Test A to Test E

Source:
Dmitri Karimov, Liquid Controls

Background/Discussion:
In the Product Families Table of NCWM Publication 14, turbine meters require testing on individual products with some exceptions. This approach, which was appropriate many years ago when turbine meters were first entering the custody transfer arena, has become outdated in the opinion of the submitter. Turbine meters have been tested extensively under NTEP. Turbine meters need at least to have product tests match those of PD meters because turbine meter influence factors are similar to those of PD meters.

The Sector was asked to consider replacing Test A with Test E for turbine meters and to merge the products under turbine meters into product category groups similar to those of PD meters.

Mr. Karimov, Liquid Controls, explained that the reason he has submitted this item is that his company expects to see demand for turbine meters in a growing number of different applications and on different products requiring NTEP approval.

The NTEP laboratories were not ready to agree that Test A should be eliminated for turbine meters on all products and asked what specific details were being proposed. They pointed out that the different product categories were originally created for a reason and wanted to know what has changed and what specific product categories needed to be reviewed. Mr. Karimov, Liquid Controls, stated that the immediate focus should be on combining chlorinated solvents and fertilizer groups.

The manufacturers in the room were asked if they offer turbine meters. Mr. Rich Miller, FMC Technologies Measurement Solutions, Inc., said his company only sells turbine meters in petroleum applications. Mr. Andre Noel, Neptune Technology Group, Inc., said that his company only sells turbine meters in water applications. Mr. Karimov, Liquid Controls, said that his company sells turbine meters in a wide range of applications on various fluids. He mentioned that they use turbine meters on acids, DEF, and alcohols, and believes that this experience has shown that turbine meters can be approved for ranges of viscosities, the way that PD meters are now. Ms. Butcher, NIST, OWM, asked if data could be provided that shows how the meter behaves going from one end of a range to another; Mr. Karimov replied they do not have data they could provide.

There followed discussion about the basic nature of turbine meters with Mr. Karimov, Liquid Controls, asserting that turbine meters are affected by viscosity. Mr. Keilty, Endress + Hauser Flowtec AG USA, and Mr. Noel, Neptune Technology Group, Inc., both said that turbine meters are velocity meters. Mr. Miller, FMC Technologies Measurement Solutions, Inc., disagreed and stated that turbine meters are inference devices. Mr. Beattie, Measurement Canada, explained that Canada uses kinematic viscosity when working with turbine meters because the Reynolds number is too difficult to work with.

When turbine meters were first included in the Product Families Table, there was not as much experience with the technology in weights and measures applications. Mr. Karimov, Liquid Controls, stated that, at first, turbine meters needed to be tested with every product because they were so new to weights and measures. He asserted that, in the intervening years, much has been learned and demonstrated about their performance. He explained that there are more different product families for turbine meters than are needed and pointed to chlorinated solvents as an example. Mr. Jerry Butler, North Carolina Department of Agriculture agreed that if we have proof now, we should move forward and update the table.

The Sector reviewed the history of work done on turbine meters over the course of the NTETC Measuring Sector and NTEP. Mr. Henry Oppermann, Weights and Measures Consulting, LLC, recalled that the Sector was first formed in 1984, just prior to NTEP. Mr. Keilty, Endress + Flowtec AG USA, said that the primary focus of the Sector at that time was PD meter approvals. Mr. Keilty recalled that there had been a turbine meter work group in 1994 led by Mr. Alston, Daniel Flow Products Inc. Ms. Butcher, NIST, OWM, added that Dr. Mattingly, NIST, OWM, had provided input based on NIST's research on turbine meters to the Sector that addressed influence factors related to flow profile, installation, flow direction, and orientation.

Mr. Karimov, Liquid Controls, proposed combining families into the following new groupings:

- Chlorinated solvents – one category
- Chemicals – one category
- Fertilizers – one category

Mr. Frailer, Maryland Department of Agriculture, stated that the scope of the change, as it was originally proposed, was too broad and that it was not possible to clearly understand the reduction in scope that was being proposed in the discussion without seeing how it would appear in the Product Families Table. The laboratories all agreed that they would need to see a detailed draft with the specific proposed groupings clearly depicted and all the pertinent product property data included in order for them to be able to fully understand what they were being asked to agree to. Mr. Karimov, Liquid Controls, agreed to prepare a draft table for the next sector meeting and requested assistance from NCWM and NIST in providing a file format of the current table that would allow him to make the appropriate markings for the draft.

Conclusion:
The Sector agreed to carry this item over to the NTETC Measuring Sector's 2012 Meeting. This will allow time for Mr. Karimov, Liquid Controls, to prepare a detailed proposal using the format of the current Product Families Table. Mr. Karimov, Liquid Controls, will rework the table and send it to interested stakeholders for review and comment prior to the next sector meeting. Stakeholders were identified as all the NTEP Measuring Laboratories, Mr. Miller, FMC Technologies Measurement Solutions, Inc., and Mr. McAllister, Daniel Measurement. Mr. Karimov will include in the draft all property data for each product that is included in the recommended set of changes so that the Sector will have a clear view of how the products in the proposed groupings compare. The table will be updated prior to the release of the agenda for the next NTETC Measuring Sector Meeting to incorporate the input received back from the stakeholders identified. Mr. Buttler, NIST Technical Advisor, will ask Ms. Hier, NCWM Project Coordinator, to provide Mr. Karimov with the current table in a format that he will be able to modify to reflect his proposal. Mr. Buttler will also aid Mr. Karimov as needed in preparation of the draft.

6. Product Families Table – Consolidate Product Categories for PD and Turbine Meters

Source:
Dmitri Karimov, Liquid Controls

Background/Discussion:
NCWM Publication 14 has too many agri-chemical products categories for PD and turbine meters that were created many years ago and are outdated. This item relates to a parallel proposal to match PD and turbine product categories.

The Sector was asked to consider a proposal to consolidate most of the agri-chemical product categories for PD and turbine meters into the following two groups:

- All solvents, glycols and alcohols, and chemicals in one group
- All crop chemicals (A, B, C, and D), fertilizers, and flowables in one group

As an alternative proposal, the Sector was asked to consider adding the following note to the bottom of the Product Families Table or somewhere else in the LMD-Technical Policy:

If a meter is approved for a product of low viscosity in one product family or category and the same meter is approved for a product of high viscosity in another product family or category, the meter will be approved for this viscosity range in both product families/categories.

Mr. Dmitri Karimov, Liquid Controls, explained to the Sector that the main difference between this agenda item and the proposal presented in Agenda Item 5 was that this one includes both PD meters and turbine meters. Based on the discussion and status of Agenda Item 5, Mr. Karimov proposed limiting the scope of this item to PD meters only. Mr. Keilty, Endress + Hauser Flowtec AG USA, asked Mr. Karimov, Liquid Controls, if he would consider developing a draft table with the changes proposed, similar to what was agreed to for Agenda Item 5. Before committing to that effort, Mr. Karimov wanted to know if the labs would consider the change. Mr. Ingram, California Division of Measurement Standards, said he would be willing to consider a proposal. Mr. Frailer, Maryland Department of Agriculture, added that he would want to know why the changes were being proposed. Mr. Karimov cited as an example that fungicides and insecticides are all water-based solutions. Mr. Frailer noted that there are four different categories for crop chemicals and that he would consider combining them if they are all in fact similar. Mr. Katalinic, North Carolina Department of Agriculture, added that Round Up is not a suspension. Mr. Butler, North Carolina Department of Agriculture said that PD meters have been around since the 1950's and noted that the chemical products have not changed that much since then. Mr. Miller, FMC Technologies Measurement Solutions, Inc., stated that the Sector had been working on the format for the Product Families Table with the agreement that there would be no changes to content as part of that project. Since that project was completed in 2010, the Sector can move forward with these types of proposals to change the substance of the table.
Mr. Keilty, Endress + Hauser Flowtec AG USA, asked Mr. Karimov, Liquid Controls, to describe the alternative proposal in the recommendation above. Mr. Karimov explained that the intent of his alternate proposal is to establish a policy that defines a single approved viscosity range for a meter rather than separate approved viscosity ranges for that meter by each product family. Under this proposed policy, the limits of the range of approved viscosities for a meter would be determined by the highest viscosity and the lowest viscosity products tested, regardless of the product families those two products fall within. Furthermore, this single approved viscosity range would apply to all products in all the product families for which the meter has been approved, regardless of the range of the viscosities of the products in each family that had actually been tested during evaluations. Mr. Karimov stated that it is his intent that the scope of the alternative proposal should still include both PD and turbine meters despite his earlier request to exclude turbine meters from the primary proposal. Mr. Karimov noted that his proposal does not have any impact on multi-product approvals.

Mr. Truex, NTEP Administrator, asked Mr. Karimov, Liquid Controls, if there is any data available to support the validity of the alternative proposal. Mr. Karimov replied that he could not provide such data. Mr. Truex expressed concern about the proposal since there is no data to support it. Mr. Frailer, Maryland Department of Agriculture, added that it is important to remember that there are other similarities between products in the same family to consider in addition to just viscosity.

Mr. Miller, FMC Technologies Measurement Solutions, Inc., asked for clarification on how the proposal would impact permanence testing requirements. Mr. Karimov, Liquid Controls, said his intent was that it would still be necessary to do permanence testing on one product from each category. He described an example where a permanence test would be conducted using a high viscosity product from one family and a second permanence test would be conducted using a low viscosity product from another family; these tests would allow the full range of viscosity to be included for both families.

Mr. Keilty, Endress + Hauser Flowtec AG USA, recapped the two proposals in Agenda Item 6:

- The primary proposal suggests consolidating the solvents, glycols and alcohols, and chemicals into one group and consolidating all crop chemicals A, B, C, and D into another group.

- The alternative proposal is to add a note to the bottom of the Product Families Table or elsewhere in the Technical Policy describing the application of viscosity ranges across families.

Mr. Butler, North Carolina Department of Agriculture reminded the Sector that the product families were separate for a reason. He gave a hypothetical example wherein a CC would include approval of a meter model family for a wide range of viscosities based on testing that included a high viscosity product (e.g., molasses) tested on a smaller meter size (and, therefore, tested at lower flow rates), and a low viscosity product tested on a larger meter size (and, therefore, tested at higher flow rates). The concern would be that the entire family of meters would have coverage for the full range of viscosities across all approved families despite the fact that no testing with high viscosity product at higher flow rates and on larger meters was done. Mr. Butler's comments highlighted the concern that the flow profile, velocity, and other fluid flow characteristics of different products can vary significantly through different sized meters and at different flow rates. The current product family groupings help to ensure that an appropriate amount of testing is done to understand the effects of these variations. Mr. Karimov, Liquid Controls, responded that each meter model (size) should be tested on both high and low viscosity products over the range of approved flow rates for that meter model. He proposed to address the concern by adding the word "model" to the note to ensure that a wide range of viscosities is to be tested on each meter size that is selected for testing to adequately represent performance of the full range of sizes for that meter model family.

Mr. Ingram, California Division of Measurement Standards, interpreted the proposal as basically combining all the families into one and agreed with the other labs that the product families are currently separate for a reason. Mr. Beattie, Measurement Canada, added that, with the manufacturers taking responsibility for any variation in materials of construction, incorporating the proposed change would make manufacturers fully responsible for all variations of both meter and fluid product materials and stated that he is not comfortable with that idea. Mr. Butler, North Carolina Department of Agriculture asked if a change in the meter material would mean a change in the model number. Mr. Keilty, Endress + Hauser Flowtec AG USA, replied that was not necessarily true and it would depend on how manufacturers define their model structures.

Mr. Karimov, Liquid Controls, requested that the sector vote on the alternative proposal to add a note regarding the expanded application of tested viscosity ranges across families. Mr. Buttler, NIST Technical Advisor, asked for clarification as to whether mass flow meters and specific gravity would also be included in the scope of the proposed policy. Mr. Karimov said these are not intended to be included in the proposal and he believes that would need to be developed and submitted by someone with an interest in mass flow meter policy.

Conclusion:
Mr. Karimov, Liquid Controls, withdrew the primary proposal and plans to incorporate it into the draft changes to the Product Families Table that will be developed for Agenda Item 5 that was carried over to 2012.

The Sector voted on the alternative proposal to add a note to the LMD Technical Policy, which was modified to include the qualifiers "PD or turbine" and "model" as shown below.

If a PD or turbine meter is approved for a product of low viscosity in one product family or category and the same model meter is approved for a product of high viscosity in another product family or category, the meter will be approved for this viscosity range in both product families/categories.

The results of the vote are as follows:

- Approve: 7
- Oppose: 5
- Abstain: 0
- Note: All three labs and NIST were opposed to the item as it was framed for the vote. The item and the voting results will be forwarded to the NTEP Committee.

7. Add Metrological Sealing Checklist to Measuring Devices NCWM Publication 14

Source:
NTEP Measuring Laboratories

Background/Discussion:
At its 2011 NTETC Measuring Sector Meeting, the NTEP Measuring Laboratories agreed that a sealing table checklist that is modeled after the example in NCWM Publication 14, Digital Electronic Scales checklist, Section 10 should be added to NCWM Publication 14.

The Sector was asked to consider forming a work group to develop a sealing checklist to add to the Measuring Devices NCWM Publication 14 that is modeled on the example from NCWM Publication 14, Digital Electronic Scales checklist, Section 10.

Mr. Truex, NTEP Administrator, summarized the development of this item. The S&T Committee has determined that adding this information to the type-evaluation checklists in NCWM Publication 14 is the appropriate resolution to an item that has been on the S&T Committee agenda for several years. The original concern was raised in recognition that there were some weighing devices in service that could be left in a calibration mode while sealed. The S&T Committee determined that appropriate requirements already exist in NIST Handbook 44, and that clarification of the interpretation of these requirements in the NTEP checklists would help to ensure the requirements are more uniformly interpreted and applied. Mr. Truex supported the decision of the S&T Committee and recommended the Sector move this item forward.

Mr. Keilty, Endress + Hauser Flowtec AG USA, asked where the proposed sealing checklist would be located in NCWM Publication 14 Ms. Butcher, NIST, OWM, suggested that it appear under code reference G-S.8.1.
Mr. Truex, NTEP Administrator, explained that all the highlighted text, including the two tables would be ready to add to the LMD checklist under item 2.16 if any language related to "weight" and "weighing devices" and units were revised to include references appropriate to measuring devices. The Sector reviewed the proposal and agreed that the item would be suitable for measuring devices if the following changes were made in the table of examples at the end:

- Change each instance of "lb" to "gal"
- Change each instance of "weight" to "quantity" and "weights" to "quantities"

Mr. Truex, NTEP Administrator, noted that these terms are just provided in the tables as examples and that the references are not meant to be all-inclusive. Mr. Miller, FMC Technologies Measurement Solutions, Inc., added that PTB in Germany would require an asterisk in front if the value was a not-legal-for-trade value. Referring to the fourth item in the right column of the second table, Mr. Johnson, Gilbarco, Inc., asked why a flashing value would not be acceptable as an indication representing that a device is configured with the setup or configuration mode enabled. Mr. Johnson added that retail motor-fuel dispensers have been using a flashing display value for 30 years to signify a non-valid indication. He further noted that many of these devices use a display that only has numeric capability, making it impossible to use letter codes as shown in the first example of an acceptable indication shown in the second table. Mr. Truex responded that flashing zeros or dashes would be acceptable, but a flashing value would not be acceptable if it was flashing at a rate that would still make the value usable. He added that if the value could be sent to the console and that value could be used, then that could also be a problem.

Conclusion:
The Digital Electronic Scales sealing checklist item was reviewed and revised by the Sector during the meeting to make it suitable for measuring devices. The Sector unanimously agreed to forward a proposal to the NTEP Committee to include the revised checklist item shown in Appendix D under item 2.16. in the LMD checklist.

8. Product Families Table – Categorization of Liquid CO_2

Source:
NTEP Measuring Laboratories

Background/Discussion:
Liquid CO_2 does not appear in the Product Families Table in Technical Policy C. of the LMD checklist. Therefore, it is difficult to determine whether liquid CO_2 would fall into the compressed liquid category, or the cryogenic liquid category, or a new category of liquid. Without a clearly defined product category, it cannot be determined what tests are required to include liquid CO_2 on an NTEP CC. This item was originally introduced in 2008. At that time, the Sector had agreed to table the issue until the reorganization of the Product Families Table was completed and more data was available to suggest the best approach for including liquid CO_2 in the Product Families Table and for defining the test criteria. The Sector has not received additional data, however the issue remains that the categorization of liquid CO_2 is undefined. In the absence of data to support any other categorization and in recognition of the unique properties of liquid CO_2, the most conservative approach would be to add liquid CO_2 to the Product Families Table with Test A status; this will require it to be tested individually in order to be added to an NTEP CC.

The Sector was asked to consider adding liquid CO_2 to the Product Families Table with Test A status (which requires testing with each product) to eliminate the current ambiguous status of liquid CO_2.

Mr. Buttler, NIST Technical Advisor, explained that liquid CO_2 does not qualify as a cryogenic liquid because the boiling point (− 70 °F) is considerably higher than the maximum boiling point for cryogenic liquids (− 243 °F) defined in NIST Handbook 44.

The NTEP Measuring Laboratories were asked about their experience with liquid CO_2. Only California has evaluated devices measuring liquid CO_2 in commercial applications. California has issued CTEP approval, but there has never been an NTEP approval on a metering device on liquid CO_2 to the Sector's knowledge. The Sector agreed that, in the absence of data or experience to support a less conservative approach, liquid CO_2 should be added to the Product Families Table as a Test A fluid for all technologies so that the ambiguity would be resolved. Mr. Keilty, Endress + Hauser Flowtec AG USA, commented that magnetic flow meters do not measure liquid CO_2.

Conclusion:
The Sector unanimously agreed to propose adding a separate product category for liquid CO_2 and including liquid CO_2 as a Test A product for Mass Flow Meters, Positive Displacement Meters, and Turbine Meters.

9. Product Families Table – Add Hydrogen (Compressed Gas)

Source:
USNWG for the Development of Commercial Hydrogen Measurement Standards

Background/Discussion:
Section 3.39 Hydrogen Gas-Measuring Devices – Tentative Code was added to NIST Handbook 44 in 2011. There is no mention of hydrogen in the Product Families Table in Technical Policy C. Hydrogen should be added to the Product Families Table in Technical Policy C. to provide clarity as to the Test Requirements, Coverage, Product Category, and Typical Properties.

The Sector was asked to consider adding hydrogen to the checklist for all meter types that measure compressed gases. Because of the unique properties of compressed hydrogen gas, the NTEP Measuring Laboratories recommend that Test A, which requires individual testing, be specified for hydrogen gas.

Mr. Buttler, NIST Technical Advisor, explained that the USNWG requested this item to clarify the testing requirements for hydrogen gas-measuring device type evaluations.

Mr. Karimov, Liquid Controls, requested that hydrogen be added for PD and turbine meters, as well as mass flow meters. Mr. Cooper, Tuthill Transfer Systems, agreed, offering that this would avoid the need to revisit the issue later. Mr. Keilty, Chair, cautioned the Sector about adding blanket statements that include technologies which are not being considered in practice. Mr. Beattie, Measurement Canada, reminded the Sector that the table is not all inclusive; products that do not appear in the table can still be approved.

Conclusion:
The Sector voted on a proposal to add hydrogen to the table for mass flow meters, PD meters, and turbine meters as a Test A fluid as shown in Appendix E to this summary. The results of the vote are as follows:

- Approve: 11
- Opposed: 1
- Abstain: 2
- Note: All 3 labs and NIST approved the item as it was framed for the vote. The item and the voting results will be forwarded to the NTEP committee.

10. Add Units for Compressed Gases to Technical Policy V. List of Price and Quantity Markings on Retail Motor Fuel Dispensers (RMFDs)

Source:
Hydrogen Checklist Work Group

Background/Discussion:
Section 3.39. Hydrogen Gas-Measuring Devices – Tentative Code was added to NIST Handbook 44 in 2011. NCWM Publication 14, LMD Technical Policy V. List of Price and Quantity Markings on RMFDs does not include units for CNG or hydrogen compressed gas in the list of Acceptable Delivered Quantity representations.

The Sector was asked to consider adding "kg," "GGE," and "GLE" to the list of "Delivered Quantity Acceptable" in the top right corner of the Table in Technical Policy V. as acceptable quantity units for CNG and hydrogen RMFDs. The Hydrogen Checklist Work Group noted that the units relating to the compressed gaseous fuels CNG and hydrogen were missing from the table in NCWM Publication 14 Technical Policy V. Mr. Keilty, Endress + Hauser Flowtec AG USA, said that the proposed change should prevent confusion during type evaluation of compressed gas dispensers. Mr. Ingram, California Division of Measurement Standards, noted that the hydrogen gas method of sale regulation in NIST Handbook 130 has a provision that limits the resolution of the unit price to whole cents.

Conclusion:
The Sector reviewed the proposal and identified additional changes that further improved the clarity of the policy. The Sector unanimously agreed to propose the changes to Technical Policy V. List of Price and Quantity Markings on Retail Motor Fuel Dispensers (RMFDs) in NCWM Publication 14 as shown below:

V. List of Price and Quantity Markings on Retail Motor Fuel Dispensers (RMFDs)

List of Price and Quantity Markings on RMFDs (Does Not Apply to Receipt Format)

Total Sale Acceptable	Unit Price Acceptable	Delivered Quantity Acceptable
Total Sale $ 000.00 Total $ 000.00 This Sale $ 000.00 Purchase $ 000.00 Total Purchase $ 000.00 Sale $ 000.00	Unit Price $ 0.000 Price Per Gallon $ 0.000 Price/Gallon $ 0.000 Price Per Liter $ 0.000 Price/Liter $ 0.000 **Price Per GGE $ 0.000 (CNG only)** **Price/GGE $ 0.000 (CNG only)** **Price Per GLE $ 0.000 (CNG only)** **Price/GLE $ 0.000 (CNG only)** **Price Per kg $ 0.00 (hydrogen only)** **Price/kg $ 0.00 (hydrogen only)** Price Per Unit $ 0.000 Price/Unit $ 0.000	Gallons Gal Liters L or l **GGE (CNG only)** **GLE (CNG only)** **kg (hydrogen only)**
Total Sale Unacceptable	**Unit Price Unacceptable**	**Delivered Quantity Unacceptable**
$ 000.00	Price Per Vol Price/Vol $/G $0.000 $/Gal $0.000 $/Liter $0.000 $/L $0.000 $/l $0.000 **Price Per kg $ 0.000 (hydrogen only)** **Price/kg $ 0.000 (hydrogen only)**	G Unit Volume Vol **k** **KG**

11. Certificate of Conformance Parameters for Measuring Devices

Source:
Mr. Marc Buttler, NIST Technical Advisor

Background:
NCWM Publication 14, *Administrative Policy P*. CC lists several options for typical information to be included on an NTEP CC; however, there is no guidance on the minimum information that is to be included in a CC, such as the sealing category and product photographs. Identifying the minimum components to be included on every CC would provide better guidance for NTEP Measuring Laboratories, improve consistency of CC's, and promote easier interpretation by field inspectors.

Mr. Buttler, NIST Technical Advisor, clarified that the intent of the item was to provide guidance for new CC content and not to be applied retroactively to modify existing NTEP CCs.

Mr. Truex, NTEP Administrator, told the Sector that the NTEP CC process is able to effectively ensure that the minimum needed information is contained on all new CC's issued. The necessary content is being effectively captured by virtue of the CC application form. Mr. Truex stated that CC content is dealt with administratively and that there is no need to change NCWM Publication 14.

Conclusion:
The Sector agreed that the need to include the minimum necessary information in all new CC's can be effectively addressed administratively by NCWM. Consequently, the Sector agreed that the proposed change is unnecessary and withdrew the item.

12. Test for Mathematical Agreement of Card Reader after Power Loss

Source:
Mr. Reiswig, California Division of Measurement Standards

Background/Discussion:
During development of the draft checklist for Hydrogen Gas-Measuring Devices, a gap was identified for CNG Card-Activated Retail Motor Fuel Dispensers. NTEP evaluators have found cases where there is not mathematical agreement between the total quantity, the unit price, and the total price when executing the "Power Loss" test (item 16.1) in the LMD NCWM Publication 14, Section 16. Test Methods for Card-Activated Retail Motor Fuel Dispensers. This test is designed to ensure that the device will not dispense any fuel after a power interruption without reauthorization of the card-activated device. The test does not currently call for any check of the mathematical agreement.

The Sector was asked to consider the addition of a procedure to 16.1 of the checklist to verify mathematical agreement after a power loss shut down of an RMFD as shown below:

16.1. Authorize the dispenser and, with the pump "handle" on, interrupt power to any part (or all) of the system. The pump should de-authorize immediately. Specifically:

16.1.1. Authorize with a card and turn the "handle" on. Power down briefly, then restore power. Try to dispense product: the dispenser must not dispense because the power failure should have de-authorized the dispenser.

16.1.2. The dispenser must maintain mathematical agreement between the computed money value and the quantity (Quantity × Unit Price = Sales Price) at the point in time that de-authorization occurred.

After reviewing the proposal, the Sector was uncertain as to where within the checklist the addition should be made. The Sector asked Mr. Ingram, California Division of Measurement Standards, Mr. Buttler, NIST Technical Advisor, and Mr. Keilty, Chair, to review NCWM Publication 14 and the hydrogen draft checklist during the lunch break and share their recommendation for the proposed location(s) for the item. After their review, this group reported to the Sector that they found instances already in place in NCWM Publication 14 that appear to be sufficient to address the concern raised by the originator.

Conclusion:
The Sector agreed that provision for verifying mathematical agreement following a power loss is already covered in other sections of NCWM Publication 14, including the LMD Checklists and Test Procedures for Retail Motor-Fuel Dispensers, the LMD Checklists and Test Procedures for Mass Flow Meters, and the newly proposed draft LMD Additional Checklists and Test Procedures for Hydrogen Gas-Measuring Devices. There are references at multiple points in each checklist that would address mathematical agreement. Consequently, the Sector agreed that the proposed change is unnecessary and withdrew the item.

13. Device Marking for Electronic Linearization for Meters

Source:
NTEP Measuring Laboratories

Background/Discussion:
During the 2010 NTETC Measuring Sector Meeting, the Sector considered the item "Electronic Linearization for Positive Displacement Meters" and agreed to recommend that the second paragraph of Technical Policy G be replaced with the following:

A measuring element may use factory-established linearization curves to establish the minimum flow range (5:1, 10:1, or as required) providing the linearization programming is installed during manufacturing and the programming cannot be altered after leaving the manufacturer.

Auxiliary equipment (e.g., indicator or register) with programmable multi-point calibration that alters the output signal from the measuring element to extend the flow range of the system beyond the measuring element's required minimum flow range may be used and the auxiliary device's multi-point calibration will be noted on the CC and must be marked on the meter.

The requirements for marking flow rate limitations on devices was discussed at the spring 2011 NTEP Measuring Laboratories Meeting in relation to this change, and it was determined that additional clarification is needed regarding the marking requirement that is referenced in NCWM Publication 14, Section G. For example, if a device can have its range expanded by the addition of an optional auxiliary approved device that has multi-point calibration, how is this device to be marked, and do both ranges need to be marked on the device in case the auxiliary device is ever replaced or removed?

The Sector was asked to clarify how the multi-point calibration is to be marked on the meter and add specific guidance to the LMD checklist Section 11. Marking; "Code Reference: S.4.1.1. Marking Requirements; Limitation on Use." The Sector was asked to consider adding the example below or to offer other alternatives to clarify range of use limitations of a meter with and without an auxiliary multi-point indicator.

	Without Aux Multi-Point Indicator	**With Aux Multi-Point Indicator**
Min Flow	20 GPM	10 GPM
Max Flow	100 GPM	100 GPM

The Sector reviewed Technical Policy G and discussed how it allows an auxiliary device to be used to extend the flow range of a system beyond the measuring element's minimum flow range. Mr. Buttler, NIST Technical Advisor, and Ms. Butcher, NIST, OWM, noted two main concerns to be addressed by this proposal:

1. Technical Policy G requires that "the auxiliary device's multi-point calibration will be noted on the CC and must be marked on the meter." However, there is no guidance or example of acceptable marking.

2. When a CC lists different approved flow rate ranges depending on whether an auxiliary device is used to extend the approved flow rate range, how can the flow rate range marking on the device ensure that all the information needed by a field inspector is available when the auxiliary device can be added or removed without changing the marking on the measuring element?

Mr. Buttler, NIST Technical Advisor, illustrated these concerns further by describing a hypothetical example of a device that was marked with an extended range because it was originally installed with an auxiliary multi-point calibration device. If the auxiliary device were ever to fail or be removed and not be replaced, then the marking on the meter would reflect an incorrect approved flow rate range.

Mr. Frailer, Maryland Department of Agriculture, added another example of an inspector examining a device in service that was marked for the range that the device would be approved for if it was not using an auxiliary device (e.g., 20 GPM MIN FLOW). If the inspector found the device to be operating using an auxiliary device in the extended range approved for that system when using that auxiliary device (e.g., down to 10 gpm), the inspector would still fail the device in this case because of the disagreement between the marked range and the operating range.

Mr. Karimov, Liquid Controls, asked whether turbine meters were excluded. Mr. Buttler, NIST Technical Advisor, explained that Technical Policy G applies to all technologies.

Several sector members could see the need for greater clarity and discussed the best location within NCWM Publication 14 to make sure that the information would be clear and not overlooked during type evaluation. No clear location was identified. Mr. Cooper, Tuthill Transfer Systems, shared the history of the original item with the Sector and mentioned that the original item submitted by Mr. Cooper did not include any intent to affect marking requirements.

Conclusion:
The Sector was unable to reach a consensus for guidance on how the policy for marking meters with an extended flow range is to be applied. Consequently, the Sector withdrew the item, and the NTEP Measurement Laboratories will decide how each meter must be marked on a case-by-case basis.

14. Product Families Table - Restore Notation "(Above 50 °C)" to the Heated Products Category Definition

Source:
NTEP Measuring Laboratories

Background/Discussion:
The NTEP Measuring Laboratories noted that the newly revised Product Families Table in NCWM Publication 14 Technical Policy C. is missing the statement "(Above 50 °C)" to qualify the "Heated Products" category. This statement had appeared in prior versions of the Product Families Table and the Sector had not discussed deleting the statement. Consequently, it appears that the statement was inadvertently omitted when the table was reorganized.
The Sector is asked to consider that NIST Handbook 44 currently lists "Asphalt at temperatures greater than 50 °C" in the Tolerances Table under Accuracy Class 0.3A, with an Acceptance Tolerance of 0.3 %. The table also specifies "Heated Products (other than asphalt) at or greater than 50 °C" under Accuracy Class 0.3, with an Acceptance Tolerance of 0.2 %. NIST Handbook 44 does not include a specific definition for "Heated Products" in the Definitions section.

The Sector was asked to consider restoring the term "(Above 50 °C)" to the "Heated Products" category abbreviations as shown below to clarify the temperature range that defines "Heated Products".

Product Category Table – Category Abbreviations

Abbreviation	Product Category	Abbreviation	Product Category
Alc Gly	Alcohols, Glycols and Water Mixes Thereof	Fert	Fertilizers
CC-A	Crop Chemicals (Type A)	FL&O	Fuels, Lubricants, Industrial and Food Grade Liquid Oils
CC-B	Crop Chemicals (Type B)	Flow	Flowables
CC-C	Crop Chemicals (Type C)	Heated	Heated Products (Above 50 °C)
CC-D	Crop Chemicals (Type D)	Liq Feed	Liquid Feeds
Chem	Chemicals	Solv Chl	Solvents Chlorinated
Comp gas	Compressed Gases	Solv Gen	Solvents General
Comp liq	Compressed Liquids (Fuels and Refrigerants, NH3)	Sus Fert	Suspension Fertilizers
Cryo LNG	Cryogenic Liquids and Liquefied Natural Gas	Water	Water

Mr. Buttler, NIST Technical Advisor, explained that the omission of the note appears to have been an oversight that occurred when the new table format was added to NCWM Publication 14 in 2011.

Mr. Buttler described the associated concern about heated products and the Product Families Table. Because heated asphalt and other heated products all fall together in the category of "Heated Products," but have different tolerances in NIST Handbook 44, there was a concern that a device might be approved for a family by testing with the less stringent tolerance. The Sector discussed the concern further and agreed that the issue is effectively addressed by LMD Technical Policy B. Tolerance Application, which provides an example wherein a meter tested using only the "agri chemical" tolerance is restricted from use in applications with tighter tolerances until additional testing is performed. Ms. Butcher, NIST, OWM, pointed out that the Technical Policy B was added because companies were applying for one application and associated tolerance, but if their equipment performed within tighter tolerances, they wanted to also add applications with tighter tolerances to the CC. This provision is intended to emphasize that applicants must specify the application and tolerance for the approvals they seek at the time a device is submitted for evaluation.

The Sector noted two issues in NIST Handbook 44 related to heated products:

- There exists an inconsistency in the Accuracy Classes and Tolerance Tables in the LMD Code and in the VTM Code in NIST Handbook 44 between the temperature range defined for heated asphalt and the temperature range defined for other heated products. Heated asphalt is defined as "greater than 50 ºC," whereas other heated products are defined as "at or greater than 50 ºC."

- The description for "Heated products" in the Mass Flow Meters Code Table T.2 Accuracy Class 0.3 in NIST Handbook 44 is incomplete compared with the description from the LMD Code, which reads "Heated products (other than asphalt) at or greater than 50 ºC."

Conclusion:
The Sector unanimously agreed to propose the addition of the statement "(Above 50 °C)" to the "Heated Products" abbreviation as originally proposed.
Mr. Buttler, NIST Technical Advisor, will investigate and address the two NIST Handbook 44 issues that were identified:

- Inconsistency between the temperature ranges for heated asphalt and for other heated products in the LMD Code and the VTM Code.

- Incomplete description for "Heated products" in the Mass Flow Meters Code

15. Next Meeting

The Sector agreed to recommend to NCWM that its next meeting be held in conjunction with the 2012 Southern Weights and Measures Association (SWMA) Annual Meeting. However, because the Sector must be mindful of meeting publication deadlines for NCWM Publication 15, the Sector noted that this decision may need to be revisited once a date and location has been selected for the 2012 SWMA meeting.

ADDITIONAL ITEMS

The NTETC Measuring Sector was asked to provide input on the following measuring-related issues on its agenda if time permitted during the NTETC Measuring Sector Meeting. In the interest of brevity, the narrative for each item is abbreviated to the extent practical. Full descriptions of NCWM S&T Committee items can be found in the S&T Committee's list of carryover items and its 2011 Interim and Final Reports.

16. Section 3.31. Vehicle-Tank Meters; Paragraph T.4. Product Depletion Test

Source:
Northeast Weights and Measures Association. This item was originally part of the 2010 NCWM Publication 16 Agenda Item 360-3 – Developing Items Part 3.31., Vehicle-Tank Meters - Item 1.

Purpose:
Modify the VTM code to base the product depletion test tolerances on the meter's maximum flow rate (a required marking on all meters), rather than the meter size (a required marking for meters manufactured beginning in 2009). This will enable more consistent application of the tolerances for older meters, which are not required to be marked with the meter size and address an unintentional gap which allows an unreasonably large tolerance for smaller meters.

Item Under Consideration:
The S&T Committee is considering two options for modifications to Paragraph T.4. and Table T.4. The committee is asking for feedback on both of these proposals and is particularly interested in data from manufacturers and weights and measures jurisdictions that would illustrate the impact of these proposals on smaller meters.

Option 1 Summary:
Option 1 proposes to modify Paragraph T.4. and Table T.4. to define product depletion test tolerances based on the maximum flow rate marked on the meter, instead of the meter size and to provide corresponding examples. The proposed tolerance is equal to 0.5 % of the volume delivered in one minute at the marked maximum flow rate.

Option 2 Summary:
Option 2 proposes a wider tolerance than Option 1 for meters rated 100 gpm or lower. As with Option 1, Option 2 proposes to modify Paragraph T.4. and Table T.4. to define product depletion test tolerances based on the maximum flow rate marked on the meter, instead of the meter size and provide corresponding examples. The proposed tolerances in Option 2 are equal to 0.6 % of the volume delivered in one minute at the marked maximum flow rate for meters rated 100 gpm or lower, and 0.5 % of the volume delivered in one minute at the marked maximum flow rate for meters rated above 100 gpm.

Background/Discussion:
At the 2011 NCWM Annual Meeting, the S&T Committee reiterated its need for data to evaluate the impact of any proposed tolerances changes, noting that, to date, no data has been submitted to the committee.

The Committee asked that the following test data be submitted to assist the committee in making this assessment:

- make and model of the meter;
- marked maximum flow rate of the meter;
- actual delivery rate during the normal test;
- error (in cubic inches or percent) for the normal test;
- actual delivery rate during the product depletion test;
- error (in cubic inches or percent) for the product depletion test; and
- type of test (e.g., routine or follow-up).

For information on submitting data, please contact Ms. Butcher, S&T Committee NIST Technical Advisor, at (301) 975-2196 or tina.butcher@nist.gov. The committee also plans to distribute a request on NIST, OWM's Weights and Measures Directors' list serve for jurisdictions to submit data.

Mr. Karimov, Liquid Controls, speaking on behalf of the Meter Manufactures Association (MMA), indicated that the MMA continues to be concerned about the impact of any proposed changes on smaller meter sizes, particularly meter sizes that are less than 1½ inches.

The Committee was looking forward to receiving additional proposals and requested data by November 1, 2011, so that the information can be considered at the 2012 NCWM Interim Meeting, and the item can remain on the Committee's agenda.

Conclusion:
The Sector discussed this issue briefly. They heard an overview of an alternate proposal from Mr. Karimov, Liquid Controls, and Mr. Cooper, Tuthill Transfer Systems, with input from Mr. Miller, FMC Technologies Measurement Solutions, Inc. The Sector did not take a position on this issue.

Mr. Buttler, NIST Technical Advisor, noted the alternate proposal discussed during the sector meeting was formally submitted by the MMA to the S&T Committee on November 3, 2011, after the sector meeting. This proposal is provided below:

Meter Manufacturers Association Proposed Option
T.4. Product Depletion Test. – The difference between the test result for any normal test and the product depletion test shall not exceed:

- eight-tenths (0.8 %) of the volume delivered in one minute at the maximum flow rate marked on the meter for meters marked with a maximum flow rate of 227 Lpm (60 gpm) or less;

- six-tenths (0.6 %) of the volume delivered in one minute at the maximum flow rate marked on the meter for meters marked with a maximum a flow rate of greater than 227 Lpm (60 gpm) and equal or less than 379 Lpm (100 gpm);

- five-tenths (0.5 %) of the volume delivered in one minute at the maximum flow rate marked on the meter for meters marked with a maximum flow rate of greater than 379 Lpm (100 gpm).

Table T.4.
Tolerances for Typical Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters

Marked Maximum Flow Rate	Maintenance and Acceptance Tolerances	Marked Maximum Flow Rate	Maintenance and Acceptance Tolerances
114 Lpm	0.91 L	30 gpm	0.24 gal (55.4 in^3)
227 Lpm	1.82 L	60 gpm	0.48 gal (110.9 in^3)
379 Lpm	2.27 L	100 gpm	0.60 gal (138.6 in^3)
757 Lpm	3.79 L	200 gpm	1.0 gal (231 in^3)

Refer to T.4. for meters with maximum flow rates not listed.
Based on a test draft volume of a least the amount specified in N.3. Test Drafts.

Summary of the MMA Option:
The MMA Option is similar to Options 1 and 2, but proposes a wider tolerance than both Option 1 and Option 2 for meters rated 60 gpm or lower. As in Options 1 and 2, the MMA Option is to modify Paragraph T.4. and Table T.4. to define product depletion test tolerances based on the maximum flow rate marked on the meter, instead of the meter size and to provide corresponding examples. The proposed tolerances in the MMA Option are equal to 0.8 % of the volume delivered in one minute at the marked maximum flow rate for meters rated 60 gpm or lower, 0.6 % of the volume delivered in one minute at the marked maximum flow rate for meters rated between 60 gpm and 100 gpm (including 100 gpm), and 0.5 % of the volume delivered in one minute at the marked maximum flow rate for meters rated above 100 gpm.

17. OIML B 3 Basic Certificate System for OIML Type Evaluation of Measuring Instruments and OIML B 10 Framework for a MAA on OIML Type Evaluations

Source:
Dr. Ehrlich, NIST, OWM

Background/Discussion:
Voting was scheduled to take place on October 14 on the standards for the MAA and OIML type evaluation certificate system standards at the 46th International Committee of Legal Metrology (CIML) meeting in Prague, Czech Republic. The Committee Drafts for both B 3 and B 10 were provided to the Sector for information purposes.

Conclusion:
Mr. Buttler, NIST Technical Advisor, reported the outcome of the October 14 CIML voting. Both items passed and were forwarded to International Bureau of Legal Metrology for publication. Mr. Truex, NTEP Administrator, asked the Sector if any members had MAA Certificates, to which none responded. The Sector took no further action on this item.

18. G-S.1. Marking (Software)

Sources:
2010 Carryover Item 310-3. This item originated from the NTETC Software Sector and first appeared on the S&T Committee's 2007 Agenda as Developing Item Part 1, Item 1.

Background/Discussion:
The NTETC Software Sector has continued to collect information and concerns of stakeholders on this item.
During the 2011 NCWM Annual Meeting, the S&T Committee heard a recommendation from NIST, OWM that this item should be changed to Developing in order to provide the NTETC Software Sector additional time to more fully develop the item based on the following points:

1. The current proposal is not developed enough for consideration by the S&T Committee. Based on the diversity of comments that continue to be heard on this issue, NIST, OWM believes the item is not close to a NCWM vote and that considerable work still needs to be done to develop the item.

2. NIST, OWM interprets the current proposal as requiring that software be marked with a non-repetitive serial number. However, it is not the intent of the NTETC Software Sector to require such marking. Thus, it is believed that the language must be revised to resolve this issue and assure the intended interpretation is clear.

3. The draft of the March 2011 NTETC Software Sector Summary reported that several members envision G-S.1. being developed further to the extent that G-S.1.1. may not be needed.

There was a position posted on NCWM 2011 Online Position Forum by Mr. Johnson, Gilbarco, Inc., opposing the item as written and sharing the following comments:

> Gilbarco, Inc. does not support the current proposed language. Our pumps and dispensers have a numeric display capable of displaying 6 digits. It is not currently possible to display the version identifier or an abbreviation or symbol that identifies the version number as required in (d) (1) and (2). It is not possible to access the software version using "one or, at most, two levels of access" as noted in section G-S.1.1 (3). We do not currently offer a menu based system and do not offer functions such as "Metrology," "System Identification" or "Help." We do not have the ability not offer icons or symbols. Meeting the new marking requirements will be costly to the customer. We can currently display the software version number (i.e., Software Version number 01.8.30 would be shown on the main display as 01830 by using controls on the device). The software version will also be displayed during the power up cycle. Recommend the status be changed to Informational.

After considering all the comments received, the S&T Committee agreed to change the status of this item to Developing because the item lacks enough information for full consideration and a full proposal had yet to be developed.

This item was included on the NTETC Measuring Sector's Agenda to keep sector members informed of the item and to allow for sector comment, discussion, and input to the S&T Committee.

Conclusion:
The Sector discussed the item briefly. Mr. Truex, NTEP Administrator, shared that there is still much work to be done on this item. The NTETC Measuring Sector had no specific recommendations for the NTETC Software Sector to consider.

19. Interpretation of VTM Code 3.31., Paragraph S.2.4., with Regard to Individual vs. Multiple Deliveries

Source:
NTEP Measuring Laboratories and Ms. Butcher, NIST, OWM

Background/Discussion:
NIST, OWM received an inquiry from a regulatory official regarding the application of the VTM Code Paragraph S.2.4. Zero-Set-Back Interlock. The regulator reported receiving a complaint from a buyer who received a receipt for an individual delivery that was labeled "multiple delivery." This discussion revealed that the code is not clear regarding how the zero-set-back interlock and 3-minute timeout are to function relative to both "individual" and "multiple" deliveries. There currently is no requirement for a delivery to be designated as "individual" or "multiple." However, the NTEP Measurement Laboratories agreed that such a provision would be beneficial to field officials in identifying improper use of the device. The laboratories also discussed how paragraph S.2.4. is currently being implemented and agreed there may be confusion on how the current language applies.

NIST, OWM requests input from the Sector on the development of a proposal to help clarify how S.2.4. was intended to apply and on the concept of requiring the type (i.e., "individual" or "multiple") of delivery to be automatically identified. Modifications to paragraph S.2.4. might include an addition of a new user requirement that explains how the operator is to control and/or document "individual" vs. "multiple" delivery status. The proposal might also clearly explain if and how the 3-minute timeout is to function depending on the "individual" vs. "multiple" status.

Conclusion:
The Sector discussed the issue briefly. Ms. Butcher, NIST, OWM, explained that the item was to engage stakeholders interested in seeking a solution to the issue that meets inspectors' and consumers' needs, but is not burdensome to manufacturers or users. The issue was raised when a ticket appeared with "multiple delivery" printed on it and it could not be explained what this means. She noted that the item is still developing and there is no specific proposal to consider at this point. Mr. Miller, FMC Technologies Measurement Solutions, Inc., and Mr. Karimov, Liquid Controls, expressed interest in providing input on the item as it is being developed.

ACTION ITEMS TABLE

NTETC Measuring Sector Meeting
October 21-22, 2011, Norfolk, Virginia

Agenda Item	Title	Task	Responsible Person(s)	Due Date
1	Add Testing Criteria to NCMW Publication 14, NTEP Policy U. Evaluating Electronic Indicators Submitted Separate from a Measuring Element	Finalize the checklist, addressing all highlighted areas and the five open issues	• Work Group	1/3/12
		Forward finalized checklist to Mike Frailer and Allen Katalinic for review	• Rich Miller, FMC Technologies Measurement Solutions, Inc. • Marc Buttler, NIST Technical Advisor	1/4/12
		Review finalized checklist and provide comments to Rich Miller and Marc Buttler	• Mike Frailer, MD • Allen Katalinic, NC	1/17/12
		Incorporate laboratory comments prior to 2012 NCWM Interim Meeting	• Rich Miller, FMC • Marc Buttler, NIST Technical Advisor	1/22/12
2	Development of Water Meters Checklist	Submit recommendation to modify NCWM Publication 14 to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11
3	Development of Hydrogen Gas-Measuring Devices Checklist	Update numbering to reflect 48-58 and forward version with Item I. reference to Marc Buttler	• Michael Keilty, Endress + Hauser Flowtec AG USA	Complete
		Submit recommendation to modify NCWM Publication 14 to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11
4	Product Families Table - Include Water on Existing NTEP CC's	Submit recommendation and voting results to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11
5	Product Families Table – Change Test Requirements for Turbine Meters from Test A to Test E	• Update table with specific proposal and numbers • Incorporate stakeholder input from labs, Rich Miller	• Dmitri Karimov, Liquid Controls	Next Sector Meeting
		Provide Dmitri Karimov with workable table	• Marc Buttler, NIST Technical Advisor • Lindsay Hier, NCWM Project Coordinator	Complete
6	Product Families Table – Consolidate Product Categories for PD and Turbine Meters	Submit recommendation and voting results to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11

Agenda Item	Title	Task	Responsible Person(s)	Due Date
7	Add Metrological Sealing Checklist to Measuring Devices NCWM Publication 14	Update Scale checklist item example as agreed to in the sector meeting	• Technical Advisor, Marc Buttler	Complete
		Submit recommendation to modify NCWM Publication 14 to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11
8	Product Families Table – Categorization of Liquid CO_2	Submit recommendation to modify NCWM Publication 14 to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11
9	Product Families Table – Add Hydrogen (Compressed Gas)	Submit recommendation and voting results to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11
10	Add Units for Compressed Gases to Technical Policy V. List of Price and Quantity Markings on Retail Motor Fuel Dispensers (RMFDs	Submit recommendation to modify NCWM Publication 14 to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11
14	Product Family Table - Restore notation "(Above 50 °C)" to the heated products category definition	Submit recommendation to modify NCWM Publication 14 to NTEP Committee	• Marc Buttler, NIST Technical Advisor	12/1/11
		Address the two NIST Handbook 44 issues related to heated products that were identified	• Marc Buttler, NIST Technical Advisor	Prior to fall 2012 Regional Association meetings
15	Next Meeting	Identify location and time of next SWMA Meeting and propose location to NTEP Committee	• Chair • NTEP Administrator • NIST Technical Advisor	2012 Interim Meeting

Carry Over Actions from 2010 Measuring Sector				
	Hydrogen Gas-Measuring Devices Checklist	Monitor USNWG progress on developing test procedures. Begin development of type evaluation test procedures when USNWG completes test procedures work.	Hydrogen Meters Checklist Sub-Group	Ongoing

ATTENDANCE

Dennis Beattie
Measurement Canada
400 St Mary Avenue
Winnipeg, Manitoba R3C 4K5
Canada
(204) 983-8910
dennis.beattie@ic.gc.ca

Tina Butcher
NIST, Office of Weights and Measures
100 Bureau Drive, Stop 2600
Gaithersburg, MD 20899-2600
(301) 975-2196
tbutcher@nist.gov

Jerry Butler
North Carolina Department of Agriculture
1050 Mail Service Center
Raleigh, NC 27699-1050
(919) 733-3313
jerry.butler@ncagr.gov

Marc Buttler
NIST, Office of Weights and Measures
100 Bureau Drive, Stop 2600
Gaithersburg, MD 20899-2600
(301) 975-4615
marc.buttler@nist.gov

Rodney Cooper
Tuthill Transfer Systems
8825 Aviation Drive
Fort Wayne, IN46809
(260) 747-7529 x 7552
rcooper@tuthill.com

Mike Frailer
Maryland Department of Agriculture
50 Harry S. Truman Parkway
Annapolis, MD 21401
(410) 841-5790
frailerml@mda.state.md.us

Paul Glowacki
Murray Equipment, Inc.
2515 Charleston Place
Fort Wayne, IN 46808
(260) 480-1352
pglowacki@murrayequipment.com

Norman Ingram
California Division of Measurement Standards
6790 Florin Perkins Road, Suite 100
Sacramento, CA 95828-1812
(916) 229-3016
ningram@cdfa.ca.gov

Gordon Johnson
Gilbarco, Inc.
7300 W. Friendly Avenue
Greensboro, NC 27410
(336) 547-5375
gordon.johnson@gilbarco.com

Dmitri Karimov
Liquid Controls
105 Albrecht Drive
Lake Bluff, IL 60044
(847) 283-8317
dkarimov@idexcorp.com

Allen Katalinic
North Carolina Department of Agriculture
1050 Mail Service Center
Raleigh, NC 27699-1050
(919) 218-4305
merleallen1234@aol.com

Michael Keilty
Endress + Hauser Flowtec AG USA
211 Pinewood Drive
Lyons, CO80540
(303) 823-5796
michael.keilty@us.endress.com

Doug Long
RDM Electronics
850 Harmony Grove Rd
Nebo, NC 28761
(828) 652-8346
doug@rdm.net

Rich Miller
FMC Technologies Measurement Solutions, Inc.
1602 Wagner Avenue
Erie, PA 16510
(814) 898-5286
rich.miller@fmcti.com

Andre Noel
Neptune Technology Group, Inc.
1600 Alabama Highway 229
Tallassee, AL 36078
(334) 283-7298
anoel@neptunetg.com

James Truex
National Conference on Weights and Measures Inc.
88 Carryback Drive
Pataskala, OH43062
(740) 919-4350
jim.truex@ncwm.net

Henry Oppermann
Weights and Measures Consulting
1300 Peniston Street
New Orleans, LA 70115
(504) 896-9172
wm-consulting@att.net

Richard Tucker
RL Tucker Consulting LLC
605 Bittersweet Lane
Ossian, IN46777
(260) 622-4243
rtucker83@comcast.net

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Appendix A

Draft National Type Evaluation Program
Evaluating Digital Indicators – Checklists and Test Procedures

Introduction

This checklist is used for Technical Policy U. Evaluating Electronic Digital Indicators submitted separate from a measuring element. This section is intended for lab testing only. Is permanence necessary?

1. Identification

Code Reference: G-S.1. Identification

All equipment shall be clearly and permanently marked on an exterior visible surface after installation. It must contain the following information (prefix lettering may be initial capitals, all capitals, or all lower case):

1.1. The name, initials, or trademark of the manufacturer or distributor. ☐ Yes ☐ No ☐ N/A

1.2. A model identifier that positively identifies the pattern or design of the device. The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.) The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lower case. ☐ Yes ☐ No ☐ N/A

1.3. Except for not-built-for-purpose, software-based devices, a norepetitive serial number. The serial number shall be prefaced by the words "Serial Number" or an abbreviation, or a symbol, that clearly identifies the number as the required serial number. Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No, and S No.) ☐ Yes ☐ No ☐ N/A

1.4. For not built-for-purpose, software based devices the current software version or revision designation. The version or revision identifier shall be prefaced by the word "Version" or "Revision" as appropriate and either word may be followed by the word "Number." The abbreviations for the word "Version" shall, as a minimum, begin with the letter "V." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R." The abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.) ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.1. (e)

1.5. An NTEP Certificate of Conformance (CC) Number or a corresponding CC addendum number for devices that have (or will have) a CC. The number shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the word "Number" or an abbreviation for the word "Number." The abbreviation for the word "Number" shall as a minimum begin with the letter "N" (e.g., No or No.) ☐ Yes ☐ No ☐ N/A

The device must have an area, either on the identification plate or on the device itself, suitable for the application of the Certificate of Conformance Number. If the area for the CC number is not part of an identification plate,

then note its intended location below and how it will be applied.

1.5.1. Location of CC Number if not located with the identification information:

_____

_____

Code Reference: G-S.1.1. Location of Marking Information for Not Built-for-Purpose, Software-Based Devices

1.6. For not built-for-purpose, software-based devices, the following shall apply:

1.6.1. The required information in G-S.1 Identification. (a), (b), (d), and (e) shall be permanently marked or continuously displayed on the device. **OR** ☐ Yes ☐ No ☐ N/A

1.6.2. The Certificate of Conformance (CC) Number shall be:

1.6.2.1. Permanently marked on the device. **OR** ☐ Yes ☐ No ☐ N/A

1.6.2.2. Continuously displayed. **OR** ☐ Yes ☐ No ☐ N/A

1.6.2.3. Accessible through an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to "Help," "System Identification," "G S.1. Identification," or "Weights and Measures Identification." ☐ Yes ☐ No ☐ N/A

Note: Clear instructions for accessing the information required in G-S.1. (a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.

1.7. The identification badge must be visible after installation. ☐ Yes ☐ No ☐ N/A

1.8. The identification badge must be permanent. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.2. Facilitation of Fraud

This applies to all metering system indicators installed at a fixed location or vehicle tank meter applications and controlled remotely or within the device itself. This requirement addresses the process of changing the unit price or unit prices set in a metering system.

1.9. The system shall prevent a change of unit price during a delivery. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.3. Permanence <u>How would this be conducted or not?</u>

1.10. Equipment shall be of such materials, design and construction that, under normal service conditions:

1.10.1. Accuracy will be maintained. ☐ Yes ☐ No ☐ N/A

1.10.2. Operating parts will continue to function as intended. ☐ Yes ☐ No ☐ N/A

1.10.3. Adjustments will remain reasonably permanent. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.4. Interchange or Reversal of Parts

If a metering system has parts that may be interchanged or reversed in normal field assembly, the system shall either be constructed so that reversal will not affect the accuracy of the system or the parts must be marked to indicate their proper position. For most metering devices, this applies only to the reversal of connectors of cables to peripheral devices.

1.11. If a metering system has any parts that may be interchanged or reversed in normal field assembly, the parts must either be:

- 1.11.1. Constructed so that reversal will not affect performance. ☐ Yes ☐ No ☐ N/A
- 1.11.2. Marked or keyed to indicate their proper positions. Multiple cable connections but not interchangeable due to different plug styles. ☐ Yes ☐ No ☐ N/A
- 1.11.3. Cables are connected but are not removable without breaking a seal and opening housing. ☐ Yes ☐ No ☐ N/A

2. Indications and Recorded Representations Look at Different Codes

Code Reference: G-S.5.1. Indicating and Recording Elements

Several general requirements facilitate the reading and interpretation of displayed values. Each display for quantity or total price must be appropriate in design and have sufficient capacity for particular applications to be suitable for the application. Metering devices must be capable of indicating the maximum quantity and money values that can normally be expected in a particular application.

2.1. Minimum quantity value indications:

- 2.1.1. Display is capable of 1.0 ☐ Yes ☐ No ☐ N/A
- 2.1.2. Display is capable of 01 ☐ Yes ☐ No ☐ N/A
- 2.1.3. Display is capable of 0.01 ☐ Yes ☐ No ☐ N/A
- 2.1.4. Display is capable of 0.001 ☐ Yes ☐ No ☐ N/A
- 2.1.5. Display is capable of other: ☐ Yes ☐ No ☐ N/A

_____

2.2. Money value is properly displayed

2.3. The indications must be clear, definite and accurate: ☐ Yes ☐ No ☐ N/A

- 2.3.1. Values must be clear, definite and accurate. ☐ Yes ☐ No ☐ N/A
- 2.3.2. Unit of measure is programmable Gallon, Liter, Pound. ☐ Yes ☐ No ☐ N/A
- 2.3.3. Unit of measure is applied by permanent marking on indicator housing. ☐ Yes ☐ No ☐ N/A

2.4. The indications must be easily read under normal operating conditions. ☐ Yes ☐ No ☐ N/A

2.5. Symbols for decimal points shall clearly identify the decimal position. (Generally acceptable symbols are dots, small commas, or x.) ☐ Yes ☐ No ☐ N/A

2.6. The zero indication must consist of at least the following minimum indications as appropriate:

- 2.6.1. One digit to the left and all digits to the right of a decimal point. ☐ Yes ☐ No ☐ N/A
- 2.6.2. If a decimal point is not used, at least one active decade must be displayed. ☐ Yes ☐ No ☐ N/A

2.7. Totalizer values must be accurate to the nearest minimum interval with decimal points displayed or subordinate digits adequately differentiated from others, if applicable. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.2.2. Digital Indication and Representation

2.8. Basic operating requirements for devices:

2.8.1. All digital values of like value in a system shall agree with one another. ☐ Yes ☐ No ☐ N/A

2.8.2. A digital value coincides with its associated analog value to the nearest minimum graduation. ☐ Yes ☐ No ☐ N/A

2.8.3. Digital values shall round off to the nearest minimum unit that can be indicated or recorded. ☐ Yes ☐ No ☐ N/A

2.8.4. When a digital zero display is provided, the zero indication shall consist of at least one digit to the left and all digits to the right of the decimal point. ☐ Yes ☐ No ☐ N/A

2.9. Agreement of indications shall be checked for several deliveries. The totalizer shall be checked for accuracy and agreement with individual deliveries and with other totalizers in the system.

2.9.1. All digital values of like value in a system agree with one another. ☐ Yes ☐ No ☐ N/A

2.9.2. Digital values coincide with associated analog values to the nearest minimum graduation. ☐ Yes ☐ No ☐ N/A

2.9.3. Digital values "round off" to the nearest minimum unit that can be indicated or recorded. ☐ Yes ☐ No ☐ N/A

2.9.4. The device totalizer shall agree with the total of the individual deliveries and with other totalizers in the system. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.2.3. Size and Character

Digits used for comparable values must be uniform in size and character, but subordinate values may be displayed in different and less prominent digits than more significant values. The latter more likely occurs on analog devices. In digital indications, the digits are usually of uniform size throughout a particular display. The size of digits may differ for different quantities, for example, the quantity and unit price digits may be smaller than the total price digits.

2.10. Delete this line, nothing here.

2.11. Indications and recorded representations shall be appropriately portrayed or designated. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.2.4. Values Defined

2.12. Values shall be adequately defined by a sufficient number of figures, words, symbols, or combinations, which are uniformly placed so that they do not interfere with the accuracy of the reading. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.2.5. Permanence

2.13. Indications, or recorded representations and their defining figures, words, and symbols shall be of such character that they will not tend to easily become obliterated or illegible. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.3. and G-S.5.3.1. Values of Graduated Intervals or Increments

2.14. Digital indications and recorded representations shall be uniform in size, character, and value throughout any series. Quantity values shall be defined by the specific unit of measure in use. ☐ Yes ☐ No ☐ N/A

2.15. Indications shall be uniform throughout any series. ☐ Yes ☐ No ☐ N/A

2.16. Quantity values shall be identified by the unit of measure. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.4. Repeatability of Indications

The quantity measured by a device shall be repeatable within tolerance for the same indication. One condition that may create a problem is that the value of the quantity division may be large relative to the tolerance. A delivery must be within tolerance wherever the delivery is stopped within the nominal indication of the test draft. Meters that may be at the tolerance limit may be out of tolerance at an extreme limit of the nominal quantity indication.

2.17. When a digital indicator is tested, the delivered quantity shall be within tolerance at any point within the quantity-value division for the test draft. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.6. Recorded Representations

2.18. All recorded values shall be digital. *See also G-UR.3.3.* ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.7. Magnified Graduations and Indications

2.19. ~~Magnified indications shall conform to all requirements for graduations and indications.~~ Do not think this is needed and intend on removing this section. ~~☐ Yes ☐ No ☐ N/A~~

Code Reference: G-S.5.6. Marking, Operational Controls, Indications and Features

All operational controls, indications, and features shall be clearly and definitely identified. Nonfunctional keys and annunciators shall not be marked because their marking implies that the key or annunciator is functional and should be inspected or tested by the enforcement official. Keys and operator controls that are visible to a customer in a direct sale transaction shall be marked with words or symbols to the extent that they can be understood by the customer and aid in understanding the transaction. Keys that are visible only to the console operator need to be marked only to the extent that a trained operator can understand the function of each key.

2.20. All operational controls, indications, and features including switches, lights, displays, and push buttons shall be clearly and definitely identified. ☐ Yes ☐ No ☐ N/A

2.21. All dual function (multi-function) keys or controls shall be marked to clearly identify all functions. ☐ Yes ☐ No ☐ N/A

2.22. Non-functional controls and annunciators shall not be marked. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.7. Lettering, Readability

2.23. Required markings and instructions shall be permanent and easily read. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.8. Sealing Electronic Adjustable Components and Provision for Sealing of Adjustable Components or Audit Trail

2.24. Electronic adjustable components that affect the performance of a device shall provide for an approved means of security (e.g. data change audit trail) or for physically applying a security seal. These components include the following: ☐ Yes ☐ No ☐ N/A

1. mechanical adjustment mechanism for meters,
2. the electronic calibration factor and automatic temperature compensator for electronic meter registers,
3. selection of pressure for density correction capability and correction values, and
4. pulser setting and gallon/liter conversion switches when they may accidentally or intentionally be used to perpetrate fraud.

The following philosophy and list of sealable parameters applies to provision for sealing all liquid-measuring devices.

An electronic data audit trail is a means of allowing a weights and measures inspector to review how many times any electronic adjustment, which affects the accuracy of a volume measurement has been changed. The information contained in the audit trail shall consist of a cumulative and non-destructible number (even if a power failure occurs) which increments each time any of the adjustments required to be sealed have been changed. The electronic data audit trail information shall be capable of being recalled by the official on the main display of the device.

As a minimum, devices which use an audit trail to provide security for sealable parameters shall satisfy the following criteria and shall use the format set forth in Appendix A of the checklist for Liquid-Measuring Devices.

Philosophy for Sealing

Typical Features to Be Sealed

Principles for Determining Features to Be Sealed

The need to seal some features depends upon:

- The ease with which the feature or the selection of the feature can be used to facilitate fraud. **AND**
- The likelihood that using the feature will result in fraud not being detected.

Features or functions which the operator routinely uses as part of device operation, such as setting the unit prices on dispensers and maintaining unit prices in price look-up codes stored in memory, are not sealable parameters and shall not be sealed.

If a parameter (or set of parameters) selection would result in performance that would be obviously in error, such as the selection of parameters for different countries, then it is not necessary to seal the selection of these features.

If individual device characteristics are selectable from a "menu" or a series of programming steps, then access to the "programming mode" must be sealable.

Note: If an audit trail is the only means of security, then the audit trail shall update only after at least one sealable parameter has been changed; simply accessing the sealable parameters via a menu shall not update the audit trail.

If a physical act, such as cutting a wire is required to change a parameter setting and physically repairing the cut is required to reactivate the parameter, then this physical repair process would be considered an acceptable way to select parameters without requiring a physical seal or an audit trail.

Typical Features and Parameters to Be Sealed

The following provides examples of configuration and calibration parameters that are to be sealed. The examples are provided for guidance and are not intended to cover all possible parameters.

Calibration Parameters:

Calibration parameters are those parameters whose values are expected to change as a result of accuracy adjustments. Examples include the following:

1. Measuring element adjustments where linearity corrections are used (e.g., flow rate 1 and meter factor 1, flow rate 2 and meter factor 2, etc.)
2. Mass flow meter adjustments for zero adjustments (not simply setting the display to zero) and span settings.

Configuration Parameters:

Configuration parameters are those parameters whose values are expected to be entered only once and not changed after all initial installation settings are made. Examples include the following.

1. Octane or other blend setting ratios (optional in Canada at this time.)
3. Temperature, pressure, density, and other sensor settings for zero, span, and offset values.
4. Measurement units (in Canada, only if not displayed or printed on the primary register.)
5. Temperature compensation table, liquid coefficient of expansion, or compressibility factors or tables.
6. Liquid density setting (in Canada, only if not displayed or printed on the primary register) and allowable liquid density input range.
7. Vapor pressures of liquids if used in calculations to establish the quantity.
8. Meter or sensor temperature compensation factors.
9. False or missing pulse limits for dual pulse systems (Canada only.)
10. On/off status of automatic temperature, pressure, or density correction.
11. Automatic or manual data input for sensors.
12. Dual pulse checking feature status on or off.
13. Flow control settings (optional in Canada.)
14. Filtering constants.

Liquid Measuring Device Features and Parameters

Typical Features or Parameters to be Sealed	Typical Features or Parameters NOT Required to be Sealed
• Measuring Element Adjustment (both mechanical and electronic) • Linearity Correction Values • Measurement Units (e.g., gallons to liters) • Octane Blend Setting for Retail Motor Fuel Dispensers • Any Tables or Settings Accessed by the Software or Manually Entered to Establish the Quantity (e.g., specific gravity, pressure, etc.) • Density Ranges • Pulsers • Single Pick-up (magnetic or reluctance) • Temperature Probes and Temperature Offsets in Software • Pressure and Density Sensors and Transducers • Flow Control Settings (e.g., flow rates for slow-flow start, quantity for slow-flow start and stop) • Temperature Compensating Systems (on/off) • Differential Pressure Valves • As a point of clarification, the flow control settings referenced above are those controls typically incorporated into the installations of large-capacity meters (wholesale meters.) The reference does not include the point at which retail motor fuel dispensers slow product flow during a prepaid transaction to enable the dispenser to stop at the preset amount.	• Analog-to-Digital Converters • Quantity Division Value (display resolution) • Double Pulse Counting • Communications

Note: The above examples of adjustments, parameters, and features to be sealed are to be considered "typical" or "normal." This list may not be all inclusive. Some parameters other than those listed, which

affect the metrological performance of the device, must be sealed. If listed parameters or other parameters, which may affect the metrological function of the device, are not sealed, the manufacturer must demonstrate that all settings comply with the most stringent requirements for the application of the device (e.g., the parameter does not affect compliance with NIST Handbook 44).

Category 1 Devices (Devices with <u>No</u> Remote Configuration Capability):

- Required markings and instructions shall be permanent and easily read. ☐ Yes ☐ No ☐ N/A
- The device is sealed with a physical seal or it has an audit trail with two event counters (one for calibration, the second for configuration). ☐ Yes ☐ No ☐ N/A
- A physical seal must be applied without exposing electronics. ☐ Yes ☐ No ☐ N/A
- Event counters are non-resettable and have a capacity of at least 000 to 999. ☐ Yes ☐ No ☐ N/A
- Event counters increment appropriately. ☐ Yes ☐ No ☐ N/A
- The audit trail information must be capable of being retained in memory for at least 30 days while the device is without power. ☐ Yes ☐ No ☐ N/A
- Accessing the audit trail information for review shall be separate from the calibration mode. ☐ Yes ☐ No ☐ N/A
- Accessing the audit trail information must not affect the normal operation of the device. ☐ Yes ☐ No ☐ N/A

Category 2 Devices (Devices with Remote Configuration Capability but Controlled by Hardware):

- The physical hardware enabling access for remote communication must be on- site. ☐ Yes ☐ No ☐ N/A
- The physical hardware must be sealable with a security seal, **OR** ☐ Yes ☐ No ☐ N/A
- The device must be equipped with at least two event counters: one for calibration, the second for configuration parameters. ☐ Yes ☐ No ☐ N/A
  - Calibration parameters event counter
  - Configuration parameters event counter
- Adequate provision must be made to apply a physical seal without exposing electronics. ☐ Yes ☐ No ☐ N/A
- Event counters are non-resettable and have a capacity of at least 000 to 999. ☐ Yes ☐ No ☐ N/A
- Event counters increment appropriately. ☐ Yes ☐ No ☐ N/A
- Event counters may be located either: ☐ Yes ☐ No ☐ N/A
  - at the individual measuring device or
  - at the system controller
- If the counters are located at the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device. ☐ Yes ☐ No ☐ N/A
- An adequate number (see table below) of event counters must be available to monitor the calibration and configuration parameters of each individual device. ☐ Yes ☐ No ☐ N/A
- The device must either: ☐ Yes ☐ No ☐ N/A
  - clearly indicate when it is in the remote configuration mode, **OR**
  - the device shall not operate while in the remote configuration mode.
- If capable of printing in the calibration mode, it must print a message that it is in the calibration mode. ☐ Yes ☐ No ☐ N/A
- The audit trail information must be capable of being retained in memory for at least 30 days while the device is without power. ☐ Yes ☐ No ☐ N/A
- The audit trail information must be readily accessible and easily read. ☐ Yes ☐ No ☐ N/A

Minimum Number of Counters Required

	Minimum Counter(s) Required for Devices Equipped with Event Counters	Minimum Event Counter(s) at System Controller
Only one type of parameter accessible (calibration or configuration)	One (1) event counter	One (1) event counter for each separately controlled device, or one (1) event counter, if changes are made simultaneously.
Both calibration and configuration parameters accessible	Two (2) event counters	Two (2) event counters for each separately controlled device, or two (2) or more event counters if changes are made to all controlled devices simultaneously.

Category 3 Devices (Devices with Unlimited Remote Configuration Capability):
Category 3 devices have virtually unlimited access to sealable parameters or access is controlled though a password.

- For devices manufactured after January 1, 2001, the device must either: ☐ Yes ☐ No ☐ N/A
  - clearly indicate when it is in the remote configuration mode, or
  - the device shall not operate while in the remote configuration mode
- The device is equipped with an event logger ☐ Yes ☐ No ☐ N/A
- The event logger automatically retains the identification of the parameter changed, the date and time of the change, and the new value of the parameter. ☐ Yes ☐ No ☐ N/A
- Event counters are non-resettable and have a capacity of at least 000 to 999. ☐ Yes ☐ No ☐ N/A
- The system is designed to attach a printer, which can print the contents of the audit trail. ☐ Yes ☐ No ☐ N/A
- The audit trail information must be capable of being retained in memory for at least 30 days while the device is without power. ☐ Yes ☐ No ☐ N/A
- The event logger must have a capacity to retain records equal to ten times the number of sealable parameters in the device, but not more than 1000 records are required. ☐ Yes ☐ No ☐ N/A
- The event logger drops the oldest event when the memory capacity is full and a new entry is saved. ☐ Yes ☐ No ☐ N/A
  - Describe the method used to seal the device or access the audit trail information. Is this used?

_____

_____

Code Reference: G-UR.1.1. Suitability of Equipment
A device must be properly designed and have sufficient capacity to be suitable to use in a particular application. A device must measure the appropriate characteristics of a commodity to accurately determine the quantity, have the necessary components (e.g. vapor eliminator) to eliminate factors that may cause measurement errors during normal use, have sufficient capacity to indicate the quantity measured and the associated total price if it is a computing device. The meter must have the proper flow rate capacity to operate over the actual flow rates for the application, and the device must have a quantity division appropriate for the application. Some specific requirements for device characteristics are given in the specific codes for particular devices. Remove?

2.25. The equipment is suitable for its intended application. Remove? ☐ Yes ☐ No ☐ N/A

2.26. Equipment shall be suitable for use in the environment in which it will be used. Suitability with respect to environment includes the effects of wind, weather, temperature variations, and radio frequency interference. A device must work and remain accurate under its actual conditions of use. Unless specific tests are developed this has no meaning! ☐ Yes ☐ No ☐ N/A

Simulator Tests:

All tests shall have a minimum of 10,000 pulses applied to the device for each test. Test with a minimum of two API/Density settings. Is this appropriate for all indicator technologies PD, Mass, Mag, etc?

Product:	Meter Factor:	K Factor:	
1	Test with liquid temperature between 55 – 65 degrees F at the manufactures rated maximum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
2	Test with liquid temperature between 55 – 65 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
3	Test with liquid temperature below 35 degrees F at manufactures rated maximum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
4	Test with liquid temperature below 35 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
5	Test with liquid temperature above 100 degrees F at manufactures rated maximum frequency/pulse rate.	API Gravity: Temperature:	☐ Yes ☐ No ☐ N/A
6	Test with liquid temperature above 100 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity: This way OR? Temperature:	☐ Yes ☐ No ☐ N/A
7	Test with liquid temperature between 55 – 65 degrees F at the manufactures rated maximum frequency/pulse rate.	API Gravity/Density: This way? Temperature:	☐ Yes ☐ No ☐ N/A
8	Test with liquid temperature between 55 – 65 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
9	Test with liquid temperature below 35 degrees F at manufactures rated maximum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
10	Test with liquid temperature below 35 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
11	Test with liquid temperature above 100 degrees F at manufactures rated maximum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
12	Test with liquid temperature above 100 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
13		API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
14		API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A

15		API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
Product:	**Meter Factor:**	**K Factor:**	
1	Test with liquid temperature between 55 – 65 degrees F at the manufactures rated maximum frequency/pulse rate.	API Gravity: Temperature:	☐ Yes ☐ No ☐ N/A
2	Test with liquid temperature between 55 – 65 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity: Temperature:	☐ Yes ☐ No ☐ N/A
3	Test with liquid temperature below 35 degrees F at manufactures rated maximum frequency/pulse rate.	API Gravity: Temperature:	☐ Yes ☐ No ☐ N/A
4	Test with liquid temperature below 35 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity: Temperature:	☐ Yes ☐ No ☐ N/A
5	Test with liquid temperature above 100 degrees F at manufactures rated maximum frequency/pulse rate.	API Gravity: Temperature:	☐ Yes ☐ No ☐ N/A
6	Test with liquid temperature above 100 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity: Temperature:	☐ Yes ☐ No ☐ N/A
7	Test with liquid temperature between 55 – 65 degrees F at the manufactures rated maximum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
8	Test with liquid temperature between 55 – 65 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
9	Test with liquid temperature below 35 degrees F at manufactures rated maximum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
10	Test with liquid temperature below 35 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
11	Test with liquid temperature above 100 degrees F at manufactures rated maximum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
12	Test with liquid temperature above 100 degrees F at manufactures rated minimum frequency/pulse rate.	API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
13		API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
14		API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
15		API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
16		API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A
17		API Gravity/Density: Temperature:	☐ Yes ☐ No ☐ N/A

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Appendix B
Draft National Type Evaluation Program
Liquid Measuring Devices – Additional Checklists and Test Procedures for Water Meters

Note: Refer to Section L. Field Evaluation and Permanence Tests for Utility Type Water Meters for test procedures specific to utility type water meters.

44. Indicating and Recording Element

Code Reference: S.1.1.1. General

44.1. A water meter shall be equipped with a primary indicating element and may also be equipped with a primary recording element. Such elements shall be visible at the point of measurement or be stored in non-volatile and non-resettable memory. The display may be remotely located provided it is readily accessible to the customer. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.1.2. Units

44.2. A water meter shall indicate and record, if the device is equipped to record, its deliveries in terms of liters, gallons or cubic feet or binary or decimal subdivisions thereof except batch plant meters, which shall indicate deliveries in terms of liters, gallons or decimal subdivisions of the liter or gallon only. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.1.3. Value of the Smallest Unit

44.3. The value of the smallest unit of indicated delivery and recorded delivery, if the device is equipped to record, shall not exceed the equivalent of:

44.3.1. 50 L (10 gal or 1 ft^3) on utility type meters, sizes 1 in and smaller, **OR** ☐ Yes ☐ No ☐ N/A

44.3.2. 500 L (100 gal or 10 ft^3) on utility type meters, sizes 1½ in and 2 in, **OR** ☐ Yes ☐ No ☐ N/A

44.3.3. 0.2L ($^1/_{10}$ gal or $^1/_{100}$ ft^3) on batching meters delivering less than 375 L/min (100 gal/min or 13 ft^3/min), **OR** ☐ Yes ☐ No ☐ N/A

44.3.4. 5 L (1 gal or $^1/_{10}$ ft^3) on batching meters delivering 375 L/min (100 gal/min or 13 ft^3/min) or more. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.1.4. Advanced of Indicating and Recording Elements

44.4. Primary indicating and recording elements shall be susceptible to advancement only by the mechanical operation of the device. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.1.5. Return to Zero

44.5. If the meter is so designed that the primary indicating elements are readily returnable to a definite zero indication, means shall be provided to prevent the return of these elements beyond their correct zero position. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.2.1. Graduation Length

44.6. Graduations shall be so varied in length that they may be conveniently read. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.2.2. Graduation Width

44.7. In any series of graduations, the width of a graduation shall in no case be greater than the width of the minimum clear interval between graduations, and the width of main graduations shall be not more than 50 percent greater than the width of subordinate graduations. Graduations shall in no case be less than 0.2 mm (0.008 in) in width. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.2.3. Clear Interval Between Graduations

44.8. The clear interval shall not be less than 1.0 mm (0.04 in). If the graduations are not parallel, the measurement shall be made:

44.8.1. along the line of relative movement between the graduations at the end of the indicator, **OR** ☐ Yes ☐ No ☐ N/A

44.8.2. if the indicator is continuous, at the point of widest separation of the graduations. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.3.1. Indicator Summary

44.9. The index of an indicator shall be symmetrical with respect to the graduations, at least throughout that portion of its length associated with the graduations. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.3.2. Indicator Length

44.10. The index of an indicator shall reach to the finest graduations with which it is used, unless the indicator and the graduations are in the same plane, in which case the distance between the end of the indicator and the ends of the graduations, measured along the line of the graduations, shall be not more than 1.0 mm (0.04 in). ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.3.3. Indicator Width

44.11. The width of the index of an indicator in relation to the series of graduations with which it is used shall not be greater than:

44.11.1. the width of the widest graduation, **AND** ☐ Yes ☐ No ☐ N/A

44.11.2. the width of the minimum clear interval between graduations. ☐ Yes ☐ No ☐ N/A

When the index of an indicator extends along the entire length of a graduation, that portion of the index of the indicator that may be brought into coincidence with the graduation shall be of the same width throughout the length of the index that coincides with the graduation.

Code Reference: S.1.3.4. Clearance

44.12. The clearance between the index of an indicator and the graduations shall in no case be more than 1.5 mm (0.06 in). ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.3.6. Parallax

44.13. Parallax effects shall be reduced to the practicable minimum. ☐ Yes ☐ No ☐ N/A

45. Measuring Elements

Code Reference: S.2.1. Provision for Sealing

45.1. Adequate provision shall be made for applying security seals in such a manner that no adjustment or interchange may be made of:

44.13.1. any measurement elements, **AND** ☐ Yes ☐ No ☐ N/A

44.13.2. any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries. ☐ Yes ☐ No ☐ N/A

The adjusting mechanism shall be readily accessible for purposes of affixing a security seal.

46. Batching Meters Only

Code Reference: S.2.2.1. Air Elimination

46.1. Batching meters shall be equipped with an effective air eliminator. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.2.2. Directional Flow Valves

46.2. Valves intended to prevent reversal of flow shall be automatic in operation. ☐ Yes ☐ No ☐ N/A

47. Multi-jet Meter Indication

Code Reference: S.2.3. Multi-jet Meter Indication

47.3. Multi-jet water meters shall be clearly and permanently marked as such on the device or identified on the Certificate of Approval. ☐ Yes ☐ No ☐ N/A

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Appendix C

Draft National Type Evaluation Program
Liquid Measuring Devices – Additional Checklists and Test Procedures for Hydrogen Gas – Measuring Devices

Note: Refer to Section I. Field Evaluation and Permanence Tests for Mass Flow Meters (All topics with the exception of "Testing for Volume Units Only or to Add Volume Units to Existing Certificates") for test procedures.

48. Indicating and Recording Elements and Recorded Representations

Code Reference: S.1.1. Indicating Elements

48.1. A device shall be equipped with a primary indicating element that continuously displays measurement results relative to quantity and total price. ☐ Yes ☐ No ☐ N/A

48.2. Is the device equipped with a primary recording element? ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.2. Vehicle Fuel Dispensers

48.3. Dispensers used to fuel vehicles shall be of the computing type and shall indicate the mass, the unit price, and the total price of each delivery. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.1. Indicating Elements and S.2. Operating Requirements

Primary indicating and recording elements may advance only as a result of the operation of the device. However, means shall be provided for readily returning the device to zero. Once the zeroing operation has begun, it shall not be possible to return primary indicating elements or primary recording elements beyond the correct zero position. It shall not be possible to indicate a value other than the latest measurement, or "zeros" when the zeroing operation has been completed.

48.4. Indicating and recording elements shall advance only by the operation of the device (except for clearing the device to zero). ☐ Yes ☐ No ☐ N/A

48.5. During the reset operation, it shall not be possible to return primary indicating elements or primary recording elements to any value other than zero. ☐ Yes ☐ No ☐ N/A

48.6. During the reset operation, it shall not be possible to indicate a value other than the latest measurement, or "zeros" when the zeroing operation has been completed. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.1. Indicating and Recording Elements – General

Indicating elements must be appropriately designed and adequate in amount. Specifically, a device must have sufficient display capacity to indicate the quantities and total prices, if it applies in the normal encountered specific application. Electronic devices shall either have sufficient display capacity to indicate the normal quantities and money values or automatically stop the delivery before exceeding the display capacity of either the quantity or total price. This consideration may apply when evaluating a system that may be used in either a truck stop or an automobile service station.

48.7. An electronic digital indicating element shall either:

48.7.1. Have adequate display capacity for the application, OR ☐ Yes ☐ No ☐ N/A

48.7.2. Automatically stop the delivery before exceeding the maximum ☐ Yes ☐ No ☐ N/A

quantity or maximum total price that can be indicated.

Code Reference: G-S.7. Lettering

48.8. All required markings and instructions shall be distinct and easily readable and shall be of such character that they will not tend to become obliterated or illegible. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.2.4. and S.1.3.4. Values Defined

48.9. Values shall be adequately defined by a sufficient number of figures, words, or combinations to include a zero display for all displayed digits to the right of the decimal mark and at least one to the left. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.2.2. Digital Indication and Representation and S.2.4.4. Agreement Between Indications

Basic operating requirements for devices are that:

- All digital values of like value in a system shall agree.
- Digital values shall round off to the nearest digital division that can be indicated or recorded.
- When a digital zero display is provided, the zero indication shall consist of at least one digit to the left and all digits to the right of the decimal point.

For those systems consisting of a console and dispensers and equipped with pre-set quantity, the dispenser must deliver at least the pre-set quantity; it cannot deliver less. For example, if the console sends only the money equivalent of the pre-set quantity to the dispenser, the dispenser shall deliver at least the pre-set quantity. It may not stop at the first quantity amount that will result in mathematical agreement with the money value equivalent of the pre-set quantity if the quantity indication is less than the pre-set quantity. Similarly, if a money value is pre-set, the dispenser is not properly designed if it always stops at the lowest quantity value that provides mathematical agreement with the pre-set money value.

Tests for agreement of digital values shall be performed in the post pay, prepay money, pre-set quantity modes, and power loss. Agreement should be checked at several unit prices including the maximum unit price and with the dispenser operating at its maximum flow rate.

48.10. Digital quantity indications must agree. ☐ Yes ☐ No ☐ N/A

48.11. Manual quantity entries in invoice billing systems must be identified as such. ☐ Yes ☐ No ☐ N/A

48.12. When delivery from a computing device is based upon a pre-set quantity, the quantity indicated on the dispenser and any auxiliary device must be equal to or greater than the pre-set quantity at the conclusion of the transaction. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.5. Money Values, Mathematical Agreement

48.13. All total sale money value indications in a computing system are primary indications and must agree. ☐ Yes ☐ No ☐ N/A

48.14. Any recorded money-value and any digital money-value indication on a computing –type measuring device used in retail trade shall be in mathematical agreement with its associated quantity representation or indication to the nearest 1 cent of money value (e.g., within each element, the values indicated or recorded must meet the formula). ☐ Yes ☐ No ☐ N/A

48.15. The **printed ticket** and dispenser money values shall be in mathematical agreement to the nearest cent. ☐ Yes ☐ No ☐ N/A

48.16. The quantity, unit price, and total price indications on the **console** shall be in ☐ Yes ☐ No ☐ N/A

mathematical agreement with the dispenser and printed ticket.

48.17. The following applies when a quantity value indicated or recorded by an **auxiliary element** such as a console, ticket printer, or remote customer display, is a derived or computed value based on data received from a retail vehicle fuel dispenser.

48.17.1. The quantity values indicated or recorded on a console, electronic cash register, or other auxiliary indicating or recording element may differ, however:

48.17.1.1. All indicated or recorded total money values for an individual sale shall agree, **AND** ☐ Yes ☐ No ☐ N/A

48.17.1.2. The indicated or recorded quantity, unit price, and total sales price values shall be in mathematical agreement. ☐ Yes ☐ No ☐ N/A

[Quantity x Unit price = Total sales price] to the closest cent.

Examples: $4.5549 rounds to $4.55

$4.5551 rounds to $4.56

$4.5550 rounds to either $4.55 or $4.56

Code Reference: G-S.2.5.1. Auxiliary Elements

Money value divisions on auxiliary elements such as remote consoles and printers shall be the same as on the primary element. Any recorded money value and any digital money value indication on a primary indicator must agree mathematically with its associated quantity representation or indication.

Formula: Unit Price x Indicated quantity = Total Sale

48.18. Check mathematical agreement of all primary indications (e.g., dispenser, console, printer) under the following conditions:

48.18.1. At various flow rates, including maximum and minimum. ☐ Yes ☐ No ☐ N/A

48.18.2. Closing and reopening the nozzle outlet valve several times during delivery. Check mathematical agreement each time flow is halted. ☐ Yes ☐ No ☐ N/A

48.18.3. At several unit prices including the low prices and the maximum pricing capability of the computer and when operating at the maximum flow rate. ☐ Yes ☐ No ☐ N/A

48.18.4. Turn the dispenser off during delivery with nozzle outlet valve open. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.1. Indicating and Recording Elements/General

Discount Pricing

NIST Handbook 44 requires that, when a product or grade is offered for sale at more than one unit price through a computing device, the selection of the unit price shall be made prior to delivery using controls on the device or other customer-activated controls.

Should the customer elect to use another method of payment following completion of delivery, the console may be used to recalculate the total price – provided the dispenser complies with all applicable NIST Handbook 44 requirements. For example, the customer selects the credit card unit price on the dispenser and dispenses product at that unit price. However, the customer discovers that he forgot his credit card and decides to pay cash. In this case, the console might be used to calculate the total price at the cash unit price. In keeping with the intent of National Conference on Weights and Measures action in 1989 to require dispensers to calculate at all unit prices for which a product is offered for sale, it is anticipated that the console would be required to recalculate the new total price using the formula

(quantity x unit price = total price). A receipt providing the total quantity, unit price, total computed price, and product identity shall be available through a built-in or separate recording element for all transactions conducted with point-of-sale systems or devices activated by debit cards, credit cards, and/or cash (Code Reference S.2.6. Recorded Representations, Point of Sale Systems) as the transaction was completed. The recorded and displayed total quantity on the receipt and dispenser, respectively, shall agree.

Selectable Unit Price Capability

Selectable unit price capability is a design feature that permits the customer to select the unit price for a particular transaction at the time of sale. A dispenser may then allow the unit price for a delivery to be selected from two or more unit prices.

If the customer selects the unit price at the dispenser (e.g., cash or credit price), the selection may be made at any time prior to the start of product flow. The dispenser operating "control" may be activated when the selection is made. A system shall not permit a change to the unit price during delivery of product.

Note: The term "control" generically refers to the handle, flapper, start button, on/off switch, or other mechanism used to activate or deactivate the dispenser.

Code Reference: S.2.5.2. Display of Quantity and Total Price

After a transaction is completed, the unit price displayed at the dispenser may be changed to a base unit price. However, the quantity and total price must be displayed on the face of the dispenser for at least five minutes or until the next transaction is initiated. Any display of quantity, unit price, and total price that does not mathematically agree occurs between transactions. This is permitted (in response to demands of device users) because the displayed values between "transactions" are not "significant" relative to the actual delivery process (transaction).

The displayed unit price may revert to the base unit price immediately after the completion of a transaction, defined as the time the delivery has been terminated and payment has been settled. The payment may be automatic if the delivery is to a pre-paid amount. If the sale is prepaid, the delivery is considered terminated after the "control" is in the off position or after the nozzle has been returned to the designed hanging position. This will allow the customer adequate time to observe that the prepaid amount has been reached. If the delivery stops short or overruns a prepaid amount, settling the payment means that money is either refunded or collected from the customer and the transaction is "cashed out" by the console operator.

In the case of invoice billing systems, such as card-lock or key-lock systems which compute the total sale price, it is considered not appropriate for the displayed unit price to revert to the base unit price immediately following a transaction. Because a receipt for the transaction may not be available, the customer must be allowed an adequate period of time following the delivery to record the transaction information. The transaction unit price must be displayed for at least 30 seconds, and the total price and the quantity must be displayed for at least five minutes following the completion of the delivery or the start of the next transaction. The delivery is considered complete after the "control" is off or the nozzle has been returned to its designed hanging position.

Code Reference: S.2.4.1. Unit Price and S.2.4.3. Selection of Unit Price

48.19. The selected unit price must be made clearly evident on the dispenser. ☐ Yes ☐ No ☐ N/A

48.20. A dispenser may be equipped with means for selecting more than one unit price, provided that the selected unit price cannot be changed after the initial flow begins. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.5.2. Display of Quantity and Total Price

48.21. The selected unit price displayed at the dispenser prior to the delivery of product must be continuously displayed at the conclusion of the delivery, after automatic termination by the dispenser or after manual termination by the customer using the controls at the device, until the start of the next transaction by whichever occurs first:

48.21.1. Customer initiation of the delivery using the controls at the device, **OR** ☐ Yes ☐ No ☐ N/A

48.21.2. "Authorization/Approval" by the console operator. ☐ Yes ☐ No ☐ N/A

48.22. When a delivery is completed, the total price and quantity for that transaction shall be displayed on the face of the dispenser for at least 5 minutes or until the next transaction is initiated by using controls on the device or other user-activated (e.g., customer-activated) controls. ☐ Yes ☐ No ☐ N/A

48.23. In a system where a base unit price is automatically displayed on the dispenser after the completion of a transaction (e.g., product is dispensed and payment is settled), the dispenser may display the values for quantity, unit price, and total price that do not result in a mathematically correct equation. That is provided when the total price value displayed is divided by the quantity value displayed, the result is a unit price that is "posted" for a particular kind of transaction. ☐ Yes ☐ No ☐ N/A

Credit Card - or Debit Card – Activated Retail Vehicle Fuel Dispenser

On card-activated retail vehicle fuel dispensers, the customer authorizes the dispenser by inserting the card or swiping the card through a slot. On credit card transactions, the customer is typically billed through the same methods as have been used for credit transactions handled through a station attendant. On debit card transactions, payment is made directly from the purchaser's account by electronic funds transfer.

48.24. A receipt must be available to the customer at the completion of the transaction. The issuance of the receipt may be initiated at the option of the customer. ☐ Yes ☐ No ☐ N/A

48.25. The customer receipt must contain the following information:

48.25.1. The identity (codes may be used) of the product purchased, the quantity purchased, the unit price, and the total price. ☐ Yes ☐ No ☐ N/A

48.26. **Cash Value Card** - A cash value card that is initially encoded with the purchase price, authorizing a customer to purchase products up to the current cash value of the card. The value of the card is decreased in amounts equal to individual transactions. ☐ Yes ☐ No ☐ N/A

Means shall be provided to the customer to determine the initial cash value of the card and the remaining cash value prior to and after each transaction.

48.27. **Invoice Billing** - Invoice billing is a process in which customers are billed for one or more transactions at the end of a billing period.

48.27.1. The date, quantity, unit price, and total price shall be recorded and shall agree with the indications on the dispenser. ☐ Yes ☐ No ☐ N/A

48.27.2. All displayed transaction information must be shown for at least 30 seconds after completing a delivery or starting the next transaction. The delivery is considered complete after the "control" is off or after the nozzle has been returned to its designed hanging position. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.3.1. Primary Elements / Units

48.28. A hydrogen gas-measuring device shall indicate, and record if the device is equipped to record, its deliveries in kilograms or decimal multiples or submultiples of the kilogram. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.3.2. Numerical Value of Quantity-Divisions and S.1.3.3. Maximum Value of Quantity-Value Divisions

48.29. The value of the scale division for the indicating and recording element must be in values of 1, 2, or 5 and uniform throughout the series. The maximum value of the quantity-value division shall not be greater than 0.5 % of the minimum measured quantity. ☐ Yes ☐ No ☐ N/A

Code Reference: S.1.4. Value of Smallest Unit

48.30. The value of the quantity division shall not exceed the equivalent of 0.001 kg on devices with a marked maximum flow rate of 30 kg/min or less. ☐ Yes ☐ No ☐ N/A

48.31. The value of the quantity division shall not exceed the equivalent of 0.01 kg on devices with a marked maximum flow rate greater than 30 kg/min. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.7.; Indication of Delivery and S.3.5. Pressurizing the Discharge Hose

48.32. Retail devices shall automatically show their initial zero condition and amount delivered up to the nominal capacity of the device. The measurement, indication of delivered quantity, and the indication of total sales price shall be inhibited until the fueling position reaches conditions necessary to ensure the delivery starts at zero. ☐ Yes ☐ No ☐ N/A

Test Method:

1. Remove nozzle from dispenser and connect to test cylinder. Test cylinder initial pressure should not be greater than 2.5 MPa (360 psig) and should not be less than 2 MPa (290 psi) to simulate an actual delivery.
2. Turn nozzle valve from "OFF" to "FILL" position.
3. Empty discharge hose.
4. Turn nozzle valve to "OFF" position
5. Activate dispenser.

48.1. Dispenser indications shall not advance. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.3. Provisions for Power Loss and S.2.3.1. Transaction Information

Even if power fails during a delivery, it is still necessary to correctly complete all transactions in progress at the time of the power failure. Quantity and total sales price information shall be recallable for at least 15 minutes after the power failure. The information may be recalled at the dispenser or at the console if the console indications are accessible to the customer. Operator information, such as fuel and money value totals, shall be retained in memory during a power failure. The operator information is not required to be recallable during the power failure, but shall be recallable after power is restored. Test to determine if the indications are accurate when the delivery is continued after a power failure.

Note: For remote controllers (e.g., cash register, console, etc.) which have the capability to retain information pertaining to a transaction (e.g., stacked completed sales). If the information cannot be recalled at the dispenser following a power outage, means (e.g., uninterruptible power supply or other means) must be provided to enable the transaction information to be recalled and verified for at least 15 minutes following a power outage.

Code Reference: S.2.3.2. User Information

48.2. The quantity and total sales price shall be recallable for 15 minutes after the power failure. ☐ Yes ☐ No ☐ N/A

48.3. The quantity and total sales price values shall be correct if the power fails between deliveries. ☐ Yes ☐ No ☐ N/A

48.4. The quantity and total sales price values shall be correct if the delivery is continued after a power failure. ☐ Yes ☐ No ☐ N/A

48.5. The operator's information shall be retained in memory during a power failure. ☐ Yes ☐ No ☐ N/A

48.6. Remote controllers which stack completed sales must have a means to enable the transaction information to be recalled and verified for at least 15 minutes. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.1. Return to Zero

The primary indicating and recording elements of a retail device shall readily return to a definite zero indication. Key-lock and other self-operated devices must have a zero-return indicating element, but they are not required to have the recording element return to zero. These devices may be equipped with cumulative recording elements. The primary indicating and recording elements shall not go beyond their correct zero position.

48.7. Does the device have a primary recording element? ☐ Yes ☐ No ☐ N/A

48.8. The indicating and recording elements of a retail device shall be readily returnable to a definite zero indication. ☐ Yes ☐ No ☐ N/A

48.9. Key-lock and self-operated devices shall have an indicating element that return to zero. ☐ Yes ☐ No ☐ N/A

48.10. Does the device have:

48.10.1. A cumulative indicating element? ☐ Yes ☐ No ☐ N/A

48.10.2. A cumulative recording element? ☐ Yes ☐ No ☐ N/A

48.11. Primary indicating and recording elements shall not go beyond their correct zero position. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.4. Display of Unit Price and Product Identity

A computing or money-operated device shall have a means on the face of the device for displaying the unit price at which it is set to compute or deliver and for posting the product identity. When a product is offered for sale at more than one unit price from a device, then all of the unit prices at which that product is offered for sale shall be displayed or shall be capable of being displayed on the dispenser using controls available to the customer prior to the delivery of the product. The unit price shall be expressed as a decimal value in dollars.

Code Reference: S.2.4.1. Unit Price, S.2.4.2. Product Identity and S.2.4.3. Selection of Unit Price

48.12. Means shall be provided to display the unit price on each face of the device. ☐ Yes ☐ No ☐ N/A

48.13. Means shall be provided to post on each side of the device the identity of the dispensed product. ☐ Yes ☐ No ☐ N/A

48.14. When a product is offered for sale at more than one unit price from a device, then all of the unit prices at which that product is offered for sale:

48.14.1. Shall be displayed prior to the delivery of the product, OR ☐ Yes ☐ No ☐ N/A

48.14.2. Shall be capable of being displayed on the dispenser using controls available to the customer. ☐ Yes ☐ No ☐ N/A

48.14.3. A system shall not permit a change to the unit price during delivery of product. ☐ Yes ☐ No ☐ N/A

Note: It is not necessary to simultaneously display all of the unit prices, provided the dispenser complies with NIST Handbook 44 section S.2.4.1.

a. The unit prices for each product and price level may be:

b. Displayed simultaneously for all products,

c. Displayed simultaneously for each product separately, ***OR***

d. Displayed individually in a unit-price display only if controls permit the customer to sequence the display through the unit prices for each and every product.

48.15. The unit price shall be expressed in dollars and decimals of dollars using a dollar sign. A common fraction shall not appear in the unit price, (e.g., \$4.29 not $\$4^{29}/_{100}$). ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.5.2. Display of Quantity and Total Price

48.16. When a delivery is completed on a computing device, the total price and quantity for that transaction shall be displayed on the face of the dispenser for at least 5 minutes or until the next transaction is initiated by using controls on the device or other customer-activated controls. ☐ Yes ☐ No ☐ N/A

Note: The displayed unit price may revert to a base unit price immediately after the completion of a transaction, defined as the time the delivery has been terminated and payment has been settled. Any display of quantity, unit price, and total price that does not mathematically agree occurs between transactions and is permitted (in response to demands of device users) because the displayed values between "transactions" are not "significant" relative to the actual delivery process (transaction.)

49. Computing

Code Reference: S.2.5. Money-Value Computations

A hydrogen gas dispenser used to fuel vehicles shall be capable of computing total sale prices for all unit prices and for all deliveries within the range of measurement or computing capacity.

49.1. A retail computing device shall compute total sale prices for all quantities and unit prices within the range of its quantity and computing capacities. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.4.4. Agreement between Indications

48.17. All quantity, unit price, and total price indications shall agree. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.5.1. Auxiliary Elements

48.18. All indicated money value divisions and quantity value divisions on auxiliary elements shall be identical with those of the primary element. ☐ Yes ☐ No ☐ N/A

50. Recorded Representations, Point of Sale Systems, and Printed Receipt

A printed receipt shall be available through a built-in or separate recording element for transactions conducted with point-of-sale systems or devices activated by debit cards, credit cards, and/or cash. The printed receipt shall contain the following information for products delivered by the dispenser.

Code Reference: S.2.6. Recorded Representations, Point of Sale Systems

50.1. A printed receipt shall be available for devices activated by debit cards, credit cards, and/or cash. The printed receipt:

- 50.1.1. Shall contain the total mass of the delivery; ☐ Yes ☐ No ☐ N/A
- 50.1.2. Shall contain the unit price; ☐ Yes ☐ No ☐ N/A
- 50.1.3. Shall contain the total computed price; and, ☐ Yes ☐ No ☐ N/A
- 50.1.4. Shall contain the product identity by name, symbol, abbreviation, or code number. ☐ Yes ☐ No ☐ N/A

Code Reference: S.6. Printer

50.2. Printed information must agree with the indications on the dispenser.

- 50.2.1. Printed values shall be clearly defined. ☐ Yes ☐ No ☐ N/A

Code Reference: S.6.1. Printed Receipt

50.3. Any delivered, printed quantity:

- 50.3.1. Shall include an identification number, and; ☐ Yes ☐ No ☐ N/A
- 50.3.2. Shall include the time and date, and; ☐ Yes ☐ No ☐ N/A
- 50.3.3. Shall include the name of the seller. ☐ Yes ☐ No ☐ N/A

51. Design of Measuring Elements and Measuring Systems

Code Reference: S.3.1. Maximum and Minimum Flow-Rates

51.1. The ratio of the maximum to minimum flow-rates for devices measuring gases shall be 10:1 or greater. ☐ Yes ☐ No ☐ N/A

Code Reference: S.3.2. Adjustment Means

51.2. Means shall be provided to change the ratio between the indicated quantity and the quantity of gas measured by the assembly.

- 51.2.1. A bypass on the measuring assembly shall not be used for these means. ☐ Yes ☐ No ☐ N/A

Code Reference: S.3.2.1. Discontinuous Adjustment Means

51.3. When the adjusting means changes the ratio between the indicated quantity and the quantity of measured gas in a discontinuous manner, the consecutive values of the ratio shall not differ by more than 0.1 %. ☐ Yes ☐ No ☐ N/A

Code Reference: S.3.3. Provision for Sealing

Measuring elements shall be designed with adequate provisions to prevent changes from being made to the measuring element or the flow rate control (if the flow rate control affects the accuracy of deliveries) without evidence of the change being made. These provisions can be an approved means of security (e.g., data change audit trail) or physically applying a security seal which must be broken before

adjustments can be made. When applicable, the adjusting mechanism shall be readily accessible for the purposes of affixing a security seal.

51.4. A measuring element shall have provisions for either:

51.4.1. Applying a physical security seal, **OR** ☐ Yes ☐ No ☐ N/A

51.4.2. An approved means of security (e.g., data change audit trail) so that no changes may be made to its adjustable components. ☐ Yes ☐ No ☐ N/A

51.5. Any adjustable element controlling the delivery rate shall provide for sealing or other approved means of security (e.g., data audit trail) if the flow rate affects the accuracy of deliveries. ☐ Yes ☐ No ☐ N/A

51.6. When applicable, the adjusting mechanism shall be readily accessible for the purposes of affixing a security seal. ☐ Yes ☐ No ☐ N/A

51.7. Audit trails shall use the format set forth in the Common and General Code Criteria section of this checklist (Code Reference G-S.8. LMD-23) and in Appendix A, Philosophy for Sealing. ☐ Yes ☐ No ☐ N/A

51.8. Retail vehicle fuel dispensers with remote configuration capabilities shall be sealed according to Table S.3.3. of NIST HB 44 Section 3.39. Hydrogen Gas-Measuring Devices – Tentative Code and according to Appendix A, Philosophy for Sealing. ☐ Yes ☐ No ☐ N/A

51.9. An automatic means to determine and correct for changes in product density due to changes in temperature, pressure, and composition, shall be incorporated in any hydrogen gas-measuring system that is affected by changes in the density of the product being measured. ☐ Yes ☐ No ☐ N/A

Code Reference: S.3.6. Zero-Set-Back Interlock, Retail Vehicle Fuel Devices

The zero-set-back interlock on a dispenser is critical to prevent fraudulent practices. A retail vehicle fuel device shall have an effective automatic interlock such that once the dispenser shuts off, it cannot be restarted without resetting the indicating element to zero. This requirement also applies to the recording element if one is present. The dispenser shall be designed so that the starting lever must be in the shut-off position and the interlock engaged before the discharge nozzle can be returned to its designed hanging position. If a single pump supplies more than one dispenser, then each dispenser shall have an automatic control valve that prevents product from being delivered by a dispenser until its indications have been set to zero.

51.10. After the device is turned off by moving the lever that stops the flow, a subsequent delivery shall be prevented until the indicators (and recording element if present) have returned to their correct zero positions. ☐ Yes ☐ No ☐ N/A

51.11. The starting lever shall be in shut off position and zero-set-back interlock engaged before the nozzle can 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. ☐ Yes ☐ No ☐ N/A

51.12. If more than one dispenser is connected to a single source, an automatic control valve shall prevent fuel from being delivered until the indicating elements have been returned to their correct zero position and engaged. ☐ Yes ☐ No ☐ N/A

51.13. The use of the interlock shall be effective under all conditions when any control on the console, except a system emergency shut-off, is operating and after any momentary power failure. ☐ Yes ☐ No ☐ N/A

52. Discharge Lines and Valves

Code Reference: S.4.1. Diversion of Measured Product

52.1. No means shall be provided by which any measured product can be diverted from the measuring device. ☐ Yes ☐ No ☐ N/A

Code Reference: S.4.2. Directional Flow Valves

52.2. Valves intended to prevent the reversal of flow shall be automatic in operation. ☐ Yes ☐ No ☐ N/A

Code Reference: S.4.3. Other Valves

52.3. Check valves and closing mechanisms that are not used to define the measured quantity shall have relief valves (if necessary) to dissipate any abnormally high pressure that may arise in the measuring assembly. ☐ Yes ☐ No ☐ N/A

53. Markings

Code Reference: S.5. Marking Requirements

53.1. A measuring system shall be conspicuously, legibly, and indelibly marked with:

53.1.1. Pattern approval mark (e.g., type approval number); ☐ Yes ☐ No ☐ N/A

53.1.2. Name and address of the manufacturer or his trademark and, required by the weights and measures authority, the manufacturer's identification mark in addition to the trademark; ☐ Yes ☐ No ☐ N/A

53.1.3. Model designation or product name selected by the manufacturer; ☐ Yes ☐ No ☐ N/A

53.1.4. Non-repetitive serial number; ☐ Yes ☐ No ☐ N/A

53.1.5. Accuracy class of the meter as specified by the manufacturer consistent with Table T.2. Accuracy Classes and Tolerances for Hydrogen Gas-Measuring Devices; ☐ Yes ☐ No ☐ N/A

53.1.6. Maximum and minimum flow rates in kilograms per unit of time; ☐ Yes ☐ No ☐ N/A

53.1.7. Maximum working pressure; ☐ Yes ☐ No ☐ N/A

53.1.8. Applicable temperature range if other than – 10 °C to + 50 °C; ☐ Yes ☐ No ☐ N/A

53.1.9. Minimum measured quantity (MMQ.); ☐ Yes ☐ No ☐ N/A

53.1.10. Product limitations (such as fuel quality) if applicable. ☐ Yes ☐ No ☐ N/A

Code Reference: S.5.1. Location of Marking Information; Retail Vehicle Fuel Dispensers

53.2. The marking information required in the General Code, Paragraph G-S.1. Identification shall appear as follows:

53.2.1. Within 60 cm (24 in) to 150 cm (60 in) from the base of the dispenser, ☐ Yes ☐ No ☐ N/A

53.2.2. Either internally and/or externally provided the information is permanent and easily read and accessible, **AND** ☐ Yes ☐ No ☐ N/A

53.2.3. On a portion of the device that cannot be readily removed or interchanged (e.g., not on a service access panel). ☐ Yes ☐ No ☐ N/A

Note: The use of a dispenser key or tool to access internal marking information is permitted for retail hydrogen-measuring devices.

54. Totalizers

Code Reference: S.7. Totalizers for Retail Vehicle Fuel Dispensers

54.1. Vehicle fuel dispensers shall be equipped with a non-resettable totalizer for the quantity delivered through each separate measuring device. ☐ Yes ☐ No ☐ N/A

55. Minimum Measured Quantity

Code Reference: S.8. MMQ

55.1. The minimum measured quantity shall satisfy the conditions of use of the measuring system as follows:

55.1.1. An MMQ not exceeding 0.5 kg for measuring systems with maximum flow rate less than or equal to 4 kg/min, **OR** ☐ Yes ☐ No ☐ N/A

55.1.2. An MMQ not exceeding 1.0 kg for measuring systems with maximum flow rate greater than 4 kg/min but not greater than 12 kg/min. ☐ Yes ☐ No ☐ N/A

56. Card-Activated Hydrogen Gas-Measuring Devices

Code Reference: G-S.2. Facilitation of Fraud

There is great concern regarding the potential for accidental or intentional fraud when card-activated systems are used in service stations, especially because bank-card-activated systems give direct access to bank accounts. The following criteria and test procedures apply to card-activated retail vehicle fuel dispensers.

A card-activated system shall authorize the dispensing of product for not more than three minutes of the time between authorization and "control" on at the dispenser. It shall properly record transactions on the appropriate card account.

When a card-activated system is subjected to power loss of greater than 10 seconds, the dispenser shall de-authorize. Because systems may be installed with separate power lines to the console, card reader, and dispenser, the different parts of the system should be tested with power failures to evaluate the potential for accidental or intentional errors. The appropriate device response depends upon when the power loss occurs during the delivery sequence.

Note: The term "control" generically refers to the handle, flapper, start button, on/off switch, or other mechanism used to activate or deactivate the dispenser.

56.1. The dispenser must de-authorize in not more than three minutes if the pump "control" is not turned on. ☐ Yes ☐ No ☐ N/A

56.2. If the time limit to deactivate a dispenser is programmable, it shall not accept an entry greater than three minutes. ☐ Yes ☐ No ☐ N/A

56.3. When a power loss greater than 10 seconds occurs after the pump "control" is on, the dispenser must de-authorize. ☐ Yes ☐ No ☐ N/A

56.4. When there is a loss of power, but the dispenser "control" is not on, the dispenser must de-authorize in not more than three minutes. ☐ Yes ☐ No ☐ N/A

57. Test Methods for Card-Activated Retail Vehicle Fuel Dispensers

57.1. Authorize the dispenser and, with the pump "control" on, interrupt power to any part (or all) of the system. The pump should de-authorize immediately.

57.1.1. Authorize with a card and turn the "control" on. Power down briefly, then restore power. Try to dispense product: the dispenser must not dispense because the power failure should have de-authorized the dispenser. ☐ Yes ☐ No ☐ N/A

57.2. Authorize the dispenser using a card (leaving control off); wait more than three minutes, and try to start the dispenser. It should not start because the authorization should have timed out. ☐ Yes ☐ No ☐ N/A

57.2.1. Authorize with a card, but do not turn the "control" on. Power down for more than three minutes, and then restore power. Try to dispense product; the dispenser should have "timed-out" and not dispense. ☐ Yes ☐ No ☐ N/A

57.2.2. Authorize and dispense with card #1. Allow the system to time out and de-authorize (if it does). Do not turn off the "control." Authorize and dispense with card #2. The transactions shall be properly recorded for each card. ☐ Yes ☐ No ☐ N/A

57.2.3. Authorize with card #1. Turn the "control" on, then off. Authorize with card #2. Dispense product and complete the delivery. Check the printed receipt to verify that the delivery has been properly charged to card #2 ☐ Yes ☐ No ☐ N/A

57.2.4. Turn the dispenser "control" on, and use a card to authorize the dispenser. Turn the "control" off. After a period of 15 seconds, turn the "control" on. Try to deliver product; the dispenser must not dispense. ☐ Yes ☐ No ☐ N/A

57.2.5. Authorize with card #1 (do not turn the "control" on) and interrupt power for at least 10 seconds. This should de-authorize the dispenser. Resupply power; turn the "control" on; try to dispense. The dispenser shall not deliver product. ☐ Yes ☐ No ☐ N/A

57.2.6. Authorize with card #1 (turn the "control" on) and interrupt power for at least 10 seconds. This should de-authorize the dispenser. Resupply power; turn the "control" on; try to dispense. The dispenser shall not deliver product. ☐ Yes ☐ No ☐ N/A

Note: This test is not required if the device under test complies with paragraph 10.1.

48.18.1. Authorize a dispenser with card #1, but do not turn the dispenser "control" on. Try to authorize the same dispenser with card #2; it should not be accepted until after the 3 minute time-out. ☐ Yes ☐ No ☐ N/A

57.3. Attempt to override or confuse the card system by varying the length of time the card is in the slot (e.g., vary the "swipe" times), and pushing all other keys on the keypad during each step of the authorization process. ☐ Yes ☐ No ☐ N/A

58. Cash Activated Hydrogen Gas-Measuring Devices

The following criteria and test procedures apply to cash-activated retail vehicle fuel dispensers. Tests using various denominations of bills accepted by the cash acceptor should be performed.

Certificates of Conformance will cover the use of the cash acceptor option at both attended and unattended stations. Cash Acceptors which are used at unattended locations must meet the marking requirements of paragraph G-UR.3.4 Responsibility, Money-Operated Devices shall be clearly and

conspicuously displayed on the device or immediately adjacent to the device information detailing the return of monies paid when the product cannot be obtained.

Even if power is interrupted during a delivery, it is still necessary to correctly complete all transactions in progress at the time of the power interruption. In the event of a power loss, the information needed to complete any transaction in progress at the time of the power loss (such as the quantity and unit price, sales price, or amount of money already inserted into the cash acceptor) shall be determinable for at least 15 minutes at the dispenser or at the console or journal printer if the console or journal printer is accessible to the customer.

All portions of the transaction must be accounted for in order to complete the transaction. This information includes the following: (1) the total amount of money that was inserted into the device prior to the power interruption, (2) the amount of product already dispensed (which should be available from the dispenser and which must comply with the requirements of S.2.3. Provision for Power Loss, (3) and any bill that has been inserted but has not yet been recognized by the cash acceptor.

Note: For bills that have not yet been drawn into the cash acceptor to the point that the bill is no longer visible, it is assumed that the information on the bill denomination can be obtained from visual examination.

Various methods may be used to recall specific portions of the transaction depending on how the basic system operates. For example, systems that can print a record of the amount fed into the machine as each bill is fed into the device maintain an ongoing record of bills recognized by the system. Other systems may not print a receipt until the end of the transaction, so the information is recalled on a journal printer accessible to the customer or can be recalled on the cash acceptor display.

Check to see what happens when the power is interrupted at different points of the transaction. Note what occurs at the points where power is interrupted, what information is provided to the customer on the receipt, audibly and visually in the form of instructions or error messages. Because systems may be installed with separate power lines to the console, card reader, and dispenser may be installed, tests should be run with power interruptions to different parts of the system to evaluate the potential for accidental or intentional errors. The appropriate device response depends upon when the power loss occurs during the delivery sequence.

Code Reference: S.2.3. Provisions for Power Loss

58.1. Systems with Battery Back-up or Uninterruptible Power Supply or Equivalent - Some systems are equipped with a battery back-up or an uninterruptible power supply (or equivalent) which allows a transaction to continue in the event of a power loss. For such systems, the transaction in progress at the time of a power interrupt must continue as if no power interruption had occurred (or comply with the requirements for systems not equipped with a battery back-up.) That is, all bills (including bills being fed into the device at the time of the power loss) must be correctly accounted for, and the quantity and total sale amounts must be mathematically correct. Check these systems by interrupting power at several points in the transaction to ensure that all information (total price, quantity, mathematical agreement, and total dollar amount inserted by the customer) is accounted for correctly. ☐ Yes ☐ No ☐ N/A

All Other Systems:

To check the operation of systems not equipped with a battery backup, uninterruptible power supply, or equivalent, interrupt power as described below. As noted earlier, if separate power lines supply different components in the system, interrupt power to different parts of the system.

58.2. When one or more bills has been accepted and registered by the device, but product has not yet been dispensed, at least one of the following criteria must be met to ensure that this information can be recalled in the event of a power interruption:

58.2.1. The denomination of the bill must be printed by the printer on the device as the device recognizes the bill. (The printed receipt must be available to the customer.) ☐ Yes ☐ No ☐ N/A

58.2.2. The denomination of each bill must be printed by a journal or other printer accessible to the customer as each bill is recognized by the device. ☐ Yes ☐ No ☐ N/A

58.2.3. The running total display must be capable of being recalled for at least 15 minutes. ☐ Yes ☐ No ☐ N/A

58.2.4. Means provided to enable the customer to retrieve the money inserted into the device (e.g., a button which can be used during a power interruption to eject the money inserted by the customer). ☐ Yes ☐ No ☐ N/A

58.2.5. Other means used to provide a visual or printed record of the total amount of money accepted by the device. ☐ Yes ☐ No ☐ N/A

58.3. There is a brief period of time during which a bill has been accepted by the cash acceptor but has not yet been recognized by the device. The following criteria must be met to ensure that this information can be recalled in the event of a power failure.

58.3.1. Means provided to enable the attendant or customer to retrieve the bill (for example, a button which can be used during a power interruption to eject the bill or if the cash acceptor box can be removed by the attendant and the bill retrieved.) ☐ Yes ☐ No ☐ N/A

Note: There may be a space of time in which a bill can be caught partially in and out of the cash acceptor during a power interruption. In such a case, if the denomination of the bill is visible to the customer and attendant, this is sufficient to provide information about the bill being fed into the device at the time of the power interruption. The cash acceptor must comply with the other applicable items noted above.

It is expected that the retail vehicle fuel dispenser will comply with paragraph S.2.3. Provision for Power Loss; and the information on the product already dispensed can be recalled through this portion of the system.

58.4. Power should be interrupted at different points in the transaction to determine that all transaction information can be recalled in the event of a power interruption including combinations of the following:

58.4.1. After one bill has been inserted. ☐ Yes ☐ No ☐ N/A

58.4.2. After several bills have been inserted ☐ Yes ☐ No ☐ N/A

58.4.3. While a bill is being inserted. ☐ Yes ☐ No ☐ N/A

58.4.4. After a bill has been inserted but not yet recognized. ☐ Yes ☐ No ☐ N/A

58.4.5. After a bill(s) has been inserted and recognized, but the on/off control is still in the "off" position. ☐ Yes ☐ No ☐ N/A

58.4.6. After a bill(s) has been inserted and recognized, the on/off control is in the "on" position, but no product has been dispensed. ☐ Yes ☐ No ☐ N/A

58.4.7. After a bill(s) has been inserted and recognized, the on/off control is in the "on" position, and product is being dispensed. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.5.1. Indicating and Recording Elements, General

58.5. A running display showing the amount of money fed into the machine must be provided. It is not necessary for this information to be displayed once the customer initiates delivery. ☐ Yes ☐ No ☐ N/A

Code Reference: S.2.6. Record Representation, Point of Sale Systems

58.6. A printed receipt must be available to the customer from the device at the completion of the transaction. The issuance of the receipt may be initiated at the option of the customer. ☐ Yes ☐ No ☐ N/A

58.6.1. The customer receipt must contain the following information: ☐ Yes ☐ No ☐ N/A

58.6.2. The identity (codes may be used) of the product purchased, the quantity purchased, the unit price, and the total price. ☐ Yes ☐ No ☐ N/A

58.6.3. Because the customer must be provided with the option of receiving a receipt, at unattended devices the system must not accept cash if sufficient paper is not available to complete the transaction.

58.7. The cash acceptor must not initiate a cash transaction if either of the following conditions is true:

58.7.1. No paper is in the receipt printer of the cash acceptor. ☐ Yes ☐ No ☐ N/A

58.7.2. Insufficient paper is available to complete a transaction ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.6. Marking Operational Controls, Indications, and Features

2.1. Instructions must be marked on the device to inform the customer how to operate the cash acceptor. ☐ Yes ☐ No ☐ N/A

Code Reference: G-S.2. Facilitation of Fraud

58.8. Means must be provided for the customer to cancel the transaction at any point.

58.8.1. The customer has inserted cash, but has not yet dispensed product. If the customer cancels the transaction by pressing the cancel key (or equivalent key(s)) or by lowering the on/off control, the device must either:

58.8.1.1. Be equipped with means for the customer to retrieve the cash inserted from the device, **AND** ☐ Yes ☐ No ☐ N/A

58.8.1.2. Automatically issue a printed receipt indicating the amount tendered and the amount returned, **OR**

58.8.1.3. Display instructions (such as "sale terminated, see attendant," "sale terminated, get receipt" or similar wording) for the customer to see the attendant, **AND** ☐ Yes ☐ No ☐ N/A

58.8.1.4. Automatically issue a printed receipt showing the amount of cash inserted by the customer, a statement indicating that the sale was terminated, and instructions for the customer to see the attendant.

58.8.2. The customer has inserted cash and has started dispensing product. If the customer cancels or discontinues the transaction by pressing the cancel key (or equivalent key(s)) or lowering the on/off control before reaching the total money inserted into the device, the device must:

58.8.2.1. Display instructions for the customer to obtain the receipt and to see the attendant. ☐ Yes ☐ No ☐ N/A

58.8.2.2. Automatically issue a printed receipt showing the amount of cash inserted, the amount dispensed, the balance due to the customer, a statement indicating that the sale was terminated, and instructions for the customer to see the attendant. ☐ Yes ☐ No ☐ N/A

Note: It is acceptable for different messages to be used. This depends upon whether the transaction is terminated by use of the cancel key, (e.g., "sale terminated, get receipt" or "sale terminated, see attendant") or by lowering the on/off "control" (e.g., "change due, see attendant").

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Appendix D

Draft NCWM Publication 14, Liquid Measuring Devices 2.16.

Sealing - General

In addition to satisfying the physical security sealing requirement; the presence of a physical seal shall clearly indicate that the setup or configuration mode (any mode permitting access to any or all sealable parameters based upon the application of the Philosophy for Sealing in NCWM Publication 14) of the device cannot be accessed without additional actions (e.g., removal of a jumper, pressing a key or switch, etc.) only possible after the removal of the seal.

If the use of a physical seal is the only approved method of sealing; it shall not be possible to apply the physical seal with the device in the setup or configuration mode (any mode permitting access to any or all sealable parameters based upon the application of the Philosophy for Sealing in NCWM Publication 14) unless the device has a clear indication that the device is in this mode. See the list of acceptable and unacceptable indications below.

Applicable for Devices Using a Physical Seal

Technologist: _____ Remarks: _____
Control Number: _____ _____
Date: _____ _____
Time: _____ _____
Temp.: (°C) _____ _____
RH (%): _____ _____

Mechanism Used to Enter Calibration / Configuration:

Jumper	☐ Yes	☐ No	☐ N/A
Push-button (memory switch)	☐ Yes	☐ No	☐ N/A
Toggle/Slide Switch	☐ Yes	☐ No	☐ N/A
Other (describe in remarks)	☐ Yes	☐ No	☐ N/A
Meets Requirements	☐ Yes	☐ No	☐ N/A

Mechanism Effective Upon Exit of Calibration / Configuration in Approved Mode (when mechanism is properly set according to manufactures specifications)

Jumper	☐ Yes	☐ No	☐ N/A
Push-button (memory switch)	☐ Yes	☐ No	☐ N/A
Toggle/Slide Switch	☐ Yes	☐ No	☐ N/A
Other (describe in remarks)	☐ Yes	☐ No	☐ N/A
Meets Requirements	☐ Yes	☐ No	☐ N/A

Note: Means of entering and exiting the calibration/configuration access mode shall be listed on the NTEP CC.

Indications Representing That the Device is Configured with the Setup or Configuration Mode Enabled (i.e., any mode permitting access to any or all sealable parameters)

This list is not limiting or all-inclusive; other indications may be acceptable.

Acceptable Clear Indications	Indications NOT Acceptably Clear
Unusable quantity indications Example: C100.05E	C 100.05 gal
"not NIST Handbook 44" annunciator	Any digit in the quantity differentiated by size, shape, or color
"CAL" Annunciator (single or mixed case)	Quantities w/o units Example:100.05
"Set-up" Annunciator (single or mixed case)	Flashing Quantity Value
"Config" Annunciator (single or mixed case)	Quantity with No Annunciators Displayed
	Quantity All Annunciators Displayed

Mass Meter Product Category and Test Requirements			Magnetic Flow Meter Product Category and Test Requirements			Positive Displacement Flow Meter Product Category and Test Requirements		Turbine Flow Meter Product Category and Test Requirements	
Test B To cover a range of the following products, test with one product having a low specific gravity and test with a second product having a high specific gravity. The Certificate of Conformance will cover all products in all product categories listed in the table under Test B within the specific gravity range tested. • Test B does not apply to product categories of liquefied gases, compressed liquids, cryogenic liquids or heated products. *Note: Product categories under Test B were formerly referred to collectively as "Normal Liquids."*			**Test F** To cover a range of the following products, test with one product having a specified conductivity. The Certificate of Conformance will cover all products with conductivity equal to or above the conductivity of the tested liquid. • Test F does not apply to product categories of potable water, non-potable water, tap water, water mixes of alcohols and glycols, fertilizers, suspension fertilizers, liquid feeds, clear liquid fertilizers, chemicals or crop chemicals A, B, C, or D. • Test F does not apply to product categories of liquefied gases, or compressed liquids.			**Test C** To cover a range of products within each product category, test with one product having a low viscosity and test with a second product having a high viscosity within each category. The Certificate of Conformance will cover all products in the product category within the viscosity range tested.		**Test E** To cover a range of products within each product category, test with one product having a low kinematic viscosity and test with a second product having a high kinematic viscosity within each category. The Certificate of Conformance will cover all products in the product category within the kinematic viscosity range tested.[1]	
						Product Category: Alcohols, Glycols and Water Mixes Thereof (Alc Gly)		**Product Category:** Alcohols, Glycols and Water Mixes Thereof (Alc Gly)	
Typical Products	**Specific Gravity[2] (60 °F)**	**Product Category**	**Typical Products**	**Conductivity (micro-siemens/centimeter)**	**Product Category**	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**
Butanol	0.81	Alc Gly	Butanol		Alc Gly	Butanol	3.34	Butanol	3.34
Ethanol	0.79	Alc Gly	Ethanol	0.0013	Alc Gly	Ethanol	1.29	Ethanol	1.29
Ethylene Glycol	1.19	Alc Gly	Ethylene Glycol		Alc Gly	Ethylene Glycol	25.5	Ethylene Glycol	25.5
Isobutyl	0.81	Alc Gly	Isobutyl	0.02	Alc Gly	Isobutyl	4.54	Isobutyl	4.54
Isopropyl	0.79	Alc Gly	Isopropyl	3.5	Alc Gly	Isopropyl	2.78	Isopropyl	2.78
Methanol	0.80	Alc Gly	Methanol	0.44	Alc Gly	Methanol	0.64	Methanol	0.64
Propylene Glycol	1.04	Alc Gly	Propylene Glycol		Alc Gly	Propylene Glycol	54	Propylene Glycol	54
Banvel	0.7 – 1.2	CC-A	6 Oil (#5, #6)		FL&O	**Test C** **Product Category:** Crop Chemicals (Type A) (CC-A)		**Test E** **Product Category:** Compressed Liquids, Fuels and Refrigerants NH_3 (Comp liq)	
Herbicides	0.7 – 1.2	CC-A	Asphalt		FL&O	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**
Paraquat	0.7 – 1.2	CC-A	Avgas		FL&O	Banvel	4 – 400	Anhydrous Ammonia	0.188

[1] Kinematic viscosity is measured in centistokes. Source for some of the viscosity value information is in the Industry Canada – Measurement Canada "Liquid Products Group, Bulletin V-16-E (rev.1), August 3, 1999."

$$\text{Centistokes } (m^2/s) = \frac{\text{Centipoise } (kg/m\ s)}{\text{density } (kg/m^3)}$$

[2] The specific gravity of a liquid is the ratio of its density to that of water at standard conditions, usually 4 °C (or 40 °F) and 1 atmosphere. The density of water at standard conditions is approximately 1000 kg/m^3 (or 998 kg/m^3). The specific gravity of a gas is the ratio of its density to that of air at standard conditions, usually 4 °C (or 40 °F) and 1 atmosphere.

Mass Meter Product Category and Test Requirements			**Magnetic Flow Meter Product Category and Test Requirements**			**Positive Displacement Flow Meter Product Category and Test Requirements**		**Turbine Flow Meter Product Category and Test Requirements**	
Typical Products	**Specific Gravity[2] (60 °F)**	**Product Category**	**Typical Products**	**Conductivity (micro-siemens/centimeter)**	**Product Category**	**Test C** **Product Category:** Crop Chemicals (Type A) (CC-A) continued		**Test E** **Product Category:** Compressed Liquids, Fuels and Refrigerants NH_3 (Comp liq) continued	
Prowl	0.7 – 1.2	CC-A	Biodiesel above B20		FL&O	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**
Round-up	0.7 – 1.2	CC-A	Bunker Oil		FL&O	Herbicides	4 – 400	Butane	0.19
Touchdown	0.7 – 1.2	CC-A	Cooking Oils		FL&O	Paraquat	4 – 400	Ethane	
Treflan	0.7 – 1.2	CC-A	Corn Oil		FL&O	Prowl	4 – 400	Freon 11	0.313
Adjuvants	0.7 – 1.2	CC-B	Crude Oil		FL&O	Round-up	4 – 400	Freon 12	0.359
Fumigants	0.7 – 1.2	CC-B	Diesel Fuel[3]		FL&O	Touchdown	4 – 400	Freon 22	1.99
Fungicides	0.7 – 1.2	CC-B	Fuel Oil (#1, #2, #3, #4)	0	FL&O	Treflan	4 – 400	Propane	0.098
Insecticides	0.7 – 1.2	CC-B	Gasoline[4]		FL&O	**Test C** **Product Category:** Crop Chemicals (Type B) (CC-B)		**Test E** **Product Category:** Fuels, Lubricants, Industrial and Food Grade Liquid oils (FL&O)	
Fungicides	1 – 1.2	CC-C	Jet A		FL&O	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**
Micronutrients	0.9 – 1.65	CC-D	Jet A-1		FL&O	Adjuvants	0.7 – 100	6 Oil (#5, #6)	66 – 13,000
Hydrochloric Acid	1.1	Chem	Jet B		FL&O	Fumigants	0.7 – 100	Asphalt	100 – 5000
Phosphoric Acid	1.87	Chem	JP4		FL&O	Fungicides	0.7 – 100	Avgas	1.5 – 6
Sulfuric Acid	1.83	Chem	JP5		FL&O	Insecticides	0.7 – 100	Biodiesel above B20	10.12
3-10-30	0.9 – 1.65	Fert	JP7 and JP8		FL&O	**Test C** **Product Category:** Crop Chemicals (Type C) (CC-C)		Bunker Oil	11,200
4-4-27	0.9 – 1.65	Fert	Kerosene		FL&O	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**	Cooking Oils	9.93
9-18-9	1.32	Fert	Light Oil		FL&O	Fungicides	20 – 900	Corn Oil	4
10-34-0	1.39	Fert	Lubricating Oils		FL&O	**Test C** **Product Category:** Crop Chemicals (Type D) (CC-D)		Crude Oil	3 – 1783
20% Aqua-Ammonia	0.89	Fert	Olive Oil		FL&O	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**	Diesel Fuel[3]	10
28%, 30% or 32%	1.28 – 1.32	Fert	Peanut Oil		FL&O	Micronutrients	20 – 1000	Fuel Oil (#1, #2, #3, #4)	8 – 88

[3] Diesel fuel blends (biodiesel with up to 20% vegetable or animal fat/oil.)
[4] Gasoline includes oxygenated fuel blends with up to 15% oxygenate.

Mass Meter Product Category and Test Requirements

Typical Products	Specific Gravity[2] (60 °F)	Product Category
Ammonia Nitrate	1.16 – 1.37	Fert
Clear Liquid Fertilizer	1.17 – 1.44	Fert
Nitrogen Solution	1.17 – 1.44	Fert
N-P-K Solutions	1.2 – 1.4	Fert
Urea	1.89	Fert
6 Oil (#5, #6)	0.9	FL&O
Asphalt		FL&O
Avgas		FL&O
Biodiesel above B20	0.86	FL&O
Bunker Oil	0.99	FL&O
Cooking Oils	0.92	FL&O
Corn Oil	0.91	FL&O
Crude Oil	0.79 – 0.97	FL&O
Diesel Fuel[3]	0.84	FL&O
Fuel Oil (#1, #2, #3, #4)	0.9	FL&O
Gasoline[4]	0.72	FL&O
Jet A		FL&O
Jet A-1	0.76	FL&O
Jet B		FL&O
JP4	0.76	FL&O
JP5	0.76	FL&O
JP7 and JP8	0.76	FL&O

Magnetic Flow Meter Product Category and Test Requirements

Typical Products	Conductivity (micro-siemens/centimeter)	Product Category
SAE Grades		FL&O
Soy Oil	0	FL&O
Spindle Oil		FL&O
Sunflower Oil		FL&O
Vegetable Oil	0	FL&O
Asphalt		Heated
Bunker C		Heated
Carbon Tetra-Chloride		Solv Cl
Methylene-Chloride		Solv Cl
Perchloro-Ethylene		Solv Cl
Trichloro-Ethylene		Solv Cl
Acetates		Solv Gen
Acetone	.02	Solv Gen
Ethylacetate	0.00001	Solv Gen
Hexane	0	Solv Gen
MEK	0.1	Solv Gen
Toluene	0	Solv Gen
Xylene	0	Solv Gen
Deionized		Water
Demineralized		Water

Positive Displacement Flow Meter Product Category and Test Requirements

Test C
Product Category: Chemicals (Chem)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Hydrochloric Acid	0.80 – 1. 0
Phosphoric Acid	161
Sulfuric Acid	1.49

Test C
Product Category: Compressed Liquids, Fuels and Refrigerants (Comp liq)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Anhydrous Ammonia	0.188
Butane	0.19
Ethane	
Freon 11	0.313
Freon 12	0.359
Freon 22	1.99
Propane	0.098

Test C
Product Category: Clear Liquid Fertilizers (Fert)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
9-18-0	
10-34-0	48
20% Aqua-Ammonia	1.1 – 1.3
28%, 30% or 32%	31 – 110
Ammonia Nitrate	11.22
Clear Liquid Fertilizer	31 – 110
Nitrogen Solution	31 – 110

Turbine Flow Meter Product Category and Test Requirements

Test E
Product Category: Fuels, Lubricants, Industrial and Food Grade Liquid oils (FL&O) continued

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Gasoline[4]	0.28
Jet A	1.5 – 6
Jet A-1	1.36
Jet B	1.5 – 6
JP4	1.02
JP5	1.94
JP7 and JP8	1.82
Kerosene	1.94
Light Oil	13.47
Lubricating Oils	20 – 1000
Olive Oil	116.8
Peanut Oil	11 – 110
SAE Grades	192 – 3626
Soy Oil	90.6
Spindle Oil	
Sunflower Oil	90.1
Vegetable Oil	133

Test E
Product Category: Solvents General (Solv Gen)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Acetates	0.44
Acetone	0.34

Mass Meter Product Category and Test Requirements

Typical Products	Specific Gravity[2] (60 °F)	Product Category
Kerosene	0.75	FL&O
Light Oil	0.86	FL&O
Lubricating Oils	0.80 – 0.90	FL&O
Olive Oil	0.92	FL&O
Peanut Oil	0.9 – 1.0	FL&O
SAE Grades	0.9	FL&O
Soy Oil	0.93	FL&O
Spindle Oil		FL&O
Sunflower Oil	0.93	FL&O
Vegetable Oil	0.92	FL&O
Liquid Molasses	1.25	Liq Feed
Molasses Plus Phos Acid and/or Urea (TreaChle)	1.1 – 1.3	Liq Feed
Carbon Tetra-Chloride	1.6	Solv Cl
Methylene-Chloride	1.34	Solv Cl
Perchloro-Ethylene	1.6	Solv Cl
Trichloro-Ethylene	1.47	Solv Cl
Acetates	0.93	Solv Gen

Magnetic Flow Meter Product Category and Test Requirements

Test D
To obtain coverage for a product category, test with one product in the product category. The Certificate of Conformance will cover all products in the category.

- Test D does not apply to product categories of pure alcohols, pure glycol, pure water, solvents chlorinated, solvents general, fuels, lubricants, industrial and food grade liquid oils.
- Test D does not apply to product categories of liquefied gases, compressed liquids or heated products.

Typical Products	Conductivity (micro-siemens/centimeter)	Product Category
Water Mixes of Alcohols and Glycols		Alc Gly
Banvel		CC-A
Herbicides		CC-A
Paraquat		CC-A
Prowl		CC-A
Round-up		CC-A
Touchdown		CC-A
Treflan		CC-A
Adjuvants		CC-B
Fumigants		CC-B
Fungicides		CC-B
Insecticides		CC-B
Micronutrients		CC-D
Hydrochloric Acid	395000	Chem
Phosphoric Acid	56600	Chem

Positive Displacement Flow Meter Product Category and Test Requirements

Test C
Product Category:
Clear Liquid Fertilizers (Fert) continued

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
N-P-K Solution	
Urea	1

Test C
Product Category:
Fuels, Lubricants, Industrial and Food Grade Liquid Oils (FL&O)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
6 Oil (#5, #6)	66 – 13,000
Asphalt	100 – 5000
Avgas	1.5 – 6
Biodiesel above B20	10.12
Bunker Oil	11,200
Cooking Oils	9.93
Corn Oil	4
Crude Oil	3-1783
Diesel Fuel[3]	10
Fuel Oil (#1, #2, #3, #4)	8 to 88
Gasoline[4]	0.28
Jet A	1.5 – 6

Turbine Flow Meter Product Category and Test Requirements

Test E
Product Category:
Solvents General (Solv Gen) continued

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Ethylacetate	1.36
Hexane	0.34
MEK	0.45
Toluene	0.62
Xylene	0.86

Test A
The following products must be individually tested and noted on the Certificate of Conformance.

Typical Products	Product Category
Banvel	CC-A
Herbicides	CC-A
Paraquat	CC-A
Prowl	CC-A
Round-up	CC-A
Touchdown	CC-A
Treflan	CC-A
Adjuvants	CC-B
Fumigants	CC-B

Mass Meter Product Category and Test Requirements			Magnetic Flow Meter Product Category and Test Requirements			Positive Displacement Flow Meter Product Category and Test Requirements		Turbine Flow Meter Product Category and Test Requirements	
Typical Products	**Specific Gravity[2] (60 °F)**	**Product Category**	**Typical Products**	**Conductivity (micro-siemens/centimeter)**	**Product Category**	**Test C** **Product Category:** Fuels, Lubricants, Industrial and Food Grade Liquid Oils (FL&O) continued		**Typical Products**	**Product Category**
Acetone	0.8	Solv Gen	Sulfuric Acid	209000	Chem	**Typical Products**	**Reference Viscosity[1] (60 °F) Centipoise (cP)**	Fungicides	CC-C
Ethylacetate	0.96	Solv Gen	9-18-0		Fert	Jet A-1	1.36	Insecticides	CC-B
Hexane	0.66	Solv Gen	10-34-0		Fert	Jet B	1.5 – 6	Fungicides	CC-C
MEK	0.81	Solv Gen	20% Aqua-Ammonia		Fert	JP4	1.02	Micronutrients	CC-D
Toluene	0.87	Solv Gen	28%, 30% or 32%		Fert	JP5	1.94	Hydrochloric Acid	Chem
Xylene	0.89	Solv Gen	Ammonia Nitrate		Fert	JP7 and JP8	1.82	Phosphoric Acid	Chem
Beverages	1.0	Water	Clear Liquid Fertilizer		Fert	Kerosene	1.94	Sulfuric Acid	Chem
Deionized	1.0	Water	Nitrogen Solution		Fert	Light Oil	13.47	NH_3	Comp Liq
Demineralized	1.0	Water	N-P-K Solutions		Fert	Lubricating Oils	20 – 1000	20% Aqua-Ammonia	Fert
Juices	1.0	Water	Urea	5000	Fert	Olive Oil	116.8	28%, 30% or 32%	Fert
Milk	1.0	Water	Liquid Molasses	300	Liq Feed	Peanut Oil	11 – 110	9-18-0	Fert
Nonpotable	1.0	Water	Molasses Plus Phos Acid and/or Urea (TreaChle)		Liq Feed	SAE Grades	192 – 3626	10-34-0	Fert
Potable	1.0	Water	3-10-30		Sus Fert	Spindle Oil		Ammonia Nitrate	Fert
Tap Water	1.0	Water	4-4-27		Sus Fert	Soy Oil	90.6	Clear Liquid Fertilizer	Fert
Test D To obtain coverage for each of the following product categories, test with one product in each product category. The Certificate of Conformance will cover the products in the product category in which a product was tested.			Beverages		Water	Sunflower Oil	90.1	Nitrogen Solution	Fert
Typical Products	**Specific Gravity[2] (60 °F)**	**Product Category**	Juices		Water	Vegetable Oil	133	N-P-K Solutions	Fert
Compressed Natural Gas (CNG)	0.6 – 0.8 (1=Air)	Comp gas	Nonpotable	72[5]	Water			Urea	Fert
Anhydrous Ammonia	0.61	Comp liq	Potable	72[5]	Water			Bicep	Flow
Butane	0.595	Comp liq	Tap Water	72[5]	Water			Broadstrike	Flow

[5] This data point is suspected to be lower than that of normal tap water supplied for residential consumption.

Mass Meter
Product Category and Test Requirements

Typical Products	Specific Gravity[2] (60 °F)	Product Category
Ethane		Comp liq
Freon 11	1.49	Comp liq
Freon 12	1.33	Comp liq
Freon 22	1.37	Comp liq
Propane	0.504	Comp liq
Liquefied Natural Gas		Cryo LNG
Liquefied Oxygen	0.66	Cryo LNG
Nitrogen	0.31	Cryo LNG
Asphalt		Heated
Bunker C	1.1	Heated

Test A
The following products must be individually tested and noted on the Certificate of Conformance.

Typical Products	Specific Gravity[2] (60 °F)	Product Category
Compressed Hydrogen Gas (H or H2)	0.07 (1=Air)	CompH2

Magnetic Flow Meter
Product Category and Test Requirements

Positive Displacement Flow Meter Product
Category and Test Requirements

Test C
Product Category:
Flowables (Flow)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Bicep	20 – 900
Broadstrike	20 – 900
Doubleplay	20 – 900
Dual	20 – 900
Guardsman	20 – 900
Harness	20 – 900
Marksman	20 – 900
Topnotch	20 – 900

Test C
Product Category:
Heated (Heated)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Asphalt	100 – 5000
Bunker C	11,200

Test C
Product Category:
Liquid Feed (Liq Feed)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Liquid Molasses	8640
Molasses Plus Phos Acid and/or Urea (TreaChle)	2882

Test C
Product Category:
Solvents Chlorinated (Solv Cl)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Carbon Tetra-Chloride	0.99

Turbine Flow Meter
Product Category and Test Requirements

Typical Products	Product Category
Doubleplay	Flow
Dual	Flow
Guardsman	Flow
Harness	Flow
Marksman	Flow
Topnotch	Flow
Asphalt	Heated
Bunker C	Heated
Liquid Molasses	Liq Feed
Molasses plus Phos Acid and/or Urea (TreaChle)	Liq Feed
Carbon Tetra-Chloride	Solv Cl
Methylene-Chloride	Solv Cl
Perchloro-Ethylene	Solv Cl
Trichloro-Ethylene	Solv Cl
3-10-30	Sus Fert
4-4-27	Sus Fert
Compressed Hydrogen Gas (H or H2)	Comp H2

Test D
To obtain coverage for a product category, test with one product in the product category. The Certificate of Conformance will cover all products in the category.

Typical Products	Product Category
Liquefied Natural Gas	Cryo LNG
Liquefied Oxygen	Cryo LNG

Mass Meter Product Category and Test Requirements	Magnetic Flow Meter Product Category and Test Requirements	Positive Displacement Flow Meter Product Category and Test Requirements	Turbine Flow Meter Product Category and Test Requirements

Test C
Product Category:
Solvents Chlorinated (Solv Cl) continued

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Methylene-Chloride	0.46
Perchloro-Ethylene	1
Trichloro-Ethylene	0.6

Test C
Product Category:
Solvents General (Solv Gen)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Acetates	0.44
Acetone	0.34
Ethylacetate	1.36
Hexane	0.34
MEK	0.45
Toluene	0.62
Xylene	0.86

Test C
Product Category:
Suspension Fertilizers (Sus Fert)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
3-10-30	100 – 1000
4-4-27	20 – 215

Test D
To obtain coverage for a product category, test with one product in the product category. The Certificate of Conformance will cover all products in the category.

Product Category:
Water (Water)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Beverages	1.0
Deionized	1.0
Demineralized	1.0
Juices	1.0
Milk	1.0
Nonpotable	1.0
Potable	1.0

Typical Products	Product Category
Nitrogen	Cry LNG
Beverages	Water
Deionized	Water
Demineralized	Water
Juices	Water
Milk	Water
Nonpotable	Water
Potable	Water
Tap Water	Water

Mass Meter Product Category and Test Requirements	Magnetic Flow Meter Product Category and Test Requirements	Positive Displacement Flow Meter Product Category and Test Requirements	Turbine Flow Meter Product Category and Test Requirements

Test D

Product Category:
Water (Water) continued

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Tap Water	1.0

Test A
The following products must be individually tested and noted on the Certificate of Conformance.

Product Category:
Cryogenic Liquids and Liquefied Natural Gas (Cryo LNG)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Liquefied Natural Gas	
Liquefied Oxygen	0.038
Nitrogen	1.07

Test A
The following products must be individually tested and noted on the Certificate of Conformance.

Product Category:
Compressed Hydrogen Gas (Comp H2)

Typical Products	Reference Viscosity[1] (60 °F) Centipoise (cP)
Compressed Hydrogen Gas (H or H2)	0.0097

Product Category Table – Category Abbreviations

Abbreviation	Product Category	Abbreviation	Product Category
Alc Gly	Alcohols, Glycols and Water Mixes Thereof	Fert	Fertilizers
CC-A	Crop Chemicals (Type A)	FL&O	Fuels, Lubricants, Industrial and Food Grade Liquid Oils
CC-B	Crop Chemicals (Type B)	Flow	Flowables
CC-C	Crop Chemicals (Type C)	Heated	Heated Products
CC-D	Crop Chemicals (Type D)	Liq Feed	Liquid Feeds
Chem	Chemicals	Solv Chl	Solvents Chlorinated
Comp gas	Compressed Gases	Solv Gen	Solvents General
Comp H2	Compressed Hydrogen Gas	Sus Fert	Suspension Fertilizers
Comp liq	Compressed Liquids (Fuels and Refrigerants, NH_3)	Water	Water
Cryo LNG	Cryogenic Liquids and Liquefied Natural Gas		

Note: The Typical Products listed in this table are not limiting or all-inclusive; there may be other products and product trade names, which fall into a product family. Water and a product such as stoddard solvent or mineral spirits may be used as test products in the fuels, lubricants, industrial, and food- grade liquid oils product family.

Appendix D

National Type Evaluation Technical Committee (NTETC) Software Sector Meeting Summary

March 15 - 16, 2011
Annapolis, Maryland

INTRODUCTION

The charge of the NTETC Software Sector (herein after referred to as "Sector") is important in providing appropriate type evaluation criteria for software-based weighing or measuring device based on specifications, tolerances and technical requirements of NIST Handbook 44, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices* Section 1.10. General Code, Section 2 for weighing devices, Section 3 for liquid and vapor measuring devices, and Section 5 for taximeters, grain analyzers, and multiple dimension measuring devices. The Software Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, *Technical Policy, Checklists, and Test Procedures* for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of the National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

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***.

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.

Table A
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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
BIML	International Bureau of Legal Metrology	OIML	International Organization of Legal Metrology
CC	Certificate of Conformance	PDC	Professional Development Committee
GMMs	Grain Moisture Meters	S&T	Specifications and Tolerances Committee
NCWM	National Conference on Weights and Measures	SMA	Scale Manufactures Assocation
NTEP	National Type Evaluation Program	WELMEC	European Cooperation in Legal Metrology
NTETC	National Type Evaluation Technical Committee		

Details of All Items
(In order by Reference Key)

CARRY-OVER ITEMS

1. Software Identification/Markings

Source:
NTETC Software Sector

Background/Discussion:
Since its inception the Sector has wrestled with the issue of software identification and marking requirements. For more background information on this item, see the 2010 NTETC Software Sector Meeting Summary and the 2011 NCWM Annual Report S&T Committee Agenda Item 310-2.

On the first day of discussion, the Sector agreed that the revisions to G-S.1. Identification and G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices as they were presented in the 2010 NCWM Publication 15 and as Informational Items in NCWM Publication 16 still required some clarification in certain areas. There seems to be confusion regarding requirements for purely mechanical devices now, and there is no indication of the preference for hard-marking when the option to mark or display is allowed.

Feedback received from NCWM membership seems to indicate a preference to not delineate between device types (at least where marking requirements are concerned). This was taken into account as the sector reviewed the current and previously proposed language.

In general, the Sector agreed that for the purposes of marking there was no reason to distinguish between different types of software (i.e., a software on a CD that is to be installed on a computer, or software embedded in a chip within a built-for-purpose device).

The following draft revision of the language in G-S.1. and G-S.1.1. was crafted to try to address some of these concerns, and as a basis for further discussion:

NIST Handbook 44

G-S.1. Identification. – All equipment, except weights~~, and~~ separate parts necessary to the measurement process but not having any metrological effect~~, and software based devices covered in G-S.1.1. Location of Marking Information*,~~ shall be clearly and permanently marked **as per G-S.1.1.** for the purposes of identification with the following information:
*[*Nonretroactive as of January 1, 20XX]*

(a) the name, initials, or trademark of the manufacturer or distributor;

(b) a model identifier that positively identifies the pattern or design of the device;

(1) The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lowercase.
[Nonretroactive as of January 1, 2003]

(Added 2000) (Amended 2001)

(c) *a nonrepetitive serial number, except for equipment with no moving or electronic component parts ~~and not built for purpose software based software devices;~~*
[Nonretroactive as of January 1, 1968]

(Amended 2003)

(1) The serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.
[Nonretroactive as of January 1, 1986]

(2) Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No., and S. No.).
[Nonretroactive as of January 1, 2001]

(d) **when metrologically significant software is employed,** *the current software version or revision identifier*, **which shall be directly and inseparably linked to the software itself ~~for not built for purpose, software based electronic devices;~~**
[Nonretroactive as of January 1, 2004]

(Added 2003) **(Amended 20XX)**

(1) The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.
[Nonretroactive as of January 1, 2007]

(Added 2006)

(2) Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).
[Nonretroactive as of January 1, 2007]

(Added 2006)

(e) *an ~~National Type Evaluation Program (~~NTEP~~)~~ ~~Certificate of Conformance (~~CC~~)~~ number or a corresponding CC Addendum Number for devices that have a CC. The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms "NTEP CC," "CC," or*

"Approval." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). [Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of **the disassembly** of a part requiring the use of any means separate from the device.

(Amended 1985, 1991, 1999, 2000, 2001, 2003, ~~**and,**~~ 2006**, and 201X**)

**added by S&T Committee based on SMA comments, and not in original NTETC Software Sector submission*

The clause regarding making the software version / revision inseparably linked to the software may or may not be included in current recommendations. Feedback will be obtained from the Scale Manufactures Association (SMA) in April.

G-S.1.1. Location of Marking Information ~~***for Not Built For Purpose all Software Based Devices. – For not built for purpose, software based devices, either:***~~

(a) The required information in G-S.1. Identification~~*. (a), (b), (d), and (e)*~~ *shall be permanently marked or continuously displayed on the device; or*

(b) ***The required information in G-S.1. Identification shall be available via the user interface****. The* ~~***Certificate of Conformance (***~~*CC*~~***)***~~ *Number shall be:*

(1) permanently marked on the device;

(2) continuously displayed; or

(3) accessible through ***one or, at most, two levels of access.*** ~~***an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to, "Help," "System Identification," "G-S.1. Identification," or "Weights and Measures Identification."***~~

(i) For menu based systems, "Metrology," "System Identification," or "Help."

(ii) For systems using icons, a metrology symbol "(M)", "(SI)," or a help symbol ("?," "i," or an "i" within a magnifying glass).

Note: For (b), clear instructions for accessing the information required in G-S.1. (a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.
[Nonretroactive as of January 1, 2004]

(Added 2003) (Amended 2006 **and 20XX**)

For several years now, the Software Sector has been recommending updates to G-S.1. to eliminate the use of the undefined term "not-built-for-purpose", and to add a requirement for marking software version/revision for ALL devices using metrologically significant software (currently built-for-purpose devices are excluded from this requirement). However, the Sector tried to fit it in by generalizing other areas of the Code (meaning G-S.1.1.) to apply to all software-based devices.

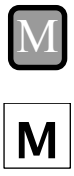
At the 2010 NCWM Interim Meeting, Mr. Truex, NTEP Administrator, provided a history of how this issue evolved. He noted that there were multiple attempts to address software in not-built-for purpose devices. The NTETC Software Sector has attempted to further simplify the identification requirements that apply to software-based systems and has made multiple suggestions that were not accepted. The Sector has taken a step back and is trying to get the point across that the marking requirements are not for the manufacturer, but to assist the inspector in the inspection process and in assessing whether or not a specific device, including software, is covered under an NTEP Certificate of Conformance (CC). The Sector realizes that ideally this information is not going to be

physically marked on the device and is looking for alternatives in which this information can be provided electronically to inspectors in an easily accessible manner. It will likely be provided on the device's display screen, and there is limited space for this information to be displayed. The Sector is looking for input on the general direction it should take in developing or updating NIST Handbook 44 requirements. If the direction seems reasonable, the Sector will further develop the idea; if not, the Sector will consider an alternative direction.

Comments in response to that question posed to the Conference indicated that the Sector was on the right track; but the language needed additional work. Limiting the options for locating required marking information seemed to be a well-received idea.

Further discussion regarding "easily recognizable" was addressed previously with an initial list of menu options/icons that would act as the "defining" set of acceptable menu selections/icons for finding the CC number of the device. The idea was to limit the options to a finite set, thus assuring evaluators and field inspectors had at least a reasonable limit to the possible ways to obtain this information. There was good feedback and discussion from other groups and was considered during the 2011 NTETC Software Sector Meeting, and the Sector did modify the document to eliminate some options that were deemed problematic, etc. Originally the plan was to put this into NIST Handbook 44 but further discussion at the 2011 NTETC Software Sector Meeting led to the consensus that the existing language is sufficient, and using such a list as guidance for the evaluating laboratories (e.g., NCWM Publication 14) would be the proper approach. Hence, the list of menu text/icons as updated to reflect the comments received can be re-circulated, but is now the opinion of the sector that this list is best targeted at NCWM Publication 14.

Table 1 – NTETC Software Sector Proposed Menu Text/Icons

Permitted Menu Text Examples	Permitted Icon Shape Examples	Essential Characteristics
Information Info		Top level menu text or icon • Icon text is a lower case "i" with block serifs • Text color may be light or dark but must contrast with the background color • Icon may have a circular border • Activation of this menu text/icon may invoke a second level menu text/icon that recalls metrology information.
Help ?		Top level menu text or icon • Icon text is a question mark • Text color may be light or dark but must contrast with the background color • Icon may have a circular border • Activation of this menu text/icon may invoke a second level menu text/icon that recalls metrology information.
Metrology Metrological Information		Top or second level menu text or icon • Icon text is an upper case "M" • Text color may be light or dark but must contrast with the background color • Icon may have a rectangle or rounded rectangle border. Note (2011 mtg): using a rectangle is problematic because it matches a symbol used in Europe. A circle would be preferred. Green M may also be an issue due to it being used as a metrology mark in EU. • If present, the activation of this menu text/icon must recall at a minimum the NTEP CC number.
SI S.I. System Information System Info		Top or second level menu text or icon • Icon text is upper case "SI" • Text color may be light or dark but must contrast with the background color • Icon may have a rectangle or rounded rectangle border • If present, the activation of this menu item/icon must recall at a minimum the NTEP CC number. • The SI is problematic since it is also used to identify the International System of Units.
NTEP Data N.T.E.P. Certificate		This one is debatable – what if the certificate is revoked? Does NTEP grant holders of CCs the right to display the logo on the device, or just in documentation?

Acceptable examples of where the text or icon may be displayed:

1. The "M" icon is available on the home screen. Activation of the icon displays a new screen containing the CC number and some additional metrology information including the software version/revision number(s).

2. The "SI" icon is available on the home screen. Touch screen activation of the icon displays a pop-up containing the CC number. Releasing the icon erases the pop-up.

3. The main screen contains the "i" icon (information). Activating this icon displays a screen of other icons including the "M" icon. Activating the "M" icon displays the NTEP CC.

4. The main menu includes a "Help" selection which in turn contains a "Metrology" selection. Activation of the Metrology selection displays a pop-up screen containing all global metrological approvals, including the NTEP CC number. The user manually dismisses the pop-up screen by pressing the [X] button.

The main menu includes an "Info" selection which in turn contains a "SI" selection. Activation of the SI selection displays a pop-up screen containing all global metrological approvals, including the NTEP CC number. The user manually dismisses the pop-up screen by pressing the [OK] button.

Comments from NTETC Weighing Sector Comments:
The NTETC Weighing Sector reviewed the initial list of menu text and icons and provided the following comments:

- Mr. Flocken, Mettler-Toledo, Inc., indicated that the green M is an EU metrology mark and for that reason should not be considered an acceptable icon.

- There was general consensus amongst NTETC Weighing Sector members that the SI should not be considered acceptable since it is also used to identify the International System of Units.

Comments from NTETC Measuring Sector Comments:
The NTETC Measuring Sector had no additional technical guidance to offer to the S&T Committee on this issue. However, based on comments from sector members present, the NTETC Measuring Sector expressed general support for trying to refine the marking requirements and limit the number of options for marking keys that enable the inspector to view the required marking information.

Potential additions to the list of acceptable options would be an icon or menu option showing "W/M", "W&M", or "Menu" for a top level menu text option.

NTETC Grain Analyzer Sector Comments:
The NTETC Grain Analyzer Sector found the wording of G-S.1.1. confusing. It seemed to say that the markings spelled out in G-S.1. were to be EITHER permanently marked or continuously displayed on the device OR the Certificate of Conformance (CC) Number shall be either: permanently marked or continuously displayed, or accessible through menu or icon. To some, this implied that the software version identifier did NOT have to be displayed. Others believed that the "OR" phrase meant that only the CC had three options for marking (permanent, continuously displayed, or accessible via menu or icon), and that the software/firmware version/revision number must be either permanently marked or continuously displayed.

Regardless of how the wording is interpreted, the NTETC Grain Analyzer Sector agreed that it was not practical to permanently mark or continuously display the software/firmware version/revision identifier for Grain Moisture Meters (GMMs). The Sector recommends that G-S.1.1.(b) be amended to include accessing the software version or revision identifier by menu or icon. At present all NTEP GMMs are built-for-purpose. They all have permanently marked CC numbers. Software version/revision identifiers, however, are accessible by menu or icon. GMM displays are of limited size. Some existing devices don't have room to display the software version/revision identifier on every "screen". Hard marking of that identifier is not practical, because it precludes updating software without also replacing the hard-marked label.

SMA Comments:
The SMA supports the requirement to access a version number for software based devices. The SMA looks forward to the NTETC Software Sector's definition of the term "software-based device".

SMA opposed the definition we provided previously. From the 2009 NTETC Software Sector Meeting Summary and 2010 NCWM Publication 15 Item 310-2:

> **Electronic devices, software-based. Weighing and measuring devices or systems that use metrological software to facilitate compliance with Handbook 44. This includes:**

(a) Embedded software devices (Type P), aka built-for-purpose. A device or element with software used in a fixed hardware and software environment that cannot be modified or uploaded via any interface without breaking a security seal or other approved means for providing security, and will be called a "P," or

(b) Programmable or loadable metrological software devices (Type U), aka not-built-for-purpose. A personal computer or other device and/or element with PC components with programmable or loadable metrological software, and will be called "U." A "U" is assumed if the conditions for embedded software devices are not met.

Software-based devices – See Electronic devices, software-based.

The Sector's previous efforts to incorporate these concepts into the text of G-S.1. seemed to result in confusion and concern over unintended side effects of the changes proposed and, hence, met with resistance. This led the Sector to consider a new approach. Rather than modify a broadly applicable section of general code language to address software concerns, the idea of inserting specific concerns as new clauses seemed much less likely to cause unintended changes (side effects).

This topic was again discussed on the second day of the meeting, resulting in the following proposed new language for G-S.1. and G-S.1.1. that contains modifications that are less invasive and more specific to the intent of the Sector:

G-S.1. Identification. – All equipment, except weights, and separate parts necessary to the measurement process but not having any metrological effect, shall be clearly and permanently marked for the purposes of identification with the following information:

(a) the name, initials, or trademark of the manufacturer or distributor;

(b) a model identifier that positively identifies the pattern or design of the device;

(1) The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lowercase.
[Nonretroactive as of January 1, 2003]
(Added 2000) (Amended 2001)

(c) *a nonrepetitive serial number, except for equipment with no moving or electronic component parts* ***~~and not built-for-purpose software-based software devices;~~***
[Nonretroactive as of January 1, 1968]
(Amended 2003)

(1) The serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.
[Nonretroactive as of January 1, 1986]

(2) Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No., and S. No.).
[Nonretroactive as of January 1, 2001]

(d) when metrologically significant software is employed, the current software version or revision identifier ***~~for not built for purpose software based electronic devices;~~***
[Nonretroactive as of January 1, 2004]
(Added 2003) **(Amended 201X)**

(1) The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.
[Nonretroactive as of January 1, 2007]
(Added 2006)

(2) Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).
[Nonretroactive as of January 1, 2007]
(Added 2006)

(3) The version or revision identifier shall be accessible via the display in lieu of being permanently marked. Instructions for displaying the version or revision identifier shall be described in the CC. As an exception, permanently marking the version or revision identifier shall be acceptable under the following conditions:

(i) the user interface does not have any control capability to activate the indication of the version or revision identifier on the display, or the display does not technically allow the version or revision identifier to be shown (analog indicating device or electromechanical counter) or

(ii) the device does not have an interface to communicate the version or revision identifier or

(iii) after the production of the device a change of the software is not possible, or only possible if the hardware or a hardware component is changed.

(e) an NTEP CC number or a corresponding CC Addendum Number for devices that have a CC.

(1) The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.)
[Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.
(Amended 1985, 1991, 1999, 2000, 2001, 2003, 2006**, and 201X**)

G-S.1.1. Location of Marking Information for ~~Not Built For Purpose~~ all Software-Based Devices. *– For ~~not built for purpose,~~ software-based devices, either:*

(a) The required information in G-S.1. Identification. ~~(a), (b), (d), and (e)~~ shall be permanently marked or continuously displayed on the device; or

(b) The CC Number shall be:

(1) permanently marked on the device;

(2) continuously displayed; or

(3) *accessible through* ***one or, at most, two levels of access.*** ~~***an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to, "Help," "System Identification," "G-S.1. Identification," or "Weights and Measures Identification."***~~

(i) For menu based systems, "Metrology," "System Identification," or "Help."

(ii) For systems using icons, a metrology symbol "(M)", "(SI)," or a help symbol ("?," "i," or an "i" within a magnifying glass).

Note: For (b), clear instructions for accessing the information required in G-S.1. (a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.

[Nonretroactive as of January 1, 2004]

(Added 2003) (Amended 2006**, and 201X**)

Note: The striking of some of the text in G-S.1.(c) should NOT in the opinion of the sector result in an interpretation that it is a requirement to mark a serial number on standalone software. Standalone software has no moving or electronic parts and hence is already exempt from the requirement.

The new language in G-S.1.1. reflects that the Sector reached consensus on the following positions:

- The software version/revision should (with very few exceptions – see D-31 5.1.1) be accessible via the user interface.
- The means by which the software version is accessed must be described in the CC.

In addition, it was asserted that the previously recommended changes to G-S.1.1.(b)(3) in fact are not really necessary; the current language of NIST Handbook 44 empowers the labs to enforce "easily recognizable" as they see fit. In fact, the previously generated "list" of icons and menu options could certainly be used by the examining lab as part of the approval process (e.g., in NCWM Publication 14). Of course, a manufacturer who is reviewing NIST Handbook 44 so as to develop an acceptable device may benefit from more explicit guidance. Where does such guidance belong?

Comments related to the circulated list included a comment from the SMA suggesting that a definition is needed for a "software-based devices". SMA opposed the definitions previously put forth by the Sector. It was suggested that perhaps the SMA would be more amenable to a definition that doesn't differentiate between software types.

Additional discussion on the topic of G-S.1. was related to the following concept, which may eventually result in additional recommendations to amend G-S.1.:

The sector sees merit to requiring some "connection" between the software identifier (i.e., version/revision) and the software itself (as does International Organization of Legal Metrology [OIML], see D-31). The proposal being considered is to add a new subparagraph to G-S.1.(d) to read as follows (with the expectation that examples of acceptable means of implementing such a link would be included in NCWM Publication 14).

> "The version or revision identifier shall be directly and inseparably linked to the software itself. The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software."

Conclusion:
The Sector wishes to obtain feedback on the newly recommended language for G-S.1. and G-S.1.1. since it does deviate somewhat from previous submissions. It is hoped that the various interested sectors, regions and associations will give this new proposal careful thought and submit their concerns to the NTETC Software Sector.

The list of suggested icons/menus that should be considered finite options for manufacturers was updated to reflect comments received by the Sector. The Sector now believes this approach is adequate without a change to NIST Handbook 44; the NTEP laboratories would be able to enforce "easily recognizable" against this finite list. Hence, the Sector recommends the list be inserted into NCWM Publication 14.

As to the requirement to have some "connection" between the software identifier and the software itself, the Sector felt that this topic requires more work, so it will be split out into a separate item and put forth as a separate proposal.

Crafting a definition for "software based device" may be included as an item in a future agenda. Note the term "not built for purpose, software based device" is already used in NIST Handbook 44.

2. Identification of Certified Software

Source:
NTETC Software Sector

Background/Discussion:
This item originated as an attempt to answer the question "How does the field inspector know that the software running in the device is the same software evaluated and approved by the lab?" In previous meetings it was shown that the international community has addressed this issue (both European Cooperation in Legal Metrology (WELMEC) and OIML).

From WELMEC 7.2:

> **Required Documentation:**
> The documentation shall list the software identifications and describe how the software identification is created, how it is inextricably linked to the software itself, how it may be accessed for viewing and how it is structured in order to differentiate between version changes with and without requiring a type approval.

From OIML D-31:

> The executable file "**tt100_12.exe**" is protected against modification by a checksum. The value of checksum as determined by algorithm **XYZ** is **1A2B3C**.

Previous discussions have included a listing of some additional examples of possible valid methods (not limiting):

- CRC (cyclical redundancy check)
- Checksum
- Inextricably Linked version no.
- Encryption
- Digital Signature

Is there some method to give the weights and measures inspector information that something has changed? Yes, the Category III audit trail or other means of sealing.

How can the weights and measures inspector identify an NTEP Certified version? They can't, without adding additional requirements like what is described here, in conjunction with including the identifier on the CC.

The Sector believes that we should work towards language that would include a requirement similar to the OIML requirement in NIST Handbook 44. It is also the opinion of the Sector that a specific method should not be defined;

rather the manufacturer should utilize a method and demonstrate the selected identification mechanism is suitable for the purpose. It is not clear from the discussion where such proposed language might belong.

OIML strongly recommends that metrological software be separated from non-metrological software for ease of identification and evaluation.

From OIML:

> Separation of software parts – All software modules (programmes, subroutines, objects etc.) that perform metrologically significant functions or that contain metrologically significant data domains form the metrologically significant software part of a measuring instrument (device or sub-assembly). The conformity requirement applies to all parts and parts shall be marked according to Section G-S-X.X.
>
> If the separation of the software is not possible or needed, then the software is metrologically significant as a whole.

(Segregation of parameters is currently allowed - see table of sealable parameters)

Initial draft proposed language: (G-S.1.1.?)

NIST Handbook 44 (This has been written into G-S.1.(d)(3), Identification of Certified Software:

> Software-based electronic devices shall be designed such that the metrologically significant software is clearly identified by the version or revision number**~~. The identification,~~** and this identification **~~of the software~~** shall be **~~inextricably~~** directly and inseparably linked to the software itself. The version or revision number may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.

NCWM Publication 14*:*

> **Identification of Certified Software:**
>
> Note: Manufacturers may choose to separate metrologically significant software from non-metrologically significant software. Separation would allow the revision of the non-metrological portion without the need for further evaluation. In addition, non-metrologically significant software may be updated on devices without breaking a seal, if so designed. Separation of software requires that all software modules (programs, subroutines, objects etc.) that perform metrologically significant functions or that contain metrologically significant data domains form the metrologically significant software part of a measuring instrument (device or sub-assembly). If the separation of the software is not possible or needed, then the software is metrologically significant as a whole. **~~The conformity requirement applies to all parts and parts shall be marked according to Section G-S-X.X.~~**
>
> The manufacturer must describe and possibly demonstrate how the version or revision identifier is directly and inseparably linked to the metrologically significant software. Where the version revision identifier is comprised of more than one part, the manufacturer shall describe which portion represents the metrological significant software and which does not.

From OIML D-31:

> Legally relevant software of a measuring instrument/electronic device/sub-assembly shall be clearly identified with the software version or another token. The identification may consist of more than one part but at least one part shall be dedicated to the legal purpose.
>
> The identification shall be inextricably linked to the software itself and shall be presented or printed on command or displayed during operation or at start up for a measuring instrument that can be turned off and on

again. If a sub-assembly/electronic device has neither display nor printer, the identification shall be sent via a communication interface in order to be displayed/printed on another sub-assembly/electronic device.

The first sentence of the first paragraph above is already addressed in NIST Handbook 44's marking requirements.

In 2010, the Sector crafted a draft recommendation for the following change to NIST Handbook 44, General Code: G-S.1.(d) to add a new subsection (3):

(d) the current software version or revision identifier for ~~***not built for purpose***~~ ***software-based electronic*** *devices;*
[Nonretroactive as of January 1, 2004]
(Added 2003) **(Amended 20XX)**

(1) The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.
[Nonretroactive as of January 1, 2007]
(Added 2006)

(2) Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).
[Nonretroactive as of January 1, 2007]
(Added 2006)

(3) The version or revision identifier shall be directly and inseparably linked to the software itself. The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.
[Nonretroactive as of January 1, 201X]
(Added 20XX)

There was some additional discussion on this item regarding where this new requirement was best located. It was suggested that the first sentence of G-S.1.d.(3) could be added as a clause to the base paragraph G-S.1.(d) text, e.g., " *the current software version or revision identifier for* ~~***not built for purpose***~~ ***software-based*** *devices, which shall be directly and inseparably linked to the software itself*;" .

It also was suggested that the second sentence in G-S.1.d.(3) might be more suitable for NCWM Publication 14, as it describes more 'how' than 'what' the requirement entails.

In addition, the Sector considered the following information to be added to NCWM Publication 14 as explanation/examples:

- The current software identifier must be displayable/printable on command during operation (or made evident by other means deemed acceptable by G-S.1.).

- At a minimum, the software identifier must include a version/revision indication (1.02.09, rev 3.0 a, etc.). It could also consist of/contain checksum, etc (crc32, for example).

- The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.

Other questions that are still outstanding:

5. If we allow hard-marking of the software identifier (the Sector has wavered on this in the past), does the above wording then imply that some mechanical means is required (i.e., physical seal) to "inseparably link" the identifier to the software?

6. If a device is capable of doing so, does it still have to be able to display, print or communicate the identifier somehow, even if it is hard-marked?

Conclusion:
The item needs additional discussion and development by the Sector. It is hoped that the Sector will obtain some feedback regarding NCWM Publication 14 recommendations from the SMA in April, and other sectors, regions and interested parties.

3. Software Protection/Security

Source:
NTETC Software Sector

Background/Discussion:
The Sector agreed that NIST Handbook 44 already has audit trail and physical seal, but these may need to be enhanced.

From the WELMEC Document:

Protection against accidental or unintentional changes
Metrologically significant software and measurement data shall be protected against accidental or unintentional changes.

Specifying Notes:
Possible reasons for accidental changes and faults are: unpredictable physical influences, effects caused by user functions and residual defects of the software even though state of the art of development techniques have been applied.

This requirement includes consideration of:

a) Physical influences: Stored measurement data shall be protected against corruption or deletion when a fault occurs or, alternatively, the fault shall be detectable.

b) User functions: Confirmation shall be demanded before deleting or changing data.

c) Software defects: Appropriate measures shall be taken to protect data from unintentional changes that could occur through incorrect program design or programming errors (e.g., plausibility checks).

Required Documentation:
The documentation should show the measures that have been taken to protect the software and data against unintentional changes.

Example of an Acceptable Solution:
- The accidental modification of software and measurement data may be checked by calculating a checksum over the relevant parts, comparing it with the nominal value and stopping if anything has been modified.

- Measurement data are not deleted without prior authorization (e.g., a dialogue statement or window asking for confirmation of deletion).

- For fault detection see also Extension I.

The sector continued to develop a proposed checklist for NCWM Publication 14. The numbering will still need to be added. This is based roughly on R 76-2 checklist and discussion at October 2007 NTETC Software Sector Meeting.

The information requested by this checklist is currently voluntary; however, it is recommended that applicants comply with these requests or provide specific information as to why they may not be able to comply. Based on this information, the checklist may be amended to better fit with NTEP's need for information and the applicant's ability to comply.

The California, Maryland, and Ohio laboratories agreed to use this checklist on one of the next devices they have in the lab and report back to the Sector on what the problems may be. In February 2011, the North Carolina laboratory was also given a copy of the checklist to try.

1. Devices with Embedded Software TYPE P (aka built-for-purpose)

1.1. Declaration of the manufacturer that the software is used in a fixed hardware and software environment. **AND** ☐ Yes ☐ No ☐ N/A

1.2. Cannot be modified or uploaded by any means after securing/verification. ☐ Yes ☐ No ☐ N/A

Note: It is acceptable to break the "seal" and load new software, audit trail is also a sufficient seal.

1.3. The software documentation contains:

1.3.1. Description of all functions, designating those that are considered metrologically significant. ☐ Yes ☐ No ☐ N/A

1.3.2. Description of the securing means (evidence of an intervention). ☐ Yes ☐ No ☐ N/A

1.3.3. Software Identification. ☐ Yes ☐ No ☐ N/A

1.3.4. Description how to check the actual software identification. ☐ Yes ☐ No ☐ N/A

1.4. The software identification is:

1.4.1. Clearly assigned to the metrologically significant software and functions. ☐ Yes ☐ No ☐ N/A

1.4.2. Provided by the device as documented. ☐ Yes ☐ No ☐ N/A

2. Personal Computers, Instruments with PC Components, and Other Instruments, Devices, Modules, and Elements with Programmable or Loadable Metrologically Significant Software TYPE U (aka not built-for-purpose)

2.1. The metrologically significant software is:

2.1.1. Documented with all relevant (see below for list of documents) information. ☐ Yes ☐ No ☐ N/A

2.1.2. Protected against accidental or intentional changes. ☐ Yes ☐ No ☐ N/A

2.2. Evidence of intervention (such as, changes, uploads, circumvention) is available until the next verification/inspection (e.g., physical seal, Checksum, CRC, audit trail, etc. means of security). ☐ Yes ☐ No ☐ N/A

3. Software with Closed Shell (no access to the operating system and/or programs possible for the user)

3.1. Check whether there is a complete set of commands (e.g., function keys or commands via external interfaces) supplied and accompanied by short descriptions. ☐ Yes ☐ No ☐ N/A

3.2. Check whether the manufacturer has submitted a written declaration of the completeness of the set of commands. ☐ Yes ☐ No ☐ N/A

4. Operating System and / or Program(s) Accessible for the User

4.1.	Check whether a checksum or equivalent signature is generated over the machine code of the metrologically significant software (program module(s) subject to legal control Weights and Measures jurisdiction and type-specific parameters).	☐ Yes ☐ No ☐ N/A
4.2.	Check whether the metrologically significant software will detect and act upon any unauthorized alteration of the metrologically significant software using simple software tools (e.g., text editor).	☐ Yes ☐ No ☐ N/A

5. Software Interface(s)

5.1. Verify the manufacturer has documented:

5.1.1.	The program modules of the metrologically significant software are defined and separated.	☐ Yes ☐ No ☐ N/A
5.1.2.	The protective software interface itself is part of the metrologically significant software.	☐ Yes ☐ No ☐ N/A
5.1.3.	The functions of the metrologically significant software that can be accessed via the protective software interface.	☐ Yes ☐ No ☐ N/A
5.1.4.	The parameters that may be exchanged via the protective software interface are defined.	☐ Yes ☐ No ☐ N/A
5.1.5.	The description of the functions and parameters are conclusive and complete.	☐ Yes ☐ No ☐ N/A
5.1.6.	There are software interface instructions for the third party (external) application programmer.	☐ Yes ☐ No ☐ N/A

The laboratories were polled to obtain any feedback on the use of the checklist.

The Maryland laboratory attempted to use this checklist a few times. Mr. Payne, Maryland Department of Agriculture, had some difficulty obtaining answers from the manufacturers because the individual(s) interacting with Mr. Payne did not always have the required information on hand. More experience in using the checklist will help determine what needs to be revised.

It was suggested that the checklist could be sent to manufacturers for their feedback as well, with the stipulation that it a completely voluntary exercise and purely informational at this point. The laboratories will coordinate with willing manufacturers to obtain feedback.

Conclusion:
Work is ongoing on this item with the intent that it eventually will be incorporated as a checklist in NCWM Publication 14; again the laboratories are requested to try utilizing this checklist for any evaluations on software-based electronic devices.

4. Software Maintenance and Reconfiguration

Source:
NTETC Software Sector

Background/Discussion:
After the software is completed, what do the manufacturers use to secure their software? At the 2010 NTETC Software Sector Meeting, significant discussion on the approach taken by OIML were reviewed by the Sector.

1. Verify that the update process is documented (OK)

2. For traced updates, installed software is authenticated and checked for integrity

   Technical means shall be employed to guarantee the authenticity of the loaded software (i.e., that it originates from the owner of the type approval certificate). This can be accomplished (e.g. by cryptographic means like signing). The signature is checked during loading. If the loaded software fails this test, the instrument shall discard it and either use the previous version of the software or become inoperative.

   Technical means shall be employed to guarantee the integrity of the loaded software (i.e., that it was not inadmissibly changed before loading). This can be accomplished, for example, by adding a checksum or hash code of the loaded software and verifying it during the loading procedure. If the loaded software fails this test, the instrument shall discard it and either use the previous version of the software or become inoperative.

   Examples are not limiting or exclusive.

3. Verify that the sealing requirements are met

   What sealing requirements are we talking about?

   This item is only addressing the software update, it can be either verified or traced. It is possible that there are two different security means, one for protecting software updates (software log) and one for protecting the other metrological parameters (Category I, II, or III method of sealing).

   Some examples provided by the sector members include but are not limited to:

   - Physical Seal, software log
   - Category III method of sealing can contain both means of security

4. Verify that if the upgrade process fails, the device is inoperable or the original software is restored

   Can this be made mandatory?

   The manufacturer shall ensure by appropriate technical means (e.g., an audit trail) that traced updates of metrologically significant software are adequately traceable within the instrument for subsequent verification and surveillance or inspection. *This requirement enables inspection authorities, which are responsible for the metrological surveillance of legally controlled instruments, to back-trace traced updates of metrologically significant software over an adequate period of time (that depends on national legislation).* The statement in italics will need to be reworded to comply with U.S. weights and measures requirements.

   The Sector agreed that the two definitions below for were acceptable.

   Verified Update
   A Verified Update is the process of installing new software where the security is broken and the device must be re-verified. Checking for authenticity and integrity is the responsibility of the owner/user.

   Traced Update
   A Traced Update is the process of installing new software where the software is automatically checked for authenticity and integrity, and the update is recorded in a software update log or audit trail.

The Sector discussed how to best move this item forward, and there was also some discussion as to whether new language for the General Code was required. The following new text was proposed:

G-S.9. Metrologically Significant Software Updates. - The updating of metrologically significant software shall be considered a sealable event. Metrologically significant software that does not conform to the approved type is not allowed for use.

Mr. Truex, NTEP Administrator, indicated that the current requirements in G-S.8. already make the statement that any changes that affect metrological function are sealable, hence, software updates may be covered and the proposed G-S.9. unnecessary. Mr. Lucas, Ohio Department of Agriculture, suggested the Sector go ahead and submit the proposed G-S.9. to the committee and request a clarification/interpretation of G-S.8.

At the 2009 meeting, the Sector opined that the explicit language proposed for G-S.9. is clearer than any implied requirement in G-S.8. The Sector would like a clarification/interpretation of G-S.8. as it relates to software updates from the S&T Committee (with their response preferably to be included in NCWM Publication 16). The Sector will also continue to develop the proposed text (and flow chart) targeted for inclusion in NCWM Publication 14.

The Sector reviewed the proposal and reconsidered allowing a separate "update log". It was decided that this would probably generate confusion and is not likely to be adopted by manufacturers anyway. Hence, the previously proposed text was modified to require a Category III audit trail for "traced updates":

> ~~**For a Traced Update, an event logger is required. The logger shall be capable of storing a minimum of the 10 most recent updates. An entry shall be generated for each software update.**~~
>
> Use of a Category 3 audit trail is ~~**acceptable**~~ required for the ~~**software update logger**~~ **Traced Update**. ~~**In this case the existing requirement of 1000 entries supersedes the 10 entry requirement. If software update is the only loggable event, then the Category 3 audit trail can be limited to only 10 entries.**~~ A ~~**software update**~~ log entry representing a software update shall include the ~~**following: the**~~ software identification of the newly installed version.
>
> - ~~**An event counter;**~~
> - ~~**the date and time of the change; and**~~
> - ~~**the event type/parameter ID, which indicates a software update event (if not using a dedicated update log);**~~
> - ~~**the new value of the parameter, which is the software identification of the newly installed version.**~~
>
> ~~**A Category III device may include the software update events in the Category III audit log in lieu of a separate software update log; the existing requirement for 1,000 entries supersedes the requirement for 10 entries.**~~

In 2010, the general consensus of the Sector after considering feedback from external interested parties is that a new G-S.9. with explicit requirements is not necessary (nor likely to be adopted by the Conference) and that this requirement belongs in NCWM Publication 14 lists of sealable parameters rather than in NIST Handbook 44; i.e.,
The updating of metrologically significant software shall be considered a sealable event.

Additional work is to be done to further develop the proposed text toward inclusion in NCWM Publication 14.

Since the 2010 NTETC Software Sector Meeting, the NTETEC Grain Analyzer Sector remitted the following:

> At its August 2009 NTETEC Grain Analyzer Sector Meeting, the sector questioned the need for a definition of "Traced Update". The Traced Update was initially intended to cover cases in Europe where the National Body controls a network of devices and wants to update all the devices simultaneously from a central location. Denmark and France do this with NIR Grain Analyzers. Even though individual states may still require that a device updated via a "Traced Update" must be "returned to service" by a registered serviceperson before it can be used, the sector may want to consider adopting "Traced Update" requirements for all Category 3 Grain Analyzers. The device is still subject to later inspection by state weights and measures personnel. By designing to the requirements for "Traced Update," states might be encouraged to allow devices updated to those requirements to be returned to service without requiring a

visit by a registered serviceperson. No formal comments or recommendations were made by the NTETC Grain Analyzer Sector.

The NTETC Software Sector concurred that these definitions should be included in NCWM Publication 14 in the section where they are used (since NCWM Publication 14 does not have a separate section devoted strictly to definitions).

It's possible that the Philosophy of Sealing section of NCWM Publication 14 may already address the above if the definitions of Verified and Traced Updates (and the statement below) were to be added. The contrary argument was that it may be better to be explicit:

Use of a Category 3 audit trail is required for a Traced Update. A log entry representing a traced software update shall include the software identification of the newly installed version.

Conclusion:
It seemed sensible to recommend consolidating the definitions with the above statement and placing them into NCWM Publication 14. The Sector recommends the following:

Verified Update
A Verified Update is the process of installing new software where the security is broken and the device must be re-verified. Checking for authenticity and integrity is the responsibility of the owner/user.

Traced Update
A Traced Update is the process of installing new software where the software is automatically checked for authenticity and integrity, and the update is recorded in a software update log or Category 3 audit trail. The audit trail entry shall include the software identification of the newly installed version.

The updating of metrologically significant software shall be considered a sealable event. The software that checks for authenticity and integrity for a Traced Update, as well as the software responsible for generating and viewing the audit trail, is metrologically significant.

5. NTEP Application for Software and Software-based Devices

Source:
NTETC Software Sector

Background/Discussion:
The purpose of initiating this item was to identify issues, requirements, and processes for type approving type U device applications. It was suggested that it may be useful to the labs to devise a separate submission form for software for Type U devices. What gets submitted? What requirements and mechanisms for submission should be available? Validation in the lab – all required subsystems shall be included to be able to simulate the system as installed.

Mr. Roach, California Division of Measurement Standards, stated that if the software package being evaluated supports platforms/subsystems from multiple manufacturers, testing should be done using at least two platforms/subsystems. (Clarification at 2011 NTETC Software Sector Meeting – this has never been required for type approval, except for retail motor fuel distribution systems.) Scale laboratories and scale manufacturers indicated that this is not usually done for scale evaluations.

Since the NTEP Committee passed the related item at NCWM Annual Meeting, the Sector will continue to work on this. Mr. Truex, NTEP Administrator, indicated that the Sector can move in this direction, but felt that it was somewhat premature to develop this thoroughly in 2010. At the point where the Sector has developed checklist requirements, then it could move to perhaps add a subsection to current NTEP applications for applicable software. Refer to D 31.6.1. It was also agreed that there seems to be no reason for limiting the scope of this item to software-

only applications and, hence, all software/software-based devices could benefit from an enhanced application process. The description of this agenda item was modified as shown in the marked up heading.

At the 2010 NTETC Software Sector Meeting, it was decided that this item would be revisited at the 2011 meeting, and it will be decided whether to begin further development of this item at that time.

Comments given at the meeting indicate that current practice does not require anything different for software/software based devices compared to any other type approval. It was also noted that for international applications, OIML D 31.6.5. states, "The approval applicant is responsible for the provision of all the required equipment and components." This would likely also be the policy of NTEP.

Since the checklist is still being tried out by some of the laboratories, the Sector is not quite ready to develop this fully. Some documentation that eventually might be required by applicants could include (from WELMEC doc. 7-2 Issue 4):

- A description of the software functions that are metrologically significant, meaning of the data, etc.
- A description of the accuracy of the measuring algorithms (e.g., price calculation and rounding algorithms).
- A description of the user interface, menus, and dialogs.
- The software identification (e.g., version, revision, etc.) and how to view it.
- An overview of the system hardware, e.g., topology block diagram, type of computer(s), type of network, etc., if not described in the operating manual.
- An overview of the security aspects of the operating system (e.g., protection, user accounts, privileges, etc.).
- The operating manual.

Conclusion:
These documentation requirements will be considered as input for requirements that will eventually appear in NCWM Publication 14 and the application paperwork. Further work by the Sector to develop NCWM Publication 14 requirements is needed, after more input from the labs is gathered.

6. Training of Field Inspectors

Source:
NTETC Software Sector

Background/Discussion:
During discussions at the 2009 NTETC Software Sector Meeting, the Sector concluded that a new agenda item should be initiated specific to the training of field inspectors in relation to evaluating/validating software-based devices.

California has an Examination Procedure Outline (EPO) that begins to address this. It was suggested that the Sector could use *California Handbook 112* as a pattern template for how it could read.

Items to be addressed:

- Certificate of Conformance
- Terminology (as related to software) beyond what is in NIST Handbook 44.

- Reference materials / information sources

- Safety

System Verification Tests
NOTE: Item numbers 1 through 5 apply to both weighing and measuring devices. Numbers 6 and 7 are specific to weighing devices; while numbers 9 and 10 apply to measuring devices.

1. Identification. The identification (ID) tag may be on the back room computer server and could be viewed on an identification screen on the computer monitor. The ID information may be displayed on a menu or identification screen. Though currently discouraged, some systems may be designed so the system must be shut down and reset to view the ID information. G-S.1. (1.10.)

   1.1. Manufacturer.

   1.2. Model designation.

2. Provisions for sealing. G-S.8. [1.10.]; S.1.11. [2.20.]; S.2.2. [3.30.]

   2.1. Verify sealing category of device (refer to Certificate of Approval for that system).

   2.2. Verify compliance with certificate.

3. Units of measure.

   3.1. A computer and printer interfaced to a digital indicator shall print all metrological values, intended to be the same, identically. G-S.5.2.2.(a); G-S.5.1. [1.10.]

   3.2. The unit of measure, such as lb, kg, oz, gal, qts, liters, or whatever is used, must agree.

4. Operational controls, indications and features (buttons and switches). Verify that application criteria and performance criteria are met (refer to Certificate of Approval).

   4.1. Any indication, operation, function or condition must not be represented in a manner that interferes with the interpretation of the indicated or printed values.

5. Indications and displays.

   5.1. Attempt to print a ticket. The recorded information must be accurate or the software must not process and print a ticket with erroneous data interpreted as a measured amount.

Weighing Devices

6. Motion detection.

   6.1. For railway track, livestock, and vehicle scales apply or remove a test load of at least 15d while simultaneously operating a print button, push-button tare or push-button zero. A good way to do this is to try to print a ticket while pulling the weight truck or another vehicle onto the scale. Recorded values shall not differ from the static display by more than 3d. Perform the test at 10 %, 50 % and 100 % of the maximum applied test load. S.2.5.1.(a) [2.20.]; EPO NO. 2-3, 2.4

   6.2. For all other scales, apply or remove at least 5d. Printed weight values must agree with the static weight within 1d and must exactly agree with other indications. S.2.5.4.(b) [2.20.]; EPO NO. 2-3, 2.4

7. Behind zero indication.

   7.1 Apply a load in excess of the automatic zero setting mechanism (AZSM) and zero the scale. S.2.1.3. [2.20.]; EPO NO. 2-3, 2.4, 2.5.2

   Example: On a vehicle scale have someone stand on the scale, then zero them off (AZSM is 3d). Remove the weight (person) and note the behind zero display (usually a minus weight value) or error condition.

   7.2. Attempt to print a ticket. With a behind zero condition, (manually or mechanically operated) a negative number must not be printed as a positive value.

8. Over capacity.

   8.1. Manually enter a gross weight if permissible or apply a test load in excess of 105 % of the scale's capacity. S.1.7. [2.20.]; S.1.12., UR.3.9. [2.20.]

   8.2. Attempt to print a weight ticket. A system must not print a ticket if the manually entered weight or load exceeds 105 % of the scale capacity.

Measuring Devices

9. Motion detection.

   9.1. Initiate flow through the measuring element. Attempt to print a ticket while the product is flowing through the measuring chamber. The device must not print while the indication is not stable. S.2.4.1. (3.30.)

10. Over capacity.

    10.1. Attempt to print a ticket in excess of the indicated capacity. A system must not print a ticket if the device is manually or mechanically operated in excess of the indicated value.

NOTE: Be aware of error codes on the indicator which may be interrupted as measured values.

This item is in the early stages; work will continue on the item working toward materials to aid in the training of field inspectors. It was indicated that working in conjunction with the Professional Development Committee (PDC) to develop training materials, etc. would be a logical path of progress once we have developed the information content to include.

At the 2011 NTETC Software Sector Meeting, it was suggested that this topic should be tabled for the time being, until items 1 to 4 in the Summary are better defined. This will also depend on the needs of and feedback from field inspectors, since the goal is to empower them to be better able to handle inspection of software-based devices.

Conclusion:
This item will be tabled until the next meeting. The Sector chair will liaise with the PDC to garner input for focus areas related to inspecting software-based devices where additional materials would be most beneficial to the needs of field inspectors.

NEW ITEMS

7. Remote or Distributed Metrologically Significant Functionality

Source:
California NTEP Laboratory

Background/Discussion:
A database on a remote server contains metrological data for a commercial transaction. The server storage containing the database is leased and access is granted for analysis manipulation, viewing, and/or printing the transaction data.

Previously the Sector has discussed situations where data that is used as part of a transaction (e.g., tare values) are being retrieved from a remote server, but examples can be given that extends the boundaries. Is it acceptable to allow situations where data printed on the transaction report is not locally available or cannot be reproduced without server access? What about situations where actual metrologically significant software routines are executed on a remote server? Does this relate to what the WELMEC working group on software terms "Data Transmission"?

The following questions were raised during the initial discussion of this item to clarify the issue:

Questions:

- What happens if communication fails?
- How will printing be performed at the local site?
- Is it possible to print at the local site under those circumstances?

Answers:

- The printer was at the local site, but all of the information sent to the printer came from the remote site. It wasn't known if/how printing would work in case of communications failure.

The opinion was that the particular situation described wouldn't be a violation of NIST Handbook 44, so long as the first indication of final quantity is local.

It was stated that the only way to seal a system like this is via a Category 3 audit trail. Type approval should verify the accuracy and integrity of the communication between the remote component(s) and the local component(s). The factor that concerns the field inspectors the most is that the metrological calculations are being performed remotely. The field inspector can ask which factors are used in the metrological calculations and verify the output.

OIML D 31.5.2.3 is relevant to this discussion:

> "5.2.3 Storage of data, transmission via communication systems. If measurement values are used at another place than the place of measurement or at a later time than the time of measurement they possibly have to leave the measuring instrument (electronic device, subassembly) and be stored or transmitted in an insecure environment before they are used for legal purposes."

Also relevant is WELMEC 7.2 Issue 5: 7.2 Specific Software Requirements for Data Transmission.

Of course these references shouldn't be assumed to be taken verbatim for NCWM purposes, but they can be used for guidance in the sort of questions that should be asked, during type approval and with the checklist used by the labs, as well as potentially by field inspectors.

Conclusion:No action. This must be resolved by the state jurisdiction.

8. Next Meeting

Background:
The Sector is on a yearly schedule for NTETC Software Sector Meetings. Mr. Truex, NTEP Administrator, will determine when the next meeting is possible. The normal rotation would have the meeting in Columbus in 2012.

Background/Discussion:
none

Conclusion:
Mr. Truex, NTEP Administrator, will arrange with the cooperation of the State of Ohio to host the next meeting in Columbus in 2012, probably in mid-March.

9. Report on 2011 Interim Meeting

There was one item on NCWM S&T Committee Agenda for the 2011 NCWM Interim Meeting related to work done by the Sector. 2011 NCWM Publication 15, S&T Item 310-2 relates to the Sector's 2011 Agenda Item 1 (Marking Requirements). After some discussion, mostly supportive but tentative, the Chair had the impression that the bulk of the feedback seemed to indicate that the goals of the proposal are worthwhile but the language is still not satisfactory or sufficiently clear to some.

Report from NIST and other attendees of NCWM Interim Meeting:
The recommendation on Identification of Software was for it to remain Informational. SMA was the most reluctant to adopt the differentiation in types of software. Their feedback is based upon the idea that all types of software should have the same marking options.

10. Report on International Weights and Measures Activity

Highlights of interest to the NTETC Software Sector:

- CIML meeting in Orlando, Florida
- MAA updates
- Steve Patoray appointed International Bureau of Legal Metrology (BIML) Director last September; took the position in January.
- New draft WELMEC 7.2 circulated in February of this year for comment.
- Workshop on Operating Systems in Legal Metrology hosted by PTB December 2010
- The second OIML document, for verification, was to be generated, but Germany doesn't seem to be working on it. The United States and Canada have the opportunity to drive this development.
- PTB held a workshop in Berlin in December regarding OS's and legal metrology.
- The director of BIML has and the president of International Committee of Legal Metrology will be changing personnel.
- OIML D11 will be having a meeting in June.

- MAA Updates: There was a special vote to determine whether to accept manufacturers' test data. This was voted down.

- There's a new WELMEC 7-2 v.5 draft including mainly editing changes but also new information regarding operating systems.

ATTENDANCE

Dennis Beattie
Measurement Canada
400 St. Mary Avenue
Winnipeg, MB R3C 4K5
Canada
(204) 983-8910
dennis.beattie@ic.gc.ca

Doug Bliss
Mettler-Toledo, Inc.
1150 Dearborn Drive
Worthington, OH 43085
(614) 438-4307
doug.bliss@mt.com

Mike Frailer
Maryland Weights and Measures
50 Harry S Truman Parkway
Annapolis, MD 21401
(410) 841-5790
frailerml@mda.state.md.us

Andy Gell
Foss North America
8091 Wallace Road
Eden Prairie, MN 55344
(952) 974-9892
agell@fossnorthamerica.com

Teri Gulke
Liquid Controls, LLC
105 Albrecht Drive
Lake Bluff, IL 60044
(847) 283-8346
tgulke@idexcorp.com

Jody Hirst
Itron, Inc.
1310 Emerald Road
Greenwood, SC 29646
(864) 942-2245
jody.hirst@itron.com

Norman Ingram
California Division of Measurement Standards
6790 Florin Perkins Road
Suite 100
Sacramento, CA 95828
(916) 229-3016
ningram@cdfa.ca.gov

Mike Kelley
Ohio Department of Agriculture
8995 East Main Street
Reynoldsburg, OH 43068
(614) 728-6290
mkelley@agri.ohio.gov

Paul A. Lewis, Sr.
Rice Lake Weighing Systems, Inc.
230 West Coleman Street
Rice Lake, WI 54868
(715) 434-5322
plewis@ricelake.com

Rick Lydon
Sick, Inc.
800 Technology Center Drive
Suite 6
Stoughton, MA 02072
(781) 302-2552
richard.lydon@sick.com

Mike McGhee
Itron, Inc.
1310 Emerald Road
Greenwood, SC 29646
(864) 223-1212
michael.mcghee@itron.com

Ed Payne
Maryland Department of Agriculture
50 Harry S. Truman Parkway
Annapolis, MD 21401
(410) 841-5790
payneea@mda.state.md.us

Jim Pettinato
FMC Technologies Measurement Solutions, Inc.
1602 Wagner Avenue
Erie, PA 16510
(814) 898-5250
jim.pettinato@fmcti.com

Dan Reiswig
California Division of Measurement Standards
6790 Florin Perkins Road
Sacramento, CA 95828
(916) 229-3023
dreiswig@cdfa.ca.gov

Chris Scott
Gilbarco, Inc.
7300 W Friendly Avenue
Greensboro, NC 27420
(336) 547-5227
chris.scott@gilbarco.com

Scott Szurek
Emerson Process Management
301 South 1st Avenue
Marshalltown, IA 50158
(641) 754-3425
scott.szurek@emerson.com

Ambler Thompson
NIST Weights and Measures Division
100 Bureau Drive
MS 2600
Gaithersburg, MD 21701
(301) 975-2333
ambler@nist.gov

James Truex
National Conference on Weights and Measures
88 Carryback Drive
Pataskala, OH 43062
(740) 919-4350
jim.truex@ncwm.net

John Wind
Bizerba USA, Inc.
5200 Anthony Road
Sandston, VA 23150
(804) 221-9699
john.wind@bizerba.com

Appendix E

National Type Evaluation Technical Committee (NTETC) Weighing Sector Meeting Summary

August 30 - September 1, 2011
Sacramento, California

INTRODUCTION

The charge of the NTETC Weighing Sector (herein after referred to as "Sector") is to provide appropriate type evaluation criteria based on specifications, tolerances, and technical requirements of NIST Handbook 44, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices,* Sections 1.10. General Code, 2.20. Scales, 2.22. Automatic Bulk Weighing Systems, and 2.24. Automatic Weighing Systems.. The Sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14, *Technical Policy, Checklists, and Test Procedures,* for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

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***.

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.

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ABWS	Automatic Bulk Weighing Systems	NCWM	National Conference on Weights and Measures
AREMA	American Railway Engineering Maintenance-of-Way Association	NEWMA	Northeastern Weights and Measures Association
AWS	Automatic Weighing Systems	NTEP	National Type Evaluation Program
CC	Certificate of Conformance	NTETC	National Type Evaluation Technical Committee
DES	Digital Electronic Scales	OIML	International Organization of Legal Metrology
IZSM	Initial Zero-Setting Mechanism	OWM	Office of Weights and Measures
LMD	Liquid Measuring Device	R	Recommendation
MC	Measurement Canada	S&T	Specifications and Tolerances Committee
MRA	Mutual Recognition Agreement	SMA	Scale Manufacturers Association

Details of All Items
(In order by Reference Key)

CARRY-OVER ITEMS

1. Recommended Changes to NCWM Publication 14

Source:
Mr. Harshman, NIST Technical Advisor, has provided the Sector with specific recommendations for incorporating test procedures and checklist language based upon actions of the 2011 NCWM Annual Meeting. The Sector is asked to briefly discuss each item and, if appropriate, provide general input on the technical aspects of the issues.

1.a. Item 310-1: NIST Handbook 44 G-S.8. Provisions for Sealing Adjustable Components

Source:
2010 NTETC Weighing Sector

Background/Discussion:
At the 2010 NTETC Weighing Sector Meeting, the Sector:

1. reviewed the sealing procedures in NCWM Publication 14 Scales type evaluation checklist and procedures;

2. compared them with similar type evaluation criteria in NCWM Publication 14 for Liquid Measuring Device (LMD); and

3. reviewed applicable NIST Handbook 44 sealing requirements in the General, Scales, and LMD codes.

Prior to the 2010 NTETC Weighing Sector Meeting, a small work group was formed to develop more detailed procedures for determining compliance of the methods for sealing and requested the Sector consider its recommendations for NCWM Publication 14, Digital Electronic Scales (DES) Section 10. The Sector reviewed the recommendations and agreed with the revised proposal to amend NCWM Publication 14 Scale Section 10 and recommended it be forwarded to the S&T Committee and the Scale Manufacturers Association (SMA) for consideration prior to the 2011 NCWM Interim Meeting. The Sector also agreed to forward the amended language for NCWM Publication 14 to the S&T Committee with a recommendation that the S&T item be Withdrawn from the Committee's agenda.

At the 2011 NCWM Annual Meeting, the Committee agreed to add the following two paragraphs into the Report of the 96th NCWM to make clear its interpretation of G-S.8.:

- The current language in paragraph G-S.8. states: "A device shall be designed with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism."

- Thus, for parameters protected by physical means of security, once a physical security seal is applied to the device, it should not be possible to make a metrological change to those parameters without breaking that seal. Likewise, for parameters protected by electronic means of security, it should not be possible to make a metrological change to those parameters without that change being reflected in the audit trail. Since this philosophy addresses provisions for protecting access to any metrological adjustment, the philosophy should be applied consistently to all electronic device types.

During the 2011 Northeastern Weights and Measures Association (NEWMA) Annual Meeting, Mr. Andersen, retired member, stated that he believed that the language that was added to NCWM Publication 14 is different than

what was proposed for vote. The language added to NCWM Publication 14 allows a device with physical means of sealing to be sealed in the calibration or configuration mode if it provides a clear indication that it's in that mode. If it was the intent of NTEP to accept an indicator light to depict when a device is in the calibration or configuration mode, he recommended that the S&T Committee sanction that in their interpretation. Since NTEP policy must conform with NIST Handbook 44, it seems necessary to ensure the code also permits the indicator light. Thus, that must be included in the interpretation of the committee.

As a result of Mr. Andersen's comments, the 2011 S&T Committee asked that the Sector review its most current interpretation of NIST Handbook 44, G-S.8., which was approved by NCWM for inclusion into the Report of the 96th NCWM at its July 2011 Annual Meeting, and verify that the Sector's 2010 recommended changes to NCWM Publication 14 are consistent with the Committee's interpretation.

Conclusion:
Mr. Harshman, NIST Technical Advisor, provided an update to the Sector on the discussions that took place relative to this item during the 2011 NEWMA Annual Meeting and the 2011 NCWM Annual Meeting. The Sector was then asked to review the language that was added to NCWM Publication 14 DES type evaluation checklists and test procedures to confirm that existing language is aligned with the Committee's interpretation of G-S.8. The Sector compared the language that was added to the 2011 S&T Committee Final Report to that which had been added to NCWM Publication 14 and concluded there were no conflicts, and that the language added to NCWM Publication 14 didn't need amending. The Sector agreed to recommend the following changes to NCWM Publication 14, DES Section 10 including the table and Automatic Weighing Systems (AWS).

> **The current language in NIST Handbook 44 paragraph G-S.8. states: "A device shall be designed with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism."**
>
> **Thus, for parameters protected by physical means of security, once a physical security seal is applied to the device, it should not be possible to make a metrological change to those parameters without breaking that seal. Likewise, for parameters protected by electronic means of security, it should not be possible to make a metrological change to those parameters without that change being reflected in the audit trail. Since this philosophy addresses provisions for protecting access to any metrological adjustment, the philosophy should be applied consistently to all electronic device types.**

NCWM Publication 14: DES Section 10. Table

> **Indications Representing That the Device is Configured with the Setup or Configuration Mode Enabled (e.g., any mode permitting access to any or all sealable parameters).**
>
> **This list is not limiting or all inclusive and other indications may be acceptable.**

Acceptable Clear Indications	Indications NOT Acceptably Clear
• Unusable Weight Indications (e.g. C100.05E)	• C 100.05 lb
• "Not NIST Handbook 44" Annunciator	• Any Digit in the Weight Differentiated by Size, Shape or Color
• "CAL" Annunciator (single or mixed case)	• Weights Without Units (e.g., 100.05)
• "Set-up" Annunciator (single or mixed case)	• Flashing Weight Value
• "Config" Annunciator (single or mixed case)	• Weight With No Annunciators Displayed
	• Weight All Annunciators Displayed

1.b. Item 320-1: NIST Handbook 44 Scales Code - T.N.4.5.1. Creep and Creep Recovery Requirements for Class III Scales with n > 4000 divisions.

Source:
2010 NTETC Weighing Sector, 2011 Interim Report of the S&T Committee: **ncwm.net/content/annual-archive**

Background/Discussion:
At the 2011 NCWM Interim Meeting, the Conference considered a proposal from the NTETC Weighing Sector to reduce the inconsistency between full load time dependence (creep) requirements in T.N.4.5.1. and return to zero requirements in T.N.4.3. Zero Load Return: Non-automatic Weighing Instruments (creep recovery).

During the 2011 NCWM Interim meeting Open Hearings, Mr. Flocken, Mettler-Toledo, Inc., speaking on behalf of the SMA supported this item. However, later, during the S&T Committee deliberations, Mr. Flocken stated that after researching the item, including a discussion he had with another scale manufacturer, it was concluded that the proposal is not needed since the ultimate determination of compliance is the four-hour test (specified in subparagraph (b) of T.N.4.5.1.) regardless of the current 0.5 e or proposed 0.83 e determinations in the referenced paragraph. The S&T Committee withdrew this item based on this new information provided at the Interim Meeting.

Conclusion:
The Sector took no action, nor discussed this item, after being advised by Mr. Harshman, NIST Technical Advisor, that the item had previously been Withdrawn by the S&T Committee.

1.c. Item 320-2: NIST Handbook 44 Scales Code – T.N.4.7. Amend Creep Recovery Tolerances for Class III L Load Cells

Source:
2010 NTETC Weighing Sector

Background / Discussion:
See the Final Report of the 2011 NCWM S&T Committee Agenda Item 320-2 for the adopted language and additional background information on the item to amend NIST Handbook 44, 2.20. Scales Code paragraph T.N.4.7. Creep Recovery Tolerances for Class III L Load Cells.

Conclusion:
Mr. Harshman, NIST Technical Advisor, provided the Sector with suggested recommendations for amending test procedures in NCWM Publication 14 based upon actions of the 2011 NCWM Annual Meeting. The Sector reviewed the amended test procedures and agreed to recommend the amended procedures:

NCWM Publication 14: Load Cells Section L. II.

L. Procedures

II. Determination of Creep and Creep Recovery, Test Procedure and Permissible Variations

9. Permissible Variations of Reading for Creep Recovery

a. The difference between the initial reading of the minimum load of the measuring range (D_{min}) and the reading after returning to minimum load subsequent to the maximum load (D_{max}) having been applied for 30 minutes shall not exceed:

1. 0.5 times the value of the load cell verification interval (0.5 v) for Class I, II, and IIII load cells.

2. 0.5 times the value of the load cell verification interval (0.5 v) for Class III load cells with 4000 or fewer divisions.

3. 0.83 times the value of the load cell verification interval (0.83 v) for Class III load cells with more than 4000 divisions.

4. ~~1~~2.5 times the value of the load cell verification interval (~~1~~2.5 v) for Class III L load cells.

2. DES Section 42. Zero-Load and Tare Adjustment – Monorail Scales Rounding of Intermediate Values in an Equation

Source:
Mr. Cook, NIST, Office of Weights and Measures (OWM)

Background/Discussion:
NCWM Publication 14 DES Section 42 Zero-Load and Tare Adjustment - Monorail Scales currently reflects language in NIST Handbook 44 regarding the setting of zero and tare value less than 5 % of the scale capacity to within 0.02 % of scale capacity according to NIST Handbook 44, 2.20. Scales Code paragraphs S.2.1.4 (Monorail Scales) and S.2.3.1. (Monorail Scales Equipped with Digital Indications). In other words, a 1000 lb × 1 lb monorail scale shall have the capability to set tare values up to 50 lb to within a resolution of 0.2 lb (1000 × 0.02 %).

However, there are no procedures in Section 42 to verify that a correct zero-load balance or semiautomatic, keyboard entered, or stored tares are not rounded to the nearest value of d (1 lb) before the net weight is calculated. In the above example, a tare that is rounded before the net weight calculation introduces an extra 0.5 lb uncertainty in the net weight. This can be a problem if an average tare value of 7.6 lb for a series of trolleys is entered as tare. Objects (animal carcasses) will be consistently short weighed if the tare is rounded from 7.6 lb to 8 lb before the net weight is calculated. This may present economic harm to sellers or producers of livestock that are paid based on the weights from the monorail scale. Conversely, average tare weights that are rounded down to the nearest displayed scale division may present economic harm to the buyers, typically processors, that pay the producers based on the weights from the monorail scale.

Another question, is whether the net weights are determined using the digital indicator's internal or displayed resolution of the gross weight in the calculation of the net weight?

The following is additional background information supporting the correct rounding (and significant digits) of values in an equation:

NIST SP 811, *Guide for the Use of the International System of Units (SI)*, Mr. Barry N. Taylor and Mr. Ambler Thompson (2008)

B.7.2 Rounding Converted Numerical Values of Quantities
The use of the factors given in sections B.8 and B.9 to convert values of quantities was demonstrated in section B.3. In most cases, the product of the unconverted numerical value and the factor will be a numerical value with a number of digits that exceeds the number of significant digits (see section 7.9) of the unconverted numerical value. Proper conversion procedure requires rounding this converted numerical value to the number of significant digits that is consistent with the maximum possible rounding error of the unconverted numerical value.

Example: To express the value l = 36 ft in meters, use the factor 3.048 E−01 from section B.8 or section B.9 and write

l = 36 ft × 0.3048 m/ft = 10.9728 m = 11.0 m.

Rounding Guidelines Found on the Internet:
In any math problem, you should wait until the end to round; only the final answer should be rounded. Carry as many significant digits as you can throughout the problem.

Round Off Rule: Round only the final answer not the intermediate values that occur during the calculation. Carry at least twice as many decimal places as will be used in the final answer.

Do the math, then round the answer so that the number of significant figures is equal to the least number of significant figures found in any one measurement in the equation.

For additional background information relative to this item and actions taken by the NTETC Weighing Sector during its 2010 meeting go to: **ncwm.net/content/weighing-archive**

Conclusion:
Mr. Harshman, NIST Technical Advisor, reviewed background information and explained the purpose of the proposal using an example depicting how NIST Handbook 44 Scales Code paragraph S.2.3.1. Monorail Scales Equipped with Digital Indications would apply relative to a 1000 × 5 lb static monorail scale equipped with digital indications. The Sector was then asked whether they still agreed that test criteria needed to be developed for possible future inclusion into NCWM Publication 14 considering that NCWM Publication 14 currently did not include such procedures and that a work group, which was supposed to form to develop test criteria for NCWM Publication 14 following the 2010 NTETC Weighing Sector Meeting had never formed. The Sector considered the example given and agreed that test criteria needs to be developed to verify whether or not scales submitted for type evaluation comply with the tare requirements in NIST Handbook 44 Scales Code paragraph S.2.3.1. A few members of the Sector agreed to work on developing possible test criteria that could be added to NCWM Publication 14 to verify whether a device submitted for type evaluation complies. It was also agreed that the work group would seek input from Mr. Ainsworth, Grain Inspection Packers and Stockyard Administration, and Mr. Vande Berg, Vande Berg Scales, when developing the test criteria.

3. Acceptable Symbols/Abbreviations to Display the Certificate of Conformance (CC) Number Via a Device's User Interface

Sources:

- 2009 NTETC Software Sector Agenda Item 3 and 2010 S&T Item 310-3 G-S.1. Identification. (Software)
- 2010 Final Report of the S&T Committee: **ncwm.net/content/annual-archive**
- 2010 Software Sector summary: **ncwm.net/content/software-archive**
- 2011 Software Sector summary: **ncwm.net/content/software-docs**

Background/Discussion:
Local weights and measures inspectors need a means to determine whether equipment discovered in the field has been evaluated by NTEP. If so, the inspector needs to know at a minimum the CC number. From this starting point, other required information can be ascertained. NIST Handbook 44 currently includes three options for marking of the CC:

1. Permanent marking
2. Continuous display
3. Recall using a special operation

Additional background information relative to this item can be found in 2011 NCWM Publication 16 at: **ncwm.net/content/annual-archive**

During the 2010 NTETC Weighing Sector Meeting, the Sector reviewed an initial list of menu text and icons developed by the NTETC Software Sector and provided comments to the NTETC Software Sector as requested.

At the 2011 NCWM Annual Meeting, NIST, OWM suggested that the S&T Committee consider changing the status of the item from Informational to Developing in order to provide the NTETC Software Sector additional time to more fully develop the item based on the following points:

1. The current proposal is not developed enough for consideration by the S&T Committee. Based on the diversity of comments heard on this issue, NIST, OWM believes the item is not close to a vote and that

considerable work still needs to be done to develop the item before it could be considered for vote by NCWM.

2. NIST, OWM interprets the current proposal to require software be marked with a non-repetitive serial number when in fact it is not the intent of the NTETC Software Sector to require such marking. Thus, it is believed that the language in the current proposal will need modification to resolve this issue.

3. The draft of the March 2011 NTETC Software Sector Summary reported that several NTETC Software Sector members envision G-S.1. being developed further to the extent that G-S.1.1. may not be needed.

The S&T Committee agreed to change the status of this item to Developing because the item was lacking enough information for full consideration and a full proposal has yet to be developed.

Conclusion:
The NTETC Weighing Sector agreed to take no additional action on this item pending further development of the item by the NTETC Software Sector.

NEW ITEMS

4. DES Section 63.4. Out-of-Level Tests (if applicable)

Source:
Mr. Payne Jr., Maryland NTEP laboratory

Background/Discussion:
Mr. Payne, Maryland Department of Agriculture, reports that the NTEP laboratories have to verify the sensitivity of the level indicator on a scale that's been submitted for type evaluation under NTEP's Mutual Recognition Agreement (MRA) with Measurement Canada (MC). An MRA is an agreement whereby the test data from evaluation in either an NTEP authorized laboratory or MC can be used by both countries in the issuance of their respective certifications. Since testing is already being performed by the NTEP laboratories on devices submitted under the MRA, Mr. Payne is recommending that testing the sensitivity of a level indicator be expanded to include all portable scales, so equipped, that are submitted to NTEP for evaluation.

Mr. Payne requests that additional test criteria for testing the suitability of a level indicating means on a portable scale, equivalent to that used by MC be added to NCWM Publication 14 DES Section 63.4. MC's current test criteria for verifying acceptable sensitivity on a scale's level indicating means is as follows:

MC Test Requirements (2011):
MRA. LG-3.05 SUITABILITY OF THE LEVEL INDICATOR
Off Level: -X direction

REFERENCE
Sections 9, 10, 11, and 22 of the Non Automatic Weighing Devices Specifications

APPLICATION
This test is intended for complete portable or movable devices and weighing elements whose performance is affected when off level. Such devices must be equipped with a suitable level indicating means. This test is to ensure that the level indicating means is sensitive enough to accurately indicate the limit of inclination at which the device ceases to perform within tolerances.

SETTINGS
- The Automatic Zero Tracking may be activated. It must be set so that the weight value that can be tracked at once does not exceed 0.6 e.

- If the Initial Zero Setting Mechanism (IZSM) range of the device does not exceed 20 % of Max, the test will be performed with the IZSM set at the maximum of the range.

- If the IZSM range exceeds 20 % of Max, the test will be performed twice: the first test with the IZSM set to the lowest possible value; the second test with the IZSM set to the maximum of its range.

NOTE: In the case of a multi-range device, it is 20 % of Max of the lowest range; in the case of a multi-interval device, it is 20 % of max of the first range.

- The device must be leveled using the level indicating means, and adjusted to as close to zero error as possible.

- If the device has an "enhance" resolution feature, perform the test with that feature activated; or use the small weight method to determine errors before rounding.

- This test is performed at ambient temperature only.

PROCEDURE

1. Incline the DUT in one direction (arbitrary referred to as − x) up to the point of limit where the level indicating means still indicates a level condition or at least 2/1 000 (0.12 degree) whichever is greater.

   LG-3.05 SUITABILITY OF THE LEVEL INDICATOR

   Off Level: X direction

   Off Level: Y direction

   Off Level: − Y direction

2. Set the device to zero if necessary; perform an increasing and decreasing load test. If necessary, use the small weight method to find errors before rounding. Record the results.

3. Record the angle with reference to the horizontal.

4. Repeat the test described above for the other three inclinations (+ x, − y, + y). (See the following illustrations.)

INTERPRETATION OF RESULTS

The device meets the requirements if, at the limits of inclination in all four directions, it performs within applicable limits of error.

Conclusion:

Mr. Payne, Maryland Department of Agriculture, provided the Sector a copy of the MC test requirements used for determining the suitability of a level indicator on a portable scale, and proposed adding similar procedures to NCWM Publication 14. The Sector reviewed the information and agreed that it was appropriate to add test criteria, similar to that used by MC into NCWM Publication 14. The Sector also agreed to recommend that the procedures be added to Section 63.4. Out-of-Level Tests. During its discussions, the work considered whether the test criteria should apply to scales designated Accuracy Class I and concluded that the test criteria should not apply to scales designated Accuracy Class I.

Mr. Harshman, NIST Technical Advisor, noted that while attempting to insert the new draft test procedures into Section 63.4. (i.e., after the 2011 NTETC Weighing Sector Meeting had concluded), it became evident to Mr. Harshman, NIST Technical Advisor, that Section 63.4 was not the most appropriate Section within the DES Section of NCWM Publication 14 to add the new procedures. Mr. Truex, NTEP Administrator, and Mr. Flocken, Chair, were made aware and the decision was made, after consulting with all NTETC Weighing Sector members

present at the 2011 NTETC Weighing Sector Meeting, to add the new procedures to Section 56 Level-Indicting Means – Portable Scales, subsection 56.4. and renumber the current subsection 56.4. to 56.5. The changes recommended by the Sector are:

NCWM Publication 14: DES Section 56.4.

56.3. The level-indicating means is rigidly mounted, easily read, protected from damage, **and** will not change its reference for level**~~, and sufficiently sensitive~~**. ☐ Yes ☐ No ☐ N/A

56.4. The level-indicating means is sufficiently sensitive: ☐ Yes ☐ No ☐ N/A

- **Except for Scales Designated Accuracy Class I, if the scale is equipped with a level-indicating means, the level indicator must be tested to determine whether or not it's sufficiently sensitive.**
- **Level Sensitivity Tests (if applicable)**
- **Test Conditions (both analog and digital indicating scales)**
  - **This test is performed at ambient temperature only.**
  - **The device must be leveled using the level indicating means, and adjusted to as close to zero error as possible.**

Additional Test Conditions Applicable Only to Digital Indicating Scales:

- **The AZT may be activated. It must be set so that the weight value that can be tracked at once does not exceed 0.5 e.**
- **If the IZSM range of the device does not exceed 20 % of Max, the test will be performed with the IZSM set at the maximum of the range.**
- **If the IZSM range exceeds 20 % of Max, the test will be performed twice: the first test with the IZSM set to the lowest possible value; the second test with the IZSM set to the maximum of its range.**
  NOTE: In the case of a multi-range device, it is 20% of Max of the lowest range; in the case of a multi-interval device, it is 20% of max of the first weighing segment.
- **If the device has an "enhance/expanded" resolution feature, perform the test with that feature activated; or use the small weight method to determine errors before rounding.**

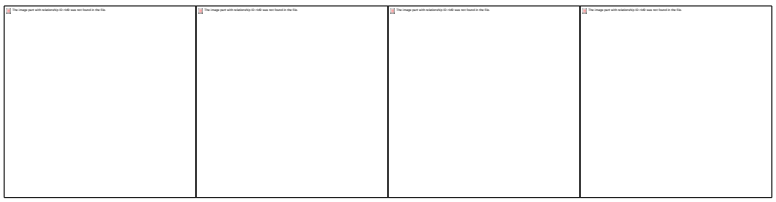
56.4.1. **Incline the DUT in one direction (arbitrary referred to as − x) up to the point of limit where the level indicating means still indicates a level condition or at least 2/1 000 (0.12 degree) whichever is greater.**

56.4.2. **Set the device to zero if necessary; perform an increasing and decreasing load test. If necessary, use the small weight method to find errors before rounding. Record the results.**

56.4.3. **Record the angle with reference to the horizontal.**

56.4.4. **Repeat the test described above for the other three inclinations (+ x, − y, + y) (See the following illustrations).**

Position of the Bubble Indicator:



56.**45**. Wheel-load weighing and axle-load scales must weigh accurately when placed out-of-level by 5 %.* ☐ Yes ☐ No ☐ N/A

5. DES Section 31. Multi-Interval Scales

Source:
Mr. Davidson, Mettler-Toledo Inc.

Background/Discussion:
Mr. Davidson, Mettler-Toledo, Inc., discovered a discrepancy in DES Section 31 relative to the maximum permissible tare value that can be taken on a multi-interval scale. There are two requirements in this section that seem to contradict each other in regards to the maximum allowed tare value. Those requirements are as follows:

- All tares must be taken in the minimum increment. Therefore, the maximum tare allowed is the maximum capacity of the smallest weighing segment.

- For multi-interval instruments, all tares, except for semi-automatic tare, must be taken in the minimum increment. Therefore, the maximum tare allowed is the maximum capacity of the smallest weighing range.

Mr. Davidson noted that the intent of the requirements is to limit the tare value of all tare types except semi-automatic tare (i.e., push-button tare) to the maximum capacity of the first weighing segment of the device. Thus, to correct the discrepancy, the following changes were suggested:

- ~~**All tares must be taken in the minimum increment. Therefore, the maximum tare allowed is the maximum capacity of the smallest weighing segment.**~~

- ~~**For multi-interval instruments, all tares, except for semi-automatic tare, must be taken in the minimum increment. Therefore, the maximum tare allowed is the maximum capacity of the smallest weighing range.**~~ **Except for semi-automatic tare, all tare values shall not exceed the maximum capacity of the first weighing segment (i.e., Max1).**

This proposed change would harmonize the NTEP requirement with that of International Organization of Legal Metrology (OIML) Recommendation (R) 76 and MC. The following pertinent clauses were copied from those documentary standards:

OIML R 76-1 Edition 2006 Section 4.7.1:
"For a multi-interval instrument, the preset tare value shall be rounded to the smallest verification scale interval, e1, of the instrument, and the maximum preset tare value shall not be greater than Max1."

Measurement Canada Laboratory Manual Section 22.1.5:
"The maximum tare value that may be entered shall not exceed Max1." (Our understanding of the use of the word "entered" in their sentence is describing the entry of a numeric value which would not exceed Max1 and all other tares could be taken to the maximum capacity of the device.)

Conclusion:
The NTETC Weighing Sector reviewed NCWM Publication 14 DES Section 31 and agreed that the referenced requirements thought to be in conflict by the submitter did in fact contradict one another. Mr. Burtini, MC, pointed out, in deference to the submitter's understanding of MC requirements, that MC's type evaluation criteria would not permit a tare entry greater than the capacity of the first weighing segment (Max1) even if that tare were a semi-automatic tare. Considering this difference in U.S. versus MC type evaluation criteria relating to the taking of tare on a multi-interval scale, it was noted that a scale passing MC's test criteria would also pass U.S. criteria, but the opposite would not necessarily hold true. The Sector agreed to recommend the following changes:

NCWM Publication 14: DES Section 31.

The scale indication for a 10-pound load must be 10.00 lb, not 10.000 lb: once the scale has exceeded an internal weight indication of 9.99975 lb, it must round to the next higher weight indication. If 10.000 lb were to be indicated, a load perceived internally as 10.003 lb would result in the scale indicating in some manner that it is no longer sensing 10.000 lb ± 0.0025 lb, hence would then indicate 10.00 lb. This round-off problem is avoided by causing the scale to indicate 10.00 when sensing a load in excess of 9.9975 lb (based upon its internal resolution). The scale will continue to indicate 10.00 lb until its internal resolution senses a load in excess of 10.005 lb, whereupon the weight display will update to 10.01 lb.

There are several considerations regarding the proper operation of tare on multi-interval scales.

- ~~**All tares must be taken in the minimum increment. Therefore, the maximum tare allowed is the maximum capacity of the smallest weighing segment.**~~

- **Except for semi-automatic tare, all tare values shall not exceed the maximum capacity of the first weighing segment (WS1).**

- Whenever gross and tare weights fall in different weighing segments, (hence the scale divisions for the gross and tare weights differ), the net weight must be in mathematical agreement with the gross and tare weights that are indicated and recorded, (e.g., net = gross – tare.)

- Scales that display or record only net weight values (e.g., most computing scales) may semi automatically (pushbutton) take tare values to either the internal resolution or the displayed scale division.

- Manually entered keyboard, thumb-wheel, and digital tare values must be entered to the displayed scale division.

In applying these principles, it is acceptable to:

- Round the indicated and printed tare values to the nearest appropriate net weight scale division. OR

- Display net weight values in scale divisions other than the scale division used in the display of gross weight, as when the gross and tare weights are in different ranges of the device. For example, a scale indicating in two-pound divisions in the lower range and five-pound divisions in the next higher range may result in net values ending in three or eight in the higher range. For example, a multi-interval scale may indicate and record tare weights in a lower weighing segment (WS) and net weights in the higher weighing segment as follows:

55 kg	Gross Weight (WS2 d = 5kg)	10.05 lb	Gross Weight (WS2 d = 0.05 lb)
− 4 kg	Tare Weight (WSR1 d = 2 kg)	− 0.06 lb	Tare Weight (WS1 d = 0.02 lb)
———		———	
= 51 kg	The Mathematically Correct Net Weight	= 9.99 lb	The Mathematically Correct Net Weight

In every case, it is required to maintain the mathematically correct equation: net = gross – tare

~~**For multi-interval instruments, all tares, except for semi-automatic tare, must be taken in the minimum increment. Therefore, the maximum tare allowed is the maximum capacity of the smallest weighing range.**~~

Semi-automatic tare may be taken to the internal resolution of the scale and any indications or recorded representations of tare shall be rounded to the nearest verification scale division.

6. DES Section 70. - Performance and Permanence Tests for Railway Track Scales Used to Weigh In-Motion

Source:
Mr. Luthy, Stock Equipment Company, Inc.

Background/Discussion:
Mr. Luthy, Stock Equipment Company, Inc., reports that they intend to offer for sale in the United States a commercial application weigh-in-motion railway track scale designed to accurately weigh railway track cars (i.e., within NIST Handbook 44 tolerances) using new technology that utilizes continuous rails (no "rail gaps") on the approaches and weighing areas of the scale. They are currently unable to offer this device for sale in the U.S. in commercial applications because current NTEP type evaluation criteria and NIST Handbook 44 requirements are written in such a way that makes it impossible for devices incorporating this new technology to comply. For example, NIST Handbook 44 Scales Code paragraph UR.2.4. Foundations, Supports, and Clearance requires clearance be provided around all live parts to the extent that no contacts may result. NCWM Publication 14, DES Section 70, Inspect the Scale, Item 4 Rail Gaps states that "the rail gaps should be set at $^{3}/_{8}$ inch." The *AAR Scale Handbook* includes language that allows $^{1}/_{8}$ inch to $^{5}/_{8}$ inch rail gaps. Mr. Luthy notes that there is no clearance, nor are there any rail gaps in a continuous rail. Thus, existing requirements are preventing the marketing and sale of equipment utilizing new technology in commercial applications despite the fact that the equipment complies with current accuracy requirements when installed and used in accordance with the manufacturer's instructions.

Mr. Luthy, Stock Equipment Company, Inc., asked the Sector to review NIST Handbook 44 requirements and NCWM Publication 14 type evaluation criteria that apply to rail gap clearance relative to WIM railway track scale installations and consider amending those requirements to eliminate existing barriers that are hindering the use of new technology. Mr. Harshman, NIST Technical Advisor, noted that other requirements may need to be addressed by the manufacturer of this equipment to enable this equipment to be submitted to NTEP and ultimately be installed and used in commercial applications. The Sector may want to consider reviewing other existing type evaluation criteria applicable to WIM Railway Track Scales and provide guidance to the submitter in other areas of concern.

To address the issue of clearance, Mr. Harshman, NIST Technical Advisor, offered the following proposed amendments/additions to NIST Handbook 44 Scales Code paragraph UR.2.4. and NCWM Publication 14 Section 70 for NTETC Weighing Sector consideration, comments, and recommendations:

NIST Handbook 44 Scales Code:

UR.2.4. Foundation, Supports, and Clearance. – ~~**The foundation and supports of any scale installed in a fixed location shall be such as to provide strength, rigidity, and permanence of all components, and 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 scale.** ****On vehicle and livestock scales, the clearance between the load receiving elements and the coping at the bottom edge of the platform shall be greater than at the top edge of the platform.***~~
~~***[*Nonretroactive as of January 1, 1973]***~~

UR.2.4.1. General. – Except for railway track scales that incorporate a continuous rail design (no rail gaps), the foundation and supports of any scale installed in a fixed location shall be such as to provide strength, rigidity, and permanence of all components, and 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 scale. ****On vehicle and livestock scales, the clearance between the load receiving elements and the coping at the bottom edge of the platform shall be greater than at the top edge of the platform.***
[*Nonretroactive as of January 1, 1973]

UR.2.4.2. Railway Track Scales That Incorporate a Continuous Rail Design. – Railway track scales that incorporate a continuous rail design (no rail gaps) shall be installed such that:

(a) Clearance shall be provided around all live parts to the extent that no other contacts with the live part of the scale may result when the weighing area element is empty, nor throughout the weighing range of the scale,

(b) The rail that introduces the rail cars to the weighing area and that carries away the rail cars away from the weighing area shall be maintained according to the manufacturer's recommendations, and

(c) The scale area shall be marked or identified with contrasting colors, or other suitable means shall be used to distinguish the weighing area from the area that carries rail cars away from the weighing area.

(Added 20XX)

NCWM Publication 14 DES Section 70.

Inspect the Scale

4. **Rail Gaps:**
   Except for railway track scales that incorporate a continuous rail design (no rail gaps), the rail gaps should be set at $^{3}/_{8}$ inch. AAR Scale Handbook says from $^{1}/_{8}$ inch to $^{5}/_{8}$ inch is allowable. A closed rail gap will have a significant effect on the weight while a large rail gap will take its toll on the rail, load cells, and grout.

Mr. Harshman, NIST Technical Advisor, summarized background information during which time Mr. Luthy, Stock Equipment Company, Inc., provided greater detail in explaining to the sector how the equipment is designed, many of the capabilities of the equipment, and some of the challenges that have been encountered trying to gain acceptance of the equipment into the U.S. marketplace. Mr. Luthy indicated that the system would pass current NIST Handbook 44 tolerances applicable to static railway track scales and uncoupled-in-motion railway track scales, but could not currently offer the Sector any test data to support this claim. Mr. Luthy acknowledged that a system had been installed at a railroad test facility operated by the Transportation Technology Center Inc., Pueblo, Colorado, but testing to verify (or confirm) accuracy had not yet been performed and would be conducted at some later date (yet to be determined). Mr. Luthy also indicated that some U.S. railroads have expressed great interest in purchasing and using this new technology. The most obvious hurdle preventing U.S. acceptance is that there are no rail gaps present in a typical installation of the system. NCWM Publication 14 specifically requires rail gaps and NIST Handbook 44 contains a provision which specifies clearance shall be maintained around all live parts to the extent that contacts do not occur. Since no rail gaps are present, it is not possible that clearance can be maintained around all live parts. Some additional concerns raised and discussed by the sector were as follows:

- Mr. Beitzel, Systems Associates, Inc., questioned how a static section test could be performed on a weighbridge that incorporates six scale sections in only 12 feet of rail. He indicated that the device could not pass current design requirements of the American Railway Engineering Maintenance-of-Way Association (AREMA) and to do so, those requirements would have to be changed. He also questioned whether more stringent permanence testing should be developed and applied to this particular system. Mr. Beitzel agreed that railroad companies would like to see this equipment be made available, noting that they are less concerned about tolerances, which, he indicated, is contrary to the concerns of members of AREMA Committee 34.

- Mr. Truex, NTEP Administrator, pointed out that a plan was being developed to address section testing. He stated that the NTEP Committee is willing to issue a provisional CC upon successful completion of the current evaluation procedures, providing the Sector can recommend the removal of the "rail gap" requirement (assuming testing would be completed before the NTETC Weighing Sector meeting). He then asked whether the Sector would be willing to make such a recommendation. Mr. Truex also agreed with Mr. Harshman, NIST Technical Advisor, that the equipment could not comply with NIST Handbook 44 Scales Code paragraph UR.2.4. Foundation, Supports, and Clearance because clearance is not provided

around all live parts of a railway track scale that has no rail gaps between the approach rails and the weighing/load-receiving element.

- Noting that the NTEP process considers all components of an evaluation, Mr. Flocken, Mettler-Toledo, Inc., questioned whether the sector would want to develop an ad hoc discussion group to develop a list of concerns and a means of addressing them, including the concerns raised by Mr. Beitzel, Systems Associates, Inc..

Conclusion:
The NTETC Weighing Sector was not willing to delete references to the required gaps in the rail until it is proven that the new technology complies with the tolerances in NIST Handbook 44. Thus, the Sector recommended that the applicant move forward with performance testing to confirm that the new technology complies with the tolerances in NIST Handbook 44. The Sector agreed with a recommendation made by Mr. Cook, NIST, OWM, that data resulting from the performance testing needs to be submitted to the Sector prior to the time that the 2012 NTETC Weighing Sector Agenda is developed or the item should not be included as a carry-over item on that agenda.

7. DES Section 57. Device Tolerances

Source:
Mr. Lewis, Rice Lake Weighing Systems, Inc.

Background/Discussion:
Mr. Lewis, Rice Lake Weighing Systems, Inc., has identified a possible error in the acceptance tolerance example of tolerance for separable elements in DES Section 57. Device Tolerances. Mr. Lewis states that the tolerance for separable indicators and weighing element for devices with more than 4000 graduations is currently listed as 1 e. In the example for Class III elements with more than 4000 divisions, the tolerance listed is 2.5 divisions; the truncated division should for "2 e" when error weights are not being used and the scale cannot be put into an expanded mode. If the tolerance is rounded down the allowable error would be 2 not 1 as shown highlighted in the following table.

Example:

Test Indication In Divisions	Tolerance
0 – 500	0
501 – 2 000	0
2 001 – 4 000	1
4 001 – 10 000	~~1~~ 2

Mr. Cook, NIST, OWM, noted that the referenced language and tables have been in NCWM Publication 14 since 1994. Mr. Cook also noted that NIST Handbook 44 paragraph T.N.3.5. Separate Main Elements, Load Transmitting Elements, Indicating Elements, Etc. applies a 0.7 times the applicable tolerance for separable main elements and including elements. Rice Lake Weighing Systems, Inc., may be misinterpreting the language in NCWM Publication 14 by applying the full acceptance tolerances (1.0 factor) before truncating instead of applying the 0.7 factor to the acceptance tolerance before truncating. To reduce the possibility of future misinterpretations of the language, Mr. Cook asked the Sector to review a proposal that he developed to amend DES Section 57. by including applicable NIST Handbook 44 code references, amending the table titled "Acceptance Tolerances" to include tolerance for both complete devices and main elements, and deleting the "Example" table.

Conclusion:
The NTETC Weighing Sector reviewed a proposal submitted by Mr. Cook, NIST, OWM, to replace the entire contents of DES Section 57 and replace it with amended language and a new table thought to be less confusing. The Sector agreed to recommend replacing the entire contents of NCWM Publication 14 Section 57 with that which was proposed by Mr. Cook. The recommended amended language and new table agreed upon by the Sector are the following:

NCWM Publication 14 DES Section 57.

Code References: G-T. 1. (e), T.N.3.2., T.N.3.5., and Table 6.
The acceptance tolerances for complete scales are shown below and apply to complete devices **and separable main elements** during type evaluation.

Acceptance Tolerances (All values in this table are in scale divisions)				
Tolerance in scale divisions				
Complete Devices	0.5	1.0	1.5	2.5
Separable Main Elements[1]	**0.35**	**0.7**	**1.05**	**1.75**
Separable Indications w/o Expanded Resolution	**0**	**0**	**1**	**1**
Class	**Test Load**			
I	0 - 50 000	50 001 - 200 000	200 0001 +	
II	0 - 5 000	5 001 - 20 000	20 0001 +	
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 1/2 d for each additional 500 d or fraction thereof)	

[1] When main elements (indicating elements and weighing/load-receiving elements) are tested separately, the tolerance applied to all laboratory tests (influence factors and permanence tests) are 0.7 times the acceptance tolerance for complete scales.

It is strongly recommended that indicating elements submitted separately for evaluation have a test mode providing reading indications to 0.1 e to provide adequate resolution to apply the tolerance **(expanded resolution)**. If the indicator provides indications to only the maximum number of divisions requested for the Certificate of Conformance, the tolerance will be truncated to the number of divisions that can be indicated. ~~**The following tolerances will be applied to class III (and III/III L) indicators.**~~

~~**Example:**~~

~~**Test Indication In Divisions**~~	~~**Tolerance**~~
~~**0 – 500**~~	~~**0**~~
~~**501 – 2 000**~~	~~**0**~~
~~**2 001 – 4 000**~~	~~**1**~~
~~**4 001 – 10 000**~~	~~**12**~~

8. DES Appendix C- Acceptable Abbreviations for Short Ton and Long Ton

Source:
Mr. Lewis, Rice Lake Weighing Systems, Inc.

Background/Discussion:
Mr. Lewis, Rice Lake Weighing Systems, Inc., is recommending adding "tn" as an acceptable abbreviation for a U.S. short ton to the current list of acceptable abbreviation of "Ton" or "TN." Mr. Lewis is also recommending that "lt" be added to the list of acceptable abbreviations for a long ton. He added that the *Canadian Lab Manual*, Part 2, Section Appendix-2A in the table for abbreviations and symbols accepted in Canada, metric ton is abbreviated by "t" and ton (short ton) is abbreviated by "tn."

Conclusion:
Mr. Harshman, NIST Technical Advisor, reviewed background information and reminded the Sector that to be considered an acceptable abbreviation (i.e., for use with equipment manufactured as of January 1, 2008), the abbreviation must be included in either NIST Handbook 44 Appendix C or NIST SP 811 in accordance with NIST Handbook 44 paragraph G S.5.6.1. Indicated and Recorded Representations of Units. Appropriate abbreviations. The NTETC Weighing Sector reviewed acceptable abbreviations for short ton, long ton, and metric ton included in Appendix C of NIST Handbook 44. Mr. Cook, NIST, OWM, pointed out that both short ton and metric ton are abbreviated the same in Appendix C of NIST Handbook 44 (i.e., the short ton is abbreviated on page C-6 as "t" and the metric ton is also abbreviated as "t" on page C-19).

The Sector agreed to add "tn" to the table of Acceptable Abbreviations in Appendix C of NCWM Publication 14 as an acceptable abbreviation for short ton. Mr. Harshman, NIST Technical Advisor, noted that the abbreviation "tn" does not exist in Appendix C of NIST Handbook 44 nor in NIST SP 811 and this change recommended by the sector, if approved, would add the abbreviation to only 1 portion of NCWM Publication 14 table, that is, to the portion titled *Exceptions to General Tables of* NIST Handbook 44. The Sector also agreed to delay taking any action on adding the abbreviation "lt" for long ton until the S&T Committee has had an opportunity to consider the proposal from Mr. Lewis, Rice Lake Weighing Systems, Inc., to amend NIST Handbook 44 by adding the abbreviations "tn" for short ton and "lt" for long ton. NCWM Publication 14 Table of Acceptable Abbreviations incorporating the new abbreviation being recommended by the Sector is:

NCWM Publication 14 DES Appendix C (entire table not shown)

Device Application	Term	Acceptable	NOT Acceptable
*Exceptions to General Tables of *NIST Handbook 44*	carat or carat troy – 200 mg	ct *common jewelry industry abbreviation and is the only acceptable abbreviation in Canada*	ct *not permitted if used as the abbreviation for carat and count on a scale with an enable count feature*
	U.S. short ton	Ton**,** ~~**or**~~ TN **or tn** *for belt-conveyor scales, the abbreviation "T" is acceptable*	
	U.S. long ton	LT	
	Grain	grain, GRN, grn, GN	

9. DES Technical Policy Section D - Substitution of Load Cells in Scales

Source:
Mr. Lewis, Rice Lake Weighing Systems Inc.

Background/Discussion:
NCWM Publication 14 DES Section D – Substitution of Load Cells in Scales paragraph states that metrologically equivalent load cells from the same or a different manufacturer may be substituted into a scale provided that the load cell to be substituted have a capacity that is not less than 85 % of the capacity of the original cell. The current policy may exclude load cells from different manufacturers where the available capacities are not within 85 % to 100 %" of the capacity of the original cell. Mr. Lewis, Rice Lake Weighing Systems Inc., states that in most load cell families, the next lower capacity cell may be less than 85 % of the next larger load cell (assuming that the capacity of the original cell is not included in the load cell family of the different manufacturer). In most cases, the percentage will be 80 %, 75 % or even 50 %. If you were to look at a family of load cell the next smaller load might be 83 % (300 lb to 250 lb), but in most cases the percentage is much less that the 85 % allowed.

Mr. Lewis, Rice Lake Weighing Systems Inc., recommended that the language in DES Section D paragraph six be amended to change the minimum capacity of the of load cell intended to be substituted in a scale from 85 % to the "next lowest load cell in that family." Mr. Cook, NIST, OWM, agreed that the differences between adjacent capacities in a manufacturer's load cell family are frequently lower than 85 %. The following example was copied

from a Rice Lake Weighing Systems, Inc. load cell CC and demonstrates that the next lower capacity load cell is between 50 % and 75 % of the next higher capacity load cell. Mr. Cook explained that the intent of the original language is to help ensure the suitability of the replacement load cell, including parameters such as v_{min}. Mr. Cook suggested that any change to the technical policy be supported by evaluating examples where a suitable capacity load cell is not available (e.g., original cell is in SI units and the potential replacement cell is in customary units).

Conclusion:
The NTETC Weighing Sector discussed the item, during which time, the question was raised whether or not anyone could explain the reason why NTEP had elected to select 85 % as the limiting factor to be used in determining whether or not a load cell of lesser capacity is suitable for use as a substitute for a load cell of greater capacity. It was noted that the 85 % factor has existed in type evaluation criteria for a very long time. No one in attendance could provide a technical justification of why 85 % was selected opposed to some lesser value (e.g., 75 %, 50 %), although some possible reasons were identified and discussed as follows:

- Use of the load cells in customary and SI applications
- The effect of shock loading and other loading characteristics
- Increased sensitivity due to influence factors and disturbances, etc.

After considering and discussing these various possibilities, the sector agreed that it was highly probable that a technical justification existed for selecting 85 %, opposed to some lesser value, and for this reason NCWM Publication 14 should not be changed.

ADDITIONAL ITEMS (NOT INCLUDED ON DRAFT AGENDA)

10. Incorrect Section References and Some Editorial Corrections Needed to NCWM Publication 14

Source:
Mr. Davidson, Mettler-Toledo, Inc.

Background/Discussion:
Mr. Davidson, Mettler-Toledo, Inc., indicated that he had discovered what appeared to be some conflicting section references and other minor editorial errors in NCWM Publication 14 that needed to be corrected as follows:

1. The reference to DES Section 34.7.1. and both references to 34.7.4. are incorrect and should be changed to 34.3.1. and 34.3.4. respectively.

2. Delete “0.5e” in the first sentence of 58.2 and replace it with “the applicable tolerance.” Also, replace the symbol “≤” with the symbol “>”in the formula “(n ≤ 4000)” on the form on page 83 where that formula appears in the last sentence under the form heading titled “For Single Range Scales:”

Conclusion:
The Sector reviewed the language in each of the sections identified by Mr. Davidson, Mettler-Toledo, Inc., and agreed to recommend that each of the sections be corrected as suggested. The changes recommended by the Sector are:

NCWM Publication 14 DES Section 34.3.3.

34.3.3. Individual indications for each load-receiving element - with summed indication. Each individual load-receiving element display must operate within the guidelines defined in section 34.~~7~~3.1. or 34.~~7~~3.4. If the instrument has the ability to operate in a "Sum Only" mode, the summed

display must operate within the guidelines in section 34.~~7~~3.4. In this case, when the system is zeroed:

NCWM Publication 14 DES Section 58.2.

58.2. The deviation on returning to zero as soon as the indication has stabilized, after the removal of any load which has remained on the instrument for 30 minutes, shall not exceed ~~**0.5 e.**~~ **the applicable tolerance.** ☐ Yes ☐ No ☐ N/A

NCWM Publication 14 DES Section 58. Time Dependence Test Form (entire form not shown)

For Single Range Scales:

Check that $|\Delta P| \leq |MPE|$ for Class III L Devices

Check that $|\Delta P| \leq 0.5$ e for Class II and IIII Devices

Check that $|\Delta P| \leq 0.5$ e for Class III Devices ($n \leq 4\,000$ d)

Check that $|\Delta P| \leq 0.83$ e for Class III Devices ($n \leq > 4\,000$ d)

11. Sealing/Capabilities of Smart Junction Boxes

Source:
Mr. Payne, Maryland Department of Agriculture

Background/Discussion:
Maryland Department of Agriculture requested the sector's guidance on the proper means of sealing, and assistance in determining the capabilities of a "smart junction box,"(aka "smart "J" box") which was about to be submitted to the Maryland Laboratory for NTEP certification. Although not confirmed, it was Mr. Payne's belief (based on discussions with an equipment manufacturer) that the "smart junction box" provided a means of remotely accessing calibration and/or configuration adjustments once installed in a scale.

Mr. Truex, NTEP Administrator, pointed out that such adjustments can generally only be carried out through the indicator of a weighing system comprised of separable components (i.e., an indicator, weighing/load-receiving element, and load cells). NTEP evaluates each of these components separately, issuing a separate CC for each component once that component has passed type evaluation criteria. Notations made on the CC by the evaluator typically provide an indication of the compatibility and/or non-compatibility of a component with other separable components.

During the discussion, it was mentioned that several U.S. scale manufacturers, including some who were represented in the room, design and manufacture smart "J" boxes. Mr. Flocken, Mettler-Toledo, Inc., noted that internationally, as many as seven different components of a scale are type evaluated using test criteria contained in OIML Recommendations. He questioned whether the Sector might want to further research the capabilities of "smart "J" boxes" and possibly consider developing type evaluation criteria to evaluate them as separate component of a weighing system.

Conclusion:
The Sector agreed to form a small work group to study the capabilities of this equipment and determine whether or not type evaluation criteria should be developed to evaluate them as a separate component.

NEXT SECTOR MEETING

Two locations for the 2012 NTETC Weighing Sector Meeting are being considered:

1. Annapolis, Maryland; or
2. Ottawa, Canada

Additionally, the Sector considered August 28 - 29, 2012, being the most probable dates for the next meeting.

ATTENDANCE

Adnan Alam
A&D Engineering, Inc.
1756 Automation Parkway
San Jose, CA 95131
(408) 518-5112
aalam@andonline.com

Steve Beitzel
Systems Associates, Inc.
1932 Industrial Drive
Libertyville, IL 60048
(847) 367-6650
sjbeitzel@systemsassoc.com

Luciano Burtini
Measurement Canada
2008 Matera Avenue
Kelowna, BCV1V1W9
(250) 862-6557
luciano.burtini@ic.gc.ca

Steven Cook
NIST, Weights and Measures Division
100 Bureau Drive, Stop 2600
Gaithersburg, MD20899-2600
(301) 975-4003
stevenc@nist.gov

Scott Davidson
Mettler-Toledo, Inc.
1150 Dearborn Drive
Worthington, OH43085
(614) 438-4387
scott.davidson@mt.com

Darrell Flocken
Mettler-Toledo, Inc.
1150 Dearborn Drive
Worthington, OH43085
(614)438-4393
darrell.flocken@mt.com

Rick Harshman
NIST, Weights and Measures Division
100 Bureau Drive, Stop 2600
Gaithersburg, MD20899-2600
(301) 975-8107
richard.harshman@nist.gov

Sam Jalahej
Totalcomp Scales and Components
13-01 Pollitt Drive
Fairlawn, NJ 07410
(201) 797-2718
sales@totalcomp.com

Ken Jones
California Division of Measurement Standards
6790 Florin Perkins Road, Suite 100
Sacramento, CA95828
(916) 229-3052
kjones@cdfa.ca.gov

Tom Jones
Hobart Corporation
401 W. Market
Troy, OH 45374
(937) 332-2427
thomas.jones@hobartcorp.com

Takashi Kawazoe
New Brunswick International, Inc.
76 Veronica Avenue
Somerset, NJ08873
(732) 828-3633
TKService@nbidigi.com

Stephen Langford
Cardinal Scale Manufacturing Co.
203 East Daugherty Street
Webb City, MO64870
(417) 673-4631
slangford@cardet.com

Paul A. Lewis, Sr.
Rice Lake Weighing Systems, Inc.
230 West Coleman Street
Rice Lake, WI54868-2404
(715) 234-9171 ext.5322
plewis@ricelake.com

Ed Luthy
Stock Equipment Co., Inc.
108 Wade Drive
Dover, OH44622
(440) 241-0194
ed.luthy@stockequipment.com

Joe Morrison
Ohio Department of Agriculture
Weights and Measures
8995 East Main Street, Building 5
Reynoldsburg, OH 43068
(614) 728-6290
jmorrison@agri.ohio.gov

Edward Payne
Maryland Department of Agriculture
50 Harry S. Truman Parkway
Annapolis, MD 21401
(410) 841-5790
payneea@mda.state.md.us

John Roach
California Division of Measurement Standards
6790 Florin Perkins Road, Suite 100
Sacramento, CA 9582
(916) 229-3456
JRoach@cdfa.ca.gov

Samuel Sagarsee
Emery Winslow Scale Co.
4530 North 25th Street
Terre Haute, IN 47805
(812) 466-5265 ext.112
srsagarsee@winslowth.com

Louis Straub
Fairbanks Scales, Inc.
3056 Irwin Drive S.E.
Southport, NC 28461
(910) 253-3250
lstraub@fairbanks.com

James Truex
National Conference on Weights and Measures
88 Carryback Drive
Pataskala, OH 43062
(740) 919-4350
jim.truex@ncwm.net

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Appendix F

NTEP Participating Laboratories and Evaluation Reports

NTEP General Statistics

General NTEP Statistics	Last Year	This Year	Grand Total
	10/01/10 - 6/30/11	10/01/11 - 6/30/12	10/1/00 - 6/33/12
Total Applications Processed	(40) 208	(21) 205	(143) 2957
Applications Completed	208	206	2832
New Certificates Issued	193	196	2547
Active NTEP Certificates on 3/31/2012			1877

( ) = Reactivations

Assignments to Labs per Year	10/1/10 - 9/30/11	10/1/11 - 6/30/12	10/1/00 -6/30/12
California	(2) 19	20	(16) 401
Canada	8	6	(4) 42
GIPSA-DC	0	1	16
GIPSA-KC	9	8	85
Kansas	10	5	(9) 73
Maryland	(9) 40	(9) 47	(37) 354
New York	1	0	(17) 161
NIST Force Group	8	5	(1) 87
North Carolina	(2) 19	13	(4) 112
Ohio	47	(7) 38	(22) 779
NTEP Staff	(1) 117	66	(9) 798
Applications Not Yet Assigned to a Lab			2

( ) = Reassignments from another lab

Process Statistics	2011 - 2012	2000 - 2012
Average Time to Assign an Evaluation	5 Days	10 Days
Average Time to Complete an Evaluation		141 Days

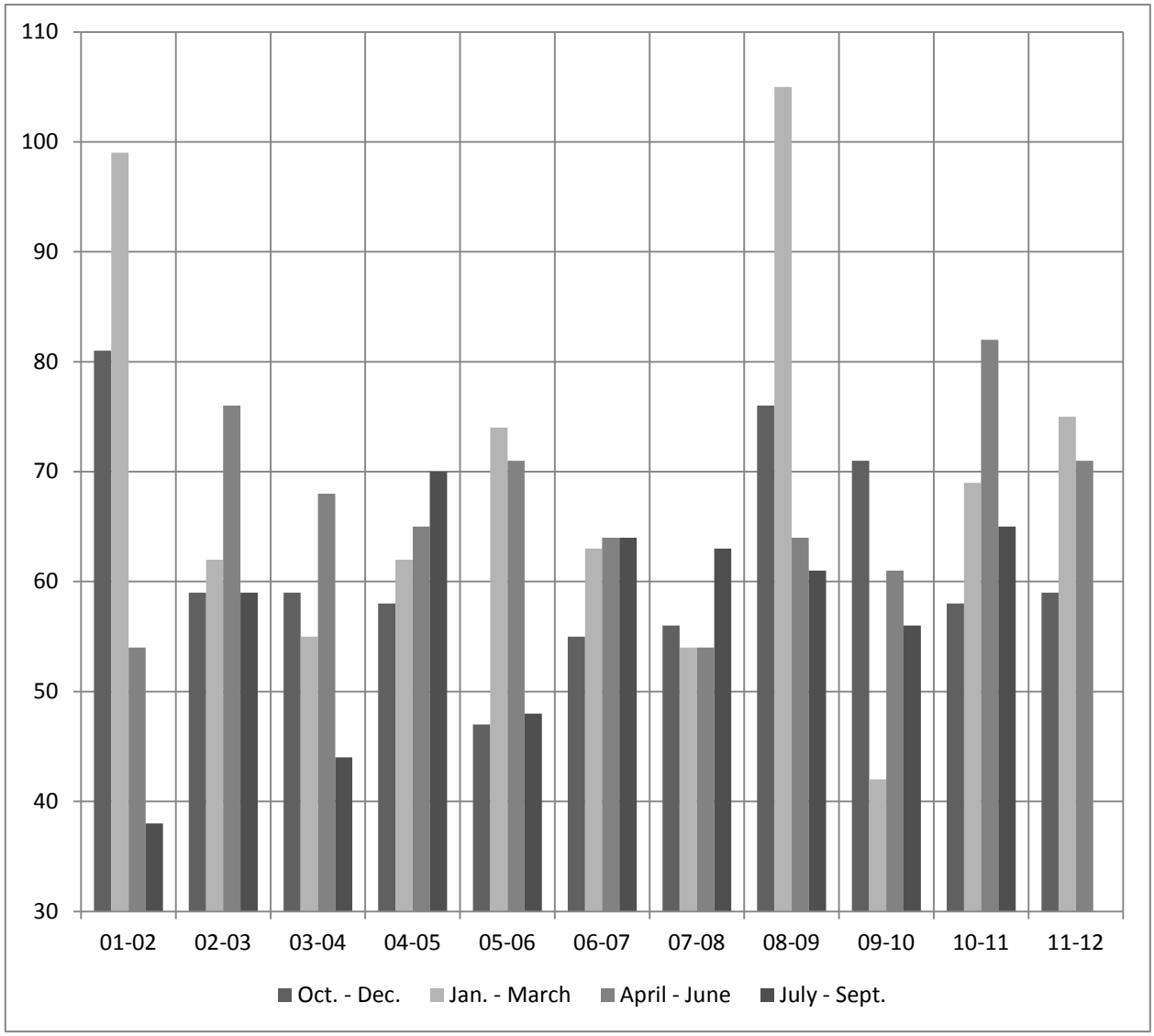
Report on Evaluations in Progress

Evaluations in Progress	0-3 Months	3-6 Months	6-9 Months	9-12 Months	Over 1 Year	Total
April 2009	58	29	27	17	36	167
June 2009	48	27	17	12	29	133
October 2009	41	33	18	12	33	137
December 2009	45	30	22	12	28	137
March 31, 2010	24	20	18	19	23	104
June 30, 2010	37	12	11	13	24	97
October 30, 2010	40	30	8	8	20	106
December 31, 2010	39	25	22	5	20	111
March 31, 2011	37	27	13	19	17	107
June 30, 2011	47	20	7	7	21	102
September 30, 2011	42	28	11	5	19	105
December 31, 2011	37	19	23	5	17	101
March 31, 2012	40	17	7	21	14	99
June 30, 2012	41	21	10	6	20	98

In Progress by Lab	0 - 3 Months	3 - 6 Months	6 - 9 Months	9 - 12 Months	Over 1 Year	Total
California	10	6	4	2	6	28
Canada	1	2	0	0	0	3
GIPSA-DC	0	0	1	0	0	1
GIPSA-KC	5	0	0	0	0	5
Kansas	0	0	0	0	0	0
Maryland	9	4	3	2	6	24
New York	0	0	0	0	0	0
NIST Force Group	1	1	0	0	3	5

In Progress by Lab	0 - 3 Months	3 - 6 Months	6 - 9 Months	9 - 12 Months	Over 1 Year	Total
North Carolina	1	0	1	2	1	5
Ohio	11	8	1	0	4	24
NTEP Staff	3	0	0	0	0	3
					Total Pending:	**98**

Report on Applications Received by Quarter



Applications	01 – 02	02 – 03	03 – 04	04 - 05	05 – 06	06 – 07	07 – 08	08 – 09	09 – 10	10 - 11	11 – 12
Oct. – Dec.	81	59	59	58	47	55	56	76	71	58	59
Jan. – Mar.	99	62	55	62	74	63	54	105	42	69	75
Apr. – June	54	76	68	65	71	64	54	64	61	82	71
July – Sept.	38	59	44	70	48	64	63	61	56	65	
Total	**272**	**246**	**226**	**244**	**240**	**246**	**227**	**306**	**230**	**274**	**205**

Average Per Quarter Overall: **63.7**

Averae Per Quarter this FY: **68.3**

Report of the Nominating Committee

Mr. Tim Tyson, Committee Chair
Kansas Department of Agriculture
Weights and Measures Division

800 INTRODUCTION

The Nominating Committee (hereinafter referred to as "Committee") met during the 97th National Conference on Weights and Measures (NCWM) Interim Meeting, January 22 - 25, 2012, in New Orleans, Louisiana. At that time, the Committee nominated persons for the various available Board of Director positions for the 98th National Conference on Weights and Measures. The following report reflects the decisions of the NCWM membership.

Table A identifies the agenda items by reference key, title of an item, page number, and the appendices by appendix designations.

Table A
Table of Contents

Reference Key		Title of Item	NOM Page
800	**INTRODUCTION**		**1**
810	**NOMINATIONS**		**2**
810-1	V	Officer Nominations	2

Table C
Summary of Voting Results

Reference Key Number	*House of Senate Representatives*		*House of Delegates*		*Results*
	Yeas	*Nays*	*Yeas*	*Nays*	
810-1	Voice Vote of Business Items				Adopted
To Accept the Report	Voice Vote				Adopted

Details of All Items
(In order by Reference Key)

810 NOMINATIONS

810-1 V Officer Nominations

(This item was adopted by unanimous vote of the 97th National Conference on Weights and Measures)

Source:
Nominating Committee

Purpose:
Election of NCWM officers

Item Under Consideration:

Chairman-Elect:
Mr. John Gaccione, Westchester County New York, Weights and Measures
Board of Directors Active Membership - Western:
Mr. Jerry Buendel, Washington State Department of Agriculture
Board of Directors At-Large:
Mr. Steve Giguere, Maine Department of Agriculture
Treasurer:
Mr. Mark Coyne, Brockton Weights and Measures

Background/Discussion:
The Nominating Committee met during the 2012 Interim Meeting at the Hotel Monteleone, New Orleans, Louisiana, at which time the Nominating Committee nominated the persons listed above to be officers of the 98th National Conference on Weights and Measures. In the selection of nominees from the active and associate membership, consideration was given to professional experience, qualifications of individuals, conference attendance and participation, and other factors considered to be important. At the Annual Meeting held in Portland, Maine, the slate of officers were selected by the membership by unanimous vote.

Mr. Tim Tyson, Kansas | Committee Chair
Ms. Judy Cardin, Wisconsin | Member
Mr. Charles Carroll, Massachusetts | Member
Mr. Thomas Geiler, Barnstable Weights and Measures | Member
Mr. Joe Gomez, New Mexico | Member
Mr. Maxwell Gray, Florida | Member
Mr. Randy Jennings, Tennessee | Member

Nominating Committee

97th Annual Meeting Attendees

Sprague Ackley
Intermec
6001 36th Avenue W
Everett, WA 98203
Phone: (425) 501-8995
E-mail: hsackley@cs.com

Cary Ainsworth
USDA, GIPSA
75 Spring Street
Suite 230
Atlanta, GA 30303-3309
Phone: (404) 562-5426
E-mail: l.cary.ainsworth@usda.gov

John Albert
Missouri Department of Agriculture
1616 Missouri Boulevard
P.O. Box 630
Jefferson City, MO 65102
Phone: (573) 751-7062
E-mail: John.Albert@mda.mo.gov

Mahesh Albuquerque
CDLE-Oil and Public Safety
633 17th Street
Suite 500
Denver, CO 80202
Phone: (303) 318-8502
E-mail: mahesh.albuquerque@state.co.us

S. Chris Anders
Zeltex, Inc.
130 Western Maryland Parkway
Hagerstown, MD 21740
Phone: (301) 791-7080
E-mail: canders@zeltex.com

Ross Andersen
25 Moon Drive
Albany, NY 12205
Phone: (518) 869-7334
E-mail: rjandersen12@gmail.com

Lanny Arnold
Kentucky Department of Agriculture
107 Corporate Drive
Frankfort, KY 40601
Phone: (502) 573-0282
E-mail: lanny.arnold@ky.gov

Brad Bachelder
Maine Department of Agriculture
28 State House Station
Augusta, ME 04333
Phone: (207) 287-3841
E-mail: bradford.bachelder@maine.gov

Jason Barber
Oregon Measurement Standards Division
635 Capitol Street NE
Salem, OR 97301
Phone: (503) 986-4767
E-mail: jbarber@oda.state.or.us

Steve Beitzel
Systems Associates, Inc.
1932 Industrial Drive
Libertyville, IL 60048
Phone: (847) 367-6650
E-mail: sjbeitzel@systemsassoc.com

Sam Bell
Echols Oil Company, Inc.
P.O. Box 1477
Greenville, SC 29602
Phone: (864) 233-6205
E-mail: info@scpma.com

Joe Benavides
Texas Department of Agriculture
1700 North Congress Avenue
Stephen F. Austin Building, 11th Floor
Austin, TX 78701
Phone: (512) 463-5706
E-mail: joe.benavides@texasagriculture.gov

Gary Benjamin
NCR Corporation
2651 Satellite Boulevard NW
Duluth, GA 30096
Phone: (770) 623-7543
E-mail: gary.benjamin@ncr.com

Stephen Benjamin
North Carolina Department of Agriculture and Consumer Services
1050 Mail Service Center
Raleigh, NC 27699-1050
Phone: (919) 733-3313
E-mail: steve.benjamin@ncagr.gov

Marla Benyshek
Phillips 66 Company
132 AL
Highway 60 & 123
Bartlessville, OK 74003-6670
Phone: (918) 661-4056
E-mail: marla.k.benyshek@p66.com

Gorden Blain
Intertek Commodities
801 Travis Street
Suite 1500
Houston, TX 77002
Phone: (713) 407-3500
E-mail: gorden.blain@intertek.com

Adam Bolain
Heinz North America
357 6th Avenue
Pittsburgh, PA 15222
Phone: (724) 778-5640
E-mail: adam.bolain@us.hjheinz.com

Mike Boone
Maine Department of Agriculture
28 State House Station
Augusta, ME 04333
Phone: (207) 287-3841
E-mail: michael.boone@maine.gov

Chris Bradley
Seraphin Test Measure
30 Indel Avenue
P.O. Box 227
Rancocas, NJ 08073
Phone: (609) 267-0922
E-mail: cparker@pemfab.com

David R. Bradley
ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428
Phone: (610) 832-9681
E-mail: dbradley@astm.org

Nicholas Brechun
Colorado Department of Agriculture
3125 Wyandot Street
Denver, CO 80211
Phone: (303) 867-9232
E-mail: nick.brechun@ag.state.co.us

Tim Broemmer
Avery Weigh-Tronix
272 Botanical Ridge Drive
Wentzville, MO 63385
Phone: (913) 617-9176
E-mail: tbroemmer@awtxglobal.com

Conrad Brown
Maine Department of Agriculture
28 State House Station
Augusta, ME 04333
Phone: (207) 287-3841
E-mail: conrad.brown@maine.gov

Rex Brown
Petroleum Equipment Institute
P.O. Box 2380
Tulsa, OK 74101
Phone: (918) 236-3961
E-mail: jrbrown@pei.org

Norm Brucker
Precision Measurement Standards, Inc.
1665 Bonaire Path West
Rosemount, MN 55068
Phone: (651) 423-3241
E-mail: sharnoma@frontiernet.net

Jerry Buendel
Washington State Department of Agriculture
1111 Washington Street
P.O. Box 42560
Olympia, WA 98504-2560
Phone: (360) 902-1856
E-mail: jbuendel@agr.wa.gov

Tina Butcher
NIST, Office of Weights and Measures
100 Bureau Drive
MS 2600
Gaithersburg, MD 20899
Phone: (301) 975-2196
E-mail: tina.butcher@nist.gov

Jerry Butler
North Carolina Department of Agriculture
1050 Mail Service Center
Raleigh, NC 27699-1050
Phone: (919) 733-3313
E-mail: jerry.butler@ncagr.gov

Jim Byers
San Diego County Department of Agriculture Weights and Measures
9325 Hazard Way
Suite 100
San Diego, CA 92123-1217
Phone: (858) 614-7726
E-mail: jim.byers@sdcounty.ca.gov

Jaime Cabot
Town of Barnstable
200 Main Street
Hyannis, MA 02601
Phone: (508) 862-4612
E-mail: jaime.cabot@town.barnstable.ma.us

David Calix
NCR Corporation
1510 North Walton Boulevard
Bentonville, AR 72712
Phone: (479) 372-8407
E-mail: david.calix@ncr.com

Judy Cardin
Wisconsin Weights and Measures
2811 Agriculture Drive
P.O. Box 8911
Madison, WI 53708-8911
Phone: (608) 224-4945
E-mail: judy.cardin@wisconsin.gov

Loretta Carey
U.S. Food and Drug Administration
5100 Paint Branch Parkway
College Park, MD 20740
Phone: (240) 402-1799
E-mail: loretta.carey@fda.hhs.gov

Stacy Carlsen
Marin County Weights and Measures
1682 Novato Boulevard
Suite 150-A
Novato, CA 94947-7021
Phone: (415) 499-6700
E-mail: scarlsen@co.marin.ca.us

Charles Carroll
Massachusetts Division of Standards
One Ashburton Place
Room 1115
Boston, MA 02108
Phone: (617) 727-3480
E-mail: Charles.Carroll@state.ma.us

Erica Caruth
Trinidad and Tobago Bureau of Standards
1-2 Century Drive
Trincity Industrial Estate, Macoya
Tunapuna
Phone: (868) 662-8827
E-mail: erica.caruth@ttbs.org.tt

James Cassidy
City of Cambridge Weights and Measures Department
831 Massachusetts Avenue
Cambridge, MA 02139
Phone: (617) 349-6133
E-mail: jcassidy@cambridgema.gov

Paul Cecil
Micro Motion
7070 Winchester Circle
Boulder, CO 80301
Phone: (303) 530-8437
E-mail: paul.cecil@emerson.com

Tim Chesser
Arkansas Bureau of Standards
4608 West 61st Street
Little Rock, AR 72209
Phone: (501) 570-1159
E-mail: tim.chesser@aspb.ar.gov

Alan Christian
USDA, GIPSA Packers and Stockyards Program
1400 Independence Avenue SW
Stop 3601
Washington, DC 20250-3641
Phone: (202) 720-7051
E-mail: alan.r.christian@usda.gov

Rick Cohen
Town of Barnstable
200 Main Street
Hyannis, MA 02601
Phone: (508) 862-4669
E-mail: richard.cohen@town.barnstable.ma.us

Clark Cooney
Oregon Measurement Standsards Division
635 Capitol Street NE
Salem, OR 97301-2532
Phone: (503) 986-4677
E-mail: ccooney@oda.state.or.us

Rodney Cooper
Tuthill Transfer Systems
8825 Aviation Drive
Fort Wayne, IN 46809
Phone: (260) 755-7552
E-mail: rcooper@tuthill.com

Chuck Corr
Archer Daniels Midland Company
1251 Beaver Channel Parkway
Clinton, IA 52732
Phone: (563) 244-5208
E-mail: corr@adm.com

Constantine Cotsoradis
Flint Hills Resources
4111 East 37th Street North
Wichita, KS 67220-3203
Phone: (316) 828-6133
E-mail: constantine.cotsoradis@fhr.com

Mark Coyne
Brockton Weights and Measures
45 School Street
City Hall
Brockton, MA 02301-9927
Phone: (508) 580-7120
E-mail: mcoyne@cobma.us

Kevin Croker
Brockton Weights and Measures
45 School Street
City Hall
Brockton, MA 02301
Phone: (508) 580-7120
E-mail: kcroker@cobma.us

Matthew Curran
Florida Department of Agriculture
and Consumer Services
3125 Conner Boulevard
Building 1 Mail Stop L1
Tallahassee, FL 32399-1650
Phone: (850) 921-1570
E-mail: matthew.curran@freshfromflorida.com

Doug Deiman
Alaska Division of Measurement Standards/CVE
12050 Industry Way
Building O, Suite 6
Anchorage, AK 99515
Phone: (907) 365-1222
E-mail: doug.deiman@alaska.gov

Bill Deitz
Sam's Club
2101 Simple Savings Drive
Bentonville, AR 72712
Phone: (479) 277-7595
E-mail: bill.deitz@samsclub.com

Rob DeRubeis
Michigan Department of Agriculture
and Rural Development
940 Venture Lane
Williamston, MI 48895
Phone: (517) 655-8202
E-mail: derubeisr@michigan.gov

Chuck Ehrlich
NIST, Office of Weights and Measures
100 Bureau Drive
MS 2600
Gaithersburg, MD 20899-2600
Phone: (301) 975-4834
E-mail: charles.ehrlich@nist.gov

John Eichberger
National Association of Convenience Stores
1600 Duke Street
Alexandria, VA 22314
Phone: (703) 518-4247
E-mail: jeichberger@nacsonline.com

Bob Feezor
Scales Consulting and Testing
35 Stonington Place
Marietta, GA 30068
Phone: (770) 971-7454
E-mail: rkfeezor@bellsouth.net

Kevin Ferrick
API
1220 L Street NW
Washington, DC 20005
Phone: (202) 682-8233
E-mail: ferrick@api.org

Cathy Fisher
Santa Barbara County Weights and Measures
263 Camino del Remedio
Santa Barbara, CA 93110
Phone: (805) 681-5600
E-mail: cfisher@co.santa-barbara.ca.us

Dave Flannery
Maine Department of Agriculture
28 State House Station
Augusta, ME 04333
Phone: (207) 287-3841
E-mail: david.flannery@maine.gov

Mark Flint
ADM
4666 Faries Parkway
Decatur, IL 62526
Phone: (217) 451-3104
E-mail: mark.flint@adm.com

Darrell Flocken
Mettler-Toledo, LLC
1150 Dearborn Drive
Worthington, OH 43085
Phone: (614) 438-4393
E-mail: darrell.flocken@mt.com

Kurt E-mail: Floren
Los Angeles County Agricultural Commissioner
Weights and Measures
12300 Lower Azusa Road
Arcadia, CA 91006
Phone: (626) 575-5451
E-mail: kfloren@acwm.lacounty.gov

Kevin Friel
Town of Barnstable
200 Main Street
Hyannis, MA 02601
Phone: (508) 862-4776
E-mail: kevin.friel@town.barnstable.ma.us

John Gaccione
Westchester County Weights and Measures
112 East Post Road
Room 419
White Plains, NY 10601
Phone: (914) 995-2164
E-mail: jpg4@westchestergov.com

Win Gardner
ExxonMobil Corporation
3225 Gallows Road
Room 6D0416
Fairfax, VA 22037
Phone: (703) 846-5400
E-mail: k.w.gardner@exxonmobil.com

Tom Geiler
Town of Barnstable
200 Main Street
Hyannis, MA 02601
Phone: (508) 862-4670
E-mail: tom.geiler@town.barnstable.ma.us

Edward Gentili
Town of Framingham
150 Concord Street
Framingham, MA 01702
Phone: (508) 532-5480
E-mail: erg@framinghamma.gov

Bill Geubelle
Phillips 66
1000 S Pine
Ponca City, OK 74602
Phone: (580) 767-3400
E-mail: bill.g.geubelle@p66.com

Steve Giguere
Maine Department of Agriculture
28 State House Station
Augusta, ME 04333
Phone: (207) 287-4456
E-mail: steve.giguere@maine.gov

Jason Glass
Kentucky Department of Agriculture
107 Corporate Drive
Frankfort, KY 40601
Phone: (502) 573-0282
E-mail: jason.glass@ky.gov

Thomas Glenn
Petroleum Quality Institute of America
40 Brunswick Avenue
Edison, NJ 08820
Phone: (732) 640-6797
E-mail: tglenn@pqiamerica.com

Angela Godwin
County of Ventura
800 S Victoria Avenue, #1750
Ventura, CA 93009
Phone: (805) 654-2428
E-mail: angela.godwin@ventura.org

Joe Gomez
New Mexico Department of Agriculture
P. O. Box 30005
MSC 3170
Las Cruces, NM 88003-8005
Phone: (575) 646-1616
E-mail: jgomez@nmda.nmsu.edu

Shawn Good
Rail Scale, Inc.
5303 N 800 E
Wilkinson, IN 46186
Phone: (317) 339-6486
E-mail: shawn@railscale.com

Larry Goodbar
Yamato Corporation
1775 S Murray Boulevard
Colorado Springs, CO 80916
Phone: (719) 457-3166
E-mail: goodbar@yamatocorp.com

Steve Grabski
Walmart Stores, Inc.
508 SW 8th Street
M/S 0505
Bentonville, AR 72712
Phone: (479) 277-8005
E-mail: steven.grabski@wal-mart.com

Max Gray
Florida Department of Agriculture
and Consumer Services
3125 Conner Boulevard
Lab 2, Mailstop L2
Tallahassee, FL 32399-1650
Phone: (850) 921-1570
E-mail: maxwell.gray@freshfromflorida.com

Frank Greene
Connecticut Dept of Consumer Protection
165 Capitol Avenue
Hartford, CT 06106
Phone: (860) 713-6168
E-mail: frank.greene@ct.gov

LuAnne Groenjes
National Conference on Weights and Measures, Inc.
1135 M Street
Suite 110
Lincoln, NE 68508
Phone: 402-434-4880
E-mail: luanne.groenjes@ncwm.net

Chris Guay
Procter and Gamble Co.
One Procter and Gamble Plaza
Cincinnati, OH 45202
Phone: (513) 983-0530
E-mail: guay.cb@pg.com

Philip Guillemette
Flint Hills Resources, LP
4111 East 37th Street North
Wichita, KS 67220
Phone: (316) 828-8440
E-mail: philip.guillemette@fhr.com

Brett Gurney
Utah Department of Agriculture and Food
P. O. Box 146500
Salt Lake City, UT 84114-6500
Phone: (801) 538-7158
E-mail: bgurney@utah.gov

Ivan Hankins
Iowa Department of Agriculture
Weights and Measures
2230 S. Ankeny Boulevard
Ankeny, IA 50023-9093
Phone: (515) 725-1492
E-mail: ivan.hankins@iowaagriculture.gov

Krister Hard af Segerstad
IKEA North America Services, LLC
420 Alan Wood Road
Conshohocken, PA 19428
Phone: (610) 834-0180
E-mail: krister.hardafsegerstad0@ikea.com

Milton Hargrave
Virginia Department of Agriculture
and Consumer Services
1100 Armory Drive, Apt 120
Franklin, VA 23851
Phone: (757) 562-6637
E-mail: milton.hargrave@vdacs.virginia.gov

John Harkins
Sunoco Logistics
4041 Market Street
Aston, PA 19014
Phone: (610) 833-3671
E-mail: jjharkins@sunocologistics.com

Steven Harrington
Minnesota Weights and Measures Division
14305 South Cross Drive
Suite 150
Burnsville, MN 55306
Phone: (651) 215-5821
E-mail: steven.harrington@state.mn.us

Rick Harshman
NIST, Office of Weights and Measures
100 Bureau Drive
MS 2600
Gaithersburg, MD 20899-2600
Phone: (301) 975-8107
E-mail: richard.harshman@nist.gov

Ryanne Hartman
Michigan Department of Agriculture and Ruaral Development
940 Venture Lane
Williamston, MI 48895-2451
Phone: (517) 655-8202
E-mail: hartmanr9@michigan.gov

Ron Hayes
Missouri Department of Agriculture
1616 Missouri Boulevard
P.O. Box 630
Jefferson City, MO 65102
Phone: (573) 751-4316
E-mail: ron.hayes@mda.mo.gov

Scott Henry
Motorola Solutions, Inc.
1700 Belle Meade Court
Lawrenceville, GA 30043
Phone: (770) 338-3884
E-mail: scott.henry@motorolasolutions.com

Marilyn Herman
Herman and Associates
3730 Military Road NW
Washington, DC 20015
Phone: (202) 362-9520
E-mail: mherman697@aol.com

Maile Hermida
Hogan Lovells US, LLP
555 13th Steet, NW
Washington, DC 20004
Phone: (202) 637-5428
E-mail: maile.hermida@hoganlovells.com

Tyler Hicks
Oklahoma Department of Agriculture
Food and Forestry
2800 N Lincoln Boulevard
Oklahoma City, OK 73105
Phone: (405) 522-5968
E-mail: tyler.hicks@ag.ok.gov

Lindsay Hier
National Conference on Weights and Measures, Inc.
1135 M Street
Suite 110
Lincoln, NE 68508
Phone: (402) 434-4880
E-mail: lindsay.hier@ncwm.net

Paul Hoar
AgriFuels LLC
73 Dayton Road
South Glastonbury, CT 06073
Phone: (860) 633-9811
E-mail: paulhoar@agrifuels.com

Mike Hoar
New World Pasta
85 Shannon Road
Harrisburg, PA 17112
Phone: (502) 396-1746
E-mail: mhoar@nwpasta.com

Carol Hockert
NIST, Office of Weights and Measures
100 Bureau Drive
MS 2600
Gaithersburg, MD 20899-2600
Phone: (301) 975-4004
E-mail: carol.hockert@nist.gov

Jayne Hoover
American Italian Pasta Company
1251 NW Briarcliff Pkwy
Suite 500
Kansas City, MO 64116
Phone: (816) 502-6204
E-mail: jhoover@aipc.com

Jerome Horn
Chevron Global Downstream, LLC
100 Chevron Way
Room 61-4228
Richmond, CA 94802
Phone: (510) 242-1367
E-mail: jerryhorn@chevron.com

Bill Hornbach
Chevron Products Company
6001 Bollinger Canyon Road
San Ramon, CA 94583
Phone: (925) 842-3484
E-mail: billhornbach@chevron.com

Fran Houston
Ohio Department of Agriculture
Division of Weights and Measures
8995 East Main Street
Reynoldsburg, OH 43068
Phone: (614) 728-6290
E-mail: houston@agri.ohio.gov

Steve Howell
MARC-IV
101 East Main
Kearney, MO 64060
Phone: (816) 903-6272
E-mail: showell@marciv.com

John Hughes
Rice Lake Weighin
230 W Coleman Street
Rice Lake, WI 54886
Phone: (507) 399-4629
E-mail: jhughes@ricelake.com

Mike Jackelen
Berry Plastics
9965 Alabama Road
Bloomington, MN 55438
Phone: (612) 816-7182
E-mail: mikejackelen@berryplastics.com

Rafael Jimenez
Association of American Railroad Transportation
Technology Center
P.O. Box 11130
55500 D.O.T. Road
Pueblo, CO 81001
Phone: (719) 584-0691
E-mail: rafael_jimenez@ttci.aar.com

Gordon Johnson
Gilbarco, Inc.
7300 West Friendly Avenue
Greensboro, NC 27410
Phone: (336) 547-5375
E-mail: gordon.johnson@gilbarco.com

Raymond Johnson Jr.
New Mexico Department of Agriculture
P.O. Box 30005
MSC 3170
Las Cruces, NM 88003-8005
Phone: (575) 646-1616
E-mail: rjohnson@nmda.nmsu.edu

Alan Johnston
Measurement Canada
151 Tunney's Pasture Driveway
Ottawa, ON K1A 0C9
Phone: (613) 952-0655
E-mail: alan.johnston@ic.gc.ca

Cathie Johnston
Intertek Commodities
801 Travis
Suite 1500
Houston, TX 77002
Phone: (864) 884-3000
E-mail: cathie.johnston@intertek.com

Tom Jones
Hobart
401 W. Market Street
Troy, OH 45374
Phone: (937) 332-2427
E-mail: thomas.jones@hobartcorp.com

Zina Juroch
Pier 1 Imports
100 Pier 1 Place
Fort Worth, TX 76102
Phone: (817) 252-8348
E-mail: zmjuroch@pier1.com

Michael Kaldro
Maine Department of Agriculture
28 State House Station
Augusta, ME 04333
Phone: (207) 287-3841
E-mail: michael.kaldro@maine.gov

Dmitri Karimov
Liquid Controls
105 Albrecht Drive
Lake Bluff, IL 60044
Phone: (847) 283-8317
E-mail: dkarimov@idexcorp.com

Phil Katselnik
Dresser Wayne
3814 Jarrett Way
Austin, TX 78728
Phone: (512) 388-8763
E-mail: phil.katselnik@dresser.com

Michael Keilty
Endress + Hauser Flowtec AG USA
211 Pinewood Drive
Lyons, CO 80540
Phone: (303) 823-5796
E-mail: michael.keilty@us.endress.com

Henry Kellogg
Compucom
2 Cromer Drive
Bella Vista, AR 72715
Phone: (479) 685-6862
E-mail: henry.kellogg@compucom.com

Michael Kerr
Southern Company Services
207 West Mount Vernon Street
Somerset, KY 42501
Phone: (606) 305-2419
E-mail: mlkerr@southernco.com

Doug Killingsworth
Georgia Department of Agriculture
19 M.L.K. Jr. Drive SW
Atlanta, GA 30334
Phone: (404) 656-3605
E-mail: william.killingsworth@agr.georgia.gov

Doug Killingsworth
Georgia Department of Agriculture
19 MLK Jr. Drive
Room 321
Atlanta, GA 30334
Phone: (404) 656-3605
E-mail: william.killingsworth@agr.georgia.gov

Ted Kingsbury
Measurement Canada
151 Tunney's Pasture Driveway
Ottawa, ON K1A 0C9
Phone: (613) 941-8919
E-mail: kingsbury.ted@ic.gc.ca

Jason Kukachka
Thermo Fisher
501 90th Avenue
Coon Rapids, MN 55433
Phone: (763) 783-2566
E-mail: jason.kukachka@thermofisher.com

Stephen Langford
Cardinal Scale Manufacturing Co.
203 East Daugherty Street
P.O. Box 151
Webb City, MO 64870
Phone: (417) 673-4631
E-mail: slangford@cardet.com

Andrew Lawrence
Tomax Corporation
224 South 200 West
Salt Lake City, UT 84101
Phone: (801) 990-0909
E-mail: alawrence@tomax.com

David Leckman
Badger Meter, Inc.
P.O. Box 245036
Milwaukee, WI 53223
Phone: (414) 371-7266
E-mail: dleckman@badgermeter.com

Jeffrey Leiter
ILMA
1707 L Street, NW, Suite 560
Washington, DC 20036
Phone: (202) 386-7670
E-mail: jll@leitercramer.com

Lisa Leondis
San Diego County Department of Agriculture Weights and Measures
5555 Overland Avenue, Ste 3101
San Diego, CA 92123
Phone: (858) 694-2741
E-mail: lisa.leondis@sdcounty.ca.gov

Paul Lewis
Rice Lake Weighing Systems, Inc.
230 West Coleman Street
Rice Lake, WI 54868-2404
Phone: (715) 434-5322
E-mail: plewis@ricelake.com

Rich Lewis
Georgia Department of Agriculture
Agriculture Building
19 MLK Drive, Room 321
Atlanta, GA 30334
Phone: (404) 656-3605
E-mail: richard.lewis@agr.georgia.gov

Russ Lewis
Marathon Petroleum Company LP
2901 Camelia Drive
Flatwoods, KY 41139
Phone: (606) 921-2009
E-mail: rplewis@marathonpetroleum.com

Tim Lloyd
Montana Weights and Measures Bureau
P.O. Box 200516
Helena, MT 59620-0516
Phone: (406) 443-3289
E-mail: tlloyd@mt.gov

Ed Luthy
Stock Equipment Co., Inc.
108 Wade Drive
Dover, OH 44622
Phone: (440) 241-0194
E-mail: ed.luthy@stockequipment.com

Andrew MacAllister
Daniel Measurement and Control, Inc.
11100 Brittmoore Park Drive
Houston, TX 77041
Phone: (713) 827-4334
E-mail: andrew.macallister@emerson.com

Kristin Macey
California Division of Measurement Standards
6790 Florin Perkins Road, Suite 100
Sacramento, CA 95828
Phone: (916) 229-3000
E-mail: kmacey@cdfa.ca.gov

John Maurer
Valero Energy Corporation
One Valero Way
San Antonio, TX 78249-1616
Phone: (210) 345-2649
E-mail: john.maurer@valero.com

Dr. Willie May
NIST
100 Bureau Drive
MS 1000
Gaithersburg, MD 20899
Phone: (301) 997-2300
E-mail: willie.may@nist.gov

Terence McBride
Memphis Weights and Measures
590 Washington Street
Memphis, TN 38105
Phone: (901) 528-2904
E-mail: terence.mcbride@memphistn.gov

Tom McGee
PMP Corporation
P.O. Box 422
25 Security Drive
Avon, CT 06001-0422
Phone: (860) 677-9656
E-mail: tmcgee@pmp-corp.com

Jim McGetrick
BP Products
Mail Code J-8
150 W. Warrenville Road
Naperville, IL 60563
Phone: (630) 487-1685
E-mail: james.mcgetrick@bp.com

Bob McGrath
Boston ISD Weights and Measures
1010 Massachusetts Avenue
Boston, MA 02118
Phone: (617) 961-3376
E-mail: Robert.Mcgrath@CityofBoston.Gov

Paul Menard
Lexmark International
740 West New Circle Road
501C14/082-1
Lexington, KY 40550
Phone: (859) 232-7379
E-mail: menard@lexmark.com

Charlie Mitchell
Total Petrochemicals and Refining USA, Inc.
P.O. Box 849
Port Arthur, TX 77641-0849
Phone: (409) 963-6885
E-mail: charlie.mitchell@total.com

Paul Moyer
Nebraska Division of Weights and Measures
301 Centennial Mall South,Box 94757
Lincoln, NE 68509-4757
Phone: (402) 471-6842
E-mail: paul.moyer@nebraska.gov

Bob Murnane
Seraphin Test Measure, Co.
30 Indel Avenue
P.O. Box 227
Rancocas, NJ 08073-0227
Phone: (609) 267-0922
E-mail: rmurnane@pemfab.com

Robert (Bob) Nelson
Shell Oil Products
1000 Main Street, Level 12
Houston, TX 77002
Phone: (713) 230-5143
E-mail: robert.e.nelson@shell.com

Dan Newcombe
Maine Department of Agriculture
333 Cony Road
Augusta, ME 04330
Phone: (207) 287-7587
E-mail: danny.newcombe@maine.gov

Andre Noel
Neptune Technology Group, Inc.
1600 Alabama Highway #229
Tallassee, AL 36078
Phone: (334) 283-7298
E-mail: anoel@neptunetg.com

Neal Nover
WinWam Software
3000 Atrium Way, Suite 2203
Mount Laurel, NJ 08054-3910
Phone: (856) 273-6988
E-mail: NealNov@winwam.com

Pete O'Bryan
Foster Farms
P.O. Box 457
Livingston, CA 95334-9900
Phone: (209) 765-4978
E-mail: obryanp@fosterfarms.com

Don Onwiler
National Conference on Weights and Measures, Inc.
1135 M Street, Suite 110
Lincoln, NE 68508
Phone: (402) 434-4871
E-mail: don.onwiler@ncwm.net

Henry Oppermann
Weights and Measures Consulting, LLC
1300 Peniston Street
New Orleans, LA 70115
Phone: (504) 896-9172
E-mail: wm-consulting@att.net

Tim Osmer
New Hampshire Department of Agriculture
Markets and Food
P.O. Box 2042
Concord, NH 03301
Phone: (603) 271-0894
E-mail: timothy.osmer@agr.nh.gov

Ed Payne
Maryland Department of Agriculture
50 Harry S. Truman Parkway
Annapolis, MD 21401
Phone: (410) 841-5790
E-mail: payneea@mda.state.md.us

Keith Penn
Colonial Pipeline Company
5019 Dripping Spring Avenue
Baytown, TX 77523
Phone: (713) 703-5339
E-mail: kpenn@colpipe.com

Dan Peterson
Yokogawa Corporation of American
2 Dart Road
Newnan, GA 30265
Phone: (770) 254-0404
E-mail: dan.peterson@us.yokogawa.com

Hank Picken
Beaumont Products
1500 Beaumont Drive
Kennesaw, GA 30144
Phone: (770) 514-9000
E-mail: hpicker@beaumontproducts.com

Kyle Pierson
Somerset County Weights and Measures
P.O. Box 3000
20 Grove Street
Somerville, NJ 08876
Phone: (908) 231-7125
E-mail: pierson@co.somerset.nj.us

Marshall Piper
Department of Agriculture
State House Station 28
Augusta, ME 04333

Marty Pound
Georgia Department of Agriculture
19 Martin Luther King Jr. Drive SW
Atlanta, GA 31087
Phone: (404) 656-3605
E-mail: marvin.pound@agr.georgia.gov

Jamie Py
Maine Energy Marketers Association
25 Greenwood Road
Brunswick, ME 04011
Phone: (207) 729-5298
E-mail: jpy@maineenergymarketers.com

Julie Quinn
Minnesota Department of Commerce
14305 South Cross Drive
Suite 150
Burnsville, MN 55306
Phone: (651) 215-5821
E-mail: julie.quinn@state.mn.us

Dave Rajala
Total Meter Services, Inc.
136 Queen Anne Drive
Hollidaysburg, PA 16648-9228
Phone: (814) 693-1055
E-mail: drajala@totalmeter.com

Kenneth Ramsburg
Maryland Department of Agriculture
50 Harry S. Truman Parkway
Annapolis, MD 21401
Phone: (410) 841-5790
E-mail: RamsbuKR@mda.state.md.us

Doug Rathbun
Illinois Department of Agriculture
801 Sangamon Avenue
P.O. Box 19281
Springfield, IL 62794-9281
Phone: (217) 785-8300
E-mail: doug.rathbun@illinois.gov

Derek Regal
Tesoro Companies, Inc
19100 Ridgewood Parkway
San Antonio, TX 78259
Phone: (210) 626-7317
E-mail: derek.b.regal@tsocorp.com

Bob Reynolds
Downstream Alternatives, Inc.
4204 Coral Drive
South Bend, IN 46614
Phone: (574) 250-2811
E-mail: rreynoldsdai@att.net

Rebecca Richardson
MARC IV Consulting
2005 Tin Cup Road
Mahomet, IL 61853
Phone: (217) 586-2860
E-mail: RRichardson@marciv.com

Sandy Rintoul
Wilks Enterprise, Inc.
25 Van Zant Street
Ste 8F
Norwalk, CT 06855
Phone: (831) 338-7459
E-mail: srintoul@wilksir.com

Bill Ripka
Thermo Fisher Scientific
501 90th Avenue NW
Minneapolis, MN 55433
Phone: (800) 445-3503
E-mail: bill.ripka@thermofisher.com

Mike Roach
VeriFone
4011 Barwood Ct
Tampa, FL 33624
Phone: (813) 205-0876
E-mail: mike_r4@verifone.com

Lance Robertson
Measurement Canada
151 Tunney's Pasture Driveway
Ottawa, ON K1A 0C9
Phone: (613) 952-0661
E-mail: lance.robertson@ic.gc.ca

Doug Rudy
Pennsylvania Department of Agriculture Bureau of Weights and Meas
2301 North Cameron Street
Harrisburg, PA 17110
Phone: (717) 787-9089
E-mail: drudy@pa.gov

Dorothy Rurak
Sunoco Logistics
1 Fluor Daniel Drive
Sugar Land, TX 77478
Phone: (281) 637-2421
E-mail: drurak@sunocologistics.com

Frank Rusk
Coti Global Sensors
7010 Sedgewick Road
Indian Trails, NC 28079
Phone: (417) 392-0624
E-mail: frank@cotiglobal.com

Louis Sakin
Towns of Hopkinton/Northbridge
1 Ford Lane
Framingham, MA 01701
Phone: (508) 620-1148
E-mail: louissakin@aol.com

Brett Saum
San Luis Obispo County Weights and Measures
2156 Sierra Way
Suite A
San Luis Obispo, CA 93401-4556
Phone: (805) 781-5922
E-mail: bsaum@co.slo.ca.us

Dale Saunders
Virginia Department of Agriculture and Consumer Services
P.O. Box 1163
Richmond, VA 23218
Phone: (804) 786-2476
E-mail: dale.saunders@vdacs.virginia.gov

Louis Sakin
Towns of Hopkinton/Northbridge
1 Ford Lane
Framingham, MA 01701
Phone: (508) 620-1148
E-mail: louissakin@aol.com

Brett Saum
San Luis Obispo County Weights and Measures
2156 Sierra Way
Suite A
San Luis Obispo, CA 93401-4556
Phone: (805) 781-5922
E-mail: bsaum@co.slo.ca.us

Dale Saunders
Virginia Department of Agriculture and Consumer Services
P.O. Box 1163
Richmond, VA 23218
Phone: (804) 786-2476
E-mail: dale.saunders@vdacs.virginia.gov

Richard Scali
Town of Barnstable
200 Main Street
Hyannis, MA 02601
Phone: (508) 862-4778
E-mail: richard.scali@town.barnstable.ma.us

Prentiss Searles
American Petroleum Institute
1220 L Street NW
Washington, DC 20005
Phone: (202) 682-8227
E-mail: searlesp@api.org

David Sefcik
NIST, Office of Weights and Measures
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899-2600
Phone: (301) 975-4868
E-mail: david.sefcik@nist.gov

Edward Seidler
Town of Framingham
150 Concord Street
Framingham, MA 01702
Phone: (508) 532-5480
E-mail: ers@framinghamma.gov

Joseph Silvestro
Gloucester Co. New Jersey
64 Forage Drive
Mickleton, NJ 08056
Phone: (856) 423-5360
E-mail: silver7777@comcast.net

Shane Skelton
API
1220 L Street, NW
Washington, DC 20005
Phone: (202) 682-8172
E-mail: skeltons@api.org

John Stokes
South Carolina Department of Agriculture
P.O. Box 11280
Columbia, SC 29211
Phone: (803) 737-9690
E-mail: jstokes@scda.sd.gov

Brad Stotler
NATSO, Representing America's Truck Stop Operators
1737 King Street
Suite 200
Alexandria, VA 22314
Phone: (202) 309-0400
E-mail: bstotler@natso.com

Lou Straub
Fairbanks Scales, Inc.
3056 Irwin Drive S.E-mail:
Southport, NC 28461
Phone: (910) 253-3250
E-mail: lstraub@fairbanks.com

Bill Studzinski
General Motors - Powertrain Division
823 Joslyn Rd
Mailcode: 483-730-472
Pontiac, MI 48340
Phone: (248) 255-7785
E-mail: william.studzinski@gm.com

Richard Suiter
Richard Suiter Consulting
9819 Anchor Bend
McCordsville, IN 46055
Phone: (317) 336-9819
E-mail: Rsuiter700@aol.com

Mike Swimm
Maine Department of Agriculture
28 State House Station
Augusta, ME 04333
Phone: (207) 540-3703
E-mail: michael.swimm@maine.gov

Bill Tedder
North Carolina Department of Agriculture
1050 Mail Service Center
Raleigh, NC 27699-1050
Phone: (919) 733-3313
E-mail: lbtedder@intrstar.net

Jennifer Thompson
Mississippi Department of Agriculture and Commerce
P.O. Box 1609
Jackson, MS 39215-1609
Phone: (601) 359-1144
E-mail: jennifer@mdac.state.ms.us

Bill Timmons
City of Medford
85 George Phone: Hassett Drive
Medford, MA 02155
Phone: (781) 393-2463
E-mail: mwtimmons@medford.org

Jim Truex
National Conference on Weights and Measures, Inc.
88 Carryback Drive
Pataskala, OH 43062
Phone: (740) 919-4350
E-mail: jim.truex@ncwm.net

Rich Tucker
RL Tucker Consulting, LLC
605 Bittersweet Lane
Ossian, IN 46777
Phone: (260) 622-4243
E-mail: rtucker83@comcast.net

Tim Tyson
Kansas Department of Agriculture
Weights and Measures Division
P.O. Box 19282
Forbes Field Building 282
Topeka, KS 66619-0282
Phone: (785) 862-2415
E-mail: tim.tyson@kda.ks.gov

Rob Underwood
Petroleum Marketers Association of America
1901 N Fort Myer Drive, Suite 500
Arlington, VA 22209
Phone: (703) 351-8000
E-mail: runderwood@pmaa.org

Rob Upright
Vishay Transducers
42 Countryside Road
North Grafton, MA 01536
Phone: (508) 615-1185
E-mail: rob.upright@vishaypg.com

Craig VanBuren
Michigan Department of Agriculture
and Rural Development
940 Venture Lane
Williamston, MI 48895-2451
Phone: (517) 655-8202
E-mail: vanburenc9@michigan.gov

Walter Vetter
Master Meter, Inc.
101 Regency Parkway
Mansfield, TX 76063
Phone: (817) 842-8165
E-mail: wvetter@mastermeter.com

Gilles Vinet
Measurement Canada
151 Tunney's Pasture Driveway
Ottawa, ON K1A 0C9
Phone: (613) 941-8918
E-mail: gilles.vinet@ic.gc.ca

Jay Visco
Vishay Precision Group
275 Warren Street
Waltham, MA 02453
Phone: (781) 330-9362
E-mail: Jay.Visco@vishaypg.com

Jack Walsh
Town of Ashland
101 Main Street--Town Hall
Ashland, MA 01721
Phone: (774) 279-2559
E-mail: JackBWalsh@verizon.net

Lisa Warfield
NIST, Office of Weights and Measures
100 Bureau Drive, MS 2600
Gaithersburg, MD 20899-2600
Phone: (301) 975-3308
E-mail: lisa.warfield@nist.gov

Lisa Weddig
National Fisheries Institute
7918 Jones Branch Drive, Suite 700
McLean, VA 22102
Phone: (703) 752-8886
E-mail: lweddig@nfi.org

Tim White
Michigan Department of Agriculture
and Rural Development
940 Venture Lane
Williamston, MI 48895-2451
Phone: (517) 655-8202
E-mail: whitet@michigan.gov

Juana Williams
NIST, Office of Weights and Measures
100 Bureau Drive
MS 2600
Gaithersburg, MD 20899-2600
Phone: (301) 975-3989
E-mail: juana.williams@nist.gov

Curt Williams
CP Williams Energy Consulting, LLC
95 Roundtree Court
Stockbridge, GA 30281
Phone: (770) 957-6992
E-mail: curtispwilliams@aol.com

Michelle Wilson
Arizona Department of Weights and Measures
4425 West Olive Avenue, Suite 134
Glendale, AZ 85302
Phone: (602) 771-4933
E-mail: mwilson@azdwm.gov

William Woebkenberg
Mercedes-Benz Research and Development NA
3953 Research Park Drive
Ann Arbor, MI 48108
Phone: (734) 997-2030
E-mail: william.woebkenberg@daimler.com

Scott Zaremba
Zarco 66
1548 East 23rd, Suite C
Lawrence, KS 66046-5117
Phone: (785) 843-6086
E-mail: scott@zarco66.com

Jane Zulkiewicz
Town of Barnstable
200 Main Street
Hyannis, MA 02601
Phone: (505) 862-4773
E-mail: jane.zulkiewicz@town.barnstable.ma.us