

NATIONAL CONFERENCE ON WEIGHTS AND MEASURES



Interim Meeting Agenda January 27- 30, 2008 Hyatt Regency Albuquerque Albuquerque, NM



NATIONAL CONFERENCE ON WEIGHTS AND MEASURES



Interim Meeting of the 93rd NCWM

January 27 - 30, 2008 Hyatt Regency Albuquerque Albuquerque, New Mexico

> NCWM Publication 15



National Conference on Weights and Measures

Interim Meeting of the 93rd NCWM

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*Drafts of the sector summaries can be viewed at - http://www.ncwm.net/ntep/index.cfm?fuseaction=meetings

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National Conference on Weights and Measures, Inc. (NCWM) Organization Chart 2007/2008

NCWM Board of Directors						
Office Represer	ntation N	Name/Affiliation		Term Expires		
Chairman:	J	Judy Cardin, WI*	2008			
Chairman-Elec	t: J	Jack Kane, MT*		2009		
NTEP Commit	tee Chair:	Don Onwiler, NE*		2008		
Treasurer:		Will Wotthlie, MD		2008		
Active Member	ship/Northeastern:	Charles Carroll, MA*		2009		
Active Member	ship/Central:	Steven Malone, NE	2010			
Active Member	ship/Southern:	Randy Jennings, TN*		2008		
Active Member	ship/Western:	Steven Grabski, NV		2012		
At-Large:	(Christopher Guay, Pro	octer & Gamble	2008		
At-Large:	1	Tim Tyson, KS		2011		
Associate Mem	bership: F	Robert Murnane, Sera	phin Test Measure	2012		
*National Type	Evaluation Program (NTEP) Comm	ittee Member				
Honorary NCV	M President: J	James Turner, NIST A	Acting Director			
NCWM Execut	ive Secretary:	Carol Hockert, Chief,	NIST W&M Divisio	n		
NCWM Execut	ive Director:	Beth Palys, CAE, NC	WM Headquarters			
BOD Advisor:	(Gilles Vinet, Measurement Canada				
NTEP Director		Stephen Patoray, NCWM Headquarters*				
NTEP Commit	tee Technical Advisor:	Don Onwiler, NE				
	NCWM	Committees				
Laws	R Degulations Committee	Specificatio	ns & Toloranoos	Committee		
Position	Name/Affiliation (Term Ends)	Position	Name/Affiliation (Commutee Term Fnds)		
	Name/Armation (Term Enus)		Name/Annation (Term Enus)		
Chair:	Vicky Dempsey, Montgomery County OH (2008)	y, Chair:	Carol Fulmer, SC (2008)		
Members: Roger Macey, CA (2009) Stephen Benjamin, NC (2010) Joe Benavides, TX (2011) John Gaccione, Westchester County NY (2012)		Members:	Todd Lucas, OH (2 Brett Saum, CA (20 Kristin Macey, CO Rick Fogal, PA (20	009) 010) (2011) 12)		
Associate Member Rep:	O.R. "Pete" O'Bryan, Foster Farms					
CanadianDoug HutchinsonTechAdvisors:		Canadian Tech Advisor:	Ted Kingsbury			
NIST Tech. Advisors:	Kenneth Butcher Lisa Warfield	NIST Tech. Advisors:	Richard Suiter Steven Cook			

NCWM Committees (Continued)					
Professional	Development Committee	Metrology Committee			
Position	Name/Affiliation (Term Ends)	Position	Name/Affiliation (Term Ends)		
	Name/Annation (Term Ends)		Name/Armation (Term Enus)		
Chair:	Agatha Shields, OH (2008)	Chair:	TBD		
Members:	Kenneth Deitzler, PA (2009) Ross Andersen, NY (2010) John Sullivan, MS (2011) Stacy Carlsen, CA (2012) Tina Butcher, NIST/W&M	Co-Chair: Members:	TBD		
Safety Liaison Staff Liaison	Charles Gardner, NY Linda Bernetich, NCWM				
Associate Member Rep:	Dave Wankowski, Kraft Foods	NIST Tech Advisor:	TBD		
Nomin	nating Committee	Leg	gislative Liaison		
	•				
Chair:	Don Onwiler, NE	Chair:	TBD		
Members:	Ross Andersen, NY Dennis Ehrhart, AZ Thomas Geiler, MA Maxwell Gray, FL Steven Malone, NE James Truex, OH	Members:	TBD		
Crede	ntials Committee	Ap	pointed Officers		
Chair:	Mark Buccelli, MN (2008)	Parliamentarian:	Lou Straub, Fairbanks Scales		
Members:	Raymond Johnson, NM (2009) Dave Pfahler, SD (2010)	Chaplain:	Stephen Langford, Cardinal Scale Manufacturing Company		
Coordinator:	Linda Bernetich, NCWM Staff	Sergeants-At- Arms:	TBA, VT TBA, VT		
		Presiding Officers:	Jerry Butler, NC Tim Chesser, AR Kurt Floren, CA Mike Sikula, NY		
	Associate Membe	ership Committee			
Chair:		Christopher Guay, Pr	octer and Gamble (2009)		
Vice Chair:		Paul Lewis, Rice Lake Weighing Systems (2009)			
Secretary/Treasurer:		Michael Gaspers, Farmland Foods, Inc. (2009)			
Members:		Darrell Flocken, Mettler-Toledo (2008) Cary Frye, International Dairy Foods Assoc. (2008) Thomas Herrington, Nestle USA (2010) Doug Biette, Sartorius North America (2010) Dave Wankowski, Kraft Foods, Inc. (2010)			

	National Type Evaluation Technical Committees (NTETC)					
	NTETC Weighing Sector		NTETC Measuring Sector			
Chair:	Darrell Flocken, Mettler-Toledo	Chair:	Michael Keilty, Endress & Hauser Flowtec AG			
Technical Advisor:	Steven Cook, NIST/WMD	Technical Advisor:	Richard Suiter, NIST/WMD			
Public Sector Members:	Cary Ainsworth, GIPSA Ross Andersen, NY William Bates, GIPSA Andrea Buie, MD Luciano Burtini, Measurement Canada Tina Butcher, NIST/WMD Gary Castro, CA Terry Davis, KS Ken Jones, CA Jack Kane, MT Don Onwiler, NE Ronald Rigdon, MN James Truex, OH Russ Wyckoff, OR	Public Sector Members:	Ross Andersen, NY Tina Butcher, NIST/WMD Jerry Butler, NC Gary Castro, CA Steve Hadder, FL Ted Kingsbury, Measurement Canada John Makin, Measurement Canada Steven Malone, NE Don Onwiler, NE Dan Reiswig, CA Richard Wotthlie, MD			
Private Sector Members:	 Steven Beitzel, Systems Associates, Inc. Doug Biette, Sartorius North America John Elengo, Contractor Robert Feezor, Norfolk Southern Corp. Willliam GeMeiner, Union Pacific Railroad David Hawkins, Thurman Scale Co. Scott Henry, NCR Rafael Jimenez, Association of American Railroads Gary Lameris, Lameris Consulting Stephen Langford, Cardinal Scale Mfg. Paul Lewis, Rice Lake Weighing Systems L. Edward Luthy, Brechbuhler Scales, Inc. Nigel Mills, Hobart Corporation Naresh Puri, NMB Technologies, Inc. Louis Straub, Fairbanks Scales, Inc. Jerry Wang, A&D Engineering, Inc. Otto Warnlof, Consultant William West, Consultant Nathaniel Wieselquist, Sick, Inc. Walter Young, Emery Winslow Scale 	Sector Members:	 Marc Buttler, Emerson Process Management - Micro Motion Joe Buxton, Daniel Measurement & Control Rodney Cooper, Actaris Neptune Maurice Forkert, Tuthill Transfer Systems Mike Gallo, Clean Fueling Technologies Paul Glowacki, Murray Equipment Alex Gutierrez, MEGGITT Fueling Products, Whittaker Controls Gordon Johnson, Gilbarco, Inc. Yefim Katselnik, Dresser Wayne, Inc. Douglas Long, RDM Industrial Electronics Wade Mattar, Invensys/Foxboro Daniel Maslowski, LTS Sales Richard Miller, FMC Measurement Solution Robert Murnane, Jr., Seraphin Test Measure Andre Noel, Neptune Technology Charlene Numrych, Liquid Controls Johnny Parrish, Brodie Meter Company, LLC David Rajala, Veeder-Root Company Otto Warnlof, Consultant 			

Nation	al Type Evaluation Technic	al Committ	ees (NTETC) Continued
NI	<i>TETC Software Sector</i>	NTEI	IC Grain Analyzer Sector
Chair:	Jim Truex, OH	Chair:	Cassie Eigenmann, DICKEY-john Corp.
Technical Advisor:	Stephen Patoray, NCWM	Technical Advisors:	G. Diane Lee, NIST/WMD John Barber, J. B. Associates
Public Sector Members:	Dennis Beattie, MC Andrea Buie, MD Bill Fishman, NY Mike Frailer, MD Norman Ingram, CA Todd Lucas, OH Don Onwiler, NE John Roach, CA Ambler Thompson, NIST/WMD	Public Sector Members:	Randy Burns, AR Tina Butcher, NIST/WMD Karl Cunningham, IL Don Onwiler, NE Richard Pierce, GIPSA Edward Szesnat, Jr., NY Cheryl Tew, NC
Private Sector Members:	Private Sector Members: Doug Bliss, Mettler-Toledo André Elle, Endress & Hauser Flowtec AG Travis Gibson, Rice Lake Weighing Systems Teri Gulke, Liquid Controls LLC Keith Harper, Gencor Industries, Inc. Tony Herrin, Cardinal Scale Mfgr. Co. Robert Hoblit, IBM Gordon Johnson, Gilbarco, Inc. Gary Lameris, Gainco Inc. Paul Lewis, Rice Lake Weighing Systems Mike McGhee, Actaris US Liquid Measurement Richard Miller, FMC Measurement Solutions Charlene Numrych, Liquid Controls LLC Michael Parks, Vulcan Materials Co. Jim Pettinato, FMC Measurement Solutions Mike Roach, Verifone Robin Sax, CompuWeigh Corp. Jim Sexton, Rice Lake Weighing Systems Chris Scott, Gilbarco, Inc. David Vande Berg, Vande Berg Scales Roland Wagner, Flow Measurements & Engineering GmbH		James Bair, NA Miller's Association Martin Clements, The Steinlite Corp. Victor Gates, Shore Sales Company Andrew Gell, Foss North America Charles Hurburgh, Jr., Iowa State University David Krejci, Grain Elevator & Processing Society Jess McCluer, National Grain & Feed Association Thomas Runyon, Seedboro Equipment

National Type Evaluation Technical Committees (NTETC) Continued					
NTETC Belt Conveyor Sector					
Chair:	TBD				
Technical Advisor:	Steven Cook, NIST/WMD				
Public Sector Members:	Andrea Buie, MD Tina Butcher, NIST/WMD				
Private Sector Members:	 R. Jimenez, Association of American Railroads L. Marmsater, Merrick Industries B. Ripka, Thermo Electron P. Sirrico, Thayer Scale - Hyer Industries, Inc. T. Vormittag, Sr, SGS Minerals Services O. Warnlof, Consultant 				
Regional Weights an	d Measures Associations				
Regional Weights	and Measures Contacts				
Northeastern Weights and Measures Association (NEWMA): Annual Meeting 2008: May 12 - 15 Holiday Inn/Conference Center Fishkill, NY	John P. Gaccione Westchester County Weights & Measures (914) 995-2160 jpg4@westchestergov.com				
Interim Meeting 2008: October 15 – 16 Springfield Station Monarch Springfield, MA					
Southern Weights and Measures Association (SWM Annual Meeting 2008: October 5 - 8 Double Tree Airport Hotel Atlanta, GA	A): Rich Lewis Georgia Department of Agriculture (404) 656-3605 rlewis@agr.state.ga.us				
Central Weights and Measures Association (CWMA Annual Meeting 2008: May 4 - 7 Great Wolf Lodge Kansas City, KS	 Tim Tyson Kansas City Department of Agriculture, W&M Div. (785) 862-2415 ttyson@kda.state.ks.us 				
Interim Meeting 2008: September 14 - 17 Holiday Inn Rock Island Hotel & Conference Center Rock Island, IL	Steve Gill Missouri Department of Agriculture (573) 751-4278 steve.gill@mda.mo.gov				
Western Weights and Measures Association (WWM Annual Meeting 2008: September 7 – 11 Anchorage Marriott Downtown Anchorage, AK	IA): Doug Deiman Alaska Division of Measurement Standards/CVE (907) 365-1222 doug.deiman@alaska.gov				

Organization Chart

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General Conference Information

Introduction

This document contains the Board of Directors and Standing Committee agendas for the **Interim Meeting of the National Conference on Weights and Measures, Inc.,** (NCWM) scheduled for January 27 - 30, 2008, at the Hyatt Regency Albuquerque, Albuquerque, New Mexico. To reserve a room, call the hotel directly at (800) 233-1234 or (505) 842-1234 and ask for the National Conference on Weights and Measures meeting rate of \$107 single or double. The reservation cut-off date is December 21, 2007.

Agenda items to be addressed by the Standing Committees are assigned Reference Key numbers as follows:

Committee	Reference Key		
Board of Directors	100 series		
Laws and Regulations	200 series		
Specifications and Tolerances	300 series		
Professional Development Committee	400 series		
National Type Evaluation Program Committee	500 series		

The subject matter listed on each Standing Committee's agenda will be open for discussion as noted. Each committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. At its discretion, each committee may decide to accept items for discussion that are not listed in this document.

The agendas:

- 1. Include items brought to the attention of the Standing Committees prior to the submission deadline of November 1, 2007, and approved for inclusion in their agendas by the Committees, and
- 2. Serve as the basis for the Standing Committee Interim Reports (to be printed in the Program and Committee Reports of the National Conference on Weights and Measures 93rd Annual Meeting, NCWM Publication 16). The final reports of the committees will be published in the NIST Special Publication Report of the 93rd Annual Meeting of the NCWM, following the Annual Meeting in 2008, scheduled for July 13 17 at the Sheraton Burlington Hotel and Conference Center, Burlington, Vermont.

The Committees have not determined whether the items presented will be voting or informational in nature; these determinations will result from their deliberations at the Interim Meeting.

Special Meetings

Several Annual Committees and other organizations are conducting meetings concurrently with the Standing Committees of the Conference.

Joint Meetings for All Committees

A joint meeting for all committees will be held on Sunday, January 27, and Wednesday, January 30, 2008. Each Standing Committee will highlight the major decisions made during the week, and the Nominating Committee will present its report.

Participation

Sunday meetings are scheduled for Committee members to review their agendas (see the particular committee agenda for details). Although the sessions are open to all delegates, participation in discussions during agenda reviews is normally limited to Committee members. Comments and input are welcome when specific topics are scheduled in the Committee agendas.

All sessions of NCWM meetings are normally open to members of the Conference. If a Committee chairman recognizes a special situation involving a proprietary issue (e.g., NTEP appeals) or sensitive issue or other substantive need, that portion of the session dealing with the special issue may be closed, provided that: (1) the Conference chairman (or in his absence, the chairman-elect) approves, and (2) announcement of the closed meeting is posted on or near the door to the meeting session and on the announcement board at the registration desk. If at all possible, the posting will be done at least a day prior to the planned closed session. Please note that the one-day notice will not always be possible if a closed meeting is called on Sunday. Since Sunday is a day for agenda reviews and participants may make their travel reservations in order to observe these agenda reviews, if a closed meeting becomes necessary on Sunday, every effort will be made to limit such a meeting to only part of the day.

To request an appearance with a Standing Committee, contact the appropriate technical advisor by December 31, 2007:

Board of Directors	Carol Hockert	(301) 975-4004
Laws and Regulations Committee	Kenneth Butcher or	(301) 975-4859
-	Lisa Warfield	(301) 975-3308
Specifications & Tolerances Committee	Steve Cook or	(301) 975-4003
	Richard Suiter	(301) 975-4406
Professional Development Committee	Agatha Shields	(614) 462-7380
National Type Evaluation Program Committee	Don Onwiler	(402) 471-4292

You may also contact the Executive Secretary at the following address and telephone number:

Weights and Measures Division National Institute of Standards and Technology 100 Bureau Drive, STOP 2600 Gaithersburg, MD 20899-2600 Telephone: (301) 975-4004

Contact for More Information

If you have questions about the program, registration, lodging, or meeting arrangements, contact NCWM Headquarters at the following address and telephone number:

National Conference on Weights and Measures 15245 Shady Grove Road, Suite 130 Rockville, MD 20850 Telephone: (240) 632-9454

Reports

There will **not** be a transcript made of the proceedings of the Interim Meetings. Each committee will prepare its report to the NCWM containing its recommendations based upon the presentations, discussions, and deliberations on all matters on its agenda that were addressed during the Interim Meetings. These reports will be published in the Committee Reports for the 93rd Annual Meeting, NCWM Publication 16, to be mailed to the NCWM membership in May 2008.

93rd Annual Meeting of the National Conference on Weights and Measures

The National Conference on Weights and Measures 93rd Annual Meeting will be held at the Sheraton Burlington Hotel and Conference Center, Burlington, Vermont, from July 13 - 17, 2008. The room rate for the Annual Meeting will be \$109 per night, single or double, plus tax. For reservations, please call the hotel at (800) 325-3535 or (802) 862-6600. The reservation cut-off date is Friday, June 13, 2008.

Units of Measurement

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

General Conference Information

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Schedule



Saturday, January 26

2008 NCWM Interim Meeting January 27 - 30, 2008 Hyatt Regency Albuquerque ♦ Albuquerque, NM

Schedule of Events (as of November 1, 2007)

8:30 a.m. - 5:00 p.m. **Board of Directors Meeting** Enchantment AB Sunday, January 27 7:30 a.m. - 9:00 a.m. Morning Coffee Grand Pavilion Foyer 7:30 a.m. - 5:00 p.m. Registration and Exhibits Grand Pavilion Foyer 8:30 a.m. - 10:30 a.m. **Industry Committee on Packaging & Labeling** Enchantment AB 8:30 a.m. - 11:00 a.m. Enchantment CD **Board of Directors' Meeting – Executive Session** 10:30 a.m. - 12:00 p.m. **Associate Membership Committee** Enchantment EF 12:00 p.m. - 12:30 p.m. Lunch on your own Pavilion I & II 12:30 p.m. - 1:30 p.m. Joint Meeting for all Standing Committees STANDING COMMITTEES REVIEW SESSIONS 1:30 p.m. - 5:00 p.m. Board of Directors/NTEP Committee Enchantment CD Laws & Regulations Committee Fiesta 3 & 4 Enchantment A Professional Development Committee Specifications & Tolerances Committee Enchantment EF Fiesta 3 & 4 2:45 p.m. - 5:00 p.m. Moisture Loss Work Group Pavilion I & II 5:30 p.m. - 7:00 p.m. **Chairman's Reception** Monday, January 28 7:30 a.m. - 9:00 a.m. Morning Coffee Grand Pavilion Foyer 7:30 a.m. - 5:00 p.m. **Registration and Exhibits** Grand Pavilion Foyer 8:30 a.m. - 11:30 a.m. Joint Session of the L&R and S&T Committees Pavilion I - III **ATC Steering Committee Report** Don Onwiler Nebraska Division of Weights and Measures

Lincoln, NE



Monday, January 28 (*continued*) 8:30 a.m. - 11:30 a.m.

2008 NCWM Interim Meeting January 27 - 30, 2008 Hyatt Regency Albuquerque ♦ Albuquerque, NM

Schedule of Events

(as of November 1, 2007)

ATC Steering Committee Report (continued)

Pavilion I - III

In 2000, the S&T Committee presented an item to address ATC in NIST Handbook 44, Vehicle Tank Meter Code. The L&R Committee also presented an item to recognize ATC in NIST Handbook 130, Method of Sale Regulation. Since then, the question has expanded to potentially include all retail sales of motor fuel. In 2007, no resolution was reached. Our membership is divided and the media and politicians have gotten involved.

In January, the NCWM Board received a request to form an ATC Steering Committee to assist NCWM membership in reaching a resolution to the question of whether to implement ATC into our standards. The Steering Committee was appointed in May, conducted its first conference call in June, and held a well-attended open meeting in Chicago in August.

Don Onwiler, Chairman of the ATC Steering Committee, will provide an overview of the issues being addressed by the Committee and recommendations from the Committee to the NCWM Standing Committees for consideration by our membership.

ATC Concepts and Testing ATC Dispenser

Henry Oppermann Weights and Measures Consulting, LLC New Orleans, LA

Henry Oppermann will discuss the physics of the measurement process, the reasons that we must choose the volume correction factors that must be used, how making temperature corrections increases the accuracy of the measurement with respect to temperature, the accuracy required for thermometers, and two approaches that may be used when testing ATC dispensers.

12:30 p.m. - 5:00 p.m. STANDING COMMITTEES OPEN HEARINGS Pavili (Note: Times of hearings are not firm; when one committee finishes, the next committee will begin.) Pavili Laws & Regulations Committee Specifications & Tolerances Committee Professional Development Committee Board of Directors/NTEP Committee

Pavilion I - III

Pavilion I - III

Schedule

2008 NCWM Interim Meeting January 27 - 30, 2008 Hyatt Regency Albuquerque ♦ Albuquerque, NM

Schedule of Events

(as of November 1, 2007)

7:30 a.m 9:00 a.m.	Morning Coffee	Grand Pavilion Foyer
7:30 a.m 5:00 p.m.	Registration and Exhibits	Grand Pavilion Foyer
8:30 a.m 12:00 p.m.	STANDING COMMITTEES OPEN HEARINGS (<i>Note: Times of hearings are not firm; when one committee finishes, the next committee will begin.</i>) Laws & Regulations Committee Specifications & Tolerances Committee Professional Development Committee Board of Directors/NTEP Committee	Pavilion I - III
	Each committee will begin their individual work sessions at the conclusion of the Open Hearings/Technical Session.	
12:00 p.m 1:00 p.m.	Lunch on your own	
1:00 p.m 5:00 p.m.	STANDING COMMITTEES WORK SESSIONS Board of Directors/NTEP Committee Laws & Regulations Committee Professional Development Committee Specifications & Tolerances Committee	Enchantment CD Fiesta 3 & 4 Enchantment A Enchantment EF
Wednesday, January 30		
7:30 a.m 9:00 a.m.	Morning Coffee	Grand Pavilion Foyer
7:30 a.m 12:00 p.m.	Registration & Exhibits	Grand Pavilion Foyer
8:30 a.m 11:00 a.m.	STANDING COMMITTEES WORK SESSIONS Board of Directors/NTEP Committee Laws & Regulations Committee Professional Development Committee Specifications & Tolerances Committee	Enchantment CD Fiesta 3 & 4 Enchantment A Enchantment EF
11:00 a.m 12:00 p.m.	JOINT MEETING - ALL STANDING COMMITTEES	Pavilion I & II

NOTE: 2008 Interim Meeting schedule of events is tentative and subject to change.



Tuesday, January 29

Schedule

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Board of Directors Interim Agenda

Judy Cardin Regulation & Safety Section Chief, Trade and Consumer Products Wisconsin Department of Agriculture

Reference Key Number

100 **INTRODUCTION**

The Board will hold its quarterly Board of Directors meeting on Saturday, January 28, 2008, and continue that meeting during work periods throughout the remainder of the Interim Meetings. Except when posted, all meetings are open to the membership. The Board of Directors and NTEP Committee will hold open hearings at the Interim Meeting and members will be invited to engage in dialogue with the Board on issues the Board and NTEP Committee have on their agenda. The Board of Directors is currently working on the following issues: membership and meeting attendance, Marketplace Surveys, Automatic Temperature Compensation, website issues, International Organizations on Legal Metrology (OIML), the OIML Mutual Acceptance Arrangement (MAA) the Canadian Forum on Trade Measurement (CFTM), the Asia-Pacific Legal Metrology Form (APLMF), and U.S. National Work Groups.

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Details of all Items (In order by Reference Key Number)

1. NCWM Automatic Temperature Compensation Steering Committee

The Board will review the recent activities of the ATC Steering Committee. In addition, they will be reviewing future Steering Committee activities and related NCWM work on this issue.

2. Marketplace Surveys Update

The Board will begin planning the next Marketplace survey during the Interim meeting.

3. Membership and Meeting Attendance

NCWM Membership Report									
	10/29/07 10/1/06 10/18/05 10/1/04 10/1/03 10/1/02								10/1/02
Associate	(161)	771	(156)	736	(124)	751	713	712	801
Foreign Assc	(8)	50	(18)	44	(8)	43	41	29	25
Federal Gov't	(1)	9	(5)	9	(3)	13	12	17	23
NIST	(2)	14	(1)	14		11	11	18	16
State Gov't	(207)	684	(224)	620	(113)	765	637	613	774
Local Gov't	(67)	537	(76)	512	(82)	434	417	450	504
Int'l Gov't	(10)	22	(7)	28	(13)	21	20	15	13
Retired		220		227	(5)	220	222	229	230
Total	(456)	2307	(487)	2190	(348)	2258	2097	2083	2386
(Memberships not renewed as of date at top of column)									

We have contacted stakeholders regarding the ATC and moisture loss issues to maximize membership and attendance. The BOD asks that members contact stakeholders in their jurisdictions to encourage attendance and membership.

4. Newsletter & Website

Steven Grabski has agreed to serve as Subcommittee Chair for the newsletter and website. The committee is charged with continuing to improve and monitor the content of the newsletter and website. Steve is soliciting comments from the membership.

5. Meetings Update

Hyatt Regency Albuquerque, Albuquerque, New Mexico
Hilton Daytona Beach Hotel, Daytona Beach, Florida
Sheraton Burlington Hotel & Conference Center, Burlington, Vermont
Marriott Plaza Hotel, San Antonio, Texas
Crowne Plaza St. Paul Hotel, St. Paul, Minnesota

6. Participation in International Standard Setting

Chuck Ehrlich and other NIST Weights and Measures Division (WMD) staff will brief the NCWM Board and NCWM Members on key activities of OIML and regional legal metrology organizations (see Appendix A).

7. Efficiency and Effectiveness

The Board is examining cost efficiency measures to control meeting and administrative costs. We welcome member feedback on this topic and any ideas to increase the effectiveness of the Conference.

8. Bylaws Amendment: Article IX, Section 2 – Standing Committees

The Board of Directors may create and disband standing committees in the best interests of the Corporation. As referenced in Article IX, Section 1, the Chairman makes appointments to the several special purpose committees. The current standing committees are:

Committee on Specifications and Tolerances; Committee on Laws and Regulations; and Professional Development Committee (formerly, Committee on Administration and Public Affairs)

Judy Cardin, Wisconsin, NCWM Chairman Jack Kane, Montana, Chairman-Elect Don Onwiler, Nebraska, NTEP Chairman Will Wotthlie, Maryland, Treasurer Charles Carroll, Massachusetts, Northeastern Regional Representative Steven Malone, Nebraska, Central Regional Representative Randy Jennings, Tennessee, Southern Regional Representative Steven Grabski, Nevada, Western Regional Representative Christopher Guay, Procter & Gamble, At-Large Tim Tyson, Kansas, At-Large Robert Murnane, Seraphine Test Measure Beth W. Palys, CAE, NCWM Headquarters Carol Hockert, Chief, Weights and Measures Division

Board of Directors

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Appendix A

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

Weights and Measures Division, NIST

INTRODUCTION

The Weights and Measures Division (WMD) of the National Institute of Standards and Technology (NIST) is responsible for coordinating U.S. participation in the International Organization of Legal Metrology (OIML) and other international legal metrology organizations. Learn more about OIML at the website at http://www.oiml.org and the WMD website at http://www.nist.gov/owm. Dr. Charles Ehrlich, Group Leader of the International Legal Metrology Group (ILMG), can be contacted at charles.ehrlich@nist.gov or at (301) 975-4834 or by fax at (301) 975-8091.

Please note: OIML publications are available without cost at http://www.oiml.org.

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Table BGlossary of Acronyms

BIML	International Bureau of Legal Metrology	IWG	International Working Group
CD	Committee Draft ¹	MAA	Mutual Acceptance Arrangement
CIML	International Committee of Legal Metrology	OIML	International Organization of Legal
			Metrology
D	Document	R	Recommendation
DD	Draft Document ²	SC	Technical Subcommittee
DR	Draft Recommendation ²	TC	Technical Committee
DoMC	Declaration of Mutual Confidence	USNWG	U.S. National Work Group
ILMG	International Legal Metrology Group	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 and DR: draft documents 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 Number)

I. Report on the Activities of the OIML Technical Committees

This section reports on recent activities and the status of work in OIML Technical Committees (TCs) and Technical Subcommittees (SCs) of specific interest to members of NCWM. Also included are schedules of future activities of the Secretariats, the U.S. National Work Groups (USNWGs), and the International Work Groups (IWGs) of the Committees and Subcommittees.

TC 3/SC 1 "Pattern Approval and Evaluation" (United States)

The subcommittee approved the U.S. proposal for a combined revision of OIML D 19 "Pattern evaluation and pattern approval" and D 20 "Initial and subsequent verification of measuring instruments and processes" into a single document entitled "Principles of metrological control of measuring instruments: type approval and verification." Key elements of OIML D 3 "Legal qualification of measuring instruments," R 34 "Accuracy classes of measuring instruments," and R 42 "Metal stamps for verification officers" will also be incorporated into the combined revision of OIML D 19 and D 20. The revised documents will incorporate recent developments such as the OIML certificate system, D 27 "Initial verification of measuring instruments utilizing the manufacturer's quality management system," and the "Framework for a mutual acceptance arrangement (MAA) on OIML type evaluations." Consideration will be given to the appropriate conformity assessment options developed by the ISO Council Committee on Conformity Assessment (ISO CASCO), including quality systems, product certification, and accreditation. Consideration will also be given to information technology and statistical methods to increase or decrease verification intervals based upon proven instrument performance. For more information on this activity, contact Dr. Ambler Thompson at (301) 975-2333 or at ambler@nist.gov.

TC 3/SC 5 "Conformity Assessment" (United States and BIML)

The subcommittee plans a meeting May 27 - 30, 2008, to begin revision of the documents B3 (Certificate System) and B10 (MAA). The meeting will also include discussion of a new document on the incorporation of measurement uncertainty into conformity assessment decisions in legal metrology. For more information on this activity, contact Dr. Charles Ehrlich at (301) 975-4834 or at charles.ehrlich@nist.gov.

TC 5/SC 2 Software (Germany and BIML)

A 1 CD of OIML "General requirements for software-controlled measuring instruments" was received in June 2007 and circulated to the NCWM Software Sector and other interested U.S. parties. The U.S. comments on the 1 CD were submitted to the International Secretariat in September 2007. There will be a meeting of the OIML Software subcommittee in Berlin in December 2007. When complete, the OIML document will serve as guidance for software requirements in International Recommendations by OIML technical committees. The ILMG participated in NCWM Software Sector meetings in Little Rock, Arkansas, and Lake Tahoe, California, in October and May 2007, respectively. Please contact Dr. Ambler Thompson at (301) 975-2333 or at ambler@nist.gov if you would like to receive information and participate in this project.

TC 8/SC 1 "Static Volume and Mass Measurement" (Austria and Germany)

The subcommittee Secretariat plans to have three documents completed and ready for a CIML postal ballot in 2008: OIML R 71 "Fixed storage tanks," R 80 "Road and rail tankers," and R 85 "Automatic level gages for measuring the level of liquid in fixed storage tanks." The Secretariat circulated a 3 CD for R 80 in November 2006 and a 3 CD of R 85 in December 2006. U.S. vote and comments on R 80 and R 85 were returned in February 2007, and a subcommittee meeting was held in March 2007 in Vienna, Austria. Progress was made on all three documents in Vienna. A 3 CD of R 71 was received in July 2007, and a 4 CD of R 85 was received in August 2007. Please contact Ralph Richter at (301) 975-3997 or at 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) OIML R 117-1 "Dynamic measuring systems for liquids other than water, Part 1: Metrological and technical requirements" has undergone an extensive revision. The Recommendation obtained 100 % international "yes" votes

and final CIML approval at the CIML meeting in Shanghai, China, in October 2007. The revision incorporates new instrument technologies and includes a merger with OIML Recommendations R 86 "Drum meters" and R 105 "Mass flowmeters." After publication of R 117-1, Recommendations R 86 and R 105 will be withdrawn. The ILMG has worked closely with the USNWG on flowmeters, Germany, and the Netherlands on this effort. Meetings of the USNWG on flowmeters were held during the NCWM Interim Meeting in January 2007 in Jacksonville, Florida, and the NCWM Annual Meeting in July 2007 in Utah. Measurement Canada has also been a strong contributor to this effort. Subcommittee work on R 117-2 "Test methods" and R 117-3 "Test report format" has begun. If you have any questions, would like a copy of the R 117-1 DR, or would like to participate in the next phases of this project, please contact Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov.

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

In July 2007 the Secretariat (U.S.) requested that Participating members and U.S. stakeholders decide if there was sufficient justification for opening a new project to revise R 81 "Dynamic measuring devices and systems for cryogenic liquids." The response received by the Secretariat indicated that a revision of R 81 was justified 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; (3) Annex C to include current recommendations for density equations; and (4) existing sections into three distinct parts similar in format to recently-developed OIML Recommendations.

Subsequently, the Secretariat submitted a proposal to the BIML requesting approval for the start of a new project to revise R 81. The BIML submitted the proposal at the October 2007 42^{nd} Meeting of the CIML and was granted approval of the project. The Secretariat will ask members of TC 8/SC 6 to review and formally comment on R 81. The Secretariat will form a National Work Group to establish a U.S. position on the appropriate updates to the document by spring 2008. To obtain more information or to participate in this project, please contact Juana Williams at (301) 975-3989 or juana.williams@nist.gov.

TC 8/SC 7 "Gas Metering" (Netherlands)

In October 2007, the CIML approved the merger of TC 8/SC 7 (with France and Belgium as co-secretariats) and TC 8/SC 8 "Gas meters" (with Netherlands as secretariat). Netherlands has assumed responsibility of this newly merged technical subcommittee. In April 2007, a DR of the new Recommendation "Measuring systems for compressed natural gas (CNG) for vehicles" was circulated with annexes covering performance tests for electronic devices and basic test procedures. The postal ballot on this Recommendation failed, but the Recommendation was approved by the CIML in October 2007. The United States voted "no" on both the postal ballot and at the CIML meeting because some of the system testing requirements were considered to be excessive and very expensive.

Also in April 2007 a postal ballot was circulated on another new Recommendation "Measuring systems for gaseous fuel" and U.S. comments were submitted in June 2007. This Recommendation is intended for large pipelines with large flow rates and high operating pressures. The postal ballot on this Recommendation also failed, but the Recommendation was approved by the CIML in October 2007.

The final draft of OIML R 137-1 "Gas meters" was approved by the CIML at their October 2006 meeting in Cape Town, South Africa. Published in 2007, OIML R 137-1 combines and replaces three old Recommendations that will soon be withdrawn: R 6 "General provisions for gas volume meters," R 31 "Diaphragm gas meters," and R 32 "Rotary piston gas meters and turbine gas meters." Development of R 137-2 "Test methods" is now underway. Please contact Ralph Richter at (301) 975-3997 or ralph.richter@nist.gov if you would like to obtain a copy of any of these gas measurement documents or if you would like to participate in future work of this subcommittee.

TC 9 "Instruments for Measuring Mass" (United States)

The Secretariat to OIML R 60, "Metrological regulation for load cells" (U.S.) will send a questionnaire to the members of OIML TC 9 and the USNWG requesting input on whether or not to recommend a project be established to revise R 60 once the final version of R 76 is published. The questionnaire will ask for feedback on everything from the basic principles of R 60 (e.g., tolerances and accuracy classes) to exploring the addition of new requirements. For more information on these efforts, please contact Steve Cook at (301) 975-4003 or steven.cook@nist.gov.

TC 9/SC 1 "Nonautomatic Weighing Instruments" (Germany and France)

The revision of R 76 "Non-automatic weighing instruments" is of major importance to U.S. interests because the Recommendation serves as the foundation for a majority of the laws and regulations that govern weighing instruments around the world. The revision includes new language addressing metrological controls for type evaluations, conformity, initial and subsequent inspections, suitability of separable components and requirements for metrological software. The USNWG was consulted concerning proposals to harmonize NIST Handbook 44 and R 76. As reported at the 2007 NCWM Interim Meeting, the DR of R 76-1 was approved by the CIML in October 2006. Most recently, the United States voted "yes" on the DR of R 76-2 "Test report format." It is anticipated that the revision of R 76 will be published and posted on the OIML website prior to the 2008 NCWM Interim Meeting. For more information on these efforts, please contact Steve Cook at (301) 975-4003 or steven.cook@nist.gov.

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

The Recommendation R 134-1 "Automatic instruments for weighing road vehicles in motion – total load and axle weighing" was approved by CIML in October 2006 with the agreement that U.S. comments concerning terminology and document scope were to be incorporated before publication. The test report format of this document, R 134-2, has been approved by the subcommittee and is going through a final editorial process at the BIML.

The 3 CD of R 106 Parts 1 and 2, "Automatic rail-weighbridges" were distributed by the Secretariat to members of TC 9/SC 2 on September 25, 2007. Comments and vote are due February 11, 2008. In distributing the 3 CD, the Secretariat commented that although the 2 CD achieved majority approval, there were substantial comments and some amendments to the technical requirements of the 2 CD which did not make the draft suitable for issue as a Draft Recommendation. The subcommittee approved a revision of R 107 "Discontinuous totalizing automatic weighing instruments (totalizing hopper weighers)," and approval was granted on the 1 DR at the October 2007 42^{nd} Meeting of the CIML. If you would like to receive copies of these documents or work on these projects, Richard Harshman is the contact at (301) 975-8107 or at harshman@nist.gov.

TC 17/SC 1 "Humidity" (China)

The Secretariat (China) is working closely with the United States and 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 NTEP Grain Sector. A 4 CD was circulated to the IWG in August 2006. U.S. comments on the 4 CD were returned to the Secretariat in November 2006. A TC 17/SC 1 meeting was hosted by NIST in September 2007 to discuss the comments to the 4 CD. At the TC 17/SC 1 September 2007 meeting, the subcommittee also discussed harmonization of the Recommendation for moisture with the TC 17/SC 8 subcommittee's Recommendation for protein. Please contact Diane Lee at (301) 975-4405 or at diane.lee@nist.gov if you would like to participate in this work group.

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

A new subcommittee has been formed to study the issues and write a working draft document "Measuring instruments for protein determination in grains." Australia is the Secretariat for this new subcommittee. A work group meeting was held in September 2006 in Ottawa, Canada, to discuss comments on the 1 CD. A TC 17/SC 8 meeting was hosted by NIST in September 2007 to discuss the 2 CD. At the September 2007 meeting the TC 17/SC 8 subcommittee also discussed comments concerning the maximum permissible errors (MPEs) and harmonization of the TC 17/SC 8 Recommendation for protein with the TC 17/SC 1 Recommendation for moisture. Please contact Diane Lee at (301) 975-4405 or at diane.lee@nist.gov if you would like to participate in this work group.

OIML Mutual Acceptance Arrangement (MAA)

Note: The report on the OIML Mutual Acceptance Arrangement (MAA) has moved. It can now be found in Item 2 of the NTEP Section of the NCWM Pub 15. For further information on the MAA and its implementation, please contact Dr. Charles Ehrlich at charles.ehrlich@nist.gov or at (301) 975-4834 or by fax at (301) 975-8091.

II. Report on the 42nd CIML Meeting in Shanghai, China, October 24 - 26, 2007

The International Committee of Legal Metrology (CIML) opened with addresses given by Mr. Li Chuanqing, Minister of the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic

of China (AQSIQ), Mr. Zhou Taitong, Deputy Mayor of Shanghai, and Mr. Alan E. Johnston, CIML President. A quorum was reached as 48 Member States out of 59 were present or represented at the meeting.

The Committee noted that two new Corresponding Members, the United Arab Emirates and Sudan, had joined the OIML in the past year.

The CIML gave final approval to the following publications in China:

- Combined Revision of R 4, R 29, R 45 and R 96 "Vessels for commercial transactions"
- Combined Revision of R 117, R 105 & R 86 "Dynamic measuring systems for liquids other than water, Part 1: Metrological and technical requirements"
- New OIML Recommendation "Compressed gaseous fuel measuring systems for vehicles" (the United States and the Netherlands voted "no" on this document, based on input from industry; also see below about a new work project to immediately begin revising this document)
- New OIML Recommendation "Measuring systems for gaseous fuel"
- Revision of R 21 "Taximeters"
- Revision of R 107-1 "Discontinuous totalizing automatic weighing instruments (totalizing hopper weighers), Part 1: Metrological and technical requirements Tests, and Part 2: Test report format" (the United States voted "yes", but indicated that the "automatic zero-tracking feature" is not permitted in the United States)
- Revision of R 35 "Material measures of length for general use, Part 1: Metrological and technical requirements"
- Amendment 2 to D 2 "Legal units of measurement"

The CIML took action on the following publications:

- Recommendation R 24 "Standard one meter bar for verification officers" was re-confirmed
- Document D 4 "Installation and storage conditions for cold water meters" was withdrawn

The CIML approved the following new work projects:

- Project to revise R 79 "Labeling requirements for pre-packaged products"
- Project to revise R 81 "Dynamic measuring devices and systems for cryogenic liquids"
- Project to revise R 66 "Length measuring instruments"
- Project to revise the new OIML Draft Recommendation "Compressed gaseous fuel measuring systems for vehicles"—a new work item in (the newly merged) TC 8/SC 7. (This revision should address U.S. concerns about this document.)

The CIML also approved the following proposals in China:

- Proposal to merge subcommittees TC 8/SC 7 Gas metering and TC 8/SC 8 Gas meters, with the Netherlands as the Secretariat of the combined subcommittee
- Proposal to reallocate the responsibility for Measuring Container Bottles from TC 8 to TC 6.

The Committee noted efforts by the <u>Conformity to Type Work Group</u>. The WG is in the early stages of developing a project to study the issue of conformity to type on a global basis. The WG conducted two surveys on the subject in the past year, but survey results have thus far proved to be inconclusive as to how OIML should proceed on this. Further study will proceed. A few countries have indicated they will be conducting some tests about this, although this is not a formally sanctioned OIML activity.

The Committee also took note of a presentation given by the BIML Director concerning the development of the first draft tables of correspondence between OIML Recommendations and the applicable requirements in the European <u>Measuring Instruments Directive (MID)</u>. The Bureau plans to continue its cooperation with WELMEC on this issue and requested the European participants of the appropriate TCs/SCs to assist in this effort as soon as a Recommendation reaches DR status.

The CIML presented Awards to the following individuals in recognition of their outstanding contribution to legal metrology:

- Mr. Romain Eggermont (Belgium)
- Mr. Gerard Lagauterie (France)
- Mr. Wayne Stiefel (United States)
- Mr. Ali Tukai (Tanzania)
- Mr. Bruno Vaucher (Switzerland)

It also gave Letters of Appreciation to:

- Mr. Peter Brandes (Germany)
- Dr. Charles Ehrlich (United States)
- Mr. Mikhalchenko Vassily Nikolaevich (Kazakhstan)

III. Future OIML Meetings

The 13th OIML Conference and the 43rd CIML Meeting will be held in Sydney, Australia, in October 2008, and the CIML accepted Kenya's invitation to hold the 44th CIML Meeting in 2009.

IV. Regional Legal Metrology Organizations

Meeting of the SIM General Assembly

The SIM General Assembly was held in Ottawa, Canada, in September 2007. Dr. Huberto S. Brandi, Director of Scientific and Industrial Metrology (SIM) at INMETRO Brazil, is the SIM President (elected last year). Marcos Senna (senna@inmetro.rs.gov.br), also of INMETRO in Brazil, was announced this year as the new Chairman of the SIM Legal Metrology Work Group (LMWG).

APLMF Meeting

The 14th APLMF Meeting was held October 18 - 20, 2007, in Zouzhuang, China (just outside of Shanghai). The United States was represented by Dr. Charles Ehrlich, who serves as Chairman of the APLMF Work Group on Mutual Recognition Arrangements, and Mr. Wayne Stiefel. The APLMF conducted three training courses/seminars in 2007, including a train-the-trainer course on the verification of Mechanical Weighing Scales. A workshop on Metrology of Agricultural Products and Foods was held February 7 - 9, 2007, in Chiang Mai, Thailand, and a Seminar on Electricity Meters was held March 19 - 22, 2007, in Shanghai. The Peoples Republic of China assumed the Presidency and Secretariat of the APLMF at the conclusion of this year's meeting. The next meeting of the APLMF will be in late October 2008 in Sydney, Australia, just prior to the 43rd CIML meeting.

Associate Membership Committee (AMC) Interim Agenda January 2008

- Call to Order
- Approval of July 9, 2007, AMC Minutes
- Financial Condition
- NCWM Industry Rep Reports

Board of Directors Report (Bob Murnane)

Professional Development Report (Dave Wankowski)

Laws & Regulations Report (Pete O'Bryan)

• AMC Fund Disbursement Requests

2007 Training Funds Report

New Training Requests

2008 Special Event

- Agenda Review Report
- Recommendations for AMC members on PDC and L&R
- Old Business
- New Business
- Adjournment

Chris Guay, Procter & Gamble, Chair (2010) Paul Lewis, Rice Lake Weighing Systems, Vice Chair (2009) Michael Gaspers, Farmland Foods, Inc, Secretary/Treasurer (2009)

Darrell Flocken, Mettler-Toledo (2008) Cary Frye, International Dairy Foods Assoc. (2008) Thomas Herrington, Nestle USA (2010) Dave Wankowski, Kraft Foods (2012) Doug Biette, Sartorius North America (2012)

ASSOCIATE MEMBERSHIP COMMITTEE

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Laws and Regulations Committee Interim Agenda

Vicky Dempsey, Chairman Montgomery County, Ohio

Reference Key Number

200 INTRODUCTION

The Laws and Regulations Committee (Committee) will address the following items at its Interim Meeting. Table A identifies agenda items by Reference Key Number, title, and page number. The first three digits of the Reference Key Numbers of the items are assigned from the subject series listed below. The fact that an item may appear on the agenda does not mean it will be presented to the NCWM for a vote; the Committee may withdraw some items, present some items for information and further study, issue interpretations, or make specific recommendations for changes to the publications listed below. The recommendations presented in this agenda are statements of proposal and not necessarily recommendations of the Committee. The appendices to the report are listed in Table B.

This agenda contains recommendations to amend National Institute of Standards and Technology (NIST) Handbook 130, "Uniform Laws and Regulations," (2008), and NIST Handbook 133, "Checking the Net Contents of Packaged Goods," (2005) Fourth Edition. Revisions proposed for the handbooks are shown in **bold face print** by crossing out information to be deleted and <u>underlining</u> information to be added. Additions proposed for the handbooks are designated as such and are shown in **bold face print**. Proposals presented for information only are designated as such and are shown in *italic* type. "SI" means the International System of Units. "FPLA" means the Fair Packaging and Labeling Act. The section mark, "§," is used in most references in the text and is followed by the section number and title, (for example, Section 1.2. Weight). When used in this report, the term "weight" means "mass."

For this Agenda CWMA means the Central Weights and Measures Association; NEWMA means the Northeastern Weights and Measures Association; SWMA means the Southern Weights and Measures Association and WWMA means the Western Weights and Measures Association.

Subject Series

INTRODUCTION	
NIST Handbook 130 – General	
Uniform Laws	
Weights and Measures Law (WML)	
Weighmaster Law (WL)	
Engine Fuels, Petroleum Products, and Automotive Lubricants Inspection Law (EFL)	
Uniform Regulations	
Packaging and Labeling Regulation (PLR)	
Method of Sale Regulation (MSR)	
Unit Pricing Regulation (UPR)	
Voluntary Registration Regulation (VRR)	
Open Dating Regulation (ODR)	
Uniform National Type Evaluation Regulation (UNTER)	
Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation (EFR)	
Examination Procedure for Price Verification	240 Series
Interpretations and Guidelines	

NIST Handbook 133	
Other Items	

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Table CGlossary of Acronyms

API	American Petroleum Institute	NEWMA	Northeast Weights & Measures Association
ATC	Automatic Temperature Compensation	NTEP	National Type Evaluation Program
CWMA	Central Weights & Measures Association	S&T	Specifications & Tolerances Committee
HB 44	NIST Handbook 44	SMA	Scale Manufacturers Association
HB 130	NIST Handbook 130	SWMA	Southern Weights & Measures Association
HB 133	NIST Handbook 133	WG	Work Group
L&R	Laws & Regulations Committee	WMD	NIST Weights & Measures Division
NCWM	National Conference on Weights &	WWMA	Western Weights & Measures Association
	Measures		

Daily Schedule

Sunday, January 27 1:30 p.m 2:45 p.m.	Committee Review Session: This session is open to all NCWM members but participation in discussions is usually limited to members of the Committee.	
2:45 p.m 5:00 p.m.	Moisture Loss Working Group – Participation is open to all NCWM members.	
Monday, January 28	L&R Committee Open Hearings: Comments will be accepted on the following topics during the L&R Committee session:	
8:30 a.m 5:00 p.m.	 232 Method of Sale of Commodities Regulation 270 Other Items – Developing Items 	
Tuesday, January 29 8:30 a.m 12:00 p.m.	Committee Open Hearings (continued): Comments will continue to be accepted on the above topics if the session is not completed on Monday.	
1:00 p.m 5:00 p.m.	Committee Work Session: This session is open to all NCWM members but participation in the discussions is usually limited to members of the Committee.	
Wednesday, January 30 8:30 a.m 11:00 a.m.	Committee Work Session: This session is open to all NCWM members but participation in the discussions is usually limited to members of the Committee.	
11:00 a.m 12:00 p.m.	Joint Session with all Standing Committees	

Details of all Items (In order by Reference Key Number)

232 METHOD OF SALE REGULATION

232-1 Automatic Temperature Compensation (ATC) for Petroleum Products

This item is presented in two parts. Part I includes a proposed method of sale developed by the NCWM Automatic Temperature Compensation Steering Committee (ATCSC). Part II, which was not adopted at the Annual Meeting, includes the original recommendation for a method of sale developed by the Committee at the 2007 Interim Meeting.

At the 2008 Interim Meeting the Committee will consider the recommendations and comments received from the regional weight and measures associations (which are provided below) and accept comments on both its original proposal and on the following proposal from the ATCSC.

Part I. Automatic Temperature Compensation Steering Committee (ATCSC) Background and Recommended Method of Sale

Background: The ATCSC held a meeting August 27 - 29, 2007, in Chicago, Illinois to address issues associated with potential implementation of automatic temperature compensation for retail motor fuel. Valuable input was received during that meeting from marketers, manufacturers, consumers, and regulatory officials. Following the meeting, the ATCSC continued to receive input from the four regional weights and measures associations.

It is not the charge of the ATCSC to endorse or oppose the implementation of ATC at retail. Instead, the ATCSC is charged with addressing issues associated with the implementation of ATC to assist the NCWM membership in coming to consensus on the issue. The proposals of the ATCSC reflect the Committee's opinion on the best approach to ATC if NCWM votes to implement it.

The ATCSC considered the following discussion points in forming a proposal for the Method of Sale Regulation:

1. Permissive vs. Mandatory ATC

In cold climates voluntary introduction of ATC can be fairly successful. In regions where fuel temperatures average below 60 °F, a retailer who implements ATC could lower the unit price while maintaining the same profit margin. This acts as an enticement for retailers to take that step. Conversely, in regions where fuel temperatures average above 60 °F, retailers would find it necessary to raise the unit price to maintain profit margins. As a result, it could be expected that, under a permissive implementation, cooler regions will see implementation of ATC while warmer climates will not. In regions where there is no definite advantage one way or the other, it is possible that consumers will find price and quantity comparisons impossible between retail outlets that compensate and outlets that do not.

The preamble to the Method of Sale Regulation states, "The purpose of this regulation is to require accurate and adequate information about commodities so that purchasers can make price and quantity comparisons." The ATCSC is convinced that introduction of ATC in the marketplace without making ATC mandatory is in direct conflict with the purpose of the Regulation. Therefore, the ATCSC proposal provides a transition to ATC where the equipment is made available, followed by a period of time when ATC may be implemented (turned on), followed by a date when ATC would be mandatory. The timeline for this transition should provide a reasonable timeframe for natural replacement of the majority of dispensers in the country.

Since it is unclear whether ATC would provide a cost savings to consumers in the United States, the ATCSC believes this decision must be based on what is known. ATC is a superior method of measurement that provides a higher degree of transparency in unit pricing. With mandatory ATC at retail, consumers would have assurance that, no matter where they choose to purchase motor fuel, the price stated represents a gallon at 60 °F. This level of transparency does not exist in a gross gallon market or a permissive ATC market. It is upon this premise that the ATCSC must make its decision.

2. Referencing 60 °F and 15 °C

The ATCSC realized that the difference between 60 °F and 15 °C is relevant and must be rectified. Testimony disclosed that many international markets have established 60 °F as the reference temperature. This practice is also implemented throughout the U.S. distribution of petroleum products. One option is to only reference 60 °F, but this approach conflicts with the NCWM's commitment to acknowledge the metric system. To balance the need to recognize the metric system without disrupting the current marketing practices throughout the production and distribution system in the United States, the ATCSC recommends reference temperature for both gallons and liters to maintain a common reference temperature in the United States when both gallons and liters are used. However, the ATCSC recognizes that when liters are used as the volume measurement unit in other countries, then the reference temperature of 15 °C is used. The ATCSC recommends that other parties provide input to the NCWM committees on this subject for further discussion.

3. Establish Standardized Product Densities for Calculating Volume Correction Factors

To implement ATC for retail motor fuel, we must agree on product densities to use in volume correction factors. In late July 2007, the ATCSC conducted an outreach to accumulate data on the densities for various products falling under ASTM Committee D02 standards across the United States. Outreach went to weights and measures jurisdictions, the Alliance of Automobile Manufacturers, and the American Petroleum Institute. The ATCSC also considered standard densities used in Canada for temperature compensation. The ATCSC set out to use this data to develop a single set of standard densities to be used throughout the country for volume correction factors. Details of this item can be reviewed in the reports of the ATCSC which are available at http://www.ncwm.net on the Internet.

There was much discussion whether to reference standard density as Canada has done, or reference standard API gravity as is done through much of the US petroleum market. Ultimately, the ATCSC has opted to reference standardized API gravity for the following products based on the density data it has reviewed.

- 62 API for gasoline, including ethanol blends up to E10
- 37 API for # 2 diesel, including biodiesel blends up to B20

More data are needed to determine standard densities for additional products such as No. 1 diesel, and higher blends of biodiesel and ethanol.

4. Disclosure – Street Signs, Dispensers, Receipts or Invoices, and Other Advertisements

Based on comments the ATCSC received, the following issues were considered regarding disclosure when ATC is in use.

- Terminology needs to be uniform to assist consumer recognition.
- Disclosure on street signs must be prominent to be seen and not too wordy to allow for easy recognition by motorists while operating their vehicles.
- Disclosure on the dispenser should be near the display of volume delivered.
- Any other advertising of unit price for motor fuel should also disclose if it represents the price of temperature-compensated volume.
- Examples were provided of disclosure labeling for dispensers in Canada for the ATCSC's consideration.

The ATCSC recommends a simple, uniform, and prominent display of "ATC" on street signs. It will eventually become understood and recognized by motorists. For disclosure on dispensers, receipts, or invoices, the ATCSC recommends the statement, "Volume corrected to 60 °F." This follows the model found in Canada and seems to be clear and concise.

5. Implementation

Following the August 27 - 29, 2007, meeting of the ATCSC, its members suggested several options to address the implementation of ATC in the United States. The ATCSC discussed the different proposals and comments made at the meetings of the regional weights and measures association meetings on this subject. While it is not the charge of the ATCSC to endorse or oppose the implementation of ATC at retail, it is charged with addressing issues associated with the implementation of ATC to assist NCWM membership in coming to consensus on the issue. Hence, the ATCSC decided to recommend a single option to the NCWM S&T and L&R Committees for consideration.

The recommended option is shown below:

Implementation Option:



¹⁰ years from date of adoption by NCWM

Discussion: The ATCSC believes that if temperature compensation is adopted for the retail sales of refined petroleum products, then the ultimate goal is to have mandatory use of ATC to provide a single method of sale for these products. The time period before mandatory use of ATC is a debatable point. The ATCSC suggests that 10 years after the adoption of an ATC method of sale, using temperature compensation should be mandatory. During the first 7 years after adoption, the use of ATC is controlled by the individual states based upon existing state laws and regulations. A relatively short period of time (2 years) is suggested during which new dispensers must be equipped with ATC capability before permissive use of ATC would be permitted. This will allow station owners to decide, based on their business needs and plans, when to buy dispensers equipped with ATC and this limits the time period during which they could not use the feature after being purchased. This requirement should be placed in NIST HB 44 as a nonretroactive requirement to address this design requirement.

The time period for the permissive use of ATC should be kept reasonably short to reduce the time during which potential confusion will exist in the marketplace when both compensated and uncompensated sales may occur. One year is suggested for the time period for the permissive use of ATC. The ATCSC discussed whether or not to have different implementation dates for large and small service stations based upon throughput. The ATCSC decided to recommend a single implementation date for all service stations to reduce the time period during which gasoline and diesel fuel will be sold in compensated and uncompensated volumes. A short time period must be provided for the permissive use of ATC since time is needed to activate the ATC capability in dispensers equipped with ATC and for service companies and weights and measures officials to test the accuracy of dispensers equipped with ATC before the mandatory use of ATC is required.

Under this implementation plan there will be a 7-year period of continued uncertainty regarding the legal method of sale of these products. Some have argued that the lack of definitive language setting a method of sale means that any volume unit is acceptable, compensated or uncompensated. This is based on the principle that laws proscribe activity. All other activities, not proscribed, are legal. There are alternative interpretations. Another interpretation may be that the broad policy change made by the NCWM in 1969 and 1970 in adopting specific language on ATC use in NIST HB 44 was clear and was directed specifically, and solely, to wholesale sales of petroleum products and both wholesale and retail sales of LPG products. The ATCSC believes that inevitably each state will have to resolve this issue unless it is resolved in a decision on federal class action suits.
Alternative Proposal for a Method of Sale for Engine Fuels and Non-Engine Fuels

Source: The NCWM Automatic Temperature Compensation Steering Committee (ATCSC).

2.31. Engine Fuels and Non-Engine Fuels

2.31.1. Definitions.

- **2.31.1.1.** Engine fuel means any liquid or gaseous matter used for the generation of power in an internal combustion engine.
- 2.31.1.2. Non-engine fuel means any liquid or gaseous matter used for the generation of heat, power, or similar uses.
- **2.31.1.3.** Temperature correction. means the process of correcting volume measurements at any temperature to an equivalent volume at a reference temperature.
- **2.31.1.4.** Net volume means the volume after temperature correction.
- 2.31.1.5. Gross volume means a volume measurement that has not been subject to temperature correction.

2.31.2. Quantity.

- 2.31.2.1. Quantity, Wholesale Transactions.
 - (a) All engine fuels and non-engine fuels shall be sold, offered, or exposed for sale to wholesale customers either in terms of liquid volume in liters or gallons or barrels, or in terms of liquid volume automatically temperature corrected to 60 °F (15.56 °C) in liters or gallons or barrels.
 - (b) Effective January 1, 2XXX, all engine fuels and non-engine fuels shall be sold, offered, or exposed for sale to wholesale customers in terms of liquid volume automatically temperature corrected to 60 °F (15.56 °C) in liters or gallons or barrels.
 - (c) When engine fuels and non-engine fuels are sold temperature corrected to wholesale customers:
 - (1) Correction shall be made automatically for the fuel temperature either based on the fuel standard density and reference tables specified in Table 2.31.X. or based on the actual measured density of the fuel and using reference tables specified in Table 2.31.X.
 - (2) If using a measured density, the seller shall maintain records of the density determination for one year and shall make those records available for inspection by a weights and measures official on request during normal business hours.
 - (3) All primary indications of net volume quantities on measuring devices and all receipts, invoices, bills of lading, and other transfer documents shall clearly and conspicuously identify net volume quantities with the unit of measure and the terms "Volume corrected to 60 °F" or "Volume corrected to 15.56 °C."
 - (4) Unless otherwise agreed to by both the buyer and seller in writing, engine fuels and nonengine fuels sold temperature corrected shall be sold in that manner over at least a consecutive 12-month period.

- 2.31.2.2. Quantity, Retail Transactions.
 - (a) Effective January 1, 2XXX, all engine fuels and non-engine fuels identified in Table 2.31.X shall be sold, offered, or exposed for sale to retail customers either in terms of liquid volume in liters or gallons, or in terms of liquid volume automatically temperature corrected to 60 °F (15.56 °C) in liters or gallons.
 - (b) Effective January 1, 2XXX, all engine fuels and non-engine fuels identified in Table 2.31.X shall be sold, offered, or exposed for sale to retail customers in terms of liquid volume automatically temperature corrected to 60 °F (15.56 °C) in liters or gallons.
 - (c) When engine fuels and non-engine fuels are sold temperature corrected to retail customers:
 - (1) Correction shall be made automatically for the fuel temperature based on the fuel standard density and reference table in Table 2.31.X.
 - (2) All primary indications on measuring devices and all receipts, invoices, and other transfer documents shall clearly and conspicuously identify net volume quantities with the unit of measure and the terms "Volume corrected to 60 °F" or "Volume corrected to 15.56 °C."
 - (3) If a fuel is sold temperature corrected from a measuring device at a business or fleet location, all sales of the same fuel from that business or fleet location shall be sold temperature corrected over at least a consecutive 12-month period.
 - (4) All unit price advertisements shall be clearly and conspicuously marked with the term "ATC."

Table 2.31.X. Reference Tables and Fuel Densities for Temperature Correction						
Fuel	Reference Table for wholesale or retail temperature correction	Standard Fuel Density for retail transactions (optional density for wholesale transactions)				
Gasoline, gasoline- oxygenate blends (3.7 mass % oxygen, max.), gasoline ethanol blends (10 vol. %, max.)	API Table 6b	62 API (730 kg/m ³)				
Diesel Fuel (grade 2-D), biodiesel blends (20 vol. % biodiesel, max)	API Table 6b	37 API (840 kg/m ³)				
Other fuels TBD						

Part II. Permissive Temperature Compensation for Refined Petroleum Products and Other Fuels

(The following text describes the original proposal which was returned to the Committee after it was not adopted at the 2007 NCWM Annual Meeting.)

Sources: The Southern Weights and Measures Association (SWMA), the Western Weights and Measures Association (WWMA), and the Central Weights and Measures Association (CWMA).

Note: This or similar proposals which have been on the Committee's agenda for several years were reviewed by each of the regional weights and measures associations. The review process resulted in the submission of several different proposals and numerous comments and suggestions for the Committee to consider. Everyone expressed concern over the scope, cost and impact of establishing a method of sale for petroleum products which required temperature compensation. This subject was widely discussed by the NCWM at public forums dating back more than 30 years. A similar proposal was made by NEWMA as recently as 2000, but the Committee withdrew it in 2001. NEWMA noted at that time that Pennsylvania, New Hampshire, Maine, and Canada permit temperature-compensated sales of products like home heating fuel and retail gasoline. Additional historic and background information is available in previous editions of the Committee's agenda. For recent discussions on this subject see Item 232-1 in the L&R report of the 91st NCWM Annual Meeting in 2006 at www.nist.gov/owm on the Internet. It is also available on a searchable DVD format on NIST Special Publication 979 "Reports of the National Conference on Weights and Measures 1905 to 2006," (November 2006) which is available from NIST.

Recommendation: At its 2007 Interim Meeting the Committee received correspondence from consumer groups and other organizations and heard testimony from weights and measures officials, the petroleum industry (including API), consumers and others regarding temperature compensation of refined petroleum products. The Committee appreciates all of the data, discussion, and especially the high level of interest. The Committee acknowledges the media attention this item has drawn, and the members were pleased to learn that some agricultural commissioners and other policy makers, as well as some governors and state attorneys general, have expressed interest in temperature compensation.

Proponents for the item spoke of a need to improve the accuracy of measurements of petroleum products because of their cost and of the need to improve accountability, while opponents spoke to the cost of implementing temperature compensation and the potential for confusion in the marketplace. The Committee also was made aware of legislation under consideration in Missouri and Texas that would establish different definitions for a gallon based on the ambient temperature in varied areas of the states. The Committee was especially sensitive to concerns expressed by weights and measures inspectors about the potential cost and increased inspection time they may expend if temperature compensation is allowed in all applications, especially at the retail level.

The Committee duly considered the presentations, discussions, letters, data, media stories, comments received at public hearings and in hallways, and the proposed legislation. The NCWM has posted this information and information on the activities of its ATCSC at http://www.ncwm.net/ on the Internet.

Following is a list of justifications for adopting a standard that will facilitate the implementation of an orderly yet permissive approach to allowing broader use of temperature compensation in the marketplace:

- Cost of fuel has led to increased consumer and business interest in better methods of measurement, inventory control, and accountability. By now everyone has realized or should realize that ambient temperatures are but one factor which impacts the volume of any liquid. Thus, basing a state's temperature-compensation program on regional ambient temperatures is not a technically valid approach to addressing the issue.
- The use of dual-wall storage tanks and deliveries of fuel directly from refineries result in higher temperature product.
- Awareness and concerns over the impact of temperature on the cost of fuel has come about at the same time advances in technology such as electronics and software have made compensation possible in both new and existing measuring devices at lower costs.
- Consumer requests that temperature compensation be used for improved measurement accuracy, especially in high volume deliveries, have increased.
- The dramatic growth of public interest in recent years is evidenced by articles in many newspapers and widely-read magazines such as *Scientific America*. This national conversation about energy has led to greater consumer awareness, as well as interest on the part of political leaders, of energy issues and has contributed to creating an opportunity for change.

After a thorough discussion and polling by its chairman, the Committee was unanimous that it would recommend to the NCWM the adoption of a method of sale for refined petroleum products and other fuels. This would allow industry the option of selling these products on the basis of temperature-compensated sales. While the decision to

submit the permissive temperature-compensated method of sale for NCWM consideration was unanimous, the representative from the CWMA supported going forward with the recommendation but did not agree with including retail sales in the scope of the regulation. The Committee ultimately decided it was in the best interest of the U.S. commercial measurement system if the NCWM adopted a standard that would provide guidance to states considering legislation in this area, thus supporting the work of the S&T Committee, NTEP and others to develop technical requirements and test procedures for both type approval and field testing for devices equipped with temperature compensation. The Committee believes those efforts were critical to facilitating the introduction of temperature compensation to the marketplace, especially in NTEP states as the NCWM learned there were no retail motor-fuel dispensers available with Certificates of Conformance that included temperature compensation functions.

The following topics/considerations were addressed by the Committee:

1. Temperature Compensation was Already Legal for Use in Trade unless Prohibited by State or Local Requirements.

The Committee was aware that temperature compensation was already required or permitted in a number of states for vehicle-tank meters, liquefied petroleum gas, and wholesale deliveries to retailers, and that it had been used in the marketplace in these applications for decades. At the WWMA Annual Meeting, the State of California reported that for transactions involving 5000 gal or more, purchasers may request temperature compensation; Idaho said that for transactions involving 8000 gal or more, the purchaser had an option to buy, on a yearly basis, temperature-compensated product and that all terminal transactions were temperature; and currently the State of Hawaii was the only jurisdiction which has taken some action to account for temperature variations in retail sales. The Committee heard enough supportive comments from a broad base of weights and measures directors, inspectors and metrologists to recognize that temperature compensation may find broad acceptance in the marketplace, especially once the potential benefits it offers were realized and implementation costs fall.

The Committee also believed that, unless prohibited by state law, temperature compensation at retail dispensers was already legal in most states. Additionally, the Committee believed it would be difficult to argue against a measurement practice that could only improve the accuracy and reproducibility of a volumetric measurement. The Committee position was that legal metrology must not stand in the way of the marketplace striving to change the way fuels and other products were marketed and sold.

2. Under a Permissive Approach Consumers and Businesses will Decide Where and When to Implement Temperature Compensation.

The Committee was convinced the marketplace will best determine where and when the benefits from temperature compensation should be implemented to improve accuracy. The Committee recommended the adoption of a method of sale that would allow temperature compensation to be used in sales of petroleum products on a <u>permissive</u> (voluntary) basis, allowing the marketplace (e.g., industry, consumers, and other government agencies) to decide if and when it was appropriate to use temperature compensation in specific commercial applications (e.g., sales at truck stops). This recommendation was proposed solely for the purpose of ensuring the delivery of an accurate volume of petroleum at a specific reference temperature. It was not the intent of the Committee to attempt to define a standard energy content of a liter or gallon of gasoline or other engine fuel with this recommendation.

3. Temperature Compensation would be Permissive, but Controlled.

Although the Committee's recommendation allowed for permissive use of temperature compensation, it included mandatory provisions requiring compensation be made by automatic means to ensure the measured quantity was accurately determined. It also defined a temperature-compensated volume for both liters and gallons, requiring the posting of information on dispensers, street signs and on documents to ensure full disclosure and fair competition. Additionally, it required a business location to have all of the devices operating on temperature compensation on a year-round basis unless a written waiver was granted by the Director.

4. The Basis of the Committee's Recommendation was the Proposal from the WWMA.

The Committee's recommendation was based on the proposal submitted by the WWMA, which was developed at its 2006 Annual Meeting in Salt Lake City, Utah. The Committee made several amendments to the proposal but found it represented a well-reasoned foundation for the recommendation presented below. The CWMA L&R Committee supported the WWMA's proposal and supported submitting it to the NCWM for a vote. The CWMA agreed with the WWMA that temperature compensation is the most equitable method of sale, which is currently utilized at every step of distribution except for retail sales. Additionally, the CWMA believed the proposal should not be restricted only to petroleum products, but should also include alternative fuels such as E-85, biodiesel and biodiesel blends. The Committee's recommendation incorporated some of the CWMA's suggestions and included additional requirements to address many of the concerns raised issue at the 2007 NCWM Interim Meeting open hearings and discussions. For the purpose of this recommendation the Committee used the definition for "refined petroleum products" as presented in HB 130 Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Inspection Law which reads, "products obtained from distilling and processing of petroleum (crude oil), unfinished oils, recycled oils, natural gas liquids, refinery blend stocks, and other miscellaneous hydrocarbon compounds" with the understanding that its intent was that the requirements would apply when petroleum was blended with other products such as ethanol.

5. Full Disclosure will Allow Informed Consumers to Make Value Comparisons.

The Committee believes consumers, when educated through marketing and outreach efforts, will accept new technology and measurement practices. When provided with sound information, consumers will gain confidence that government oversight will prevent deceptive practices. The Committee believes that full disclosure provisions of the method of sale will reduce both unfair competition and consumer confusion. If, for example, a truck stop offers temperature-compensated sales of diesel fuel through high-speed dispensers for truckers, the road signs with price per unit of volume (e.g., gallon or liter) and dispensers must include a declaration that the volume is sold on the basis of temperature compensation. If the price per gallon is higher or lower than the usual price per gallon, consumers will be informed that the volume was compensated to a reference temperature. Several people expressed concern over marketplace confusion if diesel fuel were sold on the basis of both compensated and uncompensated volume. It is incorrect to say there would be two methods of sale for the same product under this recommendation just as it is inaccurate to say that some consumers will not receive a "full" gallon if temperature compensation is used as some opponents to this method of sale have claimed. The reality is that consumers will be able to compare price per gallon between stations and they will receive a "full" gallon as defined under the Method of Sale of Commodities Regulation. While confusion is possible with any method of sale, the Committee was not deterred by that possibility. If confusion occurs, the proper response is to educate consumers and address any changes identified from the confusion through further refinement of the method of sale. In this application, full disclosure will inform consumers that one product is sold on the basis of temperature compensation and one is not. When consumers are educated, they can make sound value comparisons between these choices just as they already make decisions when choosing between different brand name products, octane ratings, additive offerings, and types of fuels. Business and industry is also well equipped and very experienced in educating its customers whenever it chooses to introduce new products or services; so should they decide to use the method of sale, they are sure to introduce it using an informative marketing effort.

The Committee was urged to clarify that there may be situations in which there is a valid contract where the price is based on the fuel being sold on the basis of uncompensated measurement. The Committee agreed with the comment that if a purchaser operating under such a contract fills up at a location where the dispensers are temperature compensated, the contract should prevail in those transactions. Similarly, the Committee heard from API that it should permit either uncompensated or compensated methods of sale at loading-rack meters when such sales are under contract. The Committee believed its proposal will not interfere with the contracts or understandings that API described.

6. Costs

The Committee heard from some users that the lack of temperature compensation was costing them great sums of money while industry representatives said the cost of equipment and installation will cost industry and, ultimately, consumers even larger amounts of money. The cost of any NCWM action is a concern to the Committee which

must defend its actions on both sides of any issue. However, it is very difficult to give each side everything it wants in any recommendation. While the Committee was concerned about cost, it was skeptical of the economic claims from both sides in this debate. For example, at the 2007 Interim Meeting one estimate of the cost of implementing temperature compensation dropped nearly \$2 billion dollars once industry learned that an alternative technology was available in the marketplace.

That is but one illustration of the weaknesses the Committee saw in cost or damage claims over the years. It dates back to its work in the 1990s on the price verification procedures where some groups claimed that supermarkets were overcharging consumers billions of dollars a year. The Committee never saw data that supported such claims, yet the damage values received wide notice in the media. Some members of the NCWM may remember the claims made during Congressional consideration of the Metric Conversion Act of 1975 that changing to the metric system would cost billions of dollars. In reality those high costs never materialized, which was confirmed through several reliable studies. One reason Congress made conversion to the metric system voluntary was to allow industry to make changes as part of their normal equipment replacement cycle. The automotive industry, for instance, found it cost effective to make the change to metric units when purchasing replacement equipment. Advancements in technology also made conversions easier or allowed dual-unit displays on equipment as standard features. These factors were key contributors in reducing costs.

Each State Director in the NCWM determines whether or not to incorporate what is adopted by the NCWM into his or her state law or regulations, not the Committee. Even states that adopt the Method of Sale of Commodities Regulation by reference or citation can take action to exclude a specific section of a uniform regulation that conflicts with other requirements or policies. As for taking time for additional study, the NCWM record on consideration of the issue of temperature compensation dates back to the mid-1970s and has arisen for consideration every few years since that date. The Committee was aware of the history, the issues, the various points of view, and the potential costs of temperature compensation and believed it was time for the NCWM to move forward on temperature compensation by establishing standards by which this method of sale can be brought into the marketplace on a voluntary, yet controlled, basis. The Committee also heard that no action should be taken pending further studies. The Committee was wary of calls for no action pending another study or action by Congress.

As one speaker alluded to in his presentation, the marketplace is to some degree "intelligent" in that it helps address many factors through its price-setting function and can generally be trusted to balance costs and prices as well as justify investment in new technology and marketing practices if there is a need, demand or opportunity. A voluntary approach will allow early adopters to develop experience and pull advances in technology into the equipment market while competition and other factors will reduce costs even further if the method of sale is broadly adopted. The Committee believed a permissive approach to temperature compensation turned the choice over to the marketplace where, if consumer demand was sufficient, sellers would make a business decision to invest in the technology and marketing according to the new method of sale when the benefits offset costs.

7. Limiting the Option of Temperature Compensation to Specific Applications

The Committee received suggestions that temperature compensation be limited to certain applications or not be allowed in retail sales, but it did not hear sufficient justification for taking such positions. Temperature compensation is not new to the commercial measurement system. It is widely used in wholesale transactions in many jurisdictions, and consumers in many states have purchased LPG and oil for heating and other uses for decades on the basis of temperature-compensated sales. No information was presented to the Committee that its use in those applications has been anything but successful. The Committee recognizes that verifying devices with temperature compensation may require additional inspection time and require weights and measures officials to purchase thermometers or other equipment for testing. However, those factors are not sufficient justification to prohibit the marketplace from implementing this method of sale. If a jurisdiction adopts this method of sale and a business decides to use temperature compensation, the weights and measures agency would need to obtain funding to implement appropriate testing procedures to verify devices. However, the Committee would expect that innovation, risk-based testing, and random sampling techniques, as well as technology, would lessen the time required to conduct additional tests just as those factors have reduced the burden of testing many weighing and measuring instruments in the past.

8. Permissive vs. Mandatory Implementation

The Committee heard from the regional associations and others that temperature-compensated sales should be implemented on a permissive basis. The Committee opposed the inclusion of a future mandatory date at this time. The Committee believed temperature-compensated sales should be market driven and that suppliers will conduct sales on a compensated basis when consumers demand it and should not be required to do so before then. The Committee, based on the comments of many jurisdictions, believed the imposition of a mandatory requirement was too burdensome on the industry, requiring upgrades and possibly the replacement of many meters without adequate justification.

The Committee agreed that a mandatory requirement would not be justified at this point in time. The Committee felt it was important to get some form of regulation regarding temperature-compensated sales of petroleum into HB 130 and thought that as many barriers as possible should be removed in order to achieve that goal. Although the Committee's recommendation is a permissive requirement for temperature-compensated sales, the Committee was willing to consider establishing future mandatory dates if a justified need was demonstrated after this permissive regulation was implemented and used for a period of time.

9. Comments Reviewed by the Committee at the 2007 Annual Meeting

- a. The Committee noted that if the proposal was adopted at the 2007 Annual Meeting, it would go into effect January 1, 2008, in the eighteen jurisdictions that indicated they automatically adopt that regulation by reference or citation (see 2008 edition of NIST HB 130, "II Uniformity of Laws and Regulations" [page 9] for a list of those states). The Committee recognized that if the recommendation was adopted in July 2007, some jurisdictions might want to delay its implementation or exempt that particular section from being automatically adopted. Since, typically, rulemaking takes longer than six months to complete, the Committee debated whether or not it should include a delayed effective date of July 1, 2009, for this regulation but took no action on this issue.
- b. The Committee discussed the subject of unscrupulous retailers artificially heating fuels and the fact that this deceptive practice has occurred from time to time. The State of Arizona actually forbids the practice. The Committee considered if a prohibition on the artificial heating of fuels for the purpose of increasing volume at the time of sale should be added to the recommendation but took no action on this issue.
- c. The Committee asked to receive comments on whether or not the recommendation should allow the state director to grant (and, when justified, revoke) written waivers to some provisions if sufficient justification was provided by the business owner. The Committee discussed whether or not the requirement that all devices that dispense product at a location might result in a hardship for some retailers or difficulties in implementing the new method of sale for specific customers (e.g., over-the-road truckers). For example, if a station decided to sell gasoline and diesel fuel on a temperature-compensated basis but also had a dispenser for K-1 kerosene (from which limited sales were made), a waiver from the temperature-compensation requirement on all dispensers could be justified. Likewise, if a chain of truck stops decided to sell diesel fuel on a temperature-compensated basis through its high-output dispensers to truckers (e.g., its prime customers), but did not want to implement temperature-compensated sales through its gasoline dispensers, a waiver could also be justified. The purpose of the requirement that all devices at a single location be temperature compensated or not was to prevent a retailer from selling through the compensated or uncompensated dispensers when it benefited the seller. The Committee agreed flexibility was warranted and could make acceptance of the method of sale easier to implement but took no action on this issue.

Committee Recommendation: Amend the Method of Sale of Commodities Regulation in HB 130 by adding a new Section 2.30. Refined Petroleum Products:

2.30. Refined Petroleum Products – Permissive Temperature Compensation

2.30.1. Where not in conflict with other statutes or regulations, these products may be sold on the basis of temperature-compensated volume.

2.30.2. When products are sold on the basis of temperature compensated volume:

- (a) All sales shall be in terms of liters with the delivered volume adjusted to 15 °C or gallons with the delivered volume adjusted to 60 °F;
- (b) <u>Temperature compensation must be accomplished through automatic means.</u>

2.30.3. Full Disclosure Requirements

- 2.30.3.1 <u>The primary indicating elements of measuring devices, recording elements, and all</u> recorded or display representations (e.g., receipts, invoices, bills of lading, etc.) shall be clearly and conspicuously marked to show that the product was delivered on the basis of temperature-compensated volume;
- 2.30.3.2 When a product is offered for sale on the basis of temperature-compensated volume, street signs or other advertisements of its unit price must clearly and conspicuously indicate that the volume is temperature compensated.

2.30.4. Other Provisions

- 2.30.4.1 <u>At a business location all sales on a temperature-compensated basis shall be made</u> <u>continuously and for a period of not less than 12 months (e.g., a person may not engage</u> <u>the automatic-temperature compensator on a device only during certain times of the</u> <u>year to prevent the person from taking advantage of temperature compensation).</u>
- 2.30.4.2 At a business location which offers products for sale on the basis of a temperature-compensated volume, all measuring devices shall dispense on the basis of temperature-compensated volume (e.g., a person must not operate some devices at a location with automatic-temperature compensators and others without compensators to prevent them from taking advantage of temperature variations).

Annotations:

- 1. As defined in Handbook 130 Engine Fuels, Petroleum Products, and Automotive Lubricants Inspection Law, refined petroleum products are products obtained from distilling and processing of petroleum (crude oil), unfinished oils, recycled oils, natural gas liquids, refinery blend stocks, and other miscellaneous hydrocarbon compounds as well as Biofuels such as E-85 and Biodiesel at various blends.
- 2. <u>A temperature-compensated liter is defined as having a reference temperature of 15 °C</u> and a temperature-compensated gallon is defined as 231 cubic inches at a reference temperature of 60 °F;
- 3. When a product is sold on the basis of a temperature-compensated volume, it is typically called "net" or "net volume," whereas the volume before compensation is called the "gross" or "gross volume."
- 4. <u>The metric units are shown solely for the purpose of showing metric equivalents in this uniform regulation in this NIST handbook. There is no requirement that dual units be shown in any full disclosure information required under this section.</u>
- 5. <u>Temperature Compensation may be abbreviated (e.g., Temp Comp, or Compensated to 60 °F) in the interest of space as long as its meaning is clear.</u>

- 6. <u>The seller is not prohibited from providing both gross and net gallons on receipts,</u> invoices, bills of lading, or other documentation as long as it is not misleading or <u>deceptive.</u>
- 7. <u>A "business location" means a single outlet and should not be interpreted to mean all of the outlets or locations that a business or company operates in a jurisdiction.</u>

Action at 2007 Annual Meeting: The Committee received eighteen comments requesting this item be made Informational to allow the Committee time for additional study and deliberation. The Committee believed the concerns of the commentators were valid but were issues to be addressed by the S&T Committee and NTEP. Additional studies of the method of sale proposal would bring nothing new to the current recommendation that could not be addressed through further revisions next year if needed. The Committee believed adopting this proposal would provide guidance to policy makers and others currently considering action on temperature compensation at the national, state or local level. Jurisdictions opposing the proposal because their state laws or their policies were against it would not be affected by the adoption of this method of sale because their laws simply prohibited its implementation. The implementation of temperature compensation will be slow primarily because there is no existing nationally approved temperature-compensation device and NIST HB 44 must be revised to set forth the specifications, tolerances and other technical requirements for this technology. NTEP will then need to undertake its work where needed. However, the Committee acknowledged that some states may move ahead with their own type approvals to allow temperature compensation. The majority of the Committee believed the proposed method of sale was ready for NCWM adoption as there was not a reasonable justification for delaying the adoption of the proposal as presented. Therefore, the Committee recommended adoption of this item. This item was subjected to a lengthy discussion at the general voting session and several issues were raised along with calls for further study. The vote in the House of Representatives was 23 Yeas and 16 Nays while the vote in the House of Delegates was 24 Yeas and 16 Nays; the item did not garner enough support to pass. When an item does not clearly pass or fail under NCWM procedures, it is carried forward for reconsideration by the appropriate committee. In this instance that reconsideration will occur at the 2008 NCWM Interim Meeting.

Information on the consideration of this issue by the regional weights and measures associations following the NCWM Annual Meeting in July 2007 is presented below.

Central Weights and Measures Association (CWMA)

This is an excerpt from the report of the CWMA's L&R Committee which considered this issue at its 2007 Interim Meeting in Bettendorf, Iowa, on September 16 - 19, 2007. The full report is available at http://www.ncwm.net/central//lr/lr_2007_interim.doc on the Internet.

The CWMA L&R Committee "heard considerable testimony both in support and opposition of the Temperature Compensation proposal during the open hearings. Many industry representatives opposed the item due to the anticipated cost of equipment and the lack of data that supports whether a better system of measurement is worth the cost. The CWMA L&R Committee cannot support the item as proposed due to the considerable opposition to the permissive language. Several state regulators feel that if permissive is adopted, it will be implemented in the northern states, not in the southern states where there appears to be more pressure to implement temperature compensation. A good example of this was given that in Canada where temperature compensation is allowed, it is not widely used in areas west of the Rockies where the climate is more temperate. The Committee further feels that making the item Informational will not resolve the issue. The most requested information of a cost-benefit analysis is not currently being conducted by any organization. Although several statements were made that temperature compensation may be a more equitable method of sale, many stated that it is not "perfect" nor will it resolve current issues of fraud such as artificial heating of fuel. To address the concern of "hot spots", the Committee discussed the option of amending the proposal to exclude sales at retail based upon the flow rate of dispensers as previously proposed. The Committee feels that another potential solution for a more equitable method of sale is to formulate an alternate proposal to change the method of sale to mass. Technology exists to sell motor fuel through mass flow meters. This method of sale would be more equitable for all types of fuel including alternative fuels which would allow consumers to make value comparisons. The Committee expects that the ATC Steering Committee will provide more information which will provide direction to the conference on this issue. We look forward to their

information which will provide answers to many questions. Based upon the testimony heard, the Committee recommends that the item be withdrawn. Note: In response to the ATC Steering Committee request, the CWMA L&R Committee suggests that if this proposal goes forward as a voting item, that there be a mandatory implementation date with little to no permissive period as a transition."

Northeastern Weights and Measures Association (NEWMA)

This is an excerpt from the report of the L&R Committee meeting held at that association's 2007 Interim Meeting in Springfield, Massachusetts, on October 9 - 10, 2007. The full report is available at http://www.ncwm.net on the Internet.

"It is clear from the majority of comments received (both in written and oral form) that strong opposition exists to the item as proposed, especially the inclusion of permissive ATC sales. NEWMA could not support an item which allowed for two methods of sale. Confusion would be widespread. Additionally, the item raises far too many questions and uncertainties that to date have not been answered. Further research must be conducted to answer those questions. The National Conference on Weights and Measures is an organization made up of weights and measures officials and industry representatives that consistently over the years has worked as a consensus organization. A consensus on this item does not exist and the item should be withdrawn. Making the item Informational would not bring us to the needed consensus."

Western Weights and Measures Association (WWMA)

The WWMA held its Annual Meeting September 9 - 13, 2007, in Lake Tahoe, Nevada, during which it voted to recommend the Committee move a modified version of the original proposal forward as a Voting item at the 2008 NCWM Annual Meeting. The WWMA recommended removal of the term "Permissive" from the title in Section 2.30: *Refined Petroleum Products – Permissive-Temperature Compensation*. This change will not alter the intent of the original proposal which is to allow petroleum sellers to determine if and when they offer their products for sale on the basis of temperature-corrected volume. The full report is available from NIST WMD.

Southern Weights and Measures Association (SWMA)

The SWMA held its Annual Meeting October 21 - 24, 2007, in Little Rock, Arkansas, during which it voted to recommend the Committee move a modified version of the original proposal forward as a Voting item at the 2008 NCWM Annual Meeting. The amendments and other changes proposed by the SWMA are presented below. The full report is available from NIST WMD.

"The Committee heard opposition to permissive temperature compensation for retail and other meters during the open hearing primarily from industry representatives many of whom suggested that further study was needed to determine if the cost versus benefit justified adoption of the original proposal. The Committee agrees that more information would be helpful in determining the value of using ATC on retail motor fuel dispensers that are marked to deliver less than 30 gal/min. Several comments called for the withdrawal of the item but the Committee recognized that the item will be on the NCWM L&R Interim Agenda in 2008 because it was carried over from the 2007 Annual Meeting and because the Western Weights and Measures Association supported adoption of the original item at its recent meeting. The Committee also believes that withdrawing this item as some regions have suggested would only delay consideration of this issue, which has been on the NCWM agenda in one form or another for almost a decade, because the item would likely be resubmitted by a regional association. There were other comments recommending that no further action be taken on this item or that it be tabled. One comment suggested that the original proposal be amended to limit the method of sale to Loading Rack Meters. Vehicle Tank Meters and Retail Dispensers which are marked to deliver 30 gal/min or more (which are typically used in making larger quantity deliveries at truck stops). The Committee believes that separating large flow meters (some of which are already equipped with ATC) from the proposal may reduce the opposition to the proposed method of sale for ATC. A majority of the Committee recommends the following to the SWMA for adoption"

SWMA recommendation to the NCWM L&R Committee:

1. Remove the word "Permissive" from the title of the proposed method of sale for ATC.

- 2. Divide the item into two separate proposals.
 - a. For retail motor-fuel dispensers marked to deliver less than 30 gal/min, make the item Developmental and recommend the NCWM ATCSC lead or coordinate a study to determine if the cost/benefit justifies the implementation of ATC.
 - b. For retail motor-fuel dispensers marked to deliver 30 gal/min or more, amend the method of sale proposal and establish a mandatory implementation date. The SWMA recommends the NCWM L&R Committee move this item for adoption at the 2008 Annual Meeting with the following amendments:
 - i. Amend Section 2.30.2. to read: When products are sold on the basis of temperature compensated volume through loading-rack meters, vehicle-tank meters and retail motor-fuel dispensers marked to deliver 30 gal/min or more.
 - ii. Add an implementation date of 10 years from date of adoption.

232-2 Biodiesel Labeling

Source: Central Weights and Measures Association (CWMA) (See Item 232.3 in the Report of the 92nd Annual NCWM Meeting in 2006)

Recommendation: Add the biodiesel labeling requirements contained in HB 130 Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation to the Method of Sale of Commodities Regulation:

2.XX. Biodiesel.

- 2.XX.1. Identification of Product. Biodiesel and biodiesel blends shall be identified by the capital letter B followed by the numerical value representing the volume percentage of biodiesel fuel. (Examples: B10; B20; B100)
- 2.XX.2. Labeling of Retail Dispensers Containing Between 5 % and 20 % Biodiesel. Each retail dispenser of biodiesel blend containing more than 5 % and up to and including 20 % biodiesel shall be labeled with either:
 - 2.XX.2.1. The capital letter B followed by the numerical value representing the volume percentage of biodiesel fuel and ending with "biodiesel blend." (Examples: B10 biodiesel blend; B20 biodiesel blend), or;
 - 2.XX.2.2. The phrase "biodiesel blend between 5 % and 20 %" or similar words.
- 2.XX.3. Labeling of Retail Dispensers Containing More Than 20 % Biodiesel. Each retail dispenser of biodiesel or biodiesel blend containing more than 20 % biodiesel shall be labeled with the capital letter B followed by the numerical value representing the volume percentage of biodiesel fuel and ending with either "biodiesel" or "biodiesel blend." (Examples: B100 Biodiesel; B60 Biodiesel Blend)
- 2.XX.4. Documentation for Dispenser Labeling Purposes. The retailer shall be provided, at the time of delivery, with a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other similar document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.
- 2.XX.5. Exemption. Biodiesel blends containing 5 % or less biodiesel by volume are exempted from requirements 2.XX.1 through 2.XX.4.

Discussion: It is the Committee's view that this proposal did not impose any new requirements. However, by including these requirements in the Method of Sale of Commodities Regulation, the Committee was obligated to give notice that the requirements will become effective on January 1 of the year following adoption in the eighteen jurisdictions which indicate they automatically adopt that regulation by reference or citation (see the 2008 edition of NIST HB 130, "II Uniformity of Laws and Regulations" [page 9] for a list of those states). These requirements have already been adopted and are published in the Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation in HB 130.

Section 2.20. in the Method of Sale of Commodities Regulation in HB 130 currently contains requirements for the disclosure of oxygenates in gasoline blends. Including requirements for the disclosure of biodiesel and biodiesel blends is consistent with this practice and should be required to ensure consumers are fully informed when making purchasing decisions.

The Committee received numerous comments in support of this item and heard from the National Biodiesel Board (NBB) that, in general, supported this item. However, the NBB requested the Committee keep this item on its agenda as an information item until ASTM finalizes its biodiesel specifications. Waiting for the ASTM biodiesel standard before moving this item forward for a vote will ensure there is no conflict with those specifications.

At its 2006 Annual Meeting, the WWMA L&R Committee received no comments regarding this item. The WWMA supported the NBB request to keep this item as Informational pending ASTM action. The WWMA concurred that waiting for adoption of the ASTM specifications will prevent conflicts in the final labeling requirement for biodiesel. At a recent CWMA meeting, a few comments were received that the biodiesel label requirement should include percentages below 5 %. An update on activity within ASTM to develop a stability specification for B100 was provided. After negative votes were addressed, ballots were circulated to add a B5 limit to the D975 diesel specification and to establish a B20 specification.

Committee Action at the 2007 Interim and Annual Meetings: At the 2007 Interim Meeting, the CWMA and others recommended the Committee hold this proposal until ASTM finalized its work on the biodiesel blend specifications. In response to those suggestions, the Committee agreed to separate this item from the Fuel Ethanol requirements and carried this item forward as an Information item. At the Annual Meeting, several people called for this item to be presented for a vote at the 2008 Annual Meeting and they encouraged the Petroleum Subcommittee to encourage all stakeholders to move quickly to resolve their concerns so this important consumer protection requirement can be considered by the NCWM.

Information about the discussions of this issue by the regional weights and measures association after the July 2007 NCWM Annual Meeting is presented below:

At the meetings of the CWMA, NEWMA, and the WWMA, a representative from the National Biodiesel Board expressed support for the item as presented in the Committee's agenda. Both associations recommended that dispensers be labeled with a notice to consumers to "Consult manufacturer fuel recommendations." The CWMA and SWMA also recommended labeling requirements for fuels containing more than 5 % biodiesel that is shown below in underlined text.

2.XX.2. <u>Labeling of Retail Dispensers Containing More than 5 % and Up to and Including</u> 20 % Between 5 % and 20 % Biodiesel. – Each retail dispenser of biodiesel blend containing more than 5 % and up to and including 20 % biodiesel shall be labeled with either:

2.XX.2.1. The capital letter B followed by the numerical value representing the volume percentage of biodiesel fuel and ending with 'biodiesel blend.' (Examples: B10 biodiesel blend; B20 biodiesel blend), or;

2.XX.2.2. The phrase 'biodiesel blend between 6 5-% and 20 %' or similar words.

The SWMA also proposed new wording for 2.XX.1. that is shown below in underlined text:

1.XX.1. Identification of Product. – Biodiesel shall be identified by the term Biodiesel followed with the designation B100. Biodiesel blends shall be identified by the term Biodiesel Blend.

The Petroleum Subcommittee is working on further revisions to this section and recommendations will be provided to the NCWM Interim Meeting.

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 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 (WG).

The Developing items are marked according to the specific NIST Handbook into which they fall - HB 130 or HB 133. The Committee encourages interested parties to examine the proposals included in the appendices and send their comments to the contact listed in each part.

The Committee asks that the regional weights and measures associations, subcommittees, and WGs continue their work to develop fully each proposal. Should an association, subcommittee, or WG 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 Amend Section 2.2.1. in Handbook 130 Uniform Engine Fuels Regulation – Premium Diesel Lubricity

Source: Southern Weights and Measures Association (SWMA) (See Item 270-5 in the Report of the 92nd Annual NCWM Meeting in 2006)

Proposal: Amend Section 2.2.1. in HB 130 Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation as follows:

- **2.2.1. Premium Diesel Fuel.** All diesel fuels identified on retail dispensers, bills of lading, invoices, shipping papers, or other documentation with terms such a premium, super, supreme, plus, or premier must conform to the following requirements:
 - (a) **Cetane Number.** A minimum cetane number of 47.0 as determined by ASTM Standard Test Method D613.
 - (b) Low Temperature Operability. A cold flow performance measurement which meets the ASTM D975 tenth percentile minimum ambient air temperature charts and maps by either ASTM Standard Test Method D2500 (Cloud Point) or ASTM Standard Test Method D4539 (Low Temperature Flow Test, LTFT). Low temperature operability is only applicable October 1 March 31 of each year.
 - (c) **Thermal Stability.** A minimum reflectance measurement of 80 % as determined by ASTM Standard Test Method D6468 (180 min, 150 °C).
 - (d) **Lubricity.** A maximum wear scar diameter of 520 μ m as determined by ASTM D6079. If an enforcement jurisdiction's single test of more than 560 μ m is determined, a second test shall be conducted. If the average of the two tests is more than 560 μ m, the sample does not conform to the requirements of this part.

Background: A member of the petroleum industry believed the test and associated tolerances for lubricity on premium diesel specified in Section 2.2.1.(d) were inconsistent with that for regular diesel. Effective January 1, 2005, the test tolerance for regular diesel lubricity was the ASTM D6079 reproducibility of 136 μ m (see ASTM D975-04b). The NCWM chose to accept the ASTM reproducibility limits for all diesel (D975) and gasoline (D4814) properties (see Section 7.2.2., Reproducibility), but chose a different reproducibility limit for premium diesel lubricity without providing any explanation as to why the ASTM reproducibility limit was insufficient. If the NCWM intended to impose a stricter lubricity requirement for premium diesel, it should have designated a tighter specification for this property, not a different test tolerance (e.g., for regular and premium gasoline, premium has a different octane specification than for regular, but the test tolerance is the same). ASTM reproducibility limits were, by definition, based on establishing a 95 % probability that product that should pass, will pass. Applying an average test as specified in Section 2.2.1.(d) reduced that probability to 80 %.

The Committee received comments from several members of the Premium Diesel Work Group (WG) who did not support the item as presented by the petroleum industry member. WG members believed the process that led to the current definition was very thorough and complete and the premium diesel lubricity requirements were established with a full understanding of their implications. The WG members felt that knowledgeable individuals provided input to the process, which lead to the consensus position contained in the current regulation. The work being done by the WG was reported at meetings of ASTM Subcommittee E-2 every six months. The current regulation has been endorsed by API, the Engine Manufacturer's Association, and the NCWM.

Prior to this requirement being adopted, the ASTM Lubricity Task Force conducted a great deal of research on this topic. Based on their research, the ASTM Lubricity Task Force concluded that a limit of 520 µm would meet the requirements of equipment in the field. Since the passage of this model regulation, ASTM included a lubricity requirement for No. 1 and No. 2 diesel fuel effective January 1, 2005. The ASTM requirement is also 520 µm.

WG members reported that when this regulation was written, fuels with adequate lubricity provided a functional benefit to the end user. The WG agreed with the ASTM Lubricity Task Force that 520 μ m was the correct limit to set for premium diesel. However, the WG's review process also indicated increased pump wear for fuels with High-Frequency Reciprocating Rig (HFRR) values greater than 560 μ m. The current reproducibility value of the HFRR test method would have placed enforcement well beyond the 560 μ m level, essentially allowing fuels with little lubricity protection to be sold as "Premium." The WG believed they could not recommend a premium fuel standard that would permit excessive pump wear. Using the statistical tools provided in ASTM D3244, the WG evaluated an enforcement limit of 560 μ m. The statistical tools indicated that a single laboratory reporting the assigned test value would have an enforcement limit of approximately 80 % probability of acceptance, while the average of two separate laboratories reporting the assigned test value would have an enforcement limit of approximately 80 % probability of acceptance. It was agreed that for a premium fuel the average of two test results was the best approach given the current test methods and precision available. Therefore, if a test exceeded 560 μ m, then a second test must be run. The average of the two tests must exceed 560 μ m before a violation would occur. At the 2005 WWMA the Petroleum Subcommittee agreed the proposal was at that time the best approach, and, lacking new information, it continues to hold that position.

Discussion: At the WWMA 2006 Annual Meeting, the WWMA L&R Committee received only one comment regarding this item, acknowledging the ongoing review by the Petroleum Subcommittee. The WWMA noted that the NCWM L&R Committee forwarded the proposal for review by the Petroleum Subcommittee and agreed this item should remain Developmental pending the Subcommittee's recommendation.

At its 2006 Interim Meeting, the CWMA indicated the NCWM Petroleum Subcommittee would make recommendations after ASTM improved the test method's precision and after the conclusion of other tests. The CWMA L&R Committee was awaiting the recommendation from the NCWM Petroleum Subcommittee.

Committee Action at the 2007 Interim Meeting: The Committee carried this item over as an Information item. The Committee sent this proposal to the Petroleum Subcommittee and requested its recommendation on how to proceed with the issue. The Subcommittee suggested this item remain on the agenda as an Information item until further notice and reported that the activities of ASTM International and the Coordinating Research Council were continuing.

Contact: NCWM Petroleum Subcommittee, Ron Hayes, Chairman, (573) 751-2922 or <u>ron.hayes@mda.mo.gov</u> for additional information.

270-2 Amend Handbook 130 Interpretations and Guidelines Section 2.3.2. Guidelines for the Method of Sale of Fresh Fruits and Vegetables

Source: Northeast Weights and Measures Association (NEWMA) (See Item 270-6 in the Report of the 92nd Annual NCWM Meeting in 2006)

Proposal: Amend HB 130 Interpretations and Guidelines Section 2.3.2. to recognize and support innovation in modern retail food marketing approaches at all forms of outlets from typical grocery stores to the age-old farm markets.

Discussion: The method of sale guidelines for the sale of fresh fruits and vegetables that currently appear in HB 130 are outdated and in need of revision. The present guidelines do not recognize current retailing practices and are not expansive enough to cover many exotic and unusual fruits and vegetables that are becoming more common in the marketplace. Additionally, the present guidelines do not take into consideration the necessary limitations experienced by retailers at roadside stands and farmers markets.

The original proposal for this item reflected input from only a single jurisdiction. The Committee was informed that several industry associations requested an opportunity to review and respond to this proposal. The Committee believed there were several factual errors within the classifications of produce provided, and several types of produce still were not covered by the provided proposal. The Committee made this item Developmental so it may be more fully developed with input from jurisdictions throughout the country and from affected industry associations and businesses.

Discussion: At its 2006 Interim Meeting, the CWMA heard a comment that this item should be moved to Informational for a year. The body of the guidelines should be circulated within the CWMA before becoming a Voting item. The WWMA L&R Committee received no comments regarding this item. The committee chairman encouraged all to provide input on this item to the NCWM L&R Committee.

Contact Ross Andersen (NY Bureau of Weights and Measures) by telephone at (518) 457-3146 or by e-mail at <u>ross.andersen@agmkt.state.ny.us</u> to submit comments or for further information.

2.3.2. Fresh Fruits and Vegetables

(Added 1979, Amended 1980, 1982, and **200X**)

This guideline applies to all sales of fruits and vegetables. There are two tables, one for specific commodities and one for general commodity groups. Search the specific list first to find those commodities that either don't fit into any of the general groups or have unique methods of sale. If the item is not listed, find the general group in the second table. The item may be sold by any method of sale marked with an X.

			Head	Dry	Dry Measure
			or	<u>Measure</u>	<u>(1 dry qt or</u>
Specific Commodity	<u>Weight</u>	Count	Bunch	<u>(any size)</u>	<u>larger)</u>
Artichokes	X	X			
Asparagus	<u>X</u>		X		
Avocadoes		X			
Bananas	X	X			
Beans (green, yellow, etc.)	X				<u>X</u>
Brussels Sprouts (loose)	X				
Brussels Sprouts (on stalk)			X		
Cherries	X			X	X

			Head	Dry	Dry Measure
			or	<u>Measure</u>	<u>(1 dry qt or</u>
Specific Commodity	<u>Weight</u>	Count	Bunch	<u>(any size)</u>	<u>larger)</u>
Coconuts	<u>X</u>	X			
Corn on the Cob		X			<u>X</u>
Dates	<u>X</u>				
<u>Eggplant</u>	<u>X</u>	X			
Figs	<u>X</u>				
Grapes	<u>X</u>				
<u>Melons (cut in pieces)</u>	<u>X</u>				
Mushrooms (small)	<u>X</u>			<u>X</u>	<u>X</u>
Mushrooms (Portobello, large)	<u>X</u>	X			
<u>Okra</u>	<u>X</u>				
Peas	<u>X</u>				<u>X</u>
Peppers (bell and other varieties)	<u>X</u>	X			<u>X</u>
Pineapples	X	X			
Rhubarb	X		X		
Tomatoes (except cherry)	X	X			X

			Head	Drv	<u>Dry</u> Measure
			or	Measure	(1 dry at or
General Commodity Group	Weight	Count	Bunch	(any size)	larger)
Berries and Cherry Tomatoes	X			<u>X</u>	
Citrus Fruits (oranges, grapefruits, lemons, etc.)	X	X			<u>X</u>
Edible Bulbs (onions, garlic, leeks, etc.)	<u>X</u>	X	X		<u>X</u>
Edible Tubers (Irish potatoes, sweet potatoes,	<u>X</u>				<u>X</u>
ginger, horseradish, etc.)					
Flower Vegetables (broccoli, cauliflower,	X		X		
Brussels sprouts, etc.)					
Gourd Vegetables (cucumbers, squash, melons,	X	X			<u>X</u>
<u>etc.)</u>					
Leaf Vegetables (lettuce, cabbage, celery, etc.)	X		<u>X</u>		
Leaf Vegetables (parsley, herbs, loose greens)	<u>X</u>		X	<u>X</u>	
Pitted Fruits (peaches, plums, prunes, etc.)	X	X			X
Pome Fruits (apples, pears, mangoes, etc.)	X	X			X
Root Vegetables (turnips, carrots, radishes, etc.)	X		X		

Committee Action at the 2007 Interim and Annual Meetings: The Committee carried this item over as Informational and will reconsider it when it receives comments from the regional associations, retailers and other industries affected by the proposed amendments. The Committee also realized the proposed replacement table had been omitted from this item. That oversight has been corrected in this report (see next page).

At the Annual Meeting, concerns were raised that permitting quart sales of some fruits and vegetables would not be useful or practical and the Committee should reconsider that provision of the table.

Comparison of Current and Proposed Tables

The following comparison was prepared for the NCWM L&R Committee at the request of the CWMA. It compares the current Guideline for the Method of Sale of Fresh Fruits and Vegetables in Section 2.3.2. of the Interpretations and Guidelines section of NIST HB 130 with the changes proposed in Item 270-6. A table which lists the commodities included in the current Guideline but which do not appear in the Specific or General Tables is also provided.

Comparison Tables

Key to Tables:

Green rows (dark gray) indicate there is NO change between the current and proposed guideline (e.g., see the rows for Artichokes in the Comparison Table).

Yellow rows (light gray) indicate there is a change between the current and proposed guideline (e.g., see "Dry Measure (1 dry qt or larger) in the header row of the Comparison Table and the cell under the header for count in the row for "Bananas.")

Explanations of the differences or questions to be resolved are provided in the numbered footnotes which are located at the bottom of the table.

Specific Commodity	<u>Weight</u>	<u>Count</u>	<u>Head</u> <u>or</u> <u>Bunch</u>	<u>Dry</u> <u>Measure</u> (any size)	<u>Dry Measure</u> (1 dry qt or larger) ¹
Artichokes	<u>X</u>	<u>X</u>			
<u>Asparagus</u>	<u>X</u>		<u>X</u>		
Avocadoes		<u>X</u>			
Bananas ²	<u>X</u>	<u>X²</u>			
Beans (green, yellow, etc.)	<u>X</u>				<u>X</u>
Brussels Sprouts (loose) ³	<u>X³</u>				
Brussels Sprouts (on stalk) ⁴			<u>X</u> ⁴		
<u>Cherries^{5.6}</u>	<u>X</u>			<u>X</u> ⁶	<u>X</u> ⁶
Coconuts	<u>X</u>	<u>X</u>			
Corn on the Cob		<u>X</u>			<u>X</u>
Dates	<u>X</u>				
Eggplant	<u>X</u>	<u>X</u>			
Figs	<u>X</u>				
Grapes	<u>X</u>				
Melons (cut in pieces)	<u>X</u>				
Mushrooms (small) ^{6.7}	<u>X</u>			<u>X⁶</u>	<u>X</u> ⁶
Mushrooms (Portobello, large) ⁷	<u>X</u>	<u>X⁷</u>			
<u>Okra</u>	<u>X</u>				
Peas ⁸	X				<u>X</u> ⁸
<u>Peppers</u> (bell and other varieties) ²	X	X			<u>X</u> ⁹
Pineapples	X	X			
Rhubarb ¹⁰	X		<u>X¹⁰</u>		
Tomatoes (except cherry) ¹¹	X	<u>X¹¹</u>			<u>X</u>

¹ This amendment changes the minimum dry measure from 1 peck to 1 dry quart. The equivalents are: one peck = 16 dry pints, 8 dry quarts, ¹/₄ bushel, or 8.810 L.

² The current guideline forbids sales of bananas by count (only by weight). However, the NCWM permits individual bananas to be sold under the Ready-to-Eat Food exception in Section 1.12. in the Method of Sale of Commodities Regulation.

³ The current guideline addresses Brussels sprouts and does not include the "loose" distinction.

⁴ This is a new MOS for Brussels sprouts on "stalks" so there is nothing in the current method of sale to compare this with except that the current provision requires Brussels sprouts to be sold by weight.

⁵ The reference to Section 4.46. Berry Baskets and Boxes Code in NIST Handbook 44 has been deleted.

⁶ If a dry measure of "any size" is ok in Column 3, is an X correct in the 4th Column which limits sales to 1 dry quart or larger?
 ⁷ This proposal distinguishes mushrooms by size between "small" and "large (Portobello)" and introduces the method of sale by count for "large" mushrooms which is not permitted in the current guideline (only by weight or measure).

⁸ The current guideline does not allow sales of peas by "dry measure" (only by weight).

⁹ The current guideline does not allow sales peppers by "dry measure" (only by weight or count).

¹⁰ The current guideline does not allow sales of rhubarb by "head or bunch" (only by weight).

¹¹ The current guideline does not allow sales of tomatoes by "count" (only by weight and dry measure).

<u>General Commodity Group²⁶</u>	<u>Weight</u>	<u>Count</u>	<u>Head</u> <u>or</u> <u>Bunch</u>	<u>Dry</u> <u>Measure</u> (any size)	<u>Dry Measure</u> (1 dry qt or <u>larger)</u>
Berries ¹ and Cherry Tomatoes	X			X	
Citrus Fruits (oranges ² , grapefruits ³ , lemons ⁴ , etc.)	X	Χ			$X^{\frac{2,3,4}{2}}$
Edible Bulbs (onions ^{5.6} , garlic ⁷ , leeks ⁸ , etc.)	X	X ⁷	Х <u>⁷</u>		X ^{5,6,8}
Edible Tubers (Irish potatoes ² , sweet potatoes ¹⁰ , ginger ¹¹ ,					9 10
horseradish ¹² , etc.)	<u>X</u>				<u>X</u> 2.10
Flower Vegetables (broccoli, cauliflower, Brussels					
sprouts ¹³ , etc.)	<u> </u>		<u> </u>		
Gourd Vegetables (cucumbers ¹⁴ , squash ¹⁵ , melons ¹⁶ , etc.)	X	X			X ¹⁵
Leaf Vegetables (lettuce, cabbage ¹⁷ , celery ¹⁸ , etc.)	X		X ^{17,18}		
Leaf Vegetables (narslev $\frac{19}{2}$, herbs $\frac{20}{2}$, loose greens $\frac{21}{2}$)	X		X ²¹	X ^{19,21}	
Pitted Fruits (neaches, nlums ²² , nrunes ²³ , etc.)	X	X ²²	<u> </u>	<u></u>	X ²²
Pome Fruits (apples, pears, mangoes ²⁴ , etc.)	X	X			X ²⁴
Root Vegetables (turning carrots radishes ²⁵ etc.)	X	<u> </u>	X ²⁵		<u> </u>
$\frac{1}{1}$ The reference to Section 4.46 Berry Baskets and Boxes Code in NU	ST Handboo	k 44 has be	en deleted		
 ³ The current guideline does not allow sales of grapefruit by "dry measu ⁴ The current guideline does not allow sales of lemons by "dry measu ⁵ The current guideline allows sales by weight or bunch for "spring or ⁷ The current guideline does not permit sales of garlic by "dry measur ⁸ The current guideline does not allow sales of leeks by "count" or "d ⁹ The current guideline does not allow sales of leeks by "count" or "d ⁹ The current guideline does not allow sales of sweet potatoes by "dry the current guideline does not allow sales of sweet potatoes by "dry the current guideline does not include ginger. ¹² The current guideline does not include horseradish. ¹³ Brussels sprouts are also in the Specific Commodity Table as "loose ¹⁴ The current guideline does not allow sales of cucumbers by "dry met ¹⁵ The current guideline does not allow sales of whole melons by "dry the the current guideline does not allow sales of whole melons by "dry the the current guideline does not allow sales of parsley by "count" (c ¹⁸ The current guideline does not allow sales of parsley by "dry measu ²⁰ The current guideline does not allow sales of parsley by "dry measu ²¹ The current guideline does not allow sales of parsley by "dry measu ²² The current guideline does not allow sales of parsley by "dry measu ²³ The current guideline does not allow sales of prunes by count (only be the current guideline does not allow sales of prunes by count or dry the current guideline does not allow sales of prunes by count or dry the current guideline does not allow sales of prunes by count or dry the current guideline does not allow sales of mangoes by dry measu ²⁰ The current guideline does not allow sales of mangoes by dry measu 	sure" (only by re" (only by re" (see 6). green" onio re" (only by ry measure" (on ry measure" (on r measure" (on r measure" (only measure" (only measure" (only berhaps the C re" (only we t or dry mea by weight or measure (on re (only by count" (only by ted above, it the table, say	by weight or weight or c ans and sale weight or c (only by weight) by weight alk." by weight by weight by weight or bt). Committee s agent or bund dry measur aly by weig weight or c by weight. may impro- ring for inst	r count). ount). s by "weight ount). eight). ht). ght). or count). r count). r count). r count). whould decide ch). by weight). e). ht). ount). ve uniformiti ance, "Edibl	" for dry onion e whether or no y and simplify t e Tubers, etc."	s. t "head or bunch" or the use of the table if

This table lists the commodities in the current method of sale				
guidelines but which are	e not specifically identified in the			
prop	osed tables.*			
<u>Commodity</u>	Method of Sale			
<u>Apricots</u>	Weight			
Beets	Weight or Bunch			
Cantaloupes	Weight or Count			
<u>Cranberries</u>	Weight or Measure			
Currants	Weight or Measure			
Eggplant Weight or Count				

<u>Commodity</u>	<u>Method of Sale</u>					
Escarole	Weight or Bunch					
Kale	<u>Weight</u>					
<u>Kohlrabi</u>	<u>Weight</u>					
Limes	Weight or Count					
Nectarines	Weight or Count					
Papaya	Weight or Count					
Parsnips	Weight					
Persimmons	Weight or Count					
Pomegranates	Weight or Count					
Rutabagas	<u>Weight</u>					
<u>Spinach</u>	Weight or Bunch					
Tangerines	Weight or Count					
*While many of these items may fall under the general categories						
listed above it may be improve uniformity and simplify the use of						
the table if all of these commodities are placed in a general						
category instead of the table saying, for instance, "Edible Tubers,						
etc."						

The Committee requested this item be considered at upcoming regional meetings and that comments be submitted by November 1, 2007, for inclusion and review at the Interim Meeting in January 2008.

270-3 Amend HB 133 Section 2.3, Moisture Allowances to Provide Clearer Guidance

(See Item 270-7 in the Report of the 92nd Annual NCWM Meeting in 2006)

This item was added to the agenda of the Committee's WG on Moisture Loss (see Appendix A) following the 2007 NCWM Interim Meeting. Also see Item 270-4 for an explanation of the WG's role and responsibilities.

270-4 Laws and Regulations Committee Work Group (WG) on Moisture Loss

(See Item 270-8 in the Report of the 92nd Annual NCWM Meeting in 2006)

At the 2007 NCWM Interim Meeting, the Committee created a WG to undertake a review of a number of moisture loss and other issues relating to NIST HB 133 "Checking the Net Contents of Packaged Goods." NIST recommended the NCWM L&R Committee retain responsibility for this project instead of creating a task force because that would entail additional travel and meeting expenses for all parties. The NCWM Board of Directors and the Committee agreed with that proposal because a large portion of this project can be accomplished using e-mail and teleconferences to reduce costs. The Committee also noted the number of items on the Committee's agenda has declined so it has time available during its work sessions at the Interim and Annual Meetings to address this project. If additional meetings are needed, they will be scheduled to coincide with the regional meetings to reduce travel and other costs. Another justification for this approach was that it allowed regional representatives on the Committee to develop a greater understanding of moisture loss and enabled them to better explain the subject matter to their constituents.

Participation in this effort is open to everyone. The first meeting took place on Sunday, July 8, 2007, following the Committee's regular work session at the NCWM Annual Meeting at the Snow Bird Resort near Salt Lake City, Utah. The first major subject of discussion was the determination of tare using gel-soaker pads. The participants agreed that information on the appropriate test procedures for using gel-soaker pads should be distributed to weights and measures officials and industry following the NCWM Annual Meeting, and NIST agreed to publish an article in the September 2007 edition of WMD's newsletter, which is presented below. A discussion of that issue is contained in Item 1 of Appendix A attached to this report. The group developed a formal work plan and addressed additional items listed in Appendix A as time allowed. To obtain more information on moisture loss or to participate in this group contact, Lisa Warfield at (301) 975-3308, e-mail: lisa.warfield@nist.gov or Ken Butcher at (301) 975-4859 or kbutcher@nist.gov.

270-5 Petroleum Subcommittee

(See Item 270-9 in the Report of the 92nd Annual NCWM Meeting in 2006)

The Subcommittee met on January 24, 2007, at the NCWM Interim Meeting in Jacksonville, Florida, to undertake a review of a number of significant issues related to fuel standards. Their first major project was to undertake a major review and update of the Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation in HB 130. The goal of the Subcommittee was to prepare and submit a major revision of this regulation for consideration by the Committee at the 2008 Interim Meeting. The Subcommittee also conducted a review of the Engine Fuels, Petroleum Products, and Automotive Lubricants Law and will prepare suggested changes for that uniform law as well. Another project will be to update and possibly expand the Basic Engine Fuels, Petroleum Products, and Lubricants Laboratory Publication which will then be made available on the Internet. The Subcommittee will undertake other projects as time and resources permit. 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 Labeling requirement in Item 232-2.

The Subcommittee has scheduled a meeting for December 5, 2007, at the ASTM Fall Meetings in Phoenix, Arizona, at which it will finalize its work on a number of projects including a revision of the Uniform Engine Fuels regulation. The Chairman of the Subcommittee is Ron Hayes, Missouri, who can be contacted at (573) 751-2922 or at <u>ron.hayes@mda.mo.gov</u>. If you would like to participate in the work of the Subcommittee, contact Ron Hayes or Ken Butcher at (301) 975-4859 at <u>kbutcher@nist.gov</u>.

Roger Macey, California Stephen Benjamin, North Carolina Joe Benavides, Texas John Gaccione, New York

Ron Hayes, Missouri, Chairman of the Petroleum Subcommittee

Pete O'Bryan, Foster Farms, Associate Member Representative Doug Hutchinson, Canada, Technical Advisor Ken Butcher, NIST, Technical Advisor Lisa Warfield, NIST, Technical Advisor

Vicky Dempsey, Chairperson, Montgomery County, Ohio

Appendix A

L&R Committee Work Group on Moisture Loss

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*NOTE: These documents are not included in this publication. They are y available in Adobe PDF format; NIST will provide copies on request. Please contact Lisa Warfield at (301) 975-3308 or at lisa.warfield@nist.gov or Ken Butcher at (301) 975-4859 or at kbutcher@nist.gov.

Detail of all Items (In order by Reference Key Number)

Moisture Loss and Other Issues for Consideration by the NCWM Laws and Regulations Committee and the Board of Directors

INTRODUCTION

The Weights and Measures Division (WMD) prepared this document in 2007 at the request of NCWM Chairman Mike Cleary to detail several moisture loss and other package inspection issues to be studied under this project with the goal of developing recommendations for amendments to NIST Handbook 133 (HB 133) in 2008. There are four items listed below and most of the resource material is included to enable this document to serve as an agenda and comprehensive resource. WMD provided this outline for consideration by the NCWM L&R Committee, the Board of Directors and other interested parties with the goal of developing a consensus on whether or not there was sufficient justification to study the issues described below.

Item 1. Gel-Soaker Pads

Several weights and measures officials are concerned that HB 133 does not provide adequate guidance on how to verify the net weight declaration on packages where "gel-soaker pads" are used in the package to absorb moisture.

Based on information WMD has received, this discussion paper is provided as a technical examination of the use of "gel type" soaker pads when determining net weight. Gel-soaker pads contain granules of a highly absorbent compound that soak up fluid and retain it so efficiently that the "usual" methods of drying (pressure, wiping and air) do not allow the recreation of "Used Dry Tare." According to two manufacturers, "gel-based soaker pads" can absorb up to 50 times their original weights in fluid compared to "cellulose-based fluff pulp" which absorb only two to four times its weight (see **www.thermasorb.com** and **www.stockhausen-inc.com**). Gel-type soaker pads are used by industry to: (1) extend shelf life thus reducing repackaging costs, (2) reduce bacterial growth, and (3) improve the "presentation of packages" by absorbing blood and fluid, eliminating free flowing liquid in the package.

Inspection problems with this type of tare arise when officials attempt to verify net weight declarations on packages which have been wrapped and labeled at a location other than where the commodity is inspected/tested since officials have no access to "unused dry tare." Some officials report that it is impossible to dry these types of soaker pads using traditional drying procedures and have even attempted to use microwave ovens to establish "used dry tare." WMD discourages the use of microwave ovens or other extreme drying methods for drying tare materials because (1) unused "dry" tare materials have a natural moisture content which cannot be reestablished using most heating methods (e.g., for gel-pads this could be 5 % or more); (2) the intensity/power of microwave ovens varies substantially from device to device so, given the range of variability, it would be impossible to suggest a power setting or heating time that could be considered reasonable, repeatable, and safe; and (3) a more practical concern is that an official could overheat tare material and damage the microwave or cause even more serious problems such as the possibility of fire.

WMD solicits recommendations and comments from all who have interest in this topic. Please consider possible solutions to allow accurate measurement practices that permit officials to safely recreate "used dry tare" for net weight verification on products using "gel-type" material.

WMD believes the requirements of HB 133 are written broadly enough to apply to all types of tare materials including those which are "gel based." Under the definition of "Used Dry Tare" officials use air drying, washing, scraping, pressure, or other techniques which can involve more than normal household procedures but do not go so far as to include laboratory procedures such as oven drying. The field test procedures in HB 133 were developed to provide uniform procedures to enable officials to dry out "used" tare to recreate as close as possible the weight of "unused tare material" the packager used. When a packager uses a tare material that does not permit the recreation of unused dry tare (and the official does not have access to "unused dry tare" material or to readily accessible reliable information on tare), the official is limited to drying at least two samples of the tare material as best he can

using the procedures described by the handbook; he then can use an average tare to determine a net weight. If the packages are then found to be underweight, the packer must be permitted to provide information on whether or not the average tare value used by the official was reasonable or provide other information to the official to defend the net weight claims on the label. Since this is really the same opportunity any packer of any type of tare material has available to him, WMD believes the current guidance in HB 133 is adequate.

A test procedure in HB 133 is necessary to ensure weights and measures can continue to maintain marketplace surveillance to ensure equity and fair competition while still recognizing reasonable moisture loss or gain as required under both federal and state laws and regulations. The relevant sections describing the tare definition and determination procedures from 4th edition of HB 133 (2005) are shown below:

Used Dry Tare

Used Dry Tare is defined as follows: <u>Used tare material that has been air dried, or dried in</u> some manner to simulate the unused tare weight. It includes all packaging materials that can be separated from the packaged product, either readily (e.g., by shaking) or by washing, scraping, ambient air drying, or other techniques involving more than "normal" household recovery procedures, but not including laboratory procedures like oven drying. Labels, wire closures, staples, prizes, decorations, and such are considered tare. Used Dry Tare is available regardless of where the packages are tested. The net content procedures described in this handbook reference Used Dry Tare.

How is a tare weight determined?

Except in the instance of applying unused dry tare, select the packages for the initial tare sample from the sample packages. Mark the first two (three or five) packages in the order the random numbers were selected; these packages provide the initial tare sample. Determine the gross weight of each package and record it in block a, "Gross Wt," under the headings "Pkg. 1," "Pkg. 2," "Pkg. 3," etc. on the report form. Except for aerosol or other pressurized packages, open the sample packages, empty, clean, and dry them as appropriate for the packaging material.

NIST HB 133 is available online at http://ts.nist.gov/WeightsAndMeasures/h1334-05.cfm.

Item 2. Moisture Loss Guidance in NIST HB 133

The three items shown below were taken from the L&R Report of the 2004 89th NCWM Annual Meeting Proceedings and later agendas including an item from the Committee's 2007 Interim Meeting agenda. The Committee withdrew two of these items in 2004 and asked NIST to review the moisture loss sections of HB 133, revise them to improve their readability, and, where appropriate, add additional information or clarifications.

NIST conducted the promised review but found there were several suggestions contained in these two items. A few of the suggestions raised substantive questions about what needs to be added to HB 133 and which questions would be the most useful or practical for field officials. NIST believes that responding to some of the suggestions or questions could lead to extensive revisions to the handbook. This level of discussion will take considerable time and effort for the Committee, and WMD would like to ensure everyone has a full understanding of the concerns and agrees to the necessity for change so time and resources will not be wasted. The Committee should review these sections and identify what information administrators need versus what information field officials need to perform their duties.

270-7 Amend NIST Handbook 133 Section 2.3, Moisture Allowances to Provide Clearer Guidance (This Item was added to the agenda of the WG on Moisture Loss following the 2007 Interim Meeting)

Source: Northeast Weights and Measures Association (NEWMA)

Proposal: Amend NIST Handbook 133 (HB 133) Section 2.3, Moisture Allowances (pages 17 through 19) to provide clearer guidance.

Background: The issue of moisture loss is complex. HB 133 currently provides specific guidance on the determination and application of moisture allowances for only a limited number of commodities. Concerns have been raised that this guidance is confusing and difficult to understand, particularly with regard to when moisture loss is applied (i.e., at the time of inspection or subsequent to the inspection). Requests have been received to reword this section to make it easier to understand and apply.

Additionally, HB 133 provides little guidance on the determination and application of moisture allowances for commodities other than those specifically listed. Weights and measures jurisdictions across the country have been struggling with how to properly handle moisture loss during packaging inspections and need more definite guidance on this issue.

The Committee did not believe it had the time or expertise to address properly the issue of moisture loss within the structure of the NCWM. The Committee decided to request activation of a NIST Moisture Loss WG to establish more effective and extensive guidance to the NCWM regarding the proper determination and application of moisture loss.

Discussion of this Item by the WWMA: The WWMA L&R Committee heard that a meeting was tentatively planned for November 2006; the meeting was delayed to allow time for everyone to identify and agree on the issues to be addressed by the group to ensure expectations for the meeting results were clear. WMD agreed to fund the travel and attendance of one NCWM representative. Leading issues included providing additional guidance in HB 133 regarding the determination and application of appropriate moisture loss allowances in package inspections, with noted examples including how to address gel soaker pads in poultry/meat packages, as well as how to determine moisture allowances for pasta, rice, and other commodities for which no established moisture loss allowances exist. Additionally, guidance regarding application of moisture loss allowances at the point-of-pack needed to be addressed.

An industry representative urged involvement in the meeting and ensuing work on HB 133 amendments from the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) to ensure input and consensus from all relevant agencies. He further emphasized the need to review and consolidate all decisions and directives from any and all court rulings regarding moisture loss issues. Factors to be considered in determining and applying appropriate moisture loss allowances and influences upon such losses included commodity stability limits and varying environmental conditions at packing plants such as relative humidity and constant temperature rooms maintained at different temperature levels. The industry representative also urged that guidance be provided to industry members regarding the types of data needed to be tracked and provided by packers/manufacturers in addressing moisture allowance determinations.

Discussion of this Item by the CWMA at its 2006 Interim Meeting: A comment was heard from industry that this needs to be addressed in order for businesses to be competitive. The USDA and FDA need to be involved in the development of this item. A meeting was tentatively scheduled for November prior to the NCWM Interim Meeting. There was general agreement that in order for this meeting to be effective, the USDA and FDA must be present. Comments were heard in support of using the New York proposal to correct the error in HB 133.

Item 3. WMD Package Inspection and Moisture Loss Guidance Letter – Withdrawn

WMD believed there was some useful information for weights and measures officials and industry contained in the 2005 Memorandum that WMD issued to state weights and measures officials and other interested parties, entitled "Verifying the Net Contents of Packaged Goods and Recommended Procedures for Moisture Allowances." WMD withdrew the memorandum at the request of Kraft Foods which detailed a number of concerns about the guidance contained in the WMD communication. The Kraft Foods letter, dated January 31, 2006, was prepared by Steven Steinborn of Hogan and Hartson. WMD recommended the Committee review <u>both</u> documents to resolve the corporation's concerns where possible and determine if any information in the WMD letter could be revised and republished to assist weights and measures officials in dealing with net quantity of contents. The WMD memorandum and Kraft's letter are presented in Reference Section II below.

Item 4. WMD Suggestions

a. Seek Greater Recognition of NIST HB 133 by FDA and other Federal Agencies.

WMD would like to avoid frequent amendments to HB 133 because, unlike NIST HB 44, it is not widely adopted automatically. Many jurisdictions adopt new versions of HB 133 using their Administrative Procedures Acts. Another consideration is that the USDA adopts versions of the handbook which then preempts other versions from being used to verify the net quantity of packages put up under that agency's supervision. In the past, WMD found that several jurisdictions used the wrong edition of HB 133 to take action against USDA-inspected products simply because they used a newer version of the handbook than had been adopted by the USDA. WMD believes that USDA adoption gives a strong endorsement and recognition to the handbook. WMD also believes the 4th edition of HB 133, whose core elements have been in use by the states since 1994, should be recognized by the FDA and all other agencies to eliminate any uncertainty over its use by the states. Perhaps it is time the NCWM consider petitioning the FDA to provide some type of formal recognition of the handbook. WMD believes that establishing a 5-year review cycle for HB 133 may be one way to ensure it is acceptable to other agencies, which will help avoid the confusion over which edition is currently in effect.

b. Create a new supplement or website to NIST HB 133 which would provide useful information to administrators, field officials and industry.

WMD would like to explore the possibility and usefulness of creating a new publication or website called NIST Handbook 133-1 which would provide supplementary information and guidance on net quantity of contents testing and moisture loss for administrators and industry. The publication or website would be "informative," thus it would not include regulatory requirements. Instead it would be used to provide additional guidance and more examples than can be included in HB 133 itself. Such a publication or website could also be used to provide complete full-size copies of the various inspection forms and worksheets contained in HB 133 and other useful tools developed by jurisdictions. The publication or website could also include a variety of other information related to net contents verification and random sampling and could include appropriate information from federal regulations and policies as well as frequently asked questions (FAQs). Currently in NIST HB 130 Interpretations and Guidelines there are sections related to moisture loss, point-of-pack inspections, and administrative procedures which may not be well known or readily accessible. These could be updated and moved to the new publication or website.

For example:

- 2.2.5. Lot, Shipment, or Delivery
- 2.5.6. Guidelines for NCWM Resolution of Requests for Recognition of Moisture Loss in Other Packaged Products
- 2.6.10. Model Guidelines for the Administrative Review Process
- 2.6.11. Good Quantity Control Practices
- 2.6.12. Point-of-Pack Inspection Guidelines

These documents are shown below in Reference Section I.

Another example of the type of package information which could be included in a publication or website for reference purposes is the following report on a meeting held at NIST in 2005 to address concerns over packer-supplied tare values.

NIST Weights and Measures Quarterly November 2005 Report of Meeting on Tare

On November 2, 2005, the Laws and Metric Group at NIST hosted a meeting to discuss ways to improve the communication of tare information between packers and retailers when meat products are packaged at a plant, but weighed and labeled at the retail store. Representatives from the meat

packing industry, the retail food industry, and several weights and measures agencies attended the meeting.

The Problem

There is a fundamental change occurring in the retail food marketplace. Retail food stores are shifting from having in-store meat cutters to purchasing already-packaged meat from an outside plant. The supplying plant provides the retail store with packaged meat (including tray, soakers, and overwrap), and the store is then responsible for weighing and labeling the package. In order to weigh and label these products properly, the retail store needs to know the weight of the packaging materials used by the plant (i.e., the tare weight). While this may sound simple and straightforward, it is not.

Retailers

Many retail food chains manage their tare weights from a central location. Tares are maintained at the central or regional office and downloaded to the individual stores on a routine basis. While individual stores may have the ability to override the tare provided in a download (e.g., when an official from weights and measures informs them that they are using an incorrect tare), this correction will be erased when the next download occurs. Several retail food chains believe that the centralized management of tare information is critical to the overall success of their meat departments. With little cutting and packaging being done at the retail level, stores rarely have experienced, professional staff in their meat departments. Without significant expertise at the store level, food retailers are reluctant to leave decisions regarding the use and amount of tare to individual store management.

Weights and Measures Officials

When weights and measures officials find inaccuracies in tares being used, often these inaccuracies are not being communicated to the food retailer's central or regional offices. If the food retailer's central or regional office is not informed that a tare value is inaccurate, then the tare value will not get changed in the next download. While some retail food chains require their store managers to submit copies of inspection reports to the central or regional office, many do not. Some chains leave that decision to the discretion of the individual store managers. Individual store managers may be reluctant to forward disparaging information about their store's performance to the central or regional office. As a result, when weights and measures officials find an inaccurate tare being used in a store and only notify store management of the correction necessary, that information may not be communicated to the people who really need to know—the people at the central or regional office who set the tare values for the entire chain of stores.

Packers

The weight of tare materials used at a meat packing plant varies regularly. Whenever the plant changes suppliers, whether it is suppliers providing soakers, trays, or overwrap, the tare must be reevaluated and changed. Whenever suppliers change the materials used in their products, the tare must be reevaluated and changed. Most meat packers monitor tare continuously and regularly make small adjustments to ensure their packages are accurate. While tare information is routinely shared with retailers, it is difficult to ensure that the correct tare goes on the correct package. Packers may ship individual packages from several different production lots (lots which may have been packaged using different tare materials) in a single shipment to a retailer's warehouse. The retailer's warehouse then further breaks up these package groups to distribute packages to individual stores. Even if accurate tare information for all packages is provided to the retailer's central or regional office, the retailer has difficulty using this information effectively since not all packages of the same product at the same location will necessarily have the same tare. In addition, new tare information provided to a retailer may only apply to packages still in the retailer's warehouse (and not those presently in the store). This means retailers must coordinate the updating of tare data with the placement of new packages on the store shelves.

Is There a Solution?

The question remains: How do you effectively ensure that the tare information for a particular package "travels" with the package from the point of production to the final retail destination? One suggestion has been to print tare information directly on individual packages. However, packers and retailers all agree that printing tare information on packages, shipping cases, or shipping invoice forms would not be effective. Packers order packaging materials and shipping containers months in advance and at that point could only guess as to what amount of tare would need to be preprinted on these materials. In addition, if tare information were provided on individual packages, shipping cases, or shipping invoices, that information would only be available at the retail store and would never reach the retailer's central or regional office in time to be included in the next download. Most retail food chains do not want individual stores making independent decisions about what tares to use.

Ultimately, the key will be for packers and retailers to communicate more frequently and more effectively. To that end, the American Meat Institute (AMI) has agreed to contact other trade associations representing the retail and meat packing industries to ask for their help in reiterating to their members the importance of accurate net weight labeling at retail. AMI will encourage their packer and processor members to communicate tare values to retail customers whenever changes in tare values occur.

How Can Weights and Measures Officials Help?

Weights and measures agencies can help by sending copies of test reports (especially from failed inspections) to the corporate or regional office of the retailer. While ideally the corporate or regional office will receive this information from the retail store, retailers at this meeting stressed they would rather receive duplicate reports (from the weights and measures agency and the store) than none at all. Retailers consider it absolutely critical that weights and measures officials contact, communicate, and work with the corporate and regional offices early and often. Retailers specifically asked that weights and measures agencies not wait for problems to escalate before they get the corporate or regional offices involved. Weights and measures officials should conduct package inspections in full compliance with NIST Handbook 133 (HB 133). Inspectors are encouraged to properly clean tare materials during inspections to avoid imposing tares larger than they should be.

According to HB 133, Used Dry Tare is "tare material that has been air dried, or dried in some manner to simulate the unused tare weight." Before adding this definition to HB 133, members of the NCWM and NIST did extensive testing to compare the weights of Unused Dry Tare (which the packer uses), and Used Dry Tare (which the inspector uses). If Used Dry Tare is dried and cleaned properly, its weight should not vary significantly from the Unused Dry Tare weight. In addition, NIST strongly discourages the use of microwave ovens when drying tare materials, particularly soaker pads. Past tests have shown that excessive heating of soaker pads and other tare materials can significantly alter their weight, and even start a fire as some officials have learned.

Following the 2007 Annual Meeting NIST WMD published the following article in its quarterly newsletter to provide additional guidance to officials on how to provide moisture allowances for packages.

MOISTURE LOSS AND GEL SOAKER PADS—WHAT DO I DO? Tom Coleman

Weights and Measures Quarterly - September 2007 - Volume 10 Number 3, Page 4

Moisture loss is the loss of weight or volume after packaging. Packaged products (e.g., cookies, granulated sugar), however, may gain as well as lose moisture. The amount of loss or gain depends on many factors including but not limited to the nature of the product, packaging material, length of time "offered for sale," environmental conditions, and many other

combinations of "similar" circumstances. Loss of weight may include solvent evaporation and natural juices—not just the loss of water. Tare determinations can be very simple or a major concern depending on the type of tare material and the weight consistency of that substance. Unused dry tare (when available and applicable) may be the easiest of the tares to determine. Gel soaker pads may not be seen and tested as often, however they may prove to be equally basic. NIST Handbook 133 "Checking the Net Contents of Packaged Goods" provides the following guideline for all tare determinations:

"Tare material includes all packaging materials that can be separated from the packaged product, either readily (e.g., by shaking) or by washing, scraping, ambient air drying, or other techniques involving more than 'normal' household recovery procedures, but not including laboratory procedures like oven drying." Except for aerosol or other pressurized packages, open the sample packages, empty, clean, and dry the tare material as appropriate for the packaging material. When testing packaged product using gel soaker pads, three types of tare may be used. Used dry tare – used dry tare is tare material that has been air dried or dried in some manner to simulate the unused tare weight. It includes all packaging materials that can be separated from the packaged product, either readily (e.g., by shaking) or by washing, scraping, ambient air drying, or other techniques involving more than "normal" household recovery procedures, but not including laboratory procedures like oven drying. Labels, wire closures, staples, prizes, decorations, and such are considered tare. Used dry tare is available regardless of where the packages are tested. Unused dry tare – if testing packages in retail store locations where they are packaged and sold in small quantities to the ultimate consumers, the basic test procedures may be modified by using samples of the packaging material if available in the store. Wet tare – if wet tare is used, follow the procedures described in the used dry tare section above, except make no effort to dry the tare material. The following six steps apply when gravimetrically testing any type of packaged product:

- 1. Identify and define the inspection lot.
- 2. Select the sampling plan.
- 3. Select the random sample.
- 4. Measure the net contents of the packages in the sample.
- 5. Evaluate compliance with the maximum allowable variation (MAV) requirement.
- 6. Evaluate compliance with the average requirement. If, when following these steps using either unused dry tare, used dry tare, or wet tare, the product is found to contain less than the quantity represented, or if there is a violation of the maximum allowable variation (MAV) requirement, provide a copy of the test results to the appropriate store authority. Once this has been accomplished, the "field" test is complete. If upon receipt of the "official" test report the manufacturer wishes to contest the inspection results based on the "loss or gain of moisture," official notification shall be directed to the appropriate weights and measures administrator for consideration/verification.

*** If testing flour, dry pet food or USDA packages of fresh poultry, franks, hotdogs, bacon, fresh sausage, and luncheon meats, specific instructions are provided in NIST Handbook 133, moisture allowances, page 17. Note: Dry pet food means all extruded dog and cat foods and baked treat products packaged in Kraft paper bags and/or cardboard boxes with a moisture content of 13 % or less at the time of pack.

If you have any questions or need additional information regarding moisture loss, please contact Lisa Warfield at (301) 975-3308 or at lisa.warfield@nist.gov or Ken Butcher at (301) 975-4859 or at kbutcher@nist.gov.

REFERENCE SECTION I – EXCERPTS FROM THE INTERPRETATIONS AND GUIDELINES SECTION OF NIST HANDBOOK 130

The following are currently in NIST HB 130 Interpretations and Guidelines

2.2.5. Lot, Shipment, or Delivery

(L&R, 1981, p. 95)

Policy

The requirements for the average package net contents to meet or exceed the labeled declaration may be applied to production lots, shipments, or deliveries. Shipments or deliveries are smaller collections of packages than production lots that may or may not consist of mixed lot codes.

Emphasis in inspection activities should be placed on warehouse and in-plant testing without neglecting retail consumer protection.

Background

The Committee heard a petition from the California Brewers Association to define a lot as:

"A selection of containers under one roof produced by a single company of the same size, type and style, manufactured or packed under similar conditions with a minimum number to be equivalent to one production line shift."

The intention of the petition is to focus Weights and Measures enforcement on production lots as opposed to small collections of packages on retail shelves, because the production lot is under the control of the packager.

An alternative proposal was made that would require mingling of lot and date codes in package inspection at warehouse locations.

The Committee has reviewed the proposals in light of paragraph 7.6. and paragraph 12.1. of the Uniform Packaging and Labeling Regulation which refers to "shipment, delivery, or lot." If the petition is approved, the terms "shipment" and "delivery" would have to be dropped from this Uniform Regulation.

The Committee recognizes the inherent value of in-plant and warehouse inspection and is of the opinion that, wherever possible, such inspections should be carried out. At the same time, the Committee recognizes the need for the state and local weights and measures officials to protect the consumer at the level where the ultimate sale is made. Therefore, the Committee recommends no change to the Uniform Regulation.

The Committee looks forward to the work of the Special Study Group on Enforcement Uniformity of the NCWM which will be exploring the mechanisms that might be instituted to make in-plant inspection workable.

2.5.6. Guidelines for NCWM Resolution of Requests for Recognition of Moisture Loss in Other Packaged Products

(Exec, 1988, p. 94)

The Task Force on Commodity Requirements limited its work to only a few product categories, using these categories as models for addressing moisture loss. The gray-area concept is the result of this work.

Recognizing several candidates for future work in moisture loss, the Task Force recommends that the following guidelines for moisture loss be followed as far as possible by any industry requesting consideration:

1. There should be reasonable uniformity in the moisture content of the product category. For example, since pet food has final moisture contents ranging from very moist to very dry, some subcategorization of pet food needs to be defined by industry before the NCWM study of the issue.

- 2. The predominant type of moisture loss (whether into the atmosphere or into the packaging materials) must be specified.
- 3. Different types of packaging might make it necessary to subcategorize the product. For example, pasta is packaged in cardboard, in polyethylene, or other packaging more impervious to moisture loss. The industry should define the domain of packaging materials to be considered.
- 4. "Real-world" data is needed on the product as found in the retail marketing chain—not just laboratory moisture-loss data.
- 5. The industry requesting consideration of moisture loss for its product should collect data on an industrywide basis (rather than from only one or two companies).

Information concerning the relative fractions of imported and domestically produced product should be available, for example, in order to assess the feasibility of interacting with the manufacturer on specific problem lots.

- 6. Moisture loss may occur either:
 - during manufacturing or
 - during distribution.

Data will be needed to show the relative proportion of moisture loss in these different locations since moisture loss is permitted only under good distribution practices. Geographical and seasonal variations may apply.

- 7. A description of the processing and packaging methods in use in the industry will be of great value, as will a description of the distribution system and time for manufacturing and distribution. A description of the existing net quantity control programs in place should be given, together with information on how compliance with Handbook 133 is obtained. A description of maintenance and inspection procedures for the scales should be provided, together with information on suitability of equipment and other measurements under Handbook 44.
- 8. A description of federal and local agency jurisdiction and test should be given, as well as any regulatory history with respect to moisture loss and short weight. Has weights and measures enforcement generated the request? What efforts have addressed the moisture loss issue prior to approaching the NCWM? Are the appropriate federal agencies aware of the industry's request to the NCWM?
- 9. The industry should propose the type of compliance system and/or moisture determination methodology to be used. The compliance scheme, if it contains industry data components, should be susceptible to verification (examples: USDA net weight tests for meat; exchange of samples with millers for flour) and should state what the companies will do to provide data to field inspection agencies in an ongoing fashion (as the gray-area approach requires). If in-plant testing is to be combined with field testing, who is to do such testing, and how is this to be accomplished? It should be possible to incorporate the proposed testing scheme into Handbook 133 to be used with Category A or B sampling plans.

When all the preliminary information recommended above has been collected, a field test of the proposed compliance scheme should be conducted by weights and measures enforcement officials to prove its viability. See the plan diagrammed on the next page.



Plan For NCWM Resolution of Individual Requests For Recognition of Moisture Loss

- W Weights & Measures Officials N NCWM Voting Membership
- F Federal Agency
- i i edelal Agen

2.6.10. Model Guidelines for the Administrative Review Process

Purpose

These guidelines are provided to assist weights and measures programs in establishing an administrative review process. <u>They are not intended to be the only process an agency may use nor are they intended to supersede any agency's existing process. Before implementing ANY process, it should be approved by legal counsel.</u>

These guidelines ensure that persons affected by "inspection findings" (e.g., price misrepresentations or shortweight packages), or who are deprived of the use of their property (devices or packages placed under "stop" or "off-sale" order), are provided a timely-independent review of the action. The process enables affected persons to provide evidence which could be relevant in determining whether the enforcement action was proper. The purpose of the process is to ensure that a person's ability to conduct business is not hindered by improper enforcement actions. This process is independent of any other action (e.g., administrative penalties, prosecutions, etc.) that may be taken by the enforcement agency.

Background

In the course of their work, weights and measures officials take enforcement actions that may prohibit the use of devices or the sale of packaged goods (e.g., "stop-sale" or "off-sale" orders for packages and "stop-use" or "condemnation" tags issued on devices). Improper actions (e.g., not following prescribed test procedures, enforcing labeling requirements on exempted packages, or incorrectly citing someone for a "violation") place the official and the jurisdiction in the position of being liable for the action if it is found that the action was "illegal." In some cases, weights and measures jurisdictions could be ordered to pay monetary damages to compensate the affected party for the improper action.

This process is one way to provide affected persons an opportunity to present evidence which may be relevant in determining whether the order or finding has been properly made to an independent party. The procedure enables business operators to obtain an independent review of orders or findings so that actions affecting their business can be evaluated administratively instead of through litigation. This ensures timely review, which is essential because of the impact that such actions may have on the ability of a business to operate and in cases where perishable products may be lost.

Review Provisions

Parties affected by enforcement actions must be given the opportunity to appeal enforcement actions.

Inspectors are the primary contacts with regulated firms and thus are in the best position to ensure that the enforcement actions they take are "proper." "Proper" means that inspections are conducted (1) within the scope of the authority granted by law, (2) according to recognized investigative or testing procedures and standards, and (3) that enforcement actions are lawful. The "burden" for proving that actions are "proper" falls on the weights and measures program, not on regulated firms.

Weights and measures officials are law enforcement officers. Therefore, they have the responsibility to exercise their authority within the "due process" provisions of the U.S. Constitution. As weights and measure programs carry-out their enforcement responsibilities in the future, more and more challenges to their actions and authority will occur. It is in the best interest of any program to establish strict operational procedures and standards of conduct to prevent the occurrence of improper actions which may place the jurisdiction in an untenable position in a court challenge of an enforcement action. The foundation for ensuring "proper" actions is training, clear and concise requirements, and adoption of, and adherence to uniform test procedures and legal procedures.

Prior to taking enforcement actions, the inspector should recheck test results and determine that the information on which the action will be taken is accurate.

Inspections shall be conducted with the understanding that the findings will be clearly and plainly documented and reviewed with the store's representative.

During the review of the findings, the firm's representative may provide information which must be used by the inspector to resolve the problems and concerns before enforcement actions are taken. In some cases, the provided

information may not persuade the inspector to forego the action. In some cases the inspector and business representative may not understand the circumstances surrounding the violations, or there may be a conflict between the parties that they cannot resolve. In other cases, the owner or manufacturer may not learn that an enforcement action has occurred until long after the inspector leaves the establishment.

Steps:

- 1. Provide a framework that will help in resolving most of these situations where "due process" is of concern. Make sure that the responsible party (e.g., as declared on the package label) is notified of violations and receives copies of inspection reports. Establish standard operating procedures to assure the affected party of timely access to a representative of the weights and measures program so that the firm can provide the relevant information or obtain clarification of legal requirements.
- 2. Make the process as simple and convenient as possible. Especially in distant or rural areas where there are no local offices, the review should be conducted by a supervisor of the official taking the action if agreed to by the person filing the request for review.
- 3. The process should include notice that the firm can seek review at a higher level in the weights and measures program or an independent review by a third party. The following procedures are recommended:
 - (a) Any owner, distributor, packager, or retailer of a device ordered out of service, or item or commodity ordered "off-sale," or inspection finding (e.g., a price misrepresentation or a shortweight lot of packages) shall be entitled to a timely review of such order, to a prompt, impartial, administrative review of such off-sale order or finding.

A notice of the right to administrative review should be included on all orders or reports of findings or violations and should be communicated to the responsible firm (e.g., person or firm identified on the product label):

- (b) The administrative review shall be conducted by an independent party designated by the Director or before an independent hearing officer appointed by the Department. The officer shall not be a person responsible for weights and measures administration or enforcement.
- (c) No fees should be imposed for the administrative review process.

Sample Notice
You have the right to Administrative Review of this order or finding. To obtain a review, contact the Director of Weights and Measures by telephone or send a written request (either postmarked, faxed, or hand delivered) to:
(Name, Address or Fax Number of the Director or other Designated Official)
Your request should reference any information that you believe supports the withdrawal or modification of the order or finding.

(d) The firm responsible for the product or the retailer may introduce any record or other relevant evidence.

For example:

- (i) Commodities subject to the off-sale action or other findings were produced, processed, packaged, priced, or labeled in accordance with applicable laws, regulations or requirements.
- (ii) Devices subject to the "stop-use" order or "condemnation" were maintained in accordance with applicable laws, regulations or requirements.
- (iii) Prescribed test procedures or sampling plans were not followed by the inspector.
- (iv) Mitigating circumstances existed which should be considered.
- (e) The reviewer must consider the inspector's report, findings, and actions as well as any evidence introduced by the owner, distributor, packager, or retailer as part of the review process.
- (f) The reviewer must provide a timely written recommendation following review unless additional time is agreed to by the department and the petitioner.
- (g) The reviewer may recommend to the Department that an order be upheld, withdrawn or modified. If justified the reviewer may recommend other action including a reinspection of the device or commodity based upon information presented during the review.
- (h) All actions should be documented and all parties advised in writing of the results of the review. The report of action should be detailed in that it provides the reasons for the decision.

2.6.11. Good Quantity Control Practices

Good Quantity Control Practices means that the plant managers should take all reasonable precautions to ensure the following quantity control standards or their equivalent are met:

- 1. A formal quantity control function is in place with authority to review production processes and records, investigate possible errors, and approve, control, or reject lots.
- 2. Adequate facilities (e.g., equipment, standards and work areas) for conducting quantity control functions are provided and maintained.
- 3. A quantity control program (e.g., a system of statistical process control) is in place and maintained.
- 4. Sampling is conducted at a frequency appropriate to the product process to ensure that the data obtained is representative of the production lot.
- 5. Production records are maintained to provide a history of the filling and net content labeling of the product.
- 6. Each "production lot" contains on the average the labeled quantity and the number of packages exceeding the specified maximum allowable variation (MAV) value in the inspection sample shall be no more than permitted in Tables 2-1 and 2-2 in NIST Handbook 133.
- 7. Packaging practices are appropriate for specific products and measurement procedures (e.g., quantity sampling, density and tare determinations) and guidelines for recording and maintaining test results are documented.
- 8. Personnel responsible for quantity control follow written work instructions and are competent to perform their duties (e.g., background, education, experience and training). Training is conducted at sufficient intervals to ensure good practices.

- 9. Recognized procedures are used for the selection, maintenance, adjustment, and testing of filling equipment to insure proper fill control.
- 10. Weighing and measuring devices are suitable for their intended purpose, and measurement standards are suitable and traceable to national standards. This includes a system of equipment maintenance and calibration to include recordkeeping procedures.
- 11. Controls over automated data systems and software used in quantity control ensure that information is accessible, but changeable only by authorized personnel.
- 12. Tare materials are monitored for variation. Label changes are controlled to ensure net quantity matches labeled declaration.

2.6.12. Point-of-Pack Inspection Guidelines

A. Weights and Measures Officials' Responsibilities

- 1. Conduct inspections during hours when the plant is normally open for business. Open the inspection by making contact with the plant manager or authorized representative (e.g., the quality assurance manager or the production manager).
- 2. Present the proper credentials and explain the reason for the visit (e.g., routine or follow-up inspection or consumer complaint, etc.).
- 3. Request access to quantity measurement equipment in the packing room, moisture testing equipment in the laboratory or in the packing room, and product packed on premise or stored in warehouse areas.
- 4. Obtain permission from a plant representative prior to using a tape recorder or a camera.
- 5. Conduct inspection-related activities in a professional and appropriate manner and, if possible, work in an area that will not interfere with normal activities of the establishment.
- 6. Abide by all the safety and sanitary requirements of the establishment and clean the work area upon completion of the inspection/test. Return borrowed equipment and materials.
- 7. To close the inspection, recheck inspection reports in detail and ascertain that all information is complete and correct.
- 8. Sample questions and tasks for Inspectors:
 - a. Inside Buildings and Equipment:
 - (i) Is all filling and associated equipment in good repair?
 - (ii) Are net content measurement devices suitable for the purpose being used?
 - (iii) Are standards used by the firm to verify device accuracy traceable to NIST?
 - b. Packing Room Inspection:
 - (i) Observe if the program for net quantity of content control in the packing room is actually being carried out.
 - (ii) Ensure that the weighing systems are suitable and tare determination procedures are adequate. If there are questions regarding tare determination, weigh a representative number of tare and/or filled packages.

- (iii) For products labeled and filled by volume and then checked by weight, ensure that proper density is used.
- c. Warehouse Inspection:

If an inspection is conducted:

- (i) Select lot(s) to be evaluated.
- (ii) Determine the number of samples to be inspected. Use the appropriate sampling plan as described in NIST Handbook 133.
- (iii) Randomly select the number of samples or use a mutually agreed on plan for selecting the samples.
- (iv) Determine the average net quantity of the sample and use the standard deviation factor to compute the Sample Error Limit (SEL) to evaluate the lot.
- (v) Look for individual values that exceed the applicable Maximum Allowable Variation as found in NIST Handbook 133.
- (vi) Apply moisture allowances, if applicable.
- (vii)Review the general condition of the warehouse relevant to package integrity, good quantity control, and distribution practices.

(viii) Prepare an inspection report to detail findings and actions.

9. Close the inspection – Review findings with Plant Representative.

After the inspection, meet with the management representative to discuss inspection findings and observations. Provide additional information as needed (e.g., information on laws and regulations or explanations of test procedures used in the inspection). Be informative, courteous and responsive. If problems/violations are found during the inspection/test, bring them to the attention of the appropriate person.

B. Plant Management Responsibilities

- 1. Recognize that inspectors are enforcing a federal, state or local law.
- 2. Assist the official in conducting inspection activities in a timely and efficient manner.
- 3. During the initial conference with the inspector, find out whether the inspection is routine, a follow-up, or the result of a consumer complaint. If a complaint, obtain as much information as possible concerning the nature of the complaint, allowing for an appropriate response.
- 4. The plant manager, quality assurance manager, or any designated representative should accompany the inspector.
- 5. Plant personnel should take note of the inspector's comments during the inspection and prepare a detailed write-up as soon as the inspection is completed.
- 6. When an official presents an inspection report, discuss the observations and, if possible, provide explanations for any changes deemed necessary as a result of the inspection/test.
Plant Management: Information that must be shared with the inspector.

- 1. Establishment name and address.
- 2. Type of firm and information on related firms or applicable information (e.g., sub-contractor, servant or agent).
- 3. General description and location of shipping and storage areas where packaged goods intended for distribution are stored.
- 4. Commodities manufactured by or stored at the facility.
- 5. Names of responsible plant officials.

Plant Management: Information that may be shared with the inspector.

- 1. Simple flow sheet of the filling process with appropriate net content control checkpoints.
- 2. Weighing or measuring device maintenance and calibration test records.
- 3. Type of quantity control tests and methods used.
- 4. Net content control charts for any lot, shipment, or delivery in question or lots which have previously been cited.
- 5. Method of date coding the product to include code interpretation.
- 6. Laboratory reports showing the moisture analysis of the products which are in question or have been previously cited.
- 7. Product volume of lot sizes or related information.
- 8. Distribution records related to any problem lots including names of customers.

REFERENCE SECTION II – OTHER MOISTURE LOSS GUIDANCE AND RELATED DOCUMENTS

This section contains the text from a WMD memorandum to state weights and measures directors and other interested parties and a letter from Kraft General Foods stating the reasons justifying a withdrawal of the WMD memorandum.

A. Text from the WMD Memorandum that was issued on January 1, 2006

Memorandum for State Weights and Measures Directors and Other Interested Parties

Subject: Verifying the Net Contents of Packaged Goods and Recommended Procedures for Moisture Allowances

This memo supersedes the April 3, 1995, memorandum from the Weights and Measures Division (WMD) concerning the impact of the Nutrition Labeling and Education Act of 1990 (NLEA) on net content testing by State and local weights and measures officials.

I am revising the earlier correspondence primarily in response to the National Conference on Weights and Measures' (NCWM) adoption of the 4th edition (January 2005) of the National Institute of Standards and Technology's Handbook 133 "Checking the Net Contents of Packaged Goods" (Handbook 133). Recent inquiries from State officials on the status of package inspection programs that test products subject to Food and Drug Administration (FDA) jurisdiction have further prompted a response. This memorandum describes guidance provided by FDA. Since 1985 that agency has advised NIST that Handbook 133 has <u>not</u> been in conflict with that agency's practices enforcing net quantity of content on packaged foods.

I. Recommendations for Verifying the Net Quantity of Contents of Packages Subject to FDA Jurisdiction

WMD recommends that weights and measures officials use the 4th edition of Handbook 133 (January 2005) for all products <u>except</u> those subject to regulation by the U.S. Department of Agriculture (USDA), which has adopted the 3rd edition of Handbook 133 and its 4th Supplement.¹ NIST recently learned that the USDA may adopt the 2005 edition of Handbook 133 in the near future. These publications are available on the Internet.²

The Category A Sampling Plans in Handbook 133 provide a statistically valid sampling scheme and sample correction factors to enable you to determine if a sample passes or fails a test with a confidence level of at least 97 %. The test methods prescribed for foods are consistent with those used by the FDA.³

Weights and measures officials must apply both the "average" and "individual package" requirements in Handbook 133 to the packages they inspect because Federal and State laws and regulations relating to net quantity of content require officials to allow reasonable variations (both plus and minus errors in net contents) from the labeled net contents. By applying both requirements, officials avoid the appearance

¹ See 9CFR317.19 and 9CFR381.121b for the applicable meat and poultry regulations.

² The 3rd Edition and 4th Supplement required by USDA and the January 2005 4th Edition of Handbook 133 are free at http://ts.nist.gov/WeightsAndMeasures/h1334-05.cfm on the Internet.

³ Historically, the FDA has used enforcement procedures based on a 95 % confidence level that findings of underfill are accurate. The Category A Sampling Plans in the 4th edition of Handbook 133 are based on an approximate 97 % confidence level that the findings are accurate; therefore, these plans should be acceptable to use in testing packages under FDA jurisdiction.

they are imposing a "minimum" net content system⁴ while providing a high level of protection for consumers and ensuring fair competition in the marketplace.

Weights and Measures Officials should continue to test packages at retail and should consider Section 1.1. of Handbook 133 before taking enforcement action on small inspection lots of package:

Testing packages at retail outlets evaluates the soundness of the manufacturing, distributing, and retailing processes of the widest variety of goods at a single location. It is an easily accessible, practical means for State, county and city jurisdictions to monitor packaging procedures and to detect present or potential problems. Generally, retail package testing is not conducive to checking large quantities of individual products of any single production lot. Therefore, follow-up inspections of a particular brand or lot code number at a number of retail and wholesale outlets, and ultimately at the point-of-pack are extremely important aspects in any package-checking scheme. After the evaluation of an inspection lot is completed, the jurisdiction should consider what, if any, further investigation or follow-up is warranted. At the point-of-sale, a large number of processes may affect the quality or quantity of the product. Therefore, there may be many reasons for any inspection lot being out of compliance. A shortage in weight or measure may result from mishandling the product in the store, or the retailer's failure to rotate stock. Shortages may also be caused through mishandling by a distributor, or failure of some part of the packaging process. Shortages may also be caused by moisture loss (desiccation) if the product is packaged in permeable media. Therefore, being able to determine the cause of an error in order to correct defects is more difficult when retail testing is used.

It is important to realize that the Category A Sampling Plans in Handbook 133, while statistically valid, may fail lots that contain the labeled net quantity of content approximately three times out of 100 tests. By basing enforcement actions on samples from multiple lots of the same product from the same manufacturer tested at different locations, you will have a better indication of whether or not an enforcement action is necessary. When a lot fails an inspection, NIST recommends you contact the manufacturer to obtain quantity control records and other production information on the lot to assist in your decision process. To ensure due process, we encourage jurisdictions to follow the NCWM's Section 2.6.10. Model Guidelines for the Administrative Review Process in NIST Handbook 130 "Uniform Laws and Regulations in the area of legal metrology...." (Those guidelines are shown below this memorandum) for reference but, your agency's general counsel may of course have you follow other procedures. When following up on possible violations with manufacturers, recognize they are required under Federal and State laws or regulations to follow current good manufacturing practices. The NCWM has also adopted guidelines in Section 2.6.11. on "Good Quantity Control Practices" that officials can use as a tool to assess quantity control systems. (These are provided below).

Weights and Measures officials should conduct inspections at the point of pack whenever possible so they will have access to larger lots of packages and can also assess the packager's entire packaging system. The NCWM adopted guidelines in Section 2.6.12. on "point-of-pack inspections" to help officials conduct these inspections, (See below this memorandum).

We encourage jurisdictions to collaborate on conducting marketplace surveys to determine the level of compliance of commodity groups (e.g., store-packed random weight items, mulch, polyethylene sheeting, flour, milk, soft drinks, animal food, etc.) and to work together to follow up on possible problems at the point-of-pack where the packaging plant or distribution point is located in a jurisdiction other than where the packages failed to pass a test. The State of California conducts a wide variety of marketplace surveys which can serve as model for other states to follow. NIST encourages all states to follow the example set by California's Division of Measurement Standards for monitoring compliance in the all areas of weights

⁴ Under a "minimum" net content system (these systems are common in European countries), no package in a sample may contain less than the net quantity of contents stated on the package label.

and measures enforcement. NIST will provide assist to states who want to conduct or collaborate in surveys...

<u>Ensure that all samples are selected randomly</u>. The statistical reliability of the sampling plans is valid only when the sample has been randomly selected from the inspection lot.

To be consistent with FDA inspection activities, utilize used dry tare when taking enforcement actions. The handbook permits unused dry tare to be used to conduct audits and to verify net weights of packages put up in retail stores.

Apply the average and individual package requirements to products tested at any point in distribution. Over the last ten years several jurisdictions have contacted WMD concerning industry claims that States can only take action on production lots. FDA advises that there are no provisions in the Federal Food, Drug, and Cosmetic Act or its legislative history that support this claim. Another issue that WMD has been asked about is the claim that the FDA has a "1 %" tolerance that States must permit. FDA advises that they have a policy for their field compliance staff to use in determining whether or not to request enforcement actions by the U.S. Justice Department. The only purpose for the policy is for FDA to prioritize agency resources, not to set a limit for State enforcement actions. The FDA also reports that it did not establish this policy as a statistical allowance or tolerance that could be easily abused by an unscrupulous packager.

Allow for reasonable moisture loss.

The following Federal regulation preempts any State or local requirement that is not identical:

21 CFR § 101.105

(q) The declaration of net quantity of contents shall express an accurate statement of the quantity of contents of the package. Reasonable variations caused by loss or gain of moisture during the course of good distribution practice or by unavoidable deviations in good manufacturing practice will be recognized. Variations from stated quantity of contents shall not be unreasonably large.

State and local jurisdictions <u>must</u> allow reasonable variations in net contents caused by the loss or gain of moisture in food products that occurs during good distribution practice. If not, a jurisdiction may be questioned if enforcement action is taken against the product. The moisture loss issue has challenged weights and measures officials and industry since the Federal Food, Drug, and Cosmetic Act allowing for moisture loss was passed more than 75 years ago. However, the fact that FDA has not adopted specific moisture allowances is not justification for not making reasonable allowances for moisture loss.

The NCWM has adopted moisture allowances (also called "gray areas") for flour, dry pet food, chicken, and hot dogs. Under the "gray area" concept, any food found short in excess of the allowance is subject to enforcement action. If the product is found short, but within the allowance, the official would take additional steps (such as comparing the moisture content of a sample from the lot to the time-of-pack moisture content provided by the packer) to determine if the product is short because of underweighing at the time of pack, or if the shortage is due to "reasonable" moisture loss that occurred during distribution. WMD recommends that officials use the following guidelines with the "gray area" approach to allow reasonable moisture loss for the listed foods.

WMD only <u>recommends</u> moisture allowances. It is the individual jurisdiction's responsibility to make the final decision concerning appropriate moisture allowances. Final decisions should be made after considering moisture loss data provided by the packager.

II. Recommended Moisture Allowances for Some Foods

WMD has consulted with State and local weights and measures agencies and affected industries on moisture loss problems associated with hygroscopic foods. The following moisture allowances, beyond those already

addressed by the NCWM, are recommended. WMD used data from the FDA's Quantity of Contents Compendium as the major source for the numerical values for gray area recommendations. Moisture loss has been identified with flour, pasta, rice, cheese and cheese products, dried fruits and vegetables, fresh and frozen fruits and vegetables, coffee beans, and bakery products. Of all of these commodities, the extent of moisture loss variations is greatest for flour and pasta. Very little current data are available for many other commodities. However, WMD considers the need for allowances for affected commodities to be pressing and believes that States must make some allowance for these commodities until other data can be obtained for the respective commodities. If a recommended allowance is perceived as too lenient, weights and measures agencies may prevent abuses of the allowance through inspections at the point of pack. Allowances if too lenient provide are a disadvantage for firms with products in competition with packers where point-of-pack inspections may not be possible; consequently, such firms may wish to provide information to WMD so that we can recommend a more stringent allowance. Where allowances are too stringent, firms may also provide information justifying a more appropriate allowance. WMD suggests that firms desiring such an allowance be encouraged to work closely with the NCWM in view of its experience in this area. Even though the process of developing moisture allowances is time-consuming, affected firms will be provided some relief during the interim period if State and local agencies implement the following recommendations:

III. Moisture Allowances at Point of Pack

WMD recommends that moisture allowances at the point of pack not be made for packages taken immediately off the production line. However, regulatory officials may often encounter product at the point of pack that has been stored by the packer prior to shipment to other locations. In the past, moisture allowances have not been recognized in tests until the food is "introduced into interstate commerce;" however, since many manufacturers store the product for extended periods at the packing location, moisture loss should be recognized. It is recognized that moisture loss is a natural phenomenon that is not controlled or delayed by any specific schedule, and WMD recommends that, at some point during such storage, allowances be permitted for moisture loss. But, considering the multiplicity of foods, differences in packing materials, and the various environmental factors that affect moisture loss, it would be impossible for WMD to determine moisture loss that occurs on the packaging line or in the first few hours or days following the packaging of any one product type, let alone the tens of thousands of products that might be inspected at the point of pack. Certainly, some products begin to lose moisture immediately after packaging, but there must be some definitive guidance provided for weights and measures officials and industry.

This problem is not unique to the United States where we are trying to encourage State and local officials to focus more on point-of-pack inspections. WMD is aware that point-of-pack inspections are one of the primary tools used in European countries to control net contents in packaged goods. We have learned that in some of these countries officials make no allowance for moisture loss within the first 7 days of the date of pack for some products. As this is the only documented guidance on the issue available, WMD recommends that States consider a similar approach until other guidance on this issue is available. This will provide packers and officials with guidance on when moisture loss allowances must be applied and will enable officials to conduct inspections at point of pack to ensure that packers are not taking advantage of recognized allowances for moisture loss. To minimize the possibility of moisture loss considerations, officials should inspect the most recently packed items.

In 1995 WMD received comments on the 7-day recommendation from the Food Industry Weights and Measures Task Force (Task Force) of the Grocery Manufacturers of America. The Task Force was concerned the 7-day period was not reasonable because the data submitted to the NCWM to develop the gray areas for flour, dry pet food, and other products clearly showed that some products lose as much as 0.5 % to 1 % of their weight due to moisture loss in the first few days of packing. WMD acknowledged the industry's concerns about the 7-day period but believed then and now that the concerns can be addressed without dropping the recommendation. WMD believes it is crucial to have specific guidelines on moisture loss for use in point-of-pack inspections.

WMD recommends an exception to the 7-day period if the packer can provide daily moisture loss data collected using the following procedures. We have developed the following guidelines in collaboration with industry for packers to use the results of the short-term moisture loss studies at the point of pack. To be acceptable, the data

must be computed using the average moisture loss determined on a daily basis (e.g., the weight of each package in each of the sample control lots is determined everyday for 7-days) in environmental conditions similar to those that exist when the product is being inspected. For example, an inspector visits a pet food plant in Ohio in the middle of July to conduct a point-of-pack inspection. If the product tested had been packaged 5 days before the inspection and is found underweight; the moisture loss data must reflect the loss that would occur in July not January. At least three sample control lots, consisting of at least 48 randomly selected packages, must be used to develop the moisture loss data. Each sample lot must be stored under the same conditions that are typical for the product (e.g., if the product is typically placed in a sealed case on a pallet and shrink wrapped, the sample lots must be stored under the same conditions. Moisture loss data obtained by removing the individual packages from the shipping case and storing them in a laboratory would not be acceptable). The three-sample control lots must be placed at various locations in the storage site. The average moisture loss value must be computed from the three-sample control lots with a 95 % prediction interval.

Since point-of-pack inspections are not routinely done in most jurisdictions at this time, there will be many situations where packers may not have "acceptable" moisture loss data for a particular product found to be underweight at the time of a point-of-pack inspection. In these cases, WMD recommends the packer be allowed to conduct a study using the criteria specified above. This data could then be provided to the weights and measures official for use in making a final determination whether or not moisture loss caused the product to be underweight. One benefit of this approach is that the moisture loss study can be conducted within a few days of the inspector finding the inspection lot underweight so the test will more closely reflect the environmental conditions under which the original inspection lot was subject.

A similar recommendation is included for fresh bakery products weighed within 1 day following the end of the day of pack (in this case the moisture loss data would have to be based on the amount of moisture lost on an hourly basis under the same conditions listed above for the 7-day period). WMD will provide technical assistance on request to any jurisdiction to resolve these individual moisture loss cases by working with you and the packer and will seek FDA assistance in resolving these situations.

IV. Recommended Moisture Allowances for Use at Point of Pack and Testing at Any Other Location

Provide the following allowances for moisture loss (expressed as a percentage of the labeled net quantity of contents):

- 1. No allowance for moisture loss should be made if:
 - (a) A food, other than a fresh bakery product, while stored by the packer, is weighed within 7 days following the end of the day of pack, except when the packer provides acceptable (see note below) documentation of the moisture loss for the product in storage at the point-of-pack, or
 - (b) A fresh bakery product, while stored by the packer, is weighed within 1 day following the end of the day of pack, except when the packer provides acceptable (see note below) documentation of the moisture loss for the product in storage at the point of pack, or
 - (c) The food is not subject to moisture loss, or
 - (d) The food is packaged in an air-/moisture-tight container (e.g., cans, glass bottles, enclosed in paraffin, etc).
- 2. Allow 1 % for the following foods: frozen fruits and frozen vegetables, and fresh baked breads, buns, rolls and muffins.
- 3. Allow 3 % for the following foods: flour, dry pet food, pasta, rice, cheese and cheese products, dried fruits and vegetables, fresh fruits and vegetables, coffee beans, and bakery products other than fresh baked breads, buns, rolls and muffins.

Note for Moisture Allowances at Point of Pack: The data must be computed using the average moisture loss determined on a daily basis (e.g., the weight of each package in each of the sample control lots is determined everyday for 7 days) in environmental conditions similar to those that exist when the product is being inspected. For example, an inspector visits a pet food plant in Ohio in the middle of July to conduct a point-of-pack inspection. If the product tested had been packaged 5 days before the inspection and is found underweight; the moisture loss data must reflect the loss that would occur in July, not January. At least three sample control lots consisting of at least 48 randomly selected packages must be used to develop the moisture loss data. Each sample lot must be stored under the same conditions that are typical for the product (e.g., if the product is typically placed in a sealed case on a pallet and shrink wrapped, the sample lots must be stored under the same conditions. Moisture loss data obtained by removing the individual packages from the shipping case and storing them in a laboratory would not be acceptable). The three-sample control lots must be placed at various locations in the storage site. The average moisture loss value must be computed from the three-sample control lots with a 95 % prediction interval. If the packer does not provide the information, no additional moisture allowance should be permitted.

V. Moisture Loss for Products Not Listed in NIST Handbook 133

When officials test product for which no moisture loss guidance has been provided NIST can provide technical assistance. In the past NIST has published recommended moisture allowances for use at all locations including Point-of-Pack. If moisture loss studies are required NIST will assist in the completion of such studies. If studies are a necessity they should be a collaborative effort between officials and industry and can 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.

The amount of moisture lost from a package is a function of many factors not the least of which is the product itself (e.g., moisture content), packaging, storage conditions (e.g., temperature, humidity, 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 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 Section 2.5.6. in the Interpretation and Guideline Section regarding "Resolution for Requests for Recognition of Moisture Loss in Other Packaged Products." NIST WMD has worked and will continue to work extensively with the NCWM, The Laws and Regulations Committee, and industry to develop protocol for determining moisture allowances that can serve as models for future studies. 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.

In some cases manufacturers can and may provide valid moisture loss data for officials to consider in lieu of conducting studies. In cases like this, WMD will provide assistance to determine if the information is complete or if further documentation is required. For example, a major producer of bar soap has provided moisture loss evidence for consideration by officials to determine what if any moisture loss could be expected to occur, in some cases this information has proven to be accurate thus avoiding the need for national data collection.

Moisture loss or gain is a critical consideration for any net content enforcement effort and one that, in most cases, cannot be addressed by a field official. If moisture loss issues are to be deliberated, it is the regulatory official's responsibility to resolve the packers concern utilizing available resources and due process procedures.

To fulfill this obligation officials 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.

VI. Background Information on Federal Preemption

In the previous memorandum we reported that FDA was expected to adopt regulations identical to those contained in the 4th Supplement of the 3rd Edition of Handbook 133 adopted by the NCWM in 1994. The FDA published proposed regulations regarding net quantity of contents test procedures for packaged food under its jurisdiction in the March 4, 1997, issue (62 FR 9826) of the Federal Register. FDA subsequently withdrew that proposal on November 26, 2004 (69 FR 68831). FDA based the withdrawal on its need to reduce its regulatory backlog and focus its resources on current public health issues. The withdrawal did not speak to the merits of the proposal. Based on the experience reported since the adoption of the substantive revisions in 1994, WMD believes that the latest edition of Handbook 133 provides the basis for nationally uniform test methods and other requirements consistent with the requirements in Federal laws relating to net quantity of contents. Therefore, WMD recommends that State and local authorities test products according to the procedures outlined in the latest edition of Handbook 133 unless future FDA guidance or regulations specify otherwise. Moreover, it is extremely important that State and local jurisdictions continue to provide regulatory oversight so businesses can compete in a fair marketplace and consumers can depend on the representations of quantity upon which they make purchasing decisions.

a. Federal Preemption under the Nutrition Labeling and Education Act (NLEA) of 1990

The NLEA was signed into law on November 8, 1990, to amend Title 21 Section 343 of the Federal Food, Drug, and Cosmetic Act (FDCA). The Act requires nutrition labeling on foods and regulates health claims about food nutrients to help consumers select a more healthful diet. Under the Act, State and local laws not "identical" to corresponding FDA requirements are preempted. According to regulations under FDA [21 CFR Part 100.1 (c)(4)], the phrase "not identical" does not refer to the specific words in the requirement. Instead it means that the State or local requirement directly or indirectly imposes obligations or contains provisions that (1) are not imposed by or contained in an FDA requirement, or (2) differ from those specifically imposed by or contained in an FDA requirement or implementing regulation.

The preemption ensures uniformity in labeling requirements and prohibits non-uniform State and local laws, regulations, formal and informal policies, and other enforcement practices that prevent firms from conducting efficient and cost-effective business in all 50 States. Congress recognized that even though federal requirements may preempt more restrictive state requirements in certain instances, the net benefits from national uniformity in these aspects of the food label outweigh any loss in consumer protection that may occur as a result.

The ultimate goal of the NLEA is uniformity in laws, regulations, and test procedures—a goal shared by the NCWM and NIST alike. Under NLEA, state and local labeling requirements must be identical to many of the regulations promulgated under the Federal Food, Drug and Cosmetic Act, as amended by the NLEA, in Title 21 - Code of Federal Regulations, Parts 100 to 169 (current edition). Jurisdictions may continue to enforce state or local regulations on foods where there is no federal requirement and continue to enforce existing state and local laws if they are "identical" to FDA regulations.

b. Defining what is "Identical"

Federal preemption of the net quantity of contents regulations and test procedures occurred on November 8, 1991. On that date, state and local regulations on quantity of contents (e.g., net quantity of contents regulations, sampling plans, and test procedures) were preempted under the NLEA if they were not "identical" to federal requirements. The question is, what is "identical?" Both State and FDA regulations require packers to express an "accurate" statement of the quantity of contents of packaged food while permitting "reasonable" variations. The most common questions WMD receives are "do the test

procedures used by the states and FDA provide identical results" (e.g., do the sampling plans have equal confidence levels, and are the products weighed or measured using recognized procedures) and "are the criteria for defining reasonable variations (e.g., the values of maximum allowable variations, the sample correction factors, and allowances for moisture loss) consistent with those used by FDA?"

FDA's test procedures are based on those contained in "Official Methods of Analysis" of the Association of Official Analytical Chemists International (AOAC). Based on information provided by FDA, WMD believes the test procedures contained in the 4th edition of Handbook 133 are identical to the AOAC procedures. If officials implement the recommendations in this memo, they should be using test procedures equivalent to FDA's.

c. Preemption Extends Beyond Food Packages Introduced into Interstate Commerce

Federal courts have ruled that the FDA has jurisdiction over all food products made from ingredients shipped in interstate commerce, regardless of the amount of the ingredient present, even though the finished product has not moved in interstate commerce. Products that have not entered interstate commerce (e.g., bakery products offered for sale in the food store where they are baked and packaged) that are made of ingredients shipped in interstate commerce to the store are subject to the Food, Drug, and Cosmetic Act and, therefore, should only be tested according to the following recommendations in this memorandum until final regulations are adopted by the FDA.

This memorandum is not legal advice. I encourage you to review this memo with your State Attorney General or staff attorney before implementing any policy on these issues or before you take enforcement action against a product that falls under FDA or other federal jurisdiction.

Training and Technical Support

WMD is committed to supporting state and local jurisdictions in their package inspection programs by providing technical assistance and training classes on Handbook 133. If you need assistance, please contact Lisa Warfield at (301) 975-3308 or by e-mail at lisa.warfied@nist.gov.

NOTICE

The following documents could not be included in this publication because they are only available in Adobe PDF format. They are available from NIST upon request. Please contact Kenneth Butcher at (301) 975-4859 or at kenneth.butcher@nist.gov or Lisa Warfield at (301) 975-3308 or at lisa.warfield@nist.gov to obtain copies.

B. Letter from Kraft Foods Requesting that NIST Withdraw Letter on Moisture Loss

C. Chapter 3 from the 3rd Edition of NIST Handbook 133 and 4th Supplement 1994

Specifications and Tolerances Committee Interim Agenda

Carol Fulmer, Chairman Director of Weights & Measures South Carolina Department of Agriculture

Reference Key Number

300 INTRODUCTION

The Specifications and Tolerances (S&T) Committee ("Committee") will address the following items at its Interim Meeting. All items are listed below in Table A by Reference Key Number. The headings and subjects apply to NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices." The Appendices to the Report are listed in Table B. The acronyms for organizations and technical terms used throughout the agenda are identified in a glossary in Table C. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean the item will be presented to the Conference for a vote. The Committee will review its agenda at the Interim Meeting and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to NIST Handbook 44 which will be presented for a vote at the Annual Meeting.

The recommendations are statements of proposals and are not necessarily those of the Committee. Suggested revisions to the handbook 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: 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 they were submitted and may, therefore, contain references to inch-pound units.

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Glossary of Acronyms							
· ·							
AWS	Automatic Weighing Systems	NW&SA	National Weighing and Sampling Association				
CC	Certificate of Conformance	NCWM	National Conference on Weights and Measures, Inc.				
CWMA	Central Weights and Measures Association	NEWMA	Northeastern Weights and Measures Association				
EPO	Examination Procedure Outline	NIST	National Institute of Standards and Technology				
GS	Grain Analyzer Sector	NTEP	National Type Evaluation Program				
GMM	Grain Moisture Meters	NTETC	National Type Evaluation Technical Committee				
GPMA	Gasoline Pump Manufacturers Association	RMFD	Retail Motor-Fuel Dispenser				
HB 44	NIST Handbook 44	SI	International System of Units				
HB 130	NIST Handbook 130	SMA	Scale Manufacturers Association				
LMD	Liquid-Measuring Device	SWMA	Southern Weights and Measures Association				
LPG	Liquefied Petroleum Gas	WG	Work Group				
MDMD	Multiple Dimension Measuring Devices	WMD	NIST Weights and Measures Division				
MFM	Mass Flow Meter	WS	NTETC Weighing Sector				
MMA	Meter Manufacturers Association	WWMA	Western Weights and Measures Association				
MS	NTETC Measuring Sector	USNWG	NIST/OIML U.S. National Working Group				
OEM	Original Equipment Manufacturer	VTM	Vehicle-tank Meters				
"Handbook 44" (HB 44) means the 2008 Edition of NIST Handbook 44 "Specifications, Tolerances, and Other							
Technical Requirements for Weighing and Measuring Devices"							
"Handbook 130" (HB 130) means the 2008 Edition of NIST Handbook 130 "Uniform Laws and Regulations in the							
Areas of Legal Metrology and Fuel Quality"							
Note: NIST does not imply that these acronyms are used solely to identify these organizations or technical topics.							

Table C

Details of All Items (In Order by Reference Key Number)

310 **GENERAL CODE**

310-1 G-S.8. Provision for Sealing Electronic Adjustable Components

Source: Southern Weights and Measures Association (SWMA)

Recommendation: Amend General Code paragraph G-S.8. as follows:

G-S.8. Provision for Sealing Electronic Adjustable Components. – 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. [Nonretroactive as of January 1, 1990]

A device may be fitted with an automatic or a semi-automatic calibration mechanism. This mechanism shall be incorporated inside the device. After sealing, neither the mechanism nor the calibration process shall facilitate fraud.

(Added 1985) (Amended 1989 and 1993)

The application of the physical security seal shall ensure that the access to the set-up mode is disabled, <u>or</u>

<u>The device shall clearly indicate that it is in the configuration mode and record such message if capable of printing in this mode, or shall not operate while in this mode, or shall automatically exit the configuration mode after 60 minutes.</u> [*Nonretroactive as of January 1, 200X]

Background/Discussion: At its 2007 Annual Meeting, the SWMA received a proposal to add requirements to G-S.8. to assure that a device could not be sealed in the configuration mode and continue to operate normally. Such a condition could facilitate fraud. The proposal as submitted required that a device continuously indicate when access to the set-up mode was not disabled. The SWMA heard comments that manufacturers can incorporate into a device ways to indicate a device is in the calibration mode other than having an enunciator or other indication. Manufacturers also believe any changes to the requirements need to be nonretroactive. The SWMA S&T Committee agreed and modified the original proposal as shown above. The SWMA agreed to forward the modified proposal to the NCWM S&T Committee with a recommendation that it be a voting item on the Committee's agenda.

310-2 Appendix D – Definition of Electronic Devices, Software-Based

Source: National Type Evaluation Technical Committee (NTETC) – Software Sector

Recommendation: Add a new definition and cross-reference term to Appendix D in HB 44 for "Electronic devices, software-based" as follows:

<u>Electronic devices, software-based.</u> 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.

Background/Discussion: During the NTETC Software Sector discussion on marking requirements and G-S.1.1. Location of Identification Information, it was initially suggested that the term "not-built-for-purpose" be removed from the wording in NIST HB 44 paragraph G-S.1.1. since there is no definition for a not-built-for-purpose," the Sector agreed these terms were not clear and should be replaced with the terminology proposed above. The proposed definitions are base on the revision of OIML R 76 Non-automatic weighing instruments sub-sections 5.5.1. (Type P) and 5.5.2. (Type U).

310-3 Appendix D – Definition of Equipment

Source: Carryover Item 310-1B. (This item originated from the 2007 Committee during discussion on Agenda Item 310-1A General Code, paragraph G-S.2. Facilitation of Fraud.)

Recommendation: Add a new definition to Appendix D in HB 44 for "equipment" as follows:

equipment. Weights, measures, and weighing and measuring devices, instruments, elements, and systems or portion thereof, used or employed in establishing the size, quantity, value, extent, area, composition, constituent value, or measurement of quantities, things, produce, or articles for distribution or consumption, purchased, offered, or submitted for sale, hire, or award, or in computing any basic charge

or payment for services rendered on the basis of weight or measure. [1.10, 2.20, 2.21, 2.22, 2.24, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.38, 4.40, 5.51, 5.56.(a), 5.56.(b), 5.57, 5.58, 5.59]

Background/Discussion: During the Committee's 2007 discussion of Agenda Item 310-1 Facilitation of Fraud, the Committee agreed there was a need to define the term "equipment." The Committee believed the proposed definition will help prevent misinterpretation of the term as used in paragraph G-S.2. and several other HB 44 codes. The proposed definition is intended to clarify which parts or portions of a device or system must comply with applicable specifications, tolerances, and other technical requirements in HB 44. The Committee recommended the proposed definition be carried over to allow sufficient time for a review of the proposed definition.

For additional background information, refer to the Committee's 2007 Interim and Annual Reports.

At its 2007 Annual Meeting, the WWMA supported the intent of the proposal. The WWMA recommended the proposed language be split into two sentences as shown below and recommended the proposal move forward as a voting item on the NCWM S&T Committee Agenda.

equipment. Weights, measures, and weighing and measuring devices, instruments, elements, and systems or portion thereof, used or employed in establishing the measurement or in computing any basic charge or payment for services rendered on the basis of weight or measure. As used in this definition, measurement includes the determination of size, quantity, value, extent, area, composition, constituent value, or measurement of quantities, things, produce, or articles for distribution or consumption, purchased, offered, or submitted for sale, hire, or award. [1.10, 2.20, 2.21, 2.22, 2.24, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.38, 4.40, 5.51, 5.56.(a), 5.56.(b), 5.57, 5.58, 5.59]

The CWMA and NEWMA supported the intent of the proposal, agreed with the changes to the proposed definition recommended by the WWMA, and recommend the proposal move forward as a voting item on the NCWM S&T Committee Agenda.

320 SCALES

320-1 S.1.1.(b) Digital Indicating Elements

Source: Carryover Item 320-2. (This item originated from the NTETC WS and first appeared on the Committee's 2007 agenda.)

Recommendation: At the 2007 Annual Meeting, the Committee modified the proposed language developed after the 2007 Interim Meeting. The recommendation (as modified by the Committee) currently under consideration by the Committee is to amend S.1.1.1. as follows:

S.1.1.1. Digital Indicating Elements.

- (a) A digital zero indication shall represent a balance condition that is within $\pm \frac{1}{2}$ the value of the scale division.
- (b) A digital indicating device shall either automatically maintain a "center-of-zero" condition to ±¼ scale division or less, or have an auxiliary or supplemental "center-of-zero" indicator that defines a zero balance condition to ±¼ of a scale division or less.
 [Nonretroactive as of January 1, 1993]

Note: The "center-of-zero" indication may also work when zero is indicated for gross load zero or <u>after a tare operation.</u> (Amended 1992 and 200X)

Background/Discussion: At the 2007 NCWM Annual Meeting, the Committee heard testimony from the CWMA, NEWMA, and SMA stating that this item in the 2007 Interim Agenda had changed from the original intent (to verify that zero tracking could be operable in the net mode) to include additional language which alters the requirement

even more. For example in paragraph S.1.1.1.(a), stating "and" instead of "or" makes both requirements mandatory. If "or" is used instead of "and," then this proposal lowered the current requirement of ½ e to ¼ e. The SMA further stated the proposal was not consistent with Canadian and OIML requirements because proposed paragraph (a) added a dual requirement for the "center-of-zero" indication. Therefore, the CWMA, NEWMA, and SMA recommended the status of the proposal be changed to Informational to allow time for further consideration.

WMD agreed with the CWMA, NEWMA, and SMA and recommended deleting the changes added to the proposal (changing "or" to "and," and requiring all electronic indicators maintain zero within ¼ e). WMD suggested the Committee consider amending the proposal as shown in the recommendation to be more consistent with the original intent of the NTETC WS. In case the Committee had chosen to recommend Agenda Item 320-1 for a vote, WMD provided the Committee with a second proposal to consider at a later date to define the zero condition of a scale with a center-of-zero annunciator while the scale was in a "sleep mode."

The Committee agreed with comments heard that the language in its 2007 Interim report significantly changed the original intent of the proposal. Additionally, the changes to the "center-of-zero" indication requirements were in conflict with OIML recommendations and Canadian requirements.

The Committee agreed the status of the item should be changed to Informational and that the first alternate proposal from the WMD should become a carryover item for the 2008 Committee agenda since that text was consistent with the intent of the original proposal from the WS.

At its 2007 Annual Meeting, the WS reviewed this item and agreed to support the WMD language as recommended in the 2007 NCWM S&T Committee Final Report on Agenda Item 320-2.

At their fall 2007 meetings, the CWMA and WWMA S&T Committees heard unanimous support for this proposal and agreed with the alternative language written by WMD. The CWMA and WWMA recommended the proposal incorporating the WMD alternate language as shown above move forward as a voting item on the NCWM S&T Committee Agenda.

NEWMA believes the scale should not indicate a "center-of-zero" indication if the scale is displaying a negative weight when the tare object is removed from the load-receiving element after tare has been taken. Therefore, at its 2007 Interim Meeting, NEWMA supported the intent of this proposal but submitted an alternate note for paragraph S.1.1.1. as follows:

Note: The "center-of-zero" indication may also work when zero is indicated in either the gross or net mode.

For additional background information, refer to the Committee's 2007 Interim and Final Reports.

320-2 S.1.2.1. Weight Units and T.N.2.1. General

Source: Carryover Item 320-3. (This item originated from the NTETC WS and first appeared on the Committee's 2007 agenda.)

Recommendation: Add a new note to paragraph S.1.2.1. and amend paragraph T.N.2.1. as follows:

S.1.2.1. Weight Units. – Except for postal scales, a digital-indicating scale shall indicate weight values using only a single unit of measure. Weight values shall be presented in a decimal format with the value of the scale division expressed as 1, 2, or 5, or a decimal multiple or sub-multiple of 1, 2, or 5. [Nonretroactive as of January 1, 1989]

Note: The requirement that the value of the scale division be expressed only as 1, 2, or 5, or a decimal multiple or submultiples of only 1, 2, or 5 does not apply to net weight indications and recorded representations that are calculated from gross and tare weight indications where the scale division of the gross weight is different from the scale division of the tare weight(s) on multi-interval or multiple range scales.

For example, a scale indicating a tare weight of 2 kg in the lower range or segment and a gross weight of 5 kg in the higher range or segment may indicate a net weight of 3 kg, or a scale indicating a tare weight of 20 lb in the lower range or segment and a gross weight of 50 lb in the higher range or segment may indicate a net weight of 30 lb.

(Added 1987) (Amended 200X)

S.2.3. Tare. – On any scale (except a monorail scale equipped with digital indications and multi-interval scales or multiple range scales when the value of tare is determined in a lower range), the value of the tare division shall be equal to the value of the scale division.* The tare mechanism shall operate only in a backward direction (that is, in a direction of underregistration) with respect to the zero-load balance condition of the scale. A device designed to automatically clear any tare value shall also be designed to prevent the automatic clearing of tare until a complete transaction has been indicated.* (Amended 1985)

[Note: On a computing scale, this requires the input of a unit price, the display of the unit price, and a computed positive total price at a readable equilibrium. Other devices require a complete weighing operation, including tare, net, and gross weight determination]* [*Nonretroactive as of January 1, 1983] (Amended 200X)

T.N.2.1. General. - The tolerance values are positive (+) and negative (-) with the weighing device adjusted to zero at no load. When tare is in use, the tolerance values are applied from the tare zero reference (zero net indication); the tolerance values apply to the net weight indication for any possible tare load using certified test loadsonly.

(Amended 200X)

Discussion: In 2006 the NTETC WS formed a Tare WG to review existing tare requirements and make recommendations as to how tare was to operate on a single range scale, a multiple range scale, and a multi-interval The WG was also asked to develop, where necessary, recommendations for changes to NCWM scale. Publication 14, HB 44, and HB 130, and to provide guidance to the WS on related type evaluation requirements.

This proposal, which was developed by the Tare WG and supported by the WS, adds a new note to paragraph S.1.2.1. The note recognizes display and printing of net weight values in divisions other than the scale division used in the display of gross weight, resulting in a more accurate net weight determination.

The Tare WG developed a corresponding proposal for the Automatic Weighing Systems Code to clarify the appropriate scale division values and the application of tolerances to tare weights for those devices (see S&T Item 324-1).

During the 2007 NCWM Annual Meeting, the Committee heard comments from the CWMA and NEWMA supporting this item with recommendations to change the word "value" to "division" and incorporate the SWMA recommendation to modify paragraph S.2.3.

NEWMA pointed out that the proposed amendment to S.1.2.1. appeared to be permissive and not a requirement. NEWMA asked if the intent was to prohibit multi-interval and multiple range scales from rounding and indicating calculated net weights in scale divisions to only 1, 2, or 5 when appropriate or was rounding the scale divisions still allowed. The WMD representative to the NCWM Tare WG stated that the intent was for the language to be permissive because there are a significant number of devices in the marketplace with an NTEP CC that round the tare values before calculating net weights.

The Committee made several modifications to the proposal:

- to clarify the examples in the proposed note to paragraph S.1.2.1., and
- to clarify that the SWMA proposed modification to the language in S.2.3. for an exception for multi-interval and multiple range scales only applied to the requirement that the value of tare shall be equal the value of the scale division.

The Committee also agreed that the words "scale value" should be changed to "scale division" to be consistent with the terminology currently used in HB 44 and recommended that the NIST technical advisor forward the amended proposal to the Tare WG and WS for their consideration and comment.

For additional background information, refer to the Committee's 2007 Interim and Annual Reports.

At its 2007 Annual Meeting, the WS reviewed this item and stated that the examples in the language carried over from the 2007 NCWM Annual Meeting did not provide enough information such as the capacities of the weighing ranges or segments and the values of "d" for each weighing range or segment. Additionally, it was agreed that the second example should have a net value that is different than the first example.

At its 2007 Annual Meeting, the WWMA S&T Committee heard from the NTETC WS and SMA which supported the intent of this item. The WWMA recommended that the example be amended by changing the second paragraph of the note and by adding sample equations:

S.1.2.1. Weight Units. – Except for postal scales, a digital-indicating scale shall indicate weight values using only a single unit of measure. Weight values shall be presented in a decimal format with the value of the scale division expressed as 1, 2, or 5, or a decimal multiple or sub-multiple of 1, 2, or 5. [Nonretroactive as of January 1, 1989]

Note: The requirement that the value of the scale division be expressed only as 1, 2, or 5, or a decimal multiple or submultiples of only 1, 2, or 5 does not apply to net weight indications and recorded representations that are calculated from gross and tare weight indications where the scale division of the gross weight is different from the scale division of the tare weight(s) on multi-interval or multiple range scales.

For example, a multiple range scale where the first weighing range (WR1) has a division size of 2 kg and the second weighing range (WR2) has a division size of 5 kg that indicates a tare weight of 4 kg in the lower range or segment and a gross weight of 55 kg in the higher range or segment may indicate a net weight of 51 kg, or 0.06 lb tare weight in a weighing range or segment with 0.02 lb intervals and with 0.05 lb intervals in the higher weighing range may have a net weight in the higher weighing range with 0.01 lb division size as follows:

S.2.3. Tare. – On any scale (except a monorail scale equipped with digital indications <u>and multi-interval</u> scales or multiple range scales when the value of tare is determined in a lower range), the value of the tare division shall be equal to the value of the scale division.* The tare mechanism shall operate only in a backward direction (that is, in a direction of underregistration) with respect to the zero-load balance condition of the scale. A device designed to automatically clear any tare value shall also be designed to prevent the automatic clearing of tare until a complete transaction has been indicated.* (Amended 1985)

[Note: On a computing scale, this requires the input of a unit price, the display of the unit price, and a computed positive total price at a readable equilibrium. Other devices require a complete weighing operation, including tare, net, and gross weight determination]* [*Nonretroactive as of January 1, 1983] (Amended 200X)

T.N.2.1. General. - The tolerance values are positive (+) and negative (-) with the weighing device adjusted to zero at no load. When tare is in use, the tolerance values are applied from the tare zero reference (zero net indication): the tolerance values apply to the net weight indication for any possible tare load using certified test loadsonly.

(Amended 200X)

The CWMA and NEWMA agreed with the Fall 2007 WS and WWMA recommendation.

The CWMA and WWMA recommend that this proposal move forward as a voting item on the NCWM S&T Committee Agenda.

320-3 S.1.7. Capacity Indication, Weight Ranges, and Unit Weights

Source: National Type Evaluation Technical Committee Weighing Sector

Recommendation: Modify paragraph S.1.7. 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 total platform load (not counting the initial dead load that has been canceled by an initial zero-setting mechanism) is in excess of 105 % of scale capacity.
- (b) Capacity Indication. Electronic computing scales (excluding postal scales and weight classifiers) shall neither display nor record a gross or net weight in excess of scale capacity plus 9 d. [Nonretroactive as of January 1, 1993]

(c) Flashing weight values are not acceptable as an overload indication.

The total value of weight ranges and of unit weights in effect or in place at any time shall automatically be accounted for on the reading face and on any recorded representation.

This requirement does not apply to: (1) single-revolution dial scales, (2) multi-revolution dial scales not equipped with unit weights, (3) scales equipped with two or more weighbeams, nor (4) devices that indicate mathematically derived totalized values.

(Amended 1990, 1992, and 1995 and 200X)

Background/Discussion: During its review and discussion of the Tare WG, the WS reviewed a comment from the WG that paragraph S.1.7, should be amended to include a statement that flashing weight values are not an acceptable indication of over capacity. The Tare WG made this recommendation to the Sector while developing a new paragraph that limits tare operating range to the capacity of a scale. This language has been in NCWM Publication 14 as early as its 2nd Edition (1989) and was added when NTEP applicants submitted scales using flashing weight values to indicate an over-capacity condition since flashing weights could be written down and used for commercial weight determinations. The WS agreed with the Tare WG recommendation and requested that appropriate language, as shown above, be developed by the NIST technical advisor and submitted to the NCWM S&T Committee.

320-4 S.2.1.5. Initial Zero-Setting Mechanism

Source: National Type Evaluation Technical Committee Weighing Sector

Recommendation: Amend NIST Handbook 44, Section 2.20. Scales Code, paragraph S.2.1.5. as follows:

S.2.1.5. Initial Zero-Setting Mechanism.

(a) Scales of accuracy Classes I, II, and III may be equipped with an initial zero-setting device.

(b) Weighing, load-receiving, and indicating elements in the same housing or covered on the same <u>CC</u>. An initial zero-setting mechanism shall not zero a load in excess of 20 % of the maximum capacity of the scale unless tests show that the scale meets all applicable tolerances for any amount of initial load compensated by this device within the specified range.

(c) Indicating element not permanently attached to weighing and load-receiving elements covered on a separate CC. The maximum Initial Zero-Setting Mechanism range of electronic indicators must be limited to 20 % of the configured capacity. [Nonretroactive as of January 1, 200X] (Added 200X)

Background/Discussion: This item first appeared on the NTETC WS agenda in 2004. The Sector noted that Scales Code paragraph S.2.1.5. was clear about the requirements for Initial Zero-Setting Mechanism (IZSM) for complete scales. However, it did not address the requirements for separable weighing and indicating elements. Electronic indicating elements have been submitted to NTEP with an IZSM of 100 % of the configured capacity of the indicator. NTEP can easily test to verify IZSM requirements on these elements. However, the problem occurred when the separable load-receiving element (with a CC) was not tested for IZSM and was interfaced with an indicating element that had been tested for IZSM.

If the IZSM on the indicating element was configured to zero off 100 % of the scale capacity and then interfaced with a load-receiving element that had not been tested for IZSM, the load-receiving element could be inadvertently loaded to 200 % of its designed capacity even though it indicated only 100 % capacity. This would likely result in inaccurate weight determinations or damage to the scale.

NTEP only evaluates load-receiving elements up to 105 % of the capacity requested by the applicant and marked on the device. All separable weighing/load-receiving elements from small capacity scales to railroad-track scale load-receiving elements have not been submitted or tested with an IZSM feature unless the submission was to be treated as a complete scale with a specific indicating element. Therefore, there is a possibility that many load-receiving elements consisting of only load-cell support structures may not comply with an indicating element configured with IZSM enabled.

The WS believes that weighing, load-receiving, and indicating elements that are type evaluated together and listed on a single CC can be tested with an IZSM up to 100 % to assure compatibility between the indicating and weighing/load-receiving elements. Separable weighing/load-receiving elements are typically not tested for IZSM since the IZSM is a feature of the indicating element. The Sector considered and agreed that the 20 % limitation was an appropriate value for IZSM in developing the proposal to amend HB 44 paragraph S.2.1.5. based on OIML R 76 [Technical requirements for a self- or semi-self-indicating instrument paragraph 4.5.1. Maximum Effect (of IZSM), WELMEC 2-1 Guide for Testing Indicators] and Canadian requirements (LG-15.04 IZSM Range-Maximum Range of Initial Zero-Setting Mechanism).

At its 2007 Annual Meeting, the WWMA S&T Committee heard comments questioning why Class III L scales are not included in this proposal. A comment was also received to amend the proposal in subparagraph (c) to state that the IZSM "shall not exceed" 20 %. The Committee agreed with the second comment and recommended amending the proposal as follows:

S.2.1.5. Initial Zero-Setting Mechanism.

(c) For indicating elements not permanently attached to weighing and load-receiving elements covered on a separate CC. The maximum Initial Zero-Setting Mechanism range shall not exceed 20 % of the configured capacity.

The WWMA agreed with the intent of the proposal and recommended this proposal, with modifications as shown above, become a voting item, and that additional research be conducted before the Interim Meeting to determine why Class III L scales were omitted from the existing language in HB 44. (**Technical Advisor's Note:** The 1990

NCWM Annual Report of the S&T Committee Agenda Item 320-1 stated that the Committee believed IZSM was not appropriate or necessary on vehicle scales or other Class III L scales.)

At its 2007 Interim Meeting, the CWMA agreed with the WWMA comment and recommendation.

320-5 S.2.4. Level-Indicating Means

Source: Western Weights and Measures Association

Recommendation: Amend paragraphs S.2.4. and S.2.4.1. as follows:

S.2.4. Level-Indicating Means. – Except for portable wheel-load weighers and portable axle-load scales, a portable scale shall be equipped with level-indicating means if its weighing performance is changed by an amount greater than the appropriate acceptance tolerance when it is moved from a level position and rebalanced in a position that is out of level <u>on a slope or grade (rise over run) up to and including in any upright</u> direction by 5 % (approximately three degrees). The level-indicating means shall be readable without removing any scale parts requiring a tool.

[This requirement in nonretroactive as of January 1, 1986, for prescription, jewelers', and dairy-product-test scales, and scales marked I and II.]

[Note: Portable wheel-load weighers and portable axle-load scales shall be accurate when placed out of level **on a slope or grade (rise over run)** up to and including 5 % **(approximately three degrees).**] (Amended 1991 **and 200X**)

S.2.4.1. Vehicle On-Board Weighing Systems. – A vehicle on-board weighing system shall operate within tolerance when the weighing system is out of level up to three degrees or 5 % <u>slope or grade (rise over run)</u>. If the accuracy of the system is affected by out-of-level conditions normal to the use of the device, the system shall be equipped with an out-of-level sensor that inhibits the weighing operation when the system is out of level to the extent that the accuracy limits are exceeded. (Added 1992) (Amended 200X)

Background/Discussion: The WWMA received a proposal from a manufacturer to amend paragraph S.2.4. to clearly state that the 5 % is referring to slope or grade based on flat plane (180 degrees). The submitter stated that existing language in HB 44 paragraph S.2.4. was confusing and that several individuals in the weighing industry have said that 5 % refers to 5 % of 90 degrees, which would make the approved angle 4.5 degrees. As a result, these manufacturers market their devices as being NTEP certified for 4.5 degrees out-of-level.

During its open hearings, the WWMA S&T Committee heard comments from the NTETC WS and a weights and measures consultant stating that they believe there is not a problem with existing language. However, additional comments from device manufacturers indicate confusion about the difference between the 5 % requirements and the parenthetical "approximately 3 degrees." The NIST technical advisor added that 5 % without a "degree" equivalent is used in international recommendations. One scale manufacturer, noting that the limits in HB 44 are not equivalent, stated that an NTEP CC had been issued stating the device complies with out-of level conditions at "5 %" or "3 degrees."

To more clearly state the specification in NIST HB 44, and because 5 % does not correspond exactly with 3 degrees, the WWMA agreed to forward the above proposal to NCWM S&T Committee as a voting item.

At its 2007 Interim Meeting, the CWMA agreed that the language for "Level Indicating Means" could be clarified in HB 44 and agreed that the 5% inferred a grade or slope and that the existing language did not state as such. Additionally, the CWMA recommended that the phrase in parentheses "(approximately three degrees)" remain in paragraph S.2.4. as shown below. The CWMA further recommended this proposal, as revised by the CWMA, move forward as a voting item on the NCWM S&T Committee Agenda.

S.2.4. Level-Indicating Means. – Except for portable wheel-load weighers and portable axle-load scales, a portable scale shall be equipped with level-indicating means if its weighing performance is changed by an amount greater than the appropriate acceptance tolerance when it is moved from a level position and rebalanced in a position that is out of level <u>on a slope or grade (rise over run) up to and including</u> in any upright direction by 5 % (approximately three degrees). The level-indicating means shall be readable without removing any scale parts requiring a tool.

[Note: Portable wheel-load weighers and portable axle-load scales shall be accurate when placed out of level **on a slope or grade (rise over run)** up to and including 5 % (approximately three degrees).]

S.2.4.1. Vehicle On-Board Weighing Systems. – A vehicle on-board weighing system shall operate within tolerance when the weighing system is out of level up to three degrees or 5 % <u>slope or grade (rise over run)</u>. If the accuracy of the system is affected by out-of-level conditions normal to the use of the device, the system shall be equipped with an out-of-level sensor that inhibits the weighing operation when the system is out of level to the extent that the accuracy limits are exceeded. (Added 1992) (Amended 200X)

At its 2007 Annual Meeting the SWMA heard support from one manufacturer for the proposal as submitted. Another manufacturer recommended removing the word "approximately" from the parentheses in the fourth line of S.2.4. The SWMA modified S.2.4. as shown below and recommended that the item move forward as a voting item on NCWM S&T Committee Agenda.

S.2.4. Level-Indicating Means. – Except for portable wheel-load weighers and portable axle-load scales, a portable scale shall be equipped with level-indicating means if its weighing performance is changed by an amount greater than the appropriate acceptance tolerance when it is moved from a level position and rebalanced in a position that is out of level in any upright direction by <u>**a**</u> 5 % <u>slope/grade</u> (<u>approximately slightly less</u> <u>than</u> three degrees). The level-indicating means shall be readable without removing any scale parts requiring a tool.

[This requirement is nonretroactive as of January 1, 1986, for prescription, jewelers', and dairy-product-test scales and scales marked I and II]

[Note: Portable wheel-load weighers and portable axle-load scales shall be accurate when placed out of level up to and including <u>a</u> 5 % <u>slope/grade</u> (approximately slightly less than three degrees).] (Amended 1991 <u>and 200X</u>)

S.2.4.1. Vehicle On-Board Weighing Systems. – A vehicle on-board weighing system shall operate within tolerance when the weighing system is out of level up to three degrees or $\underline{a} 5 \% \underline{slope/grade}$. If the accuracy of the system is affected by out-of-level conditions normal to the use of the device, the system shall be equipped with an out-of-level sensor that inhibits the weighing operation when the system is out of level to the extent that the accuracy limits are exceeded. (Added 1992) (Amended 200X)

320-6 Appendix D; Definitions for Tare Mechanism, Gross Weight Value, Net Weight, Net Weight Value, Tare, and Tare Weight Value

Source: Carryover Item 320-9. (This item originated from the NTETC WS and first appeared on the Committee's 2007 agenda.)

Recommendation: Modify the definition for "tare mechanism" and add new definitions for "gross weight value," "net weight," "net weight value," "tare," and "tare weight value" to Appendix D.

Amend the following definition for "tare mechanism:"

tare mechanism. A mechanism (including a tare bar) designed for determining or balancing out the weight of packaging material, containers, vehicles, or other materials that are not intended to be included in net weight determinations and for setting the indication to zero when the tare object is on the load-receiving element:

- 1. <u>by reducing the weighing range for net loads (e.g., subtractive tare where Net Weight + Tare</u> <u>Weight ≤ Gross Weight Capacity), or</u>
- 2. without altering the weighing range for net load on mechanical scales (e.g., additive tare mechanism such as a tare bar on a mechanical scale with a beam indicator).

The tare mechanism may function as:

- 1. <u>a non-automatic mechanism (load balanced by an operator)</u>,
- 2. <u>a semi-automatic mechanism (load balanced automatically following a single manual command)</u>,
- 3. <u>an automatic mechanism where the load is balanced automatically without the intervention of an</u> <u>operator</u>. <u>An automatic tare mechanism is only suitable for indirect sales to the customer (e.g.,</u> <u>prepackaging scales)</u>.

[2.20<u>, 2.24]</u> (Amended 200X)

Add the following new definitions to Appendix D:

gross weight value. Indication or recorded representation of the weight of a load on a weighing device, with no tare mechanism in operation. [2.20, 2.24] (Added 200X)

net weight. The term "net mass" or "net weight" means the weight of a commodity excluding any materials, substances, or items not considered to be part of the commodity. Materials, substances, or items not considered to be part of the commodity include, but are not limited to, containers, conveyances, bags, wrappers, packaging materials, labels, individual piece coverings, decorative accompaniments, and coupons, except that, depending on the type of service rendered, packaging materials may be considered to be part of the service. For example, the service of shipping includes the weight of packing materials. [2.20, 2.24]

<u>(Added 200X)</u>

<u>net weight value.</u> Indication or recorded representation of the weight of a load placed on a weighing <u>device after the operation of a tare mechanism. [2.20, 2.24]</u> (Added 200X)

<u>tare.</u> The weight of packaging material, containers, vehicles, or other materials that are not intended to be part of the commodity included in net weight determinations. [2.20, 2.24] (Added 200X)

tare weight value. The weight value of a load determined by a tare mechanism. [2.20, 2.24] (Added 200X)

In September 2007, the Tare WG submitted the following additional definitions with the recommendation they be added to HB 44.

<u>Calculated weight (gross or tare) value.</u> Calculated sum or difference of more than one measured weight value and/or calculated net value. (Added 200X)

<u>Tare-balancing mechanism.</u> A tare mechanism with an indication that tare has been taken and without an indication of the tare value (weight) when the instrument is loaded. A negative net weight is assumed to be the tare value when the weighing instrument is unloaded.

(Added 200X)

Tare-weighing mechanism. A tare-balancing mechanism that stores the tare value and is capable of displaying (continuously or upon command) or printing the value whether or not the instrument is loaded. (Added 200X)

<u>Preset Tare.</u> A numerical value, representing a weight that is entered into a weighing device (e.g., keyboard, recalling from stored data, or entered through an interface) and is intended to be applied to weighings without determining individual tares. (Added 200X)

<u>Preset Tare Mechanism. A part of a weighing system for subtracting a preset tare value from a gross or net weight value and indicating the result of the calculation as a net weight. The weighing range for net loads is reduced accordingly.</u>

Types of preset tare mechanisms include:

- Keyboard Tare. The operation of keys on a keyboard; e.g., with a typical 10-key keyboard with values 0 through 9, by the pushing of a key numbered 5, the number 5 is entered as a tare value.
- Digital Tare. By the repeated operation of a particular key, tare values are entered in amounts equal to the value of a scale division. For example, on a 25 lb x 0.01 lb scale, each time a specifically marked key is depressed, a tare is entered equal to 0.01 lb. If that key were depressed five times, the tare value would be equal to 0.05 lb.
- Programmable Tare. Preset (predetermined) tare values that are stored in memory for multiple transactions. They may be part of the product information on PLU (product look-up), preset product, or tare keys.
- Stored Tare. Preset (predetermined) tare values that are stored in memory for multiple transactions and are used predominately in vehicle scale applications.
- Percentage Tare. A preset tare value, expressed as a percentage (i.e., 5.6 %), that represents the percentage of tare material compared to the gross or net weight of the commodity. A percentage tare is one form of proportional tare.
- <u>Proportional Tare. A preset tare value, automatically calculated by the scale, proportional to the gross weight indicated by the scale. A proportional tare can be a percentage tare or a fixed tare value proportional to a range of gross weights (i.e., a 10 g tare for gross weights between 0 and 2 kg, a 20 g tare for gross weights between 2 and 4 kg, etc.). A proportional tare is, therefore, not limited to being a percentage tare.</u>

<u>(Added 200X)</u>

In September 2007, the Tare WG submitted the following proposal:

S.2. Design of Balance, Tare, Level, Damping, and Arresting Mechanisms.

S.2.3. Tare-Value of Tare Indication and Recorded Representations:

*On any scale (except a monorail scale equipped with digital indications), the value of the tare division shall be equal to the value of the scale division.** The tare mechanism shall operate only in a backward direction (that is, in a direction of underregistration) with respect to the zero-load balance condition of the scale. A device designed to automatically clear any tare value shall also be designed to prevent the automatic clearing of tare until a complete transaction has been indicated.* (Amended 1985) [Note: On a computing scale, this requires the input of a unit price, the display of the unit price, and a computed positive total price at a readable equilibrium. Other devices require a complete weighing operation, including tare, net, and gross weight determination.]* [*Nonretroactive as of January 1, 1983]

S.2.3.1. <u>Scale Interval. – The interval of a tare weighing mechanism shall be equal to the scale interval of the weighing device for any given load.</u>

- (a) On any scale (except a monorail scale equipped with digital indications and multi-interval scales or multiple range scales when the value of tare is determined in a lower range), the value of the tare division shall be equal to the value of the scale division.* [*Nonretroactive as of January 1, 1983]
- (b) S.2.3.1. Monorail Scales Equipped with Digital Indications. On a static monorail weighing system equipped with digital indications, means shall be provided for setting any tare value of less than 5 % of the scale capacity to within 0.02 % of scale capacity. On a dynamic monorail weighing system, means shall be provided to automatically maintain this condition. (Amended 1999)

(Renumbered 200X)

In September 2007, the Tare WG submitted the following proposal:

<u>S.2.3.2. Accuracy. – A tare weighing or balancing mechanism shall permit setting the indication to zero with an accuracy equal to or better than:</u>

- \pm 0.25 d for electronic weighing devices and any weighing device with an analog indication, and
- \pm 0.5 d for mechanical weighing devices with a digital indication (e.g., weighbeams with only notched poises and no sliding poises).
- On a multi-interval scale, d shall be replaced by d1 (division value of the first weighing segment).

<u>S.2.3.3. Operating Range. – The tare mechanism shall be such that it cannot be used at or below its</u> <u>zero effect or above its maximum indicated effect.</u>

- On a single or multiple range scale, the maximum tare capacity cannot exceed the maximum capacity of the highest weighing range.
- <u>On a multi-interval scale, the maximum tare capacity cannot exceed the maximum capacity of the first weighing segment.</u>

<u>S.2.3.4. Visibility of Operation. – Operation of the tare mechanism shall be visibly indicated on the instrument.</u> In the case of instruments with digital indications, this shall be done by marking the indicated net value with the word "NET" or the symbol "N."

- "NET" may be displayed as "NET", "Net" or "net".
- If a scale is equipped with an indicator that allows the gross value to be displayed temporarily while a tare mechanism is in operation, the "NET" symbol shall disappear while the gross value is displayed.

S.2.3.5. Subtractive Tare Mechanism. – After any tare operation and while tare is in effect, 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 after tare has been taken.

<u>S.2.3.6.</u> Semi-automatic or Automatic Tare* Balancing or Weighing Mechanisms. – These mechanisms shall be operable or accessible only by a tool outside of and separate from this mechanism or it shall be enclosed in a cabinet, or it shall be operable only when the indication is stable within:

- (a) ± 3 scale divisions for scales of more than 2000 kg (5000 lb) capacity in service prior to January 1, 1981, and for all axle-load, railway track, and vehicle scales; or
- (b) ± 1 scale division for all other scales.

* Automatic Tare Mechanisms are not permitted for direct sales to the public.

S.2.3.7. Combined Zero-setting and Tare-balancing Mechanisms (0/T Key). – Scales not intended to be used in direct sales to the public may be equipped with a combined zero and tare function key, provided the device is clearly marked as to how the key functions. If the semi-automatic zero-setting mechanism and the semi-automatic tare-balancing mechanism are operated by the same key, the following apply at any load:

- 1) After zero/tare setting the effect of accuracy of the zero setting shall be not more than ± 0.25 d.
- 2) <u>A "center-of-zero" condition shall either automatically be maintained to ± 0.25 scale division or less, or have an auxiliary or supplemental "center-of-zero" indicator that defines a zero-balance condition to ± 0.25 scale division or less.</u>
- 3) <u>A zero-tracking mechanism, if equipped, shall operate only when:</u>
 - the indication is at zero, or at a negative net value equivalent to gross zero, and
 - <u>the weight indication is stable.</u>
- 4) <u>The scale must also be clearly marked on or adjacent to the weight display with the statement "Not for Direct Sales."</u>

S.2.3.8. Consecutive Tare Operations. – Repeated operation of a tare mechanism (including preset tare) is permitted. If more than one tare mechanism is operative at the same time, tare weight values shall be clearly designated (identified) when indicated or printed.

S.2.3.9. Indication and Printing of Weighing Results.

- a) <u>Gross weight values may be printed without any designation or by using a complete word or</u> <u>symbol.</u> For a designation by a symbol, only "G" is permitted.
- b) If only net weight values are printed without corresponding gross or tare values, they may be printed without any designation or by using a complete word or symbol. The complete word (as shown in S.2.3.4.) or symbol "N" shall be used to designate a net weight. This applies also where semi-automatic zero-setting and semi-automatic tare balancing are initiated by the same key.
- c) <u>Gross, net, or tare values determined by a multiple range instrument or by a multi-interval</u> instrument need not be marked by a special designation referring to the (partial) weighing range.
- d) If net weight values are printed together with the corresponding gross and/or tare values, the net and tare values shall be identified at least by the corresponding symbols "N" and "T" or

by complete words using all upper-case letters, all lower-case letters, or a combination of upper- and lower-case letters.

- e) If net weight values and tare values determined by different tare mechanisms are printed separately, they shall be suitably identified.
- f) <u>When gross, net, and tare values are printed together, one of these values may be calculated</u> from two actual determinations of mass. In the case of a multi-interval device, the weight gross or tare calculated value may be printed with a smaller scale interval.
- g) <u>The printout of a calculated gross or tare weight value shall be clearly identified. This should be done by the symbol "C" in addition to the symbols mentioned above, if applicable, or by the completer complete word "calculated."</u>

Tare WG Comment: The requirements in f) and g) are from the revised version of R 76 and are beyond what is currently required by HB 44 and NTEP.

S.2.4. Preset Tare Mechanism.

<u>S.2.4.1. Modes of Operation. – A preset tare mechanism may be operated together with one or more tare devices provided:</u>

- <u>the preset tare mechanism complies with paragraph S.2.3.8.</u> Consecutive Tare Operations., <u>and</u>
- <u>the preset tare operation cannot be modified or cancelled as long as any tare mechanism</u> <u>operated after the preset tare operation is still in use</u>,
- <u>the preset tare associated with a price look-up (PLU) shall be automatically cancelled at the</u> <u>same time a PLU is cancelled, and</u>
- <u>the preset tare values are designated by the symbol "PT"; however, it is permitted to replace</u> <u>the symbol "PT" with complete words.</u>

Tare WG Comment: The symbol "PT" is from the revised version of R 76 and is beyond what is currently required by HB 44 and NTEP. The Tare WG considered a class and capacity exception for lower capacity scales since they felt that the need for providing the additional type of tare information is greater for larger capacity scales and for vehicle scale applications where preset tares are not allowed by some jurisdictions. However, the WG decided to present the wording as recommended in R 76 since U.S. manufacturers that internationally market their devices may already be capable of complying with these requirements.

A preset tare may operate automatically only if the preset tare value is clearly identified with the load to be measured (e.g., part of the product look-up information).

S.2.4.2. Indication of Operation. – Operation of the preset tare device shall be visibly indicated on the instrument. In the case of instruments with digital indications, this shall be done by marking the indicated net value with the sign "NET", "Net" or "net". If an instrument is equipped with a device that allows the gross value to be displayed temporarily while a tare device is in operation, the "NET" symbol shall disappear while the gross value is displayed. It shall be possible to temporarily indicate the preset tare value.

<u>Paragraph S.2.3.9.</u> Indication and Printing of Weighing Results. applies accordingly, provided the calculated net value is printed and at least the preset tare value is printed, with the exception of:

1. <u>a Class II or a Class III instrument with a maximum capacity not greater than 100 kg used</u> <u>in direct sales to the public,</u>

- 2. price computing scales, and
- 3. <u>nonautomatic weigh/price labeling scales.</u>

Note: Paragraph S.2.4.2. also applies to weighing devices with a combined semi-automatic zerosetting device and a semi-automatic tare-balancing device operated by the same key.

Background/Discussion: This WS proposal is one of several proposed modifications to HB 44 requirements intended to clarify the acceptable tare features already recognized for use in commercial applications. Scales Code requirements do not include sufficiently detailed language to identify all types of tare, define how tare features must operate, or specify the net and tare values a scale must indicate and record. Current HB 44 requirements that address tare include paragraphs S.2.1.6. Combined Zero-Tare ("0/T") Key, S.2.3. Tare, S.2.3.1. Monorail Scales Equipped with Digital Indications, and T.N.2.1. General (Tolerances).

The WS developed criteria used to type evaluate tare features based on General Code paragraph G-S.2. Facilitation of Fraud. and other requirements that apply to indicating and recording elements and recorded representations. NTEP laboratories find it has become increasingly difficult to base its compliance decisions solely on paragraph G-S.2. because the general nature of the language results in multiple interpretations. Type evaluation criteria are published in NCWM Publication 14; however, this document is not in wide distribution in the weights and measures community. Additionally, only a limited number of weights and measures officials, device manufacturers, and device owners and operators are regular participants in WS meetings where tare evaluation criteria are developed and discussed. It is difficult for parties responsible for the design, use, and test of the tare feature to interpret and apply technical requirements published in Publication 14. This results in differing interpretations of HB 44 requirements.

In 2006 the NTETC WS formed a Tare WG to review existing tare requirements and make recommendations as to how tare should operate on a single range scale, a multiple range scale, and a multi-interval scale. The WG was asked to develop, where necessary, recommendations for changes to Publication 14, HB 44, and HB 130, and to provide guidance to the WS on type evaluation requirements.

The WG developed proposals to amend HB 44 requirements to:

- a. ensure a tare feature operates in a manner that increases the accuracy of net weight determinations,
- b. state clearly what information and values are permitted and required for indicated and recorded representations of net weight and tare weight, and
- c. identify the types (e.g., semiautomatic and stored) of tare weight values determined at the time objects are weighed or tare weight values are determined prior to the time objects are weighed.

At its 2007 Annual Meeting, the WS reviewed the final recommendation of the Tare WG and recommended that the NIST technical advisor submit a number of Tare WG recommendations to the weights and measures regional association and the NCWM S&T committees.

The WS stated that the Tare WG had completed its work. The Sector agreed that the majority of the proposed language is currently verified in Publication 14 with G-S.2. Facilitation of Fraud., S.2.1.6. Combined Zero/Tare (0/T) Key., and S.2.3. Tare. listed as the HB 44 code references. The WG did not change any existing HB 44 tare requirements and recommended an amended definition for "tare mechanism." The Sector agreed with the WG that the highlighted items for calculated weights and the identification of preset tare weights go beyond what is currently evaluated by NTEP and recommended these items be split into Items 320-3B and 320-3C on the NCWM S&T agenda.

At their fall 2007 meetings, the WWMA and SWMA heard support from the NTETC WS and SMA to put forth the new NTETC WS version of the proposal. The WWMA agreed that the additional definitions would clarify tare-related terms. It also agreed with the Tare WG's suggested specifications changes that would further harmonize NIST HB 44 with the latest version of R 76. Therefore, the WWMA and SWMA recommended the proposal, with the additions from the Tare WG, move forward as a voting item on the NCWM S&T Committee Agenda.

At its 2007 Interim Meeting, the CWMA agreed that tare needs to be further defined in HB 44. The CWMA recommended the proposal be broken up into several parts in order to provide better clarification. The CWMA and NEWMA recommended this proposal be moved to Developmental until it can be divided into more manageable sections.

For additional background information, refer to the Committee's 2007 Interim Report.

321 BELT-CONVEYOR SCALE SYSTEMS

321-1 N.2.3. Minimum Test Load

Source: Western Weights and Measures Association (WWMA)

Proposal: Amend NIST HB 44, Section 2.21. Belt Conveyor Scales Systems (BCS) Code, paragraph N.2.3. as follows:

N.2.3. Minimum Test Load. – The minimum test load shall not be less than the largest of the following values.

- (a) 800 scale divisions,
- (b) the load obtained at maximum flow rate in one revolution of the belt, or
- (c) at least 10 minutes of operation <u>or for a normal weighment that is less than 10 minutes (i.e., belt-conveyor systems used exclusively to issue weights for individual vehicles, and railway track cars).</u>

The official with statutory authority may determine that a smaller minimum totalized load down to 2 % of the load totalized in 1 hour at the maximum flow rate may be used for subsequent tests, provided that:

- 1. the smaller minimum totalized load is greater than the quantities specified in (a) and (b), and
- 2. consecutive official testing with the minimum totalized loads described in N.2.3. (a), (b), or (c) and the smaller minimum test load has been conducted that demonstrates the system complies with applicable tolerances for repeatability, acceptance, and maintenance.
- (Added 2004) (Amended 200X)

Background/Discussion: In 2004 NIST HB 44 paragraph N.2. Conditions of Test. was amended, and the minimum totalized load (MTL) requirements were amended and renumbered to paragraph N.2.3. Since 10 minutes of operation in N.3.2.(c) typically results in a test load larger than (a) or (b), the 10 minutes MTL is used for most BCS installations. Additionally, the words "or a normal weighment" were deleted from MTL requirements because the words were no longer needed since language was developed to allow a smaller material test load provided the scale demonstrated compliance with BCS tolerances with the MTL and the smaller test load.

As a result of deleting the words "or a normal weighment," it has been reported that the revised MTL requirements are not suitable for BCS installations that issue individual weights for vehicles and railcars. This is due to limitations of the installation and uncertainties in determining the net weights of several vehicles or railcars to compare material test results of the 10 minutes MTL with the alternate test load of "2 % of the load totalized in 1 hour."

The restoration of the words "or a normal weighment" allows such operation of BCS systems used exclusively to issue weights for individual vehicles and railway track cars provided the systems comply with tolerance and repeatability requirements. It should be noted that the 10 minutes test could still be used on installations that do not need to start and stop product flow to continuously fill and issue a totalized weight for several vehicles or railcars (unit trains).

At its 2007 Annual Meeting, the WWMA heard comments from a BCS manufacturer who supported the proposal as shown above and recommended this proposal move forward as a voting item on the NCWM S&T Committee Agenda.

321-2 UR.2.2.(n) Belt Alignment

Source: Carryover Item 321-1. (This item originated from the SWMA and first appeared on the Committee's 2007 agenda.)

Recommendation: Modify paragraph UR.2.2.(n) as follows:

UR.2.2. Conveyor Installation

(n) Belt Alignment. – <u>The belt shall be centered on the idlers in the weighing area and shall track in practically the same position whether empty or loaded.</u> The belt shall not extend beyond the edge of the idler roller in any area of the conveyor.
 (Amended 1998 and 2007)

Background/Discussion: During the 2006 NCWM Interim Meeting, the Committee considered the recommendations from the NCWM review panel and the comments from industry. The review panel indicated the proposal should have included national data that demonstrated a need for modifying paragraph UR.2.2. and should be a Developing item until such data are provided. At that time, one representative from the belt-conveyor scale service industry indicated there are too many factors that influence belt tracking to ensure a belt is centered at all times. The service representative recommended that the belt should not extend beyond the edge of the idler roller in any area of the conveyor on the carrying side or touch holding brackets on the return side to reduce any detrimental effects on accuracy. Industry representatives indicated there was no mechanism available to monitor the belt's tracking 24 hours a day, 7 days a week. Industry requested specifications for what constituted either "center" or an acceptable "range of center" for belt tracking. Although the 2005 SWMA reported the proposal was ready for national consideration, the Committee agreed it was more appropriate to make the proposal a Developing item until there was some clear indication that belt alignment could be tracked for maintenance and accuracy purposes.

During the 2007 NCWM Annual Meeting, the Committee heard testimony that a work group of the NW&SA was addressing this item. The NW&SA, in a letter dated July 31, 2007, submitted a recommendation to the Committee for consideration during the 2008 NCWM Interim Meeting. In that letter, the NW&SA WG stated there was insufficient evidence of the effect of small lateral movement of the belt to establish a valid requirement narrower than the edge of the idler roller on belt-conveyor scale systems other than the short conveyors used by the original submitter. The WG added that no practical devices were available to measure such lateral alignment changes and recommended the added language in the original proposal above be withdrawn.

However, the WG made the following recommendation to UR.2.2.(n) to include language to clarify that the belt shall not come into contact with any part of the conveyor structure.

UR.2.2.(n) Belt Alignment. The belt shall not extend beyond the edge of the idler any carry side (top) roller in any area of the conveyor. <u>The belt shall not touch the conveyor structure on the return</u> (bottom) side of the conveyor.

At its 2007 Annual Meeting, the WWMA discussed the letter from the NW&SA and heard from a belt-conveyor scale manufacturer supporting the recommendation from the NW&SA WG because it provided guidance for the user to better maintain the zero condition of the scale and helped prevent damage to the belt. As a result, the WWMA recommended that the NW&SA WG version of UR.2.2. move forward as a voting item on the NCWM S&T Committee Agenda.

At its 2007 Annual Meeting, the SWMA heard that Montana and the WWMA support the position and alternate proposal from the NW&SA. The SWMA recommended that the NCWM S&T Committee present the alternate proposal shown above and move forward as a voting item on the NCWM S&T Committee Agenda.

For additional background information, refer to the Committee's 2007 Interim Report.

324 AUTOMATIC WEIGHING SYSTEMS

324-1 S.1.2. Value of Division Units and T.2.1. General

Source: Carryover Item 324-1 (This item originated from the NTETC WS and first appeared on the Committee's 2007 agenda.)

Recommendation: Add a new note to paragraph S.1.2. and amend paragraph T.2.1. as follows:

S.1.2. Value of Division Units. – The value of a division d expressed in a unit of weight shall be equal to:

- (a) 1, 2, or 5; or
- (b) a decimal multiple or submultiple of 1, 2, or 5.

Note: The requirements that the value of the scale division be expressed only as 1, 2, or 5, or a decimal multiple or submultiple of only 1, 2, or 5 does not apply to net weight indications and recorded representations calculated from gross and tare weight indications where the scale division of the gross weight is different from the scale division of the tare weight(s) on multi-interval or multiple range scales.

For example, a scale indicating a tare weight of 2 kg in the lower range or segment and a gross weight of 5 kg in the higher range or segment may indicate a net weight of 3 kg, or a scale indicating a tare weight of 20 lb in the lower range or segment and a gross weight of 50 lb in the higher range or segment may indicate a net weight of 30 lb. (Note Added 200X)

S.2.2. Tare. – On any automatic weighing system (*except for multi-interval scales or multiple range scales when the value of tare is determined in a lower range)*, the value of the tare division shall be equal to the value of the scale division. The tare mechanism shall operate only in a backward direction (i.e., in a direction of underregistration) with respect to the zero-load balance condition of the automatic weighing system. A device designed to automatically clear any tare value shall also be designed to prevent the automatic clearing of tare until a complete transaction has been indicated.

Note: On a computing automatic weighing system, this requires the input of a unit price, the display of the unit price, and a computed positive total price at a readable equilibrium. Other devices require that a transaction or lot run be completed.

(Amended 2004 and <u>200X</u>)

T.2.1. General. – The tolerance values are positive (+) and negative (-) with the weighing device adjusted to zero at no load. When tare is in use, the tolerance values are applied from the tare zero reference (zero net indication); the tolerance values apply to the net weight indication for any possible tare load using certified test loadsonly. (Amended 200X)

<u>[Amenucu 2007A]</u>

Background/Discussion: During the 2007 NCWM Annual Meeting, the Committee heard comments from the CWMA and NEWMA supporting this item with recommendations to change the word "value" to "division" and incorporate the SWMA recommendation to modify paragraph S.2.2. as shown in the recommendation above.

NEWMA pointed out that the proposed change to paragraph S.2.1. appeared to be permissive and not a requirement and asked if the intent was to prohibit multi-interval and multiple range scales from rounding and indicating calculated net weights in scale divisions to only 1, 2, or 5 or was rounding the scale divisions to only 1, 2, or 5 still allowed. The WMD representative to the NCWM Tare WG stated that the intent was for the language to be

permissive because there are a significant number of devices with NTEP CCs in the marketplace that round the tare values before calculating net weights.

The Committee made several modifications to the proposal:

- to clarify the examples in the proposed note to paragraph S.1.2., and
- to clarify that SWMA's proposed modification to the language in paragraph S.2.2. for an exception for multi-interval and multiple range scales only applied to the requirement that the value of tare shall be equal the value of the scale division.

The Committee agreed that the words "scale value" should be changed to "scale division" to be consistent with the terminology currently used in HB 44 and recommended the NIST technical advisor forward the amended proposal to the Tare WG and WS for their consideration and comment.

For additional background information, refer to the Committee's 2007 Interim Report.

At their fall 2007 meetings, the CWMA, NTETC WS, and the WWMA supported this item. See additional comments and recommendations from Agenda Item 320-2.

324-2 Appendix D; Definitions for Tare Mechanism, Gross Weight Value, Net Weight, Net Weight Value, Tare, and Tare Weight Value

Source: Carryover Item 324-2. (This item originated from S&T Committee and first appeared on the Committee's 2007 agenda.)

Recommendation: For those definitions that apply to Section 2.24. Automatic Weighing Systems, modify the definition for "tare mechanism" and add new definitions for "gross weight value," "net weight," "net weight value," "tare," and "tare weight value" to Appendix D as shown in the "Recommendation" for Scales Code Item 320-6.

Background/Discussion: At the 2007 Interim Meeting, the Committee agreed that for procedural reasons a separate corresponding proposal should have appeared on its 2007 S&T Agenda in Section 324 for Automatic Weighing Systems. Therefore, the Committee developed a separate proposal for automatic weighing systems that now appears in this agenda. The Committee recommended that new S&T Item 324-2, along with a corresponding proposal to apply these definitions to devices that fall under the Scales Code S&T Item 320-6, be discussed and considered jointly during all deliberations and voting procedures. In the interest of brevity, the Committee placed all recommendations, discussion, and background information for this proposal in S&T Item 320-6 because the proposed definitions apply to both applications; this ensures both proposals are addressed collectively.

At their fall 2007 meetings, the CWMA, NTETC WS, and the WWMA supported this item. See additional comments and recommendations from Agenda Item 320-6.

330 LIQUID-MEASURING DEVICES

330-1 Temperature Compensation for Liquid-Measuring Devices Code

Source: Carryover Item 330-4. (This item originated from the NCWM S&T Committee and first appeared on the Committee's 2007 agenda.)

Recommendation: The Committee is considering a proposal to make the following modifications to Section 3.30. Liquid-Measuring Devices (LMD) Code to recognize temperature compensation for retail devices as follows:

S.1.6.8. Recorded Representations from Devices with Temperature Compensation. – Receipts issued from devices or systems with automatic temperature compensation must include a statement that the volume of the product has been adjusted to the volume in liters at 15 °C for liters or the volume in gallons at 60 °F for gallons. [Nonretroactive as of January 1, 200X]

(Added 200X)

S.1.6.82. Lubricant Devices, Travel of Indicator. – The indicator shall move at least 2.5 cm (1 in) in relation to the graduations, if provided, for a delivery of 0.5 L (1 pt).

S.2.6. Temperature Determination - Wholesale Devices. – For test purposes, means shall be provided to determine the temperature of the liquid either:

(a) in the liquid chamber of the meter, or

(b) immediately adjacent to the meter in the meter inlet or discharge line. [Nonretroactive as of January 1, 1985] (Added 1984)(Amended 1986 <u>and 200X</u>)

S.2.7. Wholesale Devices Equipped with Automatic Temperature Compensators.

S.2.7.1. Automatic Temperature Compensation. – A device may be equipped with an automatic means for adjusting <u>conversion of</u> the indication and registration of the measured volume of product to the volume at 15 °C for liters or (60 °F) for gallons.

<u>S.2.7.2.</u> Display of Net and Gross Quantity. – A device equipped with automatic temperature compensation shall indicate or record, both the gross (uncompensated) and net (compensated) volume for testing purposes. It is not necessary that both net and gross volume be displayed simultaneously. [Nonretroactive as of January 1, 200X]

<u>S.2.7.3.</u> Display of Temperature. – For test purposes, on a device equipped with automatic temperature compensation means shall be provided to indicate or record the temperature determined by the system sensor to an accuracy of 0.2 °F. [Nonretroactive as of January 1, 200X]

S.2.7.24. Provision for Deactivating. – On a device <u>or system</u> equipped with an automatic temperaturecompensating mechanism that will indicate or record only in terms of <u>gallons <u>liters</u> compensated to 15 °C <u>or gallons compensated to (60</u> °F), provision shall be made for deactivating the automatic temperaturecompensating mechanism so that the meter can indicate, and record if it is equipped to or record, in terms of the uncompensated volume.</u>

(Amended 1972 and 200X)

S.2.7.35. Provision for Sealing Automatic Temperature-Compensating Systems. – Provision shall be made for applying security seals in such a manner that an automatic temperature-compensating system cannot be disconnected and that no adjustment <u>that detrimentally affects the metrological integrity of the device</u> may be made to the system without breaking the seal <u>or automatically providing a record (e.g., audit trail) of the action</u>. (Amended 200X)

<u>S.2.7.5.1.</u> Provision for Seal the Temperature Sensor. – Provision shall be made for applying security seals in such a manner that the temperature sensor cannot be removed or disabled without breaking the seal or providing a record (e.g., audit trail) of the action. [Nonretroactive as of January 1, 200X]

S.2.7.4.6. Temperature Determination with Automatic Temperature-Compensation. – For test purposes, means shall be provided (e.g., thermometer well) to determine the temperature of the liquid either:

- (a) in the liquid chamber of the meter, or
- (b) immediately adjacent to the meter in the meter inlet or discharge line.

(Amended 1987)

S.4.3.2. Temperature Compensation. – If a device <u>or system</u> is equipped with automatic temperature compensation, the primary indicating elements, recording elements, or<u>and</u> recorded representation shall be clearly and conspicuously marked to show that the volume delivered has been adjusted to the volume at 15 °C <u>for liters or (60 °F) for gallons.</u>

(Amended 200X)

S.4.34. Wholesale Devices, Discharge Rates. – A wholesale device shall be marked to show its designed maximum and minimum discharge rates. However, the minimum discharge rate shall not exceed 20 % of the maximum discharge rate.

S.4.4<u>5</u>. Retail Devices.

S.4.45.1. Discharge Rates. – On a retail device with a designed maximum discharge rate of 115 L (30 gal) per minute or greater, the maximum and minimum discharge rates shall be marked in accordance with S.4.4.2. The marked minimum discharge rate shall not exceed 20 % of the marked maximum discharge rate.

[Nonretroactive as of January 1, 1985] (Added 1984) (Amended 2003)

Example: With a marked maximum discharge rate of 230 L/min (60 gal/min), the marked minimum discharge rate shall be 45 L/min (12 gal/min) or less (e.g., 40 L/min (10 gal/min) is acceptable). A marked minimum discharge rate greater than 45 L/min (12 gal/min) (e.g., 60 L/min (15 gal/min) is not acceptable.

S.4.45.2. Location of Marking Information; Retail Motor-Fuel Dispensers. – *The marking information required in the General Code, paragraph G-S.1. Identification shall appear as follows:*

N.4.1.1. Wholesale Devices Equipped with Automatic Temperature-Compensating Systems. – On wholesale devices equipped with automatic temperature-compensating-systems, normal tests shall be conducted:

- (a) by comparing the <u>net (compensated)</u> volume indicated or recorded to the actual delivered volume corrected <u>adjusted</u> to 15 °C for liters or (60 °F) for gallons, and
- (b) with the temperature-compensating system deactivated, comparing the gross (uncompensated) volume indicated or recorded to the actual delivered volume. (For some devices this may require that the temperature compensator be deactivated.)

The first test shall be performed with the automatic temperature-compensating system operating in the "as found" condition. On devices that indicate or record both the compensated and uncompensated volume for each delivery, the tests in (a) and (b) may be performed as a single test. (Amended 1987<u>and 200X</u>)

N.5. <u>Change in Product</u> Temperature <u>Correction on Wholesale Devices.</u> – <u>Corrections Adjustments</u> shall be made for any changes in volume resulting from the differences in liquid temperatures between time of passage through the meter and time of volumetric determination in the prover <u>or test measure</u>. When adjustments are necessary, appropriate petroleum measurement tables should be used. (Amended 1974 <u>and 200X</u>)

UR.3.6. Temperature Compensation.

UR.3.6.1. Automatic.

UR.3.6.1.1. When to be Used <u>of Automatic Temperature Compensation</u>. – If a device is equipped with <u>a mechanical</u> automatic temperature <u>compensator</u> <u>compensation</u>, it shall be connected,

operable, and in use at all times. An electronic or mechanical automatic temperature-compensating system may not be removed, nor may a compensated device be replaced with an uncompensated device, without the written approval of the **responsible** weights and measures jurisdiction <u>with</u> **statutory authority over the device**.

[Note: This requirement does not specify the method of sale for product measured through a meter.] (Amended 1989 <u>and 200X</u>)

UR.3.6.1.2. Recorded Representations (Invoices, Receipts, and Bills of Lading).

- (a) A<u>n</u> written-invoice based on a reading of a device or recorded representation issued by a <u>device or system</u> that is equipped with an automatic temperature compensator shall show that the volume delivered has been adjusted to the volume at 15 °C for liters or (60 °F) for gallons and decimal subdivisions or fractional equivalents thereof.
- (b) The invoice issued from an electronic wholesale device equipped with an automatic temperature-compensating system shall also indicate: (1) the API gravity, specific gravity or coefficient of expansion for the product; (2) product temperature; and (3) gross reading.
 (Amended 1987 and 200X)

UR.3.6.1.3. Temperature Determination. – Means for determining the temperature of measured liquid in an automatic temperature-compensating system shall be so designed and located that, in any "usual and customary" use of the system, the resulting indications and/or recorded representations are within applicable tolerances. (Added 200X)

<u>UR.3.6.4.</u> Temperature-Compensated Sale. – All sales of products, when the quantity is determined by an approved measuring system with temperature compensation, shall be in terms of the liter at <u>15 °C or the U.S. gallon of 231 in³ at 60 °F.</u> (Added 200X)

Background/Discussion: Prior to the 2007 NCWM Interim Meeting, the Committee recognized via reports from the regional L&R committees and other sources that there was increasing support within the weights and measures community to address temperature compensation features for the retail sale of petroleum products in the Liquid-Measuring Devices Code. In response to these concerns and to encourage uniformity in applications where temperature compensation is being used, the Committee developed this proposal to provide design and performance requirements and testing criteria for retail metering systems that incorporate temperature compensation capability. The Committee was also concerned that if the current L&R Committee-proposed language for the Method of Sale of Commodities in NIST HB 130 is adopted, retail motor-fuel devices could be placed in service with no guidelines in HB 44 for type approval and field testing. The L&R-proposed language would permit the temperature-compensated sale of petroleum products at all levels of distribution.

At the 2007 Interim Meeting, the L&R Committee moved forward with a Method of Sale proposal containing permissive language for retail sales of petroleum products using automatic temperature compensation (see L&R Item 232-1). Although the Committee recognized this S&T item was still not fully developed, it felt it could resolve the remaining issues in time for the NCWM Annual Meeting in July 2007; therefore, the Committee unanimously voted to make this item a "priority" voting item as described in Section H of the Introduction of HB 44. It did this because it felt strongly that, if the L&R item passed, it was very important for there to be a corresponding S&T item that provided HB 44 guidance as described above. Following the Committee vote, the Committee chairman went before the NCWM Board of Directors (BOD) for their input. The BOD instructed the Committee to make this an Information item. Irrespective of the concerns about the timing of adoption of language in HB 130, the Committee, after further deliberation, concurred with the BOD and added the proposal to its agenda as an Information item. The BOD further informed the Committee of its plan to form a steering committee to provide guidance and give support to both the S&T and L&R Committees on temperature compensation issues. The Committee noted that it looked forward to working with the steering committee on this important issue.

This item is still in development. Some of the items the Committee is currently working on are outlined below:

Recorded Representations (S.1.6.7.): What, if any, abbreviations are acceptable for devices equipped with ATC (e.g., gal at 60 °F)?

API Gravity: How should the API gravity be entered in the device and what API gravity should the inspector use during a test? Should an average API gravity be used (national or state)? The Committee will work on gathering API data in order to resolve this issue.

Difference between Net and Gross (T.4.): Is the current tolerance of 0.1 % (electronic) appropriate for field-testing of retail devices with ATC? Will maintaining our current tolerances mean taking extra drafts to obtain a stable temperature? The Committee will work on gathering data concerning temperature measurement.

The Committee will continue work on this item and will seek input from the regions and other interested parties in the weights and measures community.

At its 2007 Annual Meeting, the WWMA did not receive any opposition or comments relating to the technical requirements in this proposal and, therefore, it supported the proposal as a voting item. However, the WWMA recommended that the NCWM S&T Committee consider adopting the ATC Steering Committee recommendation to use the U.S. reference temperature of 60 °F and direct conversion to SI units (15.56 °C). The WWMA S&T Committee noted that the 15 °C SI equivalent was already used in NIST Handbook 44 and that the reference temperature should be used consistently throughout the HB 44 where appropriate.

At its 2007 Interim Meeting, the CWMA S&T Committee received comments concerning the availability of API tables for SI units. The CWMA recognized that 15.56 °C is the exact conversion for 60 °F. While, the CWMA agreed with the ATC Steering Committee that 60 °F should be the reference temperature in HB 44 for dispensers measuring in gallons, the CWMA believed that 15 °C should be the reference temperature for dispensers measuring in liters since it is the international standard and is referenced in other sections of HB 44.

The CWMA recommended this item remain Informational while further information becomes available from the ATC Steering Committee and L&R Committee.

At its 2007 Interim Meeting, NEWMA received the following proposal from the State of New York:

Proposal: To ensure uniformity in application of the ATC requirements being considered by the S&T Committee, New York proposed that test notes be added to HB 44 specifying acceptable proving equations. In addition, New York recommended using a procedure for RMFDs similar to that used in Canada to simplify the inspector's job by reducing the level of calculations necessary to verify ATC functions in a system.

The following equation is found in OIML R120 Section 4.7 Calculation of meter error.

The value of the meter error is determined using the following equations:

 $E = E' + E_{\alpha} + E_{\beta}$ $E' = [(V_m - V_s) / V_s] \times 100$ $E_{\alpha} = \alpha (t_s - t_m) \times 100$ $E_{\beta} = \beta (t_r - t_s) \times 100$

Where:

- E is the meter error, in %
- E' is the uncorrected error, in %
- E_{α} is the temperature correction for the test liquid, in %
- E_{β} is the temperature correction for the standard capacity measure (%)
- $V_{\rm m}$ is the volume indicated by the meter, in L
- $V_{\rm s}$ is the volume measured in the standard capacity measure, in L
- t_s is the average liquid temperature in the standard capacity measure, in °C
- $t_{\rm m}$ is the average liquid temperature in the meter, in °C

- t_r is the reference temperature of the standard capacity measure, in °C
- α is the cubic expansion coefficient of the test liquid due to temperature, in °C⁻¹
- β is the cubic expansion coefficient of the standard capacity measure due to temperature, in °C⁻¹

The United States differs from OIML in several minor respects that require amendment of the OIML formulas for use in enforcing Handbook 44.

- First, the U.S. inspector often calculates the error in volume units rather than percent. This is driven by the custom in the United States of using provers with gages reading in 0 at nominal volume. In addition, the gage graduations on those provers often have units different than the device under test.
- Second, the U.S. inspector typically uses delivery error, which means the error would be calculated as (prover – meter) rather than (meter – prover) as in the OIML equations.
- Third, the U.S. system may use either the Celsius or the Fahrenheit temperature scale.
- Fourth, the U.S. system requires computation of errors for both net and gross deliveries, yet the OIML equation is written for gross indication only.

The U.S. proving equation for gross delivery error would be derived from the OIML equation by reversing a few terms to reflect error calculation as (prover – meter) and expressing errors in volume units by multiplying both sides of the OIML equation by $V_s / 100$. After these manipulations, a combination/reduction of common terms results in Equation (1) for gross delivery error. For net delivery error, the term $[1 + \alpha (t_s - t_m)]$ must be replaced with a factor for the predicted change in volume between the observed product temperature and the product reference temperature. For liquids with stable expansion properties this factor is given by $1 / [1 + \alpha (t_s - tref)]$ (where tref is the product reference temperature). This results in Equation (2) for net delivery.

(1) E (gross delivery) = $V_s \times [1 + \alpha (T_s - T_m)] \times [1 + \beta (T_s - T_r)] - V_m$ (gross)

(2) E (net delivery) = $V_s \times [1 / (1 + \alpha (T_s - Tref))] \times [1 + \beta (T_s - T_r)]$

Where: (note: all volume units and all temperature units must be compatible)

- E is the delivery error, in volume units
- V_m (gross) is the gross volume indicated by the meter, in volume units
- V_m (net) is the net volume indicated by the meter, in volume units
- V_s is the volume measured in the standard capacity measure, in volume units
- T_s is the average liquid temperature in the standard capacity measure in °F or °C
- T_m is the average liquid temperature in the meter in °F or °C
- T_r is the reference temperature of the standard capacity measure in °F or °C
- Tref is the reference temperature of the product in °F or °C
- α is the cubic expansion coefficient of the test liquid due to temperature in °F⁻¹ or °C⁻¹
- β is the cubic expansion coefficient of the standard capacity measure due to temperature in °F⁻¹ or °C⁻¹

These equations work well for pure liquids with uniform expansion properties over the market temperature range. However, for complex mixtures of liquids (generalized products like gasoline and diesel fuel) with variable expansion properties, the use of a single coefficient of expansion will result in errors in calculations. For example the actual expansion coefficient for 62 API gasoline changes significantly from roughly 0.000705 @ 0 °F to 0.000682 @ 110 °F. With appropriate Volume Correction Factor (VCF) tables such as API Table 6b, the formulas can be amended to replace these terms with equivalent expressions using the available VCF's as in (1a) and (2a) to accurately correct for these variations.

(1a) E (gross delivery) = $V_s \times [VCF(T_s) / VCF(T_m)] \times [1 + \beta (T_s - T_r)] - V_m(gross)$

(2a) E (net delivery) =
$$V_s \times VCF(T_s) \times [1 + \beta (T_s - T_r)] - V_m(net)$$

Where:

VCF(T) is the volume correction factor from the appropriate table for the temperature at the meter or in the standard measure.
All other terms are equivalent to those in equations (1) and (2).

Performing the calculations will probably require either a computer application or lengthy hand calculations with manual table look-ups for the inspector. When doing wholesale meters or LP meters, there is downtime while product is returned to the storage tank at the end of each test run. This time will not be available for the solo inspector when testing RMFDs as he/she will be occupied with the manual return of product. Based on testing procedures developed by officials from Measurement Canada, there may be alternatives that can simplify the calculations and avoid loss of productivity for inspectors.

Under conditions of relative temperature stability, an inspector can use the net and gross readings from a test draft to derive an average VCF for the delivery. With a simple look-up table, the average temperature used by the dispenser can be derived from that VCF, and that temperature can be compared to the observed temperature at the thermometer well. Measurement Canada has established these should agree to within 1 °C (1.8 °F) if the ATC system is working correctly. This corresponds to approximate agreement of the gross and net indications to within 0.12 % for 62 API gasoline and 0.085 % for 36 API diesel fuel. The calculations are simple and can be done using only a hand calculator in just a few keystrokes. In addition, the calculations need not be run on every delivery but perhaps only on the last delivery to allow maximum opportunity for temperature stabilization. Thus the only limitation on the inspector is to run sufficient product to ensure the product delivery temperature remains constant perhaps within 1 °F during the delivery used to verify the ATC system. Where disputes arise, the full calculation methods would serve as the final official value.

NEWMA recommended that Item 330-1 remain as an Information item but move forward as further information becomes available from the ATC Steering Committee and L&R Committee.

NEWMA anticipates this method could be used for any ATC system where the system provides both net and gross from the same test draft and the test is performed under relatively stable temperature conditions. This was verified using existing data taken during tests of wholesale and LP meters. Of course, the gross/net agreement requirement would permit larger deviation for LP since it has a significantly larger coefficient of expansion and net/gross agreement is only required at 0.5 %. This equates to about 2.9 °F agreement for LP with a coefficient of expansion of around 0.0017 °F.

In further support of this concept, it is important to note that when the existing gross/net agreement requirement was added to the LMD and LPG Codes of HB 44, there was an alternative proposal to apply temperature accuracy requirements to temperature probes on devices with ATC. The agreement option was chosen over the temperature verification. The submitter believed this was primarily because the process to verify accuracy of thermometers was difficult even under lab conditions. Also the agreement requirement looked not only at the accuracy of the temperature sensor but what the system did with that information. The agreement is essentially a performance test that can be easily done in the field. In addition, this agreement method eliminates issues of accurately finding the temperature in the prover, which is significantly affected by the ambient air and other factors.

Thus, it seems clear that the NCWM should consider adopting separate proving equations for pure liquids and generalized products, and adopting the derived temperature method for use in testing ATC functions. NEWMA therefore recommended adding new Sections N.6. and N.7. to the LMD code as follows, and further suggested the S&T Committee add similar sections to other codes where ATC equipment is used.

N.6. Volume Proving Equations. – The equations/methods in N.6.1. through N.6.3. shall be used to calculate errors or otherwise determine device compliance with tolerances for initial and subsequent verification for both gross and net volume. The equations in N.6.1. or N.6.2. shall be used in type evaluation.

Definition of Terms Used in Volume Proving in N.6.1. and N.6.2.

- <u>E (gross) is the delivery error for gross volume, in volume units</u>
- <u>E (net) is the delivery error in net volume, in volume units</u>
- Vm (gross) is the gross volume indicated by the meter in volume units
- Vm (net) is the net volume indicated by the meter in volume units

- <u>V_s is the volume measured in the standard capacity measure in volume units</u>
- Ts is the average liquid temperature in the standard capacity measure in °F or °C
- <u>**T**</u>_m is the average liquid temperature in the meter in °F or °C
- <u>**T**</u> is the reference temperature of the standard capacity measure in °F or °C
- <u>Tref is the product reference temperature in °F</u>
- α is the cubic expansion coefficient of the test liquid due to temperature in °F⁻¹ or °C⁻¹
- <u> β is the cubic expansion coefficient of the standard measure due to temperature in °F⁻¹ or °C⁻¹</u>
- $VCF(T_s)$ is the volume correction factor from the appropriate table at the liquid temperature in the standard measure
- $\underline{VCF(T_m)}$ is the volume correction factor from the appropriate table at the average liquid temperature in the meter

Note: All volume units used in these equations must be identical to the units displayed on the device. In addition, the temperature units and those of coefficients of expansion shall be consistent, e.g., all Celsius or all Fahrenheit.

<u>N.6.1. Proving Equations for Liquids with Uniform Expansion Properties. – The formulas below</u> shall be used to calculate device errors for any product having uniform expansion properties over the market range of temperature, i.e., for liquids with a uniform coefficient of expansion.

<u>N.6.1.1. Gross Delivery Error.</u> <u>E (gross delivery) = $V_s \times [1 + \alpha \times (T_s - T_m)] \times [1 + \beta \times (T_s - T_r)] - V_m$ (gross)</u>

<u>N.6.1.2. Net Delivery Error.</u> <u>E (net delivery) = $V_s \times [1 / (1 + \alpha \times (T_s - T_{ref}))] \times [1 + \beta \times (T_s - T_r)] - V_m (net)</u></u>$

N.6.2. Proving Equations for Liquids with Variable Expansion Properties. – The formulas below shall be used to calculate device errors for any product having non-uniform expansion properties over the market range of temperature, that is, liquids with a variable coefficient of expansion. The volume correction factors (VCF's) used in these equations shall come from appropriate tables as defined in regulation. These formulas may also be used in place of those in N.6.2., where a VCF table for the product has been derived using the established coefficient of expansion as in N.6.2.3.

<u>N.6.2.1. Gross Delivery Error.</u> <u>E (gross delivery) = $V_s \times [VCF(T_s) / VCF(T_m)] \times [1 + \beta \times (T_s - T_r)] - V_m$ (gross)</u>

<u>N.6.2.2. Net Delivery Error.</u> <u>E (net delivery) = $V_s \times VCF(T_s) \times [1 + \beta \times (T_s - T_r)] - V_m$ (net)</u>

<u>N.6.2.3.</u> Derivation of Volume Correction Factors (VCF's) for a Liquid with Uniform Expansion <u>Properties.</u> – Volume correction factors may be calculated for a liquid with uniform expansion <u>properties using the following formula.</u> VCF(T) = $[1 / (1 + \alpha \times (T - Tref))]$ Where T is the temperature

N.7. Verification for Electronic Automatic Compensating Systems using Volume Correction Factor Applied to the Transaction. – The following verification method may be used to verify conformance of net indications on electronic automatic temperature-compensating systems with the tolerances in paragraph T.4. during initial and subsequent verifications. This method may be used only if:

- (a) the gross indications are within appropriate tolerances as per N.6.1.1. or N.6.2.1.;
- (b) the device provides both net and gross indications for the same test draft; and
- (c) the delivery temperature at the meter is uniform within 1 °F (0.5 °C) throughout the test draft.

If these conditions are not met, or in the case of dispute, determine compliance using the appropriate proving formulas in N.6.1.2. or N.6.2.2.

- (a) During the delivery, monitor the temperature at the meter.
- (b) If the temperature is stable within 1 °F (0.5 °C), calculate an average observed temperature for the delivery.
- (c) Verify the gross indication is within tolerance using N.6.1.1. or N.6.2.1.
- (d) Using the net and gross meter indications, compute the VCF applied to the transaction as (net indication/gross indication).
- (e) Using the appropriate VCF table for the product, verify that the VCF applied to the transaction falls within the following limits:
 - (1) for Acceptance Tolerances the VCF applied to the transaction shall be not greater than the VCF corresponding to 0.9 °F or 0.5 °C less than the average observed temperature for the delivery nor less than the VCF corresponding to 0.9 °F or 0.5 °C more than the average observed temperature for the delivery.
 - (2) for Maintenance Tolerances the VCF applied to the transaction shall be not greater than the VCF corresponding to 1.8 °F or 1.0 °C less than the average observed temperature for the delivery nor less than the VCF corresponding to 1.8 °F or 1.0 °C more than the average observed temperature for the delivery.

At its 2007 Annual Meeting, the SWMA received a comment from an official that a dispenser should not print a statement that the volume of the product has been adjusted to the volume in liters at 15 °C for liters or the volume in gallons at 60 °F for gallons when ATC is not activated. The official also believed the allowance for a record of action in proposed S.2.7.5. should be performed automatically by the device and recorded in the audit trail. A manufacturer stated that the print statement currently comes from information provided by the inside control console, not from the dispenser. The SWMA S&T Committee agreed to forward the comments to the NCWM S&T Committee for consideration.

330-2 N.4.6. Pour and Drain Times for Hand-held Test Measures

Source: Central Weights and Measures Association (CWMA)

Proposal: Add a new paragraph as follows:

<u>N.4.6. Pour and Drain Times for Hand-held Test Measures – Hand-held test measures require a</u> <u>30-second (± 5 seconds) pour followed by a 10-second drain, with the measure held at a 10- to 15-degree</u> <u>angle from vertical.</u>

Background/Discussion: HB 44 does not address pour or drain times for 5 gal test measures used to test retail motor-fuel devices. However, the pour and drain time reqirements are in HB 112 Examination Procedure Outline Numbers 21 and 22 for Retail Motor-fuel Dispensers in Test Notes paragraph 2. They are also referenced in NIST HB 105-3 Specifications and Tolerances for Graduated Neck-Type Volumetric Field Standards section 7. Test Methods and References.

Metrology labs are not routinely requiring that hand-held (5 gal) test measures be labeled with this information when that information is missing. Additionally, many hand-held test measures used by service agents and agencies do not specify drain times. Service agents, as a result, are using incorrect pour and drain times.

The CWMA recommended the language in the above proposal move forward as a voting item on the NCWM S&T Committee agenda.

331 VEHICLE-TANK METERS

331-1 S.5.7. Meter Size (Marking Requirements)

Source: Central Weights and Measures Association (CWMA)

Proposal: Amend S.5. by adding a new sub-paragraph S.5.7. as follows

S.5.7. Meter Size. Except for milk meters, a meter shall be marked to show meter size. [Non-retroactive as of January 1, 200X]

Background/Discussion: Wisconsin Weights and Measures has reported that field inspectors may not be able to correctly determine the size of a VTM (in terms of pipe diameter) and, therefore, may have applied incorrect tolerances to product depletion tests. The requirement for marking the meter size would provide field inspectors with a positive method for applying the correct tolerance.

The CWMA recommends that the language above move forward as a voting item on the NCWM S&T Committee Agenda.

331-2 T.2.1. Automatic Temperature-Compensating Systems

Source: Western Weights and Measures Association (WWMA)

Proposal: Amend paragraph T.2.1. as follows:

T.2.1. Automatic Temperature-Compensating Systems. – The difference between the meter error (expressed as a percentage) for results determined with and without the automatic temperature-compensating system activated shall not exceed:

- (a) **0.40.2** % for mechanical automatic temperature-compensating systems; and
- (b) **0.2<u>0.1</u>%** for electronic automatic temperature-compensating systems.

The delivered quantities for each test shall be approximately the same size. The results of each test shall be within the applicable acceptance or maintenance tolerance.

Background/Discussion: For more than 13 years, Alaska has been testing mechanical and electronic temperaturecompensating vehicle-tank meters ranging in flow rates from 100 gal/min to 300 gal/min. They have applied the tolerances of 0.2 % for mechanical and 0.1 % for electronic wholesale meters as specified in the LMD Code, and have found that the devices are fully capable of meeting these tolerances. When devices are found out of tolerance, it is usually because of a broken cable at the probe for the mechanical devices, an electrical fault at the probe on electronic devices, or an incorrect API setting. By keeping the current tolerances that are double this amount, there is a risk these problems will be missed.

The following example illustrates the point using:

1000 gal prover Diesel #2 API 34.5 Temperature 60 °F Mechanical compensated VTM

- A net test draw is run and the result is + 2.0 gal or + 0.2 %. This meets the maintenance tolerance of 0.3 % or 3.0 gal.
- A gross draw is run and the result is 2.0 gal or 0.2 %. This still meets the tolerance and the difference between the two runs is 0.4 %.
- With the temperature of the fuel at 60 °F, both of these runs should have been equal.
- If an inspector used the system indication of temperature rather than using a certified thermometer in the meter temperature well, calculations show that the current tolerance of 0.4 % for a mechanical automatic temperature-compensating system could allow a system malfunction that provided a temperature error of

up to 9 °F difference from the actual temperature taken in the prover and not be recognized as being caused by a faulty system.

At its 2007 Annual Meeting, the WWMA was presented with a letter from a meter manufacturer in support of the proposal based on a request from Alaska Weights and Measures for input from manufacturers of the mechanical and electronic compensators. The letter states that the proposed changes will align the VTM tolerances for the difference between meter error for results determined with and without the automatic temperature-compensating system activated with the LMD Code. Current NIST HB 44 language will require this manufacturer to produce different stationary and vehicle-mounted meters; the proposed change will align the United States with Canada and OIML, who currently do not have different standards for these meters.

The WWMA recommends that this proposal move forward as a voting item on the NCWM S&T Committee agenda.

At its 2007 Interim Meeting, the CWMA commented that tightening the tolerance was premature without additional input from other jurisdictions and manufacturers to see how or if this would affect devices currently in the field. Therefore, the CWMA requested that data to support or oppose this item be gathered from additional jurisdictions.

331-3 UR.2.5. Automatic Temperature Compensation for Refined Petroleum Products

Source: Southern Weights and Measures Association (SWMA)

Proposal: Add the following subparagraphs to the Vehicle-Tank Meters Code:

<u>UR.2.5.2.1.</u> Period of Use. – When fuel is bought or sold on an automatic or non-automatic temperature-compensation basis, it shall be bought or sold using this basis over at least a consecutive 12-month period unless otherwise agreed to by both the buyer and seller in writing.

<u>UR.2.5.2.2</u> Condition of Use. – At a business location which offers fuel products for sale on the basis of a temperature-compensated volume, all measuring devices shall have active automatic temperature compensation and all products offered for sale shall be dispensed on the basis of temperature-compensated volume.

Discussion: Currently there are no published guidelines for how a company has to use or operate their VTM with or without temperature compensation. They could choose to operate only part of their fleet with ATC or use ATC only part of the year when it is to their benefit. They may choose to use ATC only on certain products such as home heating oil and not use ATC with diesel, kerosene, or gasoline.

These two proposals will help to eliminate the potential for facilitation of fraud with ATC. The proposals also will help to eliminate consumer confusion regarding why certain products are sold using ATC and others are not and will help to address consumers' questions such as, why the last delivery to a consumer's house applied ATC and today's delivery did not.

At its 2007 Annual Meeting, the SWMA received the proposal shown above and recommended it move forward as a voting item on the NCWM S&T Committee agenda.

336 WATER METERS

336-1 UR.2.1. Accessibility Customer Indication

Source: Western Weights and Measures Association (WWMA)

Proposal: Add a new paragraph UR.2. to HB 44, Section 3.36. Water Meters, as follows:

<u>UR.2.</u> Accessibility of Customer Indication. – An unobstructed standing space of at least 30 in wide, 36 in deep, and 78 in high shall be maintained in front of an indication intended for use by the customer to

allow for reading the indicator. The customer indication shall be readily observable to a person located within the standing space without necessity of a separate tool or device.

Background/Discussion: At its 2006 Annual Meeting, the WWMA received an industry proposal intended to assist enforcement personnel in properly and uniformly enforcing the applicable regulations for obtaining meter readings. The proposed language is more appropriate than (1) trying to define inherently ambiguous and subjective terms like "reasonable" and "ordinary circumstances" or (2) defining specific height requirements that insure visibility for customers and/or officials. The industry proposal recommended that a new paragraph UR.2. Accessibility for Reading should be added to Section 3.36 Water Meters Code of HB 44 because of the need for language to describe acceptable and applicable provisions.

Industry members stated that existing language in General Code paragraphs G-UR2.1.1. and G-UR.3.3. includes terms such as "reasonable" and "readily observable" which are subjective requirements; it is not possible to understand the installation requirements without relying on each local authority's interpretation of these terms, which varies even within the same jurisdiction.

In a vast majority of cases, water submetering locations are NOT chosen by the service agency or the property/meter owner, but are dictated by the engineers and architects who use both national and state building and plumbing codes as their primary guide.

The regulation which is most commonly cited on notices of violation for register visibility issues is paragraph G-UR.3.3. Position of Equipment. HB 44 defines <u>direct sale</u> as "*a sale in which both parties in the transaction are present when the quantity is being determined*...." Industry notes that paragraph G-UR.3.3. is being misapplied and should have no bearing on a water submeter application since both parties are **not** present when the quantity is determined. Furthermore, the antonym of a direct sale would be an indirect sale. NIST HB 130, Packaging and Labeling, Section 11. Exemptions, Subsection 11.1.1 Indirect Sale of Random Packages gives examples of indirect sales, several of which are exact examples of how water-submetering bills are paid. Examples of such indirect methods include on-line bill payments, phone bill payments, fax bill payments, and bill payments by mail.

Since water submetering is typically billed on a monthly cycle and since water submetering is not a direct sale where both parties are present at the time of the transaction, accessibility requirements for reading water meters should not be the same as those enforced on direct sale devices where transactions take place frequently and with both parties present.

If the interpretation of the terms "reasonable and readily observable" continue to be enforced as they are currently, many meter owners will choose to abandon their systems for alternative billing methods such as "remote utility billing service" (RUBS) because re-plumbing existing water lines within walls is costly to building and coop/condo owners. This is especially true because there is no framework in place to know how to perform such a plumbing retrofit so that the work will be compliant with all interpretations of "reasonable" and "readily observable."

A detailed, 12-month sampling of call center complaints from California properties showed that not a single complaint about the difficulty in obtaining a water meter reading had been received.

HB 44, Water Meters Code paragraph S.1.1.1. General permits a remote display as long as it is "readily accessible to the customer."

The industry proposed language was no more definitive than the existing language. The industry proposal removed the requirement for providing a readily accessible customer indicator. The California Division of Measurement Standards (DMS) proposed alternative language that would remove the vagueness from the current requirement while providing flexibility to installers.

Property owners do not read the indicators on each meter or they would be placed in a more convenient reading location. With remote reading, however, many meters are now being placed in inaccessible locations. Hardware is being installed to permit remote readings for billing purposes, but may not be available for customers' use.

Complaints have been lodged where the remote billing did not match the meter readings and the WWMA believed that customers should be able to easily monitor their actual use without involving the property owner.

The industry in California has been advised that remote customer indications are permissible. However, industry has not submitted devices to California DMS for type evaluation. This problem can be resolved in a manner more consistent with other device applications through submitting for type evaluation remote customer indicators to be used in future meter installations.

The WWMA considered the proposal developed by industry and an alternate recommendation developed by California DMS. The industry proposal would have permitted access to indications either through a primary indicator or a remote indicator. Alternatively, operators would be required to provide customer access to meter indications within 24 hours of notification within a billing cycle. The California DMS proposal specified installation requirements that provide for a clear, unobstructed perimeter surrounding the device to ensure accessibility for viewing meter indications.

The WWMA acknowledged that utility submeters are commercial devices. However, the measurement operation takes place over an extended period of time and the customer is not able to observe the entire measurement operation. The customer then receives a bill on a periodic cycle based on meter indications. In some cases, the meter operator/owner may be offsite and does not observe primary meter indications. Consequently, no one General Code or Water Meters Code requirement appears to provide a complete and uniform set of guidelines that specifies all conditions for making meter indications available so the consumer can verify the measurement and allow the official to conduct an inspection. Some jurisdictions have developed policies to address this situation. In 2002 paragraph S.1.1.1. General. was amended to ensure that when indications are remote they remain accessible to the customer.

In any case, requirements and jurisdiction policies should address the needs of the customer and the official for access to meter indications without placing an undue burden on the operator or customer, and they should not deter a customer from making a legitimate complaint. It is essential in the marketplace to have all components used in determining utility charges transparent; this includes meter indications that are available to all parties involved in the transaction.

The WWMA agreed that each proposal has some elements necessary to address meter accessibility and indicator accessibility. Therefore, the 2006 WWMA recommended the proposal become a Developing item to allow time to rework the text to provide uniform guidelines that fully address accessibility and include the following points: (1) Installation and location is such that there is no obstruction of the meter or indications, and (2) Indications are accessible for viewing by the customer and official without the use of tools separate from the device.

At its 2007 Annual Meeting, the WWMA heard comments from the California DMS stating that the dimensions listed in its alternate proposal are excerpted from utility meter requirements in the Pacific Gas & Electric Utility Company (Green Book) manual and California Weights and Measures Electric Meter regulations. The WWMA agreed with comments from DMS to add a new paragraph UR.2. to the Water Meters Code and believed it was sufficiently developed to be moved forward as a voting item on the NCWM S&T Committee Agenda.

358 MULTIPLE DIMENSION MEASURING DEVICES

358-1 A.1. General., Note 7 in Table S.4.1.b., and Appendix D. Definitions

Source: Western Weights and Measures Association (WWMA)

Proposal: Add new paragraphs A.1.1. and A.1.2.; amend Note 7 in Table S.4.1.b.; and add new definitions to Appendix D. Definitions. as follows:

A.1. General. – This code applies to dimension and volume measuring devices used for determining the dimensions and/or volume of objects for the purpose of calculating freight, storage, or postal charges based on the dimensions and/or volume occupied by the object.

A.1.1. A Multiple Dimension Measuring Device is generally used to measure regular hexahedronshaped objects.

A.1.2. A Multiple Dimension Measuring Device may be used to measure irregularly shaped objects.

Multiple Dimension Measuring Systems Table S.4.1.b. Notes for Table S.4.1.a.

7. Materials, shapes, structures, combination of object dimensions, speed, <u>minimum protrusion size</u>, or object orientations that are inappropriate for the device or those that are appropriate.

(Amended 200X)

Appendix D – Definitions.

hexahedron. A regular hexahedron shape is one where all faces of the object are square, i.e., a cube.

irregularly shaped object. Any object that is not a regular hexahedron shape.

This proposal clarifies the requirements by defining the type of objects measured by these types of devices and includes the definition of these objects. This proposal also clarifies a complex marking requirement currently included in this section by:

- 1. Providing a better description of the various objects measured using these devices. As the MDMD Irregular WG discussed irregularly shaped objects, it was determined that clarification was required as to the definition of irregular shaped objects. Examples of irregular shaped objects include, but are not limited to, pails, mufflers, tail pipes, palletized freight containing multiple hexahedron objects, and palletized freight containing large uncontainerized objects such as transmissions or engines.
- 2. Directing current marking requirements to the appropriate shapes. Current wording requires marking the unit for both appropriate and inappropriate shapes.
- 3. Defining the terms hexahedron and irregularly shaped objects to clarify the application of various MDMD devices.

The submitters of this proposal state there are no additional cost impacts to the parties involved in the evaluation of these devices. This proposal will benefit both the NTEP evaluation process as well as the field evaluation process by clarifying the objects to be used during testing.

The WWMA recognizes that clarification of the device application and marking requirements, along with the additional definitions, are integral to the understanding of this relatively new NIST Handbook 44 code. However, the WWMA recognizes that none of its members have experience in field testing or type evaluating these devices. Consequently, the WWMA recommends that this proposal be an Information item so that others with more experience may provide comments.

At its 2007 Interim Meeting, the CWMA heard comments that the proposed language provided a better description of the various objects measured on multiple dimension measuring devices and supported the language as proposed.

At its 2007 Annual Meeting, the SWMA recommended the proposal move forward on the NCWM S&T Committee agenda as a voting item.

358-2 S.1.5. Value of Dimension/Volume Division Value

Source: Western Weights and Measures Association (WWMA)

Proposal: Add a new subparagraph S.1.5.2. Devices Capable of Measuring Irregularly Shaped Objects to paragraph S.1.5. Value of Dimension/Volume Division Value. as follows:

<u>S.1.5.2.</u> Devices Capable of Measuring Irregularly Shaped Objects. – For devices capable of measuring irregularly shaped objects, the value of the division size "d" shall be the same for the 'x' (length) and 'y' (width) axis and may be different for the 'z' (height) axis.

Background/Discussion: Irregular shaped objects are often electronically rotated in software on the 'x' and 'y' axis to determine the smallest regular hexahedron shape. The only accurate way to perform this function is if the 'x' and 'y' dimensions are measured with the same resolution, i.e., the same size "d."

The WWMA acknowledged that additional clarifying language may be needed to describe the specifications of devices in this relatively new Handbook code. However, the WWMA recognized that none of its members had experience in field testing or type evaluating these devices. Consequently, the WWMA recommended this proposal be an Information item so that others with more experience may provide comments.

At its 2007 Interim Meeting, the CWMA heard comments that the proposed language provided a better description of the various objects measured on multiple dimension measuring devices and supported the language as proposed.

At its 2007 Annual Meeting, the SWMA recommended the proposal move forward on the NCWM S&T Committee agenda as a voting item.

358-3 N.1.2. Position Test

Source: Western Weights and Measures Association (WWMA)

Proposal: Add a new subparagraph N.1.2.1. to paragraph N.1.2. Position Test. as follows:

N.1.2.1. Irregular shaped objects must be measured while placed on a stable side. The rotation of the object to determine the smallest hexahedron should be calculated in a two-dimension plane, retaining the stable side plane as the bottom of the hexahedron.

Background/Discussion: This issue is important to transportation companies which are the primary users of these devices. It is critical that goods are moved while in a stable position in order to ensure the safety of the employees as well as avoiding the damage of goods being transported. Examples are goods mounted to pallets, placement in transportation vehicles, and goods moving along a conveyor belt.

Three-dimension rotation would result in a measurement that typically leaves the measured object in an unacceptable position for transportation for these safety and damage concerns. In fact, it was noted by the MDMD WG that irregularly shaped goods are frequently labeled with "This End Up," "Top Load," or "Do Not Stack" messages by shippers to enforce these concerns.

To address these concerns, this proposal maintains the "smallest hexahedron" concept while allowing the object to be placed on a stable plane.

The WWMA agreed that clarification and additional guidance was needed for proper field testing of irregularly shaped items. However, the WWMA recognized that none of its members have experience in field testing or type evaluating these devices. Consequently, the WWMA recommended this proposal be an Information item so that others with more experience may provide comments.

At its 2007 Interim Meeting, the CWMA heard comments that the proposed language provided a better description of the various objects measured on multiple dimension measuring devices and supported the language as proposed.

At its 2007 Annual Meeting, the SWMA recommended the proposal move forward on the NCWM S&T Committee agenda as a voting item.

358-4 N.1.4. Test Objects

Source: Western Weights and Measures Association (WWMA)

Proposal: Add new subparagraphs N.1.4.2. and N.1.4.3. to paragraph N.1.4. Test Objects. as follows:

<u>N.1.4.2. For irregular shaped test objects, at least one angle shall be obtuse and the smallest dimension</u> for an axis shall be equal to or greater than the minimum dimension for that axis.

N.1.4.3. If the device is marked with a minimum protrusion dimension to be measured, an irregular shaped test object with that size protrusion shall be used to verify the marked limitation.

Background/Discussion: The primary use of these devices is in the calculation of freight transportation charges based on the size of the package. Irregular shaped items are typically wrapped in plastic, not enclosed in a container or banded by straps. When these items are measured by humans, judgment can be used to exclude loose plastic wrapping, fly tag labels, strap ends and other protrusions from the dimensions used to determine the irregular object's shape.

When determining the size of irregular objects, these protrusions need to be excluded from the smallest regular hexahedron dimension or the resulting dimensions will generate excessive freight charges to the customer. Defining the size limit of the protrusion is necessary to distinguish those protrusions that will be excluded from those that are included in an irregular object's shape.

The WWMA agreed that clarification and additional guidance was needed for proper field testing of irregularly shaped items. However, the WWMA recognized that none of its members have experience in field testing or type evaluating these devices. Consequently, the WWMA recommended this proposal be an Information item so that others with more experience may provide comments.

At its 2007 Interim Meeting, the CWMA heard comments that the proposed language provided a better description of the various objects measured on multiple dimension measuring devices and supported the language as proposed.

At its 2007 Annual Meeting, the SWMA recommended the proposal move forward on the NCWM S&T Committee agenda as a voting item.

360 OTHER ITEMS

360-1 International Organization of Legal Metrology (OIML) Report

Many issues before the OIML, the Asian-Pacific Legal Metrology Forum (APLMF), 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 http://www.oiml.org. NIST WMD staff will provide the latest updates on OIML activities during the open hearing sessions at NCWM meetings. For more information on specific OIML-related device activities, contact the WMD staff listed in the table below. The OIML projects listed below represent only currently active projects. For additional information on other OIML device activities that involve WMD staff, please contact WMD using the information listed below:

NIST Weights and Measures Division (WMD) Contact List for International Activities				
Contact Information	Responsibilities			
Postal Mail and Fax for All Contacts:	NIST WMD 100 Bureau Drive MS 2600 Gaithersburg, MD 20899-2600 Tel: (301) 975-4004 Fax: (301) 975-8091			
Mr. Kenneth Butcher (LMG) (301) 975-4859 kenneth.butcher@nist.gov	 •D 1 "Elements for a Law on Metrology" •TC 3 "Metrological Control" •TC 3/SC 1 "Pattern Approval and Verification" •TC 3/SC 2 "Metrological Supervision" •TC 6 "Prepackaged Products" 			
Mr. Steven Cook (LMDG) (301) 975-4003 steven.cook@nist.gov	 •R 50 "Continuous Totalizing Automatic Weighing Instruments (Belt Weighers)" •R 51 "Automatic Catchweighing Instruments" •R 60 "Metrological Regulations for Load Cells" •R 76 "Non-automatic Weighing Instruments" 			
Dr. Charles Ehrlich (ILMG) (301) 975-4834 charles.ehrlich@nist.gov	 CIML Member B 10 "Framework for a Mutual Acceptance Arrangement (MAA) 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," & "OIML Procedures for Review of Laboratories to Enable Mutual Acceptance of Test Results and OIML Certificates of Conformity" TC 3 Metrological Control 			
Mr. Richard Harshman (LMDG) (301) 975-8107 richard.harshman@nist.gov	 •R 106 "Automatic Rail-weighbridges" •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 (LMDG) (301) 975-4405 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" 			
Mr. Ralph Richter (ILMG) (301) 975-3997 ralph.richter@nist.gov	 •R 35 "Material Measures of Length for General Use" •R 49 "Water Meters" (Cold Potable Water & Hot Water Meters) •R 71 "Fixed Storage Tanks" •R 80 "Road and Rail Tankers" •R 85 "Automatic Level Gauges for Measuring the Level of Liquid in Fixed Storage Tanks" •R 105 & 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" •TC 8/SC 7 P1 "Measuring Systems for Gaseous Fuel" (i.e., large pipelines) •TC 8/SC 8 "Gas Meters" (Diaphragm, Rotary Piston, & Turbine Gas Meters) 			

NIST Weights and Measures Division (WMD) Contact List for International Activities						
Contact Information	on		Responsibilities			
 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 Qual Management System" R 34 "Accuracy Classes of Measuring Instruments" R 46 "Active Electrical Energy Meters for Direct Connection of Class 2" TC 5/SC 2 "General Requirements for Software Controlled Measuring Instruments' 						
Ms. Juana Williams (LMDG) (301) 975-3989 juana.williams@nis	t.gov	•R 21 "Taximeters" •TC 8/SC 7 P2 "Cor	npressed Gaseous Fuels Measuring Sy	vstems for Vehicles"		
LIST OF ACRONYMS						
ILMG – International Legal Metrology Group	LMDG Devic LMG – Grouj	- Legal Metrology ces Group Laws and Metrics	 B – Basic Publication CIML – International Committee of Legal Metrology D – Document 	P – Project R – Recommendation SC – Subcommittee TC – Technical Committee		

The WWMA and the SWMA support these issues and the related device activities as an Information item.

360-2 Developing Items

The NCWM established a category of items called "Developing Items" as a mechanism to share information about emerging issues which have merit and are of national interest, but have not received sufficient review by all parties affected by the proposal or that may be insufficiently developed to warrant review by the Committee. The Developing items are currently under review by at least one regional association, technical committee, or organization.

Developing items are listed in Appendix A according to the specific HB 44 code section under which they fall. Periodically, proposals will be removed from the Developing item agenda without further action because the submitter recommends it be withdrawn. Any remaining proposals will be renumbered accordingly.

The Committee encourages interested parties to examine the proposals included in Appendix A and send their comments to the contact listed in each item. The Committee asks that the regional associations and NTETC Sectors continue their work to develop each proposal fully. Should an association or Sector decide to discontinue work on an item, the Committee asks that it be notified.

Carol P. Fulmer, South Carolina, Chairman

Todd R. Lucas, Ohio Brett Saum, San Luis Obispo County, California Kristin Macey, Colorado Rick Fogal, Pennsylvania

Ted Kingsbury, Measurement Canada, Technical Advisor Steven Cook, NIST, Technical Advisor Richard Suiter, NIST, Technical Advisor

Specifications and Tolerances Committee

S&T Committee 2008 Interim Agenda

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Appendix A

Item 360-2: Developing Items

Part 1, Item 1 Scales: S.1.4.6. Height and Definition of Minimum Reading Distance, UR.2.10. Primary Indicating Elements Provided by the User, UR.2.11. Minimum Reading Distance and Definitions of Minimum Reading Distance and Primary Indications

Source: NTETC WS

Note: This proposal was Carryover Item 320-2 in the Committee's 2006 Agenda and appeared on the Committee's 2007 Agenda as Item 320-4. (This item originated from the 2005 NTETC WS and first appeared on the Committee's 2006 agenda.) The Committee believes that although the proposal has merit there does not appear to be a consensus on the size and quality of primary indication information on devices used in direct and indirect sales transactions or an enforcement date for such requirements. Therefore, the Committee removed Item 320-4 from its agenda and made it a Developing item to allow sufficient time for the community to fully develop requirements acceptable to those affected.

Recommendation: The Committee considered the WS's first attempt at a proposal that adds new paragraphs S.1.4.6., UR.2.10., and UR.2.11. to the Scales Code.

S.1.4. Indicators.

S.1.4.6. Height. – All primary indications shall be indicated clearly and simultaneously.

- (a) <u>On digital devices that display primary indications during direct sales to the customer, the</u> numerical figures displayed to the customer shall be at least 9.5 mm (0.4 in) high.
- (b) <u>The units of mass and other descriptive markings or indications, such as lb, kg, gross, tare, net,</u> <u>etc., shall be clearly and easily read and shall be at least 2 mm (0.08 in) high.</u> [Nonretroactive as of January 1, 200X] (Added 200X)

UR.2. Installation Requirements

<u>UR.2.10. Primary Indicating Elements Provided by the User. – Primary indicating elements that</u> are not the same as the primary indicating elements provided by the original equipment manufacturer (e.g., video display monitors) shall comply with the following:

- (a) <u>On digital devices that display primary indications during direct sales to the customer,</u> the numerical figures displayed to the customer shall be at least 9.5 mm (0.4 in) high.
- (b) <u>The units of mass and other descriptive information, such as gross, tare, net, etc., shall</u> <u>be displayed or marked on the device and shall be at least 2 mm (0.08 in) high.</u>

(Added 200X)

UR.2.11. Minimum Reading Distance – On digital devices that display primary indications, the height of the numbers expressed in millimeters should be not less than three times the minimum reading distance expressed in meters, without being less than 2 mm (0.08 in). (Example: If the height of the primary indications is 10 mm, then the minimum reading distance should not be greater than 30 m).

(Added 200X)

Add new definitions of "minimum reading distance" and "primary indications" to Appendix D as follows:

minimum reading distance. The shortest distance that an observer is freely able to approach the indicating device to take a reading under normal conditions of use. This approach is considered to be free for the observer if there is a clear space of at least 0.8 m in front of the indicating device. However, if the minimum reading distance "S" in Figure X below is less than 0.8 m, then the minimum reading distance is "L" in Figure X. [2.20]

(Added 200X)





primary indications. Weight or other units of measurement values displayed by a primary indicating element. The primary indications are used as the determining factor in arriving at the sale representation when the device is used commercially. (Examples of primary indications include the measurement value, unit price or count, and total price on instruments capable of price computing. Primary indications do not include indications from auxiliary indicating devices such as totalizing registers and pre-determined stop mechanisms.) [1.10], [2.20] (Added 200X)

This proposal was developed to address a growing problem with the readability of weight indications and the values that define transaction information. Field and laboratory officials indicate both are becoming increasingly smaller, as demonstrated in the following example of a weight display where the actual size of the weight values are 23 mm in height, but the unit of measurement (g) is 4 mm in height.



Field and laboratory officials need more specific requirements to consistently determine if indications are suitable for the environment in which the device is used. Currently only the Taximeters, Grain Moisture Meters, and Near-Infrared Grain Analyzers Codes include requirements that specify the minimum height of figures, words, and symbols. The size requirements for all three device technologies were developed primarily because of concerns about the visibility of indications from the customer's position. HB 44 and NCWM Publication 14 include no uniform size requirements or specific guidelines on how to evaluate display information for clarity and readability for equipment other than these three device types.

The Committee agreed that although the clarity and readability of indications was a growing issue, the current proposal had only limited support from the public and private sectors. The Committee recognized the proposal required a significant amount of work before the language was clear, technically correct, and deemed applicable to the different types of installations and technologies in current use. The Committee had concerns about whether or not the proposed 2 mm height requirements for units of measurement and other markings were adequate. The Committee also questioned the clarity of the proposed user requirements for the minimum reading distance.

The Committee recommended the submitter consider several points in its review of the current proposal:

- The proposed 2 mm height limits in the proposal may possibly be an error due to a miscommunication within the WS. The value was intended to be closer to that of the figure in the example display which was 4 mm.
- Any specification and corresponding user requirement should provide laboratory and field officials with uniform guidelines:
 - determine if the required markings on a new equipment design from the manufacturer or a device recently modified by the owner or a service company were suitable for continued use in a particular application; and
 - remove all ambiguity or subjectivity when assessing if primary indications can be observed from a reasonable customer and operator position
- A size requirement for figures and their corresponding descriptive symbols and characters specified as a percentage might be a good approach. This approach was explored by the 2006 WS in its review of the relationship of size requirements for taximeter indications. The legibility of primary indications is dependent upon or relative to not only the distance the reader is from the information, but also the total area (square footage) of the display panel where those markings are posted. For example, a 9.5 mm figure is not a suitable size for a primary indication on a typical vehicle scale scoreboard because of the distance of the scoreboard from the typical customer position.
- Corresponding new language in HB 44 that is similar to that which exists in HB 130 for labels might be needed. This language may be necessary to provide guidelines to ensure sufficient contrast between the color and illumination of all required markings and their background. For example, a requirement might specify, "all required markings shall be prominent, definite, plain, and conspicuous as to size and style of symbols, letters, and numbers and as to color that is in contrast to the background and presented so that there is adequate free area surrounding those markings." This language would be consistent with current General Code requirements or might be added to a specific code section of HB 44.
- A recognized vision standard such as those used to determine visual acuity (eye exam charts, etc.) might be a good source for establishing specific distance limits.
- When the size of indications becomes a selectable configuration parameter, access to this feature must be sealed.

For more background information refer to the Committee's 2006 Final Report.

During the 2007 Annual Meeting, The Committee was informed that the NTETC WS will continue to develop this item.

At its 2007 NTEP Participating Laboratory meeting, the weighing device labs discussed this item and reviewed the equivalent recommendations in OIML R 76. It was noted that the minimum height requirement for the weight display applied to scales used in direct sale applications with a capacity of 100 kg or less. Additionally, it was noted that R 76 was written to apply to weighing devices that indicated primarily in SI units and that U.S. scales are frequently configured with both SI and inch-pound units. The labs agreed with the suggestion that the proposed language for the minimum height of the weight display be limited to scales used in direct sales with a capacity of 200 kg or less. The minimum height of the "units" indication would only be applicable to devices with external lb/kg switching capability since there would be no chance of facilitating fraud using the lb/kg switching capability.

The NIST technical advisor contacted a manufacturer about the labs' recommendation to revise proposed S.1.4.6. The manufacturer believed most products could comply; however, he would not speak for other manufacturers. He also stated that this did not address questions about the minimum size of an annunciator that points to a unit legend silk-screened on the scale next to the annunciator.

The WMD adds that there has been little discussion on the clarity of the displays and annunciators and perhaps the proposal should include language similar to Handbook 130 Packaging and Labeling Regulation paragraphs:

- 8.1.2. Style of Type or Lettering that states that the "declaration or declarations of quantity shall be in such a style of type or lettering as to be boldly, clearly, and conspicuously presented with respect to other type, lettering, or graphic material on the package, except that . . . ," and
- 8.1.3. Color Contrast that states that the "declaration of quantity shall be in a color that contrasts conspicuously with its background . . ."

The NIST technical advisor to the NTETC WS amended the proposal to address the concerns and suggestions from the manufacturers, NTEP labs, and WMD and placed the item on the 2007 WS agenda. The NIST technical advisor did not develop any changes to the proposed definition of "Primary Indications," the proposed User Requirements, and the associated definition for "Minimum Reading Distance." The Sector was asked to review the proposed language in its agenda and provide a recommendation that can be forwarded to the regional weights and measures associations.

At its 2007 Annual Meeting, the WS reviewed and discussed the amended proposal from the NTEP participating laboratories. Manufacturers stated they prefer the proposed paragraph be written so the requirements apply to new NTEP applications instead of all devices manufactured after the effective date. They state that the cost to modify the design of the scale displays is not justified considering they have not received comments from their customers stating consumers are complaining that the size of the displays are too small. Additionally, the majority of the Sector believed the current definition for "primary indications" in HB 44 is sufficient and that it be deleted from the proposal.

The Sector agreed to submit the following revised language to the regional weights and measures associations and the NCWM S&T Committee. The Sector also recommends deleting the proposed amendment to the definition of primary indications. Additionally, the Sector did not discuss or make any recommendations on the proposed user requirements and definition for "minimum reading distance."

S.1.4. Indicators.

<u>S.1.4.6. Direct Sale Primary Indications – Size and Character.</u> Scales designed for direct sale applications with a capacity of 100 kg (200 lb) or less shall comply with the following:

a. <u>All indications-shall be indicated clearly and simultaneously.</u>

- b. <u>All indications and associated descriptive markings (e.g., lb, kg, gross, tare, net, etc.) shall be</u> presented in such a style of type or lettering as to be boldly, clearly, and conspicuously presented with respect to other type, lettering, or graphics and shall be at least 2 mm (³/₃₂ in) high.
- c. <u>All indications and associated descriptive markings shall be in a color or shade that contrasts</u> <u>conspicuously with its background.</u>
- d. <u>All primary numeric indications displayed to the customer shall be at least 9.5 mm (0.4 in) high.</u>

e. <u>All units and descriptors shall be at least 2 mm (³/32 in) high.</u> [Nonretroactive as of January 1, 200X] (Added 200X)

primary indications. Weight or other units of measurement values displayed by a primary indicating element. The primary indications are used as the determining factor in arriving at the sale representation when the device is used commercially. (Examples of primary indications include the measurement value, unit price or count, and total price on instruments capable of price computing. Primary indications do not include indications from auxiliary indicating devices such as totalizing registers and pre-determined stop mechanisms.) [1.10], [2.20] (Added 200X)

At its 2007 Annual Meeting, the WWMA heard from one scale manufacturer that his company's devices will pass the 9.5 mm and 2 mm requirements, but not the 21 %.

The WWMA recommended this item remain a Developing item on the NCWM S&T Committee agenda.

At its 2007 Interim Meeting, the CWMA commented that there may not be a necessity for such a requirement due to other requirements already present in HB 44. (G-UR.3.3). However, including a specification in HB 44 has merit. No additional user requirement would be necessary.

The CWMA recommended this item remain a Developing item on the NCWM S&T Committee agenda.

At its 2007 Interim Meeting, NEWMA recommended this item be Withdrawn as it was already covered in HB 44 General Code paragraph G-S.5.1.

At the 2007 SWMA Annual Meeting, a scale manufacturer stated it could support S.1.4. Indicators, but not UR.2. Installation Requirements. The SWMA agreed to forward the comment to the NCWM S&T Committee for consideration.

To comment on this proposal, contact Steven Cook, NIST Technical Advisor to the NTETC WS, by e-mail at steven.cook@nist.gov, by telephone at (301) 975-4003, by fax at (301) 975-8091, or by postal mail at NIST WMD, 100 Bureau Drive MS 2600, Gaithersburg, MD 20899-2600.

Part 2, Item 1 Belt-Conveyor Scale Systems: UR.3.2.(c) Maintenance; Zero Load Tests

Source: 2005 Western Weights and Measures Association (WWMA)

Recommendation: Modify UR.3.2.(c) 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 requirements:

(c) Zero-load and load (simulated or material) tests, <u>Ssimulated load tests</u>, or material tests, and zero load tests shall be conducted at periodic intervals between official tests in order to provide reasonable assurance that the device is performing correctly. (Amended 200X)

The action to be taken as a result of the zero-load tests is as follows: (Added 200X)

- <u>if the change in zero is less than ± 0.1 %</u>, make no adjustment, record results and proceed to <u>simulated load tests; or</u>
- if the change in zero is ± 0.1 % to ± 0.25 %, inspect the conveyor and weighing area for compliance with UR.2. Installation Requirements and retest.
 (Added 200X)

The action to be taken as a result of the **simulated load or** material tests or simulated load tests is as follows:

(Amended 2002)

- if the error is less than 0.25 %, no adjustment is to be made;
- if the error is at least 0.25 % but not more than 0.6 %, <u>inspect the conveyor and weighing area</u> for compliance with UR.2. Installation Requirements and repeat the testadjustment may be made if the official with statutory authority is notified; (Amended 1991<u>and 200X</u>)
- if the result of tests, after compliance with UR.2. Installation Requirements is verified, remain greater than ± 0.25 %, a span correction shall be made and the official with statutory authority notified;
- if the error is greater than 0.6 % but does not exceed 0.75 %, <u>inspect the conveyor and weighing</u> area for compliance with UR.2. Installation Requirements, and repeat the test; (Amended 1991 <u>and 200X</u>)
- <u>if the result of tests, after UR.2. Installation Requirements compliance is verified, remains</u> greater than ± 0.25 %, a span correction shall be made, the official with statutory authority shall be notified, and an official test shall be conducted;
- if the error is greater than 0.75 %, an official test is required. (Amended 1987 **and 200X**)

Discussion: HB 44 gives limited guidance on what to do with zero-load test results. Belt loss is not the only factor which may require the scale operator to make physical adjustments to the belt-conveyor system to correct for deficiencies. For example, a dirty scale structure or a worn belt scraper will increase the zero-reference number and the test results may exceed tolerances.

The scale user/owner has to protect his interest between weighing transactions. At present, some belt-conveyor systems may have errors greater than 0.5 % in zero reference over a 24-hour period. The belt is part of tare (net load) on any empty running system and the system must be maintained to within tolerance at all times.

During its 2006 meeting, the WWMA recommended the alternate industry proposal shown above. The WWMA also recommended the alternate proposal be considered at a future meeting of the USNWG on Belt-Conveyor Scale Systems. The WWMA recommended the alternate proposal remain a Developing item to allow sufficient time for a review by the WG. The CWMA and the SWMA concurred with the WWMA's recommendation.

During the 2007 NCWM Annual Meeting, the Committee heard testimony that a work group of the National Weighing and Sampling Association was working on this item and would have a recommendation for the WWMA prior to its 2007 Annual Meeting.

Participants in the work group include:

Phil Carpentier, PTC Consulting, LLC	ptcarpentier@att.net
Paul Chase, Chase Technology, Inc.	mjc@emily.net
Al Page, Montana Weight and Measures	awp88bb@gmail.com
Peter Sirrico, Thayer Scale	psirrico@thayerscale.com
Bill Ripka, Thermo Ramsey	bill.ripka@thermofisher.com

This WG agrees that there is a need to establish some zero-load test interval for the normal use of a belt-conveyor scale system and that there is also a need to vary that interval (longer interval if the scale is stable; shorter if the zero-load tests require frequent adjustment). The WG has reviewed and discussed this Developing item and submitted the following revised proposal to the NIST technical advisor to the S&T Committee.

UR.3.2. Maintenance. - Belt-conveyor scales and idlers shall be maintained and serviced in accordance with manufacturer's instructions and the following requirements:

(c) Simulated load tests or material tests and zero-load testsSimulated load tests, or material tests, and zero load tests shall be conducted at periodic intervals between official tests in order to provide reasonable assurance that the device is performing correctly. The minimum test interval shall be established by the official with statutory authority. (Amended 200X)

The action to be taken as a result of the zero-load tests is as follows: (Added 200X)

- If the zero error is less than 0.25 %, adjustment to zero. -
- If the zero error is at least 0.25 % but not more than 0.5 %, inspect the belt-conveyor scale system for installation and maintenance items (e.g., clearance, material adhering to the belt, alignment, etc.), make required corrections, adjust the zero, and repeat the zero-load test.
- If the zero error is greater than 0.5 %, inspect the belt-conveyor scale system, make required corrections installation and maintenance items (e.g., clearance, material adhering to the belt, alignment, etc.), adjust the zero, and reduce the interval between zero tests.

(Added 200X)

The action to be taken as a result of the material tests or simulated load tests is as follows: (Amended 2002)

- If the error is less than 0.25 %, no adjustment is to be made.
- If the error is at least 0.25 % but not more than 0.56 %, the span shall be adjusted by an _ authorized service agent and adjustment may be made if the official with statutory authority is notified; (Amended 1991 and 200X)
- If the error is greater than 0.56 % but does not exceed 0.75 %, adjustments shall be made only by a competent an authorized service person agent and the official with statutory authority shall be notified. After such an adjustment, if the results of a subsequent test require adjustment in the same direction, an official tests shall be conducted shall adjust the span, perform maintenance on the belt-conveyor scale system, and schedule an official test with statutory authority.

(Amended 1991 and 200X)

If the error is greater than 0.75 %, an official test is required. (Amended 1987)

At its 2007 Annual Meeting, the WWMA heard comments from a BCS manufacturer that the NW&SA WG version was superior to current language. However, the manufacturer stated that this item needed additional development and subsequent review by the entire NW&SA. The WWMA believed this item was not sufficiently developed and did not have a consensus from the NW&SW WG and therefore recommended this remain a Developing item on the NCWM S&T Committee agenda.

At its 2007 Interim Meeting, the CWMA recommended this item be withdrawn.

To comment on this proposal, contact Steven Cook, NIST Technical Advisor to the NTETC Belt-Conveyor Scales Sector, by e-mail at steven.cook@nist.gov, by telephone at (301) 975-4003, by fax at (301) 975-8091, or by postal mail at NIST WMD, 100 Bureau Drive MS 2600, Gaithersburg, MD 20899-2600.

Part 2, Item 2 Belt-Conveyor Scale Systems: N.3.1.4. Check for Consistency of the Conveyor Belt Along Its Entire Length

Source: 2005 Western Weights and Measures Association (WWMA)

Recommendation: Amend NIST Handbook 44, Section 2.21. Belt Conveyor Scales (BCS) Systems Code, paragraph N.3.1.4. as follows:

N.3.1.4. Check for Consistency of the Conveyor Belt Along Its Entire Length. – <u>During a zero-load</u> test, the total change indicated in the totalizer during one revolution of the belt shall not exceed 0.18 % of the load that would be totalized at scale capacity for the duration of the test. The end value of the zero-load test must meet the ± 0.06 % requirement of paragraphs N.3.1.2 Initial Stable Zero and N.3.1.3. Test for Zero Stability.–After a zero-load test with flow rate filtering disabled, the totalizer shall not change more than plus or minus (± 3 d) 3.0 scale divisions from its initial indication during one complete belt revolution.

(Added 2002)(Amended 2004 and 200X)

Discussion: The BCS WG agrees that the existing language in N.3.1.4. results in an excessive allowance for the variation in a belt. However, for belt-conveyor scales that can benefit from a smaller minimum division, the 3-division requirement can impose an excessively narrow restriction. It should be noted that variations in belt weight tend to be sinusoidal. In other words, the error caused by belt variations would be canceled if the material test were conducted using complete revolutions. The maximum belt variation would occur at 0.5, 1.5., 2.5, etc., revolutions. However, material tests are rarely conducted using complete revolutions of the belt.

The current tolerance of plus or minus 3 divisions can allow belt weight variation to contribute too large a portion to the 0.25 % belt-conveyor scale tolerance. The actual quantity represented by 3 divisions can vary with the belt-conveyor scale application. Paragraph N.2.3. Minimum Totalized Load (b) allows a material test load to be the amount of material to be weighed during one revolution of the belt. If the tolerance for the material test is 0.25 %, then on a root-sum-square basis, the variation in zero resulting from changes in the weight of the belt itself should not exceed 0.18 % (0.25 % times { $\sqrt{2}$ } / 2).

Some rationale other than root-sum-square could result in a different allowable variation due to belt weight.

The following example illustrates the difference between divisions and percent for this purpose:

Belt length	= 800 ft,
Division size	= 0.1 ton,
Maximum capacity	= 800 tons/hr, and
Belt speed	= 400 ft/min

These minimum totalized load (MTL) values in paragraph N.2.3. are in a feasible range for an actual application.

N.2.3. (a) 800 divisions = 80.0 tons N.2.3. (b) one revolution = 26.67 tons, which is (66.67 lb/ft * 800 ft)N.2.3. (c) ten minutes = 133.3 tons

The materials test tolerance (T.1.) based on the MTL in N.2.3.(b) = 0.07 tons.

The allowable variation due to belt weight is ± 3 divisions or ± 0.3 tons. Using ± 0.3 ton error in zero allows a total delivery error that can exceed maintenance tolerance in paragraph T.1. Tolerance values because of acceptable belt weight variation of 0.6 tons currently in HB 44 paragraph N.3.1.4. This tolerance exceeds the 0.25 % tolerance of the weighing system without weighing any material. Even for a 10 min MTL (N.3.1.4.c), the allowable error is 0.45 % of 133.3 tons.

The proposed language changes the tolerances in N.3.1.4. from \pm 3 divisions to 0.18 %. In the above example, the allowable change in the totalizer readings could be no greater than 0.048 tons [0.18 % x 26.67 tons (MTL)].

NIST HB 44 paragraph N.2. Conditions of Test. was amended, and the minimum totalized load (MTL) requirements were amended and renumbered to paragraph N.2.3. Since 10 min of operation in N.3.2.(c) typically results in a test load larger than (a) or (b), the 10 min MTL is used for most BCS installations. Additionally, the words "or a normal weighment" were removed from MTL requirements because, at that time, it was thought the words were no longer needed since language was developed to allow a smaller material test load provided the scale demonstrated compliance with BCS tolerances with the MTL and the smaller test load.

As a result of removing the words "or a normal weighment," it has been reported that the revised MTL requirements were not suitable for BCS installations that issue individual weights for vehicles and railcars. This is due to limitations of the installation and uncertainties in determining the net weights of several vehicles or railcars to compare material test results of the 10 min MTL with the alternate test load of "2 % of the load totalized in 1 hour."

The current NIST HB 44 paragraph N.2.3. permits "a smaller minimum totalized load down to 2 % of the load totalized in 1 hour...." In the above example the minimum load would be 16 tons for this criterion so the belt variation is even a larger percentage of the weighed load.

The change to 0.18 % is a better criterion in several ways.

- 1. "It defines the allowable excursion of the totalized value during the zero procedure. Plus or minus requires some reference value and it is not known at the start of a zero test whether that portion of the belt is heavy or light."
- 2. It is independent of division size. (But the division size must be small enough to resolve the variation.)
- 3. It is in harmony with OIML R 50.

In the above example 0.18 % of 26.67 tons is 0.048 tons. This is quite different from 3 divisions or \pm 3 divisions.

At its 2007 Annual Meeting, the WWMA heard comments from a device manufacturer who would like to leave the item as either Developing or withdrawn. The NIST technical advisor agreed the proposal needed additional work. Therefore, the WWMA recommended this proposal be a Developing item to allow the BCS WG additional time to make modifications.

To comment on this proposal, contact Steven Cook, NIST Technical Advisor to the NTETC Belt-Conveyor Scales Sector, by e-mail at steven.cook@nist.gov, by telephone at (301) 975-4003, by fax at (301) 975-8091, or by postal mail at NIST WMD, 100 Bureau Drive, MS 2600, Gaithersburg, MD 20899-2600.

Part 3, Item 1, Liquid-Measuring Devices: T.5. Predominance – Retail Motor-Fuel Devices

Source: Central Weights and Measures Association (CWMA)

Recommendation: The CWMA recommends withdrawing its earlier proposal (to add a new paragraph G-UR.4.1.1. to the General Code) and replacing it with the following new proposal developed by the Nebraska Weights and Measures Division to add a new paragraph T.5. to HB 44 Section 3.30. as follows:

T.5. Predominance – Retail Motor-Fuel Devices. – The retail motor-fuel devices in service at a single place of business shall be considered maintained in proper operating condition when evaluation of normal test results indicate the following parameters are met:

- (a) <u>The number of meters with minus test errors in excess of one-half maintenance tolerance shall be</u> less than 60 % of the meters at the location, and
- (b) When there are three or more meters of a single grade or type of fuel, the average error of the meters shall not be a minus value exceeding one-half maintenance tolerance. Meter test results that exceed maintenance tolerance shall not be included in determining the average meter error of a single grade or type of fuel.

(Added 200X)

In 1991 this same topic was brought before the NCWM as an Information item. The intent of the proposal at that time was to provide guidance to states in the interpretation of General Code paragraph G-UR.4.1. Maintenance of Equipment. In 1993, the State of Wisconsin adopted a policy that defined "predominance" as shown in the proposal. That policy was similar to the one proposed in 1991, except Wisconsin felt that one-third <u>acceptance</u> tolerance was too stringent because there was a need to take into account normal variability in testing procedures, equipment, and environmental conditions found in the field. Wisconsin, therefore, adopted a "greater than one-third" <u>maintenance</u> tolerance guideline. In 2003, the Wisconsin policy was further refined by deleting the language "<u>all</u> devices are found to be in error in a direction favorable to the device user." The new guideline for permissible errors was "<u>60 %</u> <u>or more</u> of the devices are found to be in error in favor of the device owner/user by more than one-third of the maintenance." Both of these criteria were seldom used in the field because they made the policy confusing.

Recently NIST conducted a national survey of retail motor-fuel dispenser testing, and the results pointed to a need to gain more uniformity in the application of tolerances. There is a wide variation in how different states handle the "predominance" question. Strides should be continually made to gain uniformity. Adoption of the proposed new paragraph G-UR.4.1.1. would be one step toward gaining greater uniformity. With more than 5 years of history using the proposed criteria, Wisconsin saw a relatively low number of devices rejected on the basis of "predominance," and most station owners and all service companies have a working understanding of predominance.

In 2005 the CWMA agreed to submit the modified proposal to the NCWM S&T Committee with a recommendation that it be placed on the Committee's agenda as a Developing item.

At their fall 2006 meetings, NEWMA, the SWMA, and the WWMA considered an earlier CWMA proposal to modify a General Code requirement and set limits on how to determine predominance in favor of the device operator. NEWMA believed the item was addressed adequately in HB 44 and recommended it be withdrawn from the NCWM S&T Committee's 2007 agenda. The SWMA recommended this item remain Developing as a user requirement in the General Code. The SWMA encouraged the jurisdictions to review the proposed policy and try it out. The WWMA considered the limits in the proposal too stringent given the effects of temperature and other uncertainties. The WWMA was concerned dispensers would be set to the limits in the proposal rather than as close as practical to zero error. Since the current General Code adequately addresses predominance, jurisdictions may establish policy to gain uniformity in determining predominance. Consequently, the WWMA recommended this proposal be withdrawn from the agenda.

At the 2007 NCWM Interim Meeting, the Committee considered proposals to withdraw this item from its agenda. However, because a jurisdiction involved in developing the current proposal indicated their intention to provide the Committee with considerable data and continue further development of the item, the Committee agreed to keep the item on its agenda as a Developing item through 2007.

At its 2007 Annual Meeting, the WWMA heard comments from state and local jurisdictions that they have been able to enforce G-UR.4.3. Predominance. through administrative policies and rules.

The WWMA believed that:

- existing language in NIST Handbook 44 was sufficient,
- the definition of predominance is anything over 50 %,
- a potential conflict exists with paragraph G-UR.4.3. Use of Adjustments.,
- the CWMA proposal addressed only retail motor-fuel devices and a review should also be considered for other weighing and measuring devices, e.g., point-of-sale scales and vapor meters,
- the proposed language did not take into account devices that were clearly out of tolerance, and
- the proposed language did not take into account the uncertainty of the test equipment, reading errors, and temperature changes between device calibration and official test.

The WWMA recommended the CWMA proposal to add 3.30. T.5. Predominance. be withdrawn. The WWMA further recommended the following alternate proposal to address some of the WWMA concerns listed above:

G-UR.4.1. Maintenance of Equipment. – All <u>weighing and measuring</u> equipment in service and all mechanisms and devices attached thereto or used in connection therewith shall be continuously maintained in proper operating condition throughout the period of such service. Equipment in service, by group or entirety, at a single place of business found to be in error predominantly in a direction favorable to the device <u>owner or</u> user shall not be considered "maintained in a proper operating condition."

For measuring devices, the term "predominantly" applies to any single product, grade, service level, or payment method, with errors in favor of the device owner or user.

At its 2007 Interim Meeting, the CWMA heard comments in favor of this item and from state and local jurisdictions that they have been able to enforce G-UR.4.3. Predominance through administrative policies and rules. However, there was some concern that the proposed tolerance was not stringent enough and allowed the meters to be set at acceptance tolerance values. By adding part (c), the concern of misuse of tolerance was adequately addressed.

The CWMA supported the following language as proposed.

T.5. Predominance – Retail Motor-Fuel Devices. – The retail motor-fuel devices in service at a single place of business shall be considered maintained in proper operating condition when evaluation of normal test results indicate the following parameters are met:

- (a) <u>The number of meters with minus test errors in excess of one-half maintenance tolerance shall</u> be less than 60 % of the meters at the location, and
- (b) When there are three or more meters of a single grade or type of fuel, the average error of the meters shall not be a minus value exceeding one-half maintenance tolerance. Meter test results that exceed maintenance tolerance shall not be included in determining the average meter error of a single grade or type of fuel.
- (c) <u>Upon initial verification or re-inspection of devices rejected for predominance, the criteria for acceptance using the paragraphs (a) and (b) shall be based on minus errors greater than 2 in³ rather than 3 in³.</u>

G-UR.4.1. Maintenance of Equipment. – All <u>weighing and measuring</u> equipment in service and all mechanisms and devices attached thereto or used in connection therewith shall be continuously maintained in proper operating condition throughout the period of such service. Equipment in service, by group or entirety, at a single place of business found to be in error predominantly in a direction favorable to the device <u>owner or</u> user shall not be considered "maintained in a proper operating condition."

For measuring devices, the term "predominantly" applies to any single product, grade, service level, or payment method, with errors in favor of the device owner-or user.

At its 2007 Interim Meeting, the NEWMA stated that they continue to oppose this item and recommended it be withdrawn as it was already adequately addressed in the General Code.

Part 3, Item 2 Liquid-Measuring Devices: Price Posting and Computing Capability and Requirements for a **Retail Motor-Fuel Dispenser (RMFD)**

Source: WMD and all Regional Associations

Recommendation: Review and update NIST HB 44 requirements that address RMFD pricing and computing capability. This issue is under development and not ready for committee action.

Background/Discussion: In the early 1990s, various sections of the Liquid-Measuring Devices Code in HB 44 (including paragraphs S.1.6.4. Display of Unit Price and Product Identity, S.1.6.5.4. Selection of Unit Price, UR.3.2. Unit Price and Product Identity, and UR.3.3. Computing Device) were modified to address multi-tier pricing applications such as cash-credit. Since that time, marketing practices have evolved and recent years have seen the addition of new practices such as frequent shopper discounts and club member discounts. Numerous questions have been posed to WMD 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 HB 44 to ensure the requirements adequately address current marketplace conditions and practices. WMD has raised this issue with the NCWM S&T Committee and has also discussed a variety of pricing practices with individual state and local weights and measures jurisdictions.

NIST WMD is now in the process of reviewing the existing requirements and their application to current market practices. WMD has collected information on a number of scenarios, including the following:

- (1) Frequent shopper discounts
- (2) Club member discounts
- (3) Discount for prepaying cash (to prevent "driveoffs")
- (4) Prepay at the cashier for credit sales
- (5) Discounts for purchasing store products
- (6) Discounts for purchasing a service (e.g., carwash)
- (7) Targeted group discounts (e.g., Tuesday-Ladies 5 cents off per gallon)
- (8) Full Service
- (9) Self Service
- (10) Progressive discounts based on volume of motor-fuel purchased
- (11) Coupons for discounts on immediate or future purchases
- (12) Rebates (e.g., use of oil company credit card)
- (13) Day-of-the-Week Discounts

Note: The conditions under some of these scenarios may not typically fall under the authority of weights and measures jurisdictions.

WMD is interested in receiving input from the weights and measures community about the various practices and pricing structures in use. Working with input from the weights and measures community, WMD plans to introduce proposed modifications to current requirements through the regional weights and measures associations and technical committees. In the meantime, WMD welcomes opportunities to discuss this item at regional weights and measures associations to ensure the item is adequately addressed.

The WWMA acknowledged that marketing practices change on a daily basis and the task to ensure HB 44 codes address each scenario is monumental. However, the WWMA encourages NIST in its efforts to tackle this ongoing issue. Therefore, the WWMA recommends this item be considered and move forward to the national level as a Developing item.

The CWMA recommends that the State Directors compile information regarding whether or not they are enforcing the Liquid-Measuring Devices Code in HB 44 (including paragraphs S.1.6.4. Display of Unit Price and Product Identity, S.1.6.5.4. Selection of Unit Price, UR.3.2. Unit Price and Product Identity, and UR.3.3. Computing Device). If they are not enforcing the specific code requirement, it should be stated why not (for example, overriding state statute). Information is to be sent to:

James Truex, ChiefPhone: (614) 728-6290Division of Weights and MeasuresFax: (614) 728-64248995 E. Main StreetE-mail: truex@mail.agri.state.oh.usReynoldsburg, Ohio 43068Fax: (614) 728-6424

NEWMA looks forward to further development of this item.

The SWMA recommends adding this item to the NCWM S&T Committee's 2007 agenda as a Developing item.

At the 2007 NCWM Interim Meeting, the Committee agreed to add this proposal to its agenda as a Developing item.

At its 2007 Annual Meeting, the WWMA urged all stakeholders to provide comments, and recommended this item remain a Developing item.

At its 2007 Interim Meeting, the CWMA recommended this remain a Developing item on the NCWM S&T Committee agenda.

At its 2007 Annual Meeting the SWMA was informed that the National Association of Convenience Stores recognized a problem with the current price posting and computing capability requirements in HB 44 and was currently working on information on this item to provide to the NCWM S&T Committee.

To comment on this proposal, contact NIST technical advisors to the NCWM S&T Committee: Steve Cook at steven.cook@nist.gov, or by telephone at (301) 975-4003, or Richard Suiter at richard.suiter@nist.gov, or by telephone at (301) 975-4406, or either by fax at (301) 975-8091, or by mail at NIST WMD, 100 Bureau Drive MS 2600, Gaithersburg, MD 20899-2600.

Part 4, Item 1 Water Meters: UR.2. Accessibility for Reading (See 336-1)

Recommendation: The WWMA believes that this item is sufficiently developed and recommends that the alternative proposal provided by the DMS as shown in the Committee's Agenda Item 336-1 be placed on the NCWM S&T Committee agenda as a voting item.

Part 4, Item 2 Water Meters: S.1.1. 3. Value of the Smallest Unit

Source: Southern Weights and Measures Association (SWMA)

Proposal: Clarify S.1.1.3 of Handbook 44, Section 3.36., for the "value of the smallest unit" of indicated delivery.

Background/Discussion: At its 2007 Annual Meeting, the SWMA received a request from a meter manufacturer for clarification of the intent of S.1.1.3. Along with the request, the manufacturer stated that, "our assumption is that this refers to the value of each graduation of the primary indicating element. If this is indeed the intention of S.1.1.3., then the S.1.1.3.(a) requirement of 10 gal would pose no problem for utility type meters. However, this would represent very poor resolution for smaller water meters. Again, if S.1.1. is indeed referring to the values for individual graduations, values for utility type meters under S.1.1.3. should instead be separated into three cateogries: 0.1 gal for meters 1 in and smaller, 1.0 gal for meters $1\frac{1}{2}$ in through 3 in and 10 gal for meters 4 in and larger. Similarly, metric "smallest unit" values would also be in three categories: 1 L for meters 1 in and smaller, 10 L for meters 4 in and larger.

Utility type water meters 1 in and smaller have 10 gal test circles with 100 graduations (i.e., 0.1 gal increments). Utility meters $1\frac{1}{2}$ in through 3 in have 100 gal test circles with 100 graduations (i.e., 1 gal increments), and utility meters 4 in and larger have 1000 gal test circles with 100 graduations (i.e., 10 gal increments). See comparable registration details for metric offerings (with 0.1 m³, 1.0 m³, and 10 m³ test circle offerings for progressively larger meter sizes)."

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The SWMA also heard comments from the manufacturer that several other water meter manufacturers were having difficulty meeting HB 44 requirements for repeatability that were added in 2002. Additionally part of the problem was the determination of what constitutes the smallest unit of measure for various sizes of their utility meters. The manufacturer is requesting a change to the test draft requirements and/or smallest unit of measure requirements to be more appropriate for the meters they and others manufacture. The SWMA agreed to forward the proposal to the NCWM S&T Committee for consideration.

Part 4, Item 3 Water Meters: N.4.1.1. Repeatability Tests and T.1. Tolerance Values

Source: Southern Weights and Measures Association (SWMA)

Proposal: Amend repeatability requirements in Section 3.36., Water Meters as follows:

- A) Alternative A: Eliminate the repeatability requirements of HB 44, Section 3.36. (N.4.1.1. and T.1.1.) for utility type meters; or
- B) Change the test draft quantities of Tables N.4.1. and N.4.2. of HB 44, Section 3.36., as shown in the table below, in order to meet the repeatability requirements as given in N.4.1.1. and T.1.1. for utility type meters.

Changes in test drafts, HB 44,	Section 3.36., if cu	rrent repeatability	criteria is to be	enforced for utility	meters (see
Tables N.4.1., and N.4.2)					

	Μ	aximum Rate	9	In	termediate Rate	e	Minimum Rate		e
Meter Size (inches)	Rate of Flow (gpm)	Test Draft (gal)	Test Draft (ft ³)	Rate of Flow (gpm)	Test Draft (gal)	Test Draft (ft ³)	Rate of Flow (gpm)	Test Draft (gal)	Test Draft (ft ³)
less than $\frac{5}{8}$	8	<u>100</u>	<u>10</u>	2	<u>40</u>	<u>4</u>	1/4	<u>20</u>	2
		50	5		10	1		5	1
⁵ /8	15	<u>100</u>	<u>10</u>	2	<u>40</u>	4	1⁄4	<u>20</u>	<u>2</u>
		50	5		10	1		5	1
3⁄4	25	<u>100</u>	<u>10</u>	3	<u>40</u>	4	1/2	<u>20</u>	2
		50	5		10	1		5	1
1	40	<u>100</u>	<u>10</u>	4	<u>40</u>	4	3/4	<u>20</u>	2
		100	10		10	1		5	1
11/2	80	<u>500</u>	<u>50</u>	8	<u>400</u>	<u>40</u>	11/2	<u>200</u>	<u>20</u>
		300	40		50	5		10	1
2	120	<u>500</u>	<u>50</u>	15	<u>400</u>	<u>40</u>	2	<u>200</u>	<u>20</u>
		500	40		50	5		10	1
3	250			20	<u>400</u>	<u>40</u>	4	<u>200</u>	<u>20</u>
		500	50		50	5		10	1
4	350	<u>5000</u>	<u>500</u>	40	<u>4000</u>	<u>400</u>	7	<u>2000</u>	<u>200</u>
		1000	100		100	10		50	5
6	700	<u>5000</u>	<u>500</u>	60	<u>4000</u>	<u>400</u>	12	<u>2000</u>	<u>200</u>
		1000	100		100	10		50	5

Background/Discussion: At its 2007 Annual Meeting, the SWMA received a proposal from a meter manufacturer with two options for modifying Section 3.36. as shown above. The manufacturer provided the following justification for the modification:

For proposal A: Water meter "transaction" volumes are based on billing cycles of monthly or quarterly "reads." As such, each transaction for a residential meter may be on the order of 3000 to 30 000 gal. Commercial/industrial accounts with larger meters may have transaction volumes that are one or two orders-of-magnitude larger than this. Meter repeatability over the course of a pattern approval test volume (currently as little as 5 gal for a residential meter, for example) is, therefore, not relevant. Utility water meters are not designed to provide the resolution required to meet the Section 3.36. repeatability requirements under typical test drafts.

For Proposal B: The graduations on the primary indicating element for the meter under test can normally be read within an uncertainty of roughly $\frac{1}{3}$ of a graduation. This is the result of limits in optical discernment, minor parallax, minor asymmetries in mechanical gear trains, minor asymmetries in graduation printing, etc.. Combining the meter's reading uncertainty at the start of any single test run with the uncertainty at the end of this same test run, total meter reading uncertainly is therefore roughly $\frac{2}{3}$ of a graduation. Keeping in mind there are other resolution/repeatability concerns for any given test series (resolution in reading the reference volume/mass, ability to duplicate parameters such as flow rate, water temperature, water pressure, evaporative losses, etc.), the uncertainty limitations for reading the meter under test should not "consume" more than $\frac{1}{4}$ of the total repeatability requirement. For the 1.3 % repeatability requirement at the minimum flow rate, this corresponds to a test draft equal to roughly 200 graduations of the primary element. For the 0.6 % repeatability requirement at the intermediate rate, this corresponds to a test draft equal to roughly 400 or 450 graduations of the primary element. Test draft volumes for the maximum flow rate must be even larger since these drafts must address other sources of error unique to testing at higher flow rates (for example, errors due to ramping up and ramping down the flow rates at the beginning and end of the test, which must be done slowly enough so as to not cause water hammer, or mechanical impulse loading of the meter under test.

The SWMA also heard comments from the manufacturer that several other water meter manufacturers were having difficulty meeting HB 44 requirements for repeatability that were added in 2002. Additionally part of the problem was the determination of what constituted the smallest unit of measure for various sizes of their utility meters. The manufacturer is requesting a change to the test draft requirements and/or smallest unit of measure requirements to be more appropriate for the meters they and others manufacture. The SWMA agreed to forward the proposal to the NCWM S&T Committee for consideration.

Part 5, Item 1 General Code: G-S.1. Identification – (Software)

Source: National Type Evaluation Technical Committee - Software Sector

Recommendation: Amend G-S.1. and/or G-S.1.1. to include the following:

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Method	NTEP CC No.	Make/Model/Serial No.	Software Version/Revision ¹		
TYPE P electronic devices shall	meet at least one of	f the methods in each colur	nn:		
Hard-Marked	Х	Х	Not Acceptable		
Continuously Displayed	Х	Х	Х		
By command or operator action	Not Acceptable	Not Acceptable	X^2		
TYPE U electronic devices shall	meet at least one o	f the methods in each colum	nn:		
Hard-Marked	X^3	Х	Not Acceptable		
Continuously Displayed	Х	Х	Х		
Via Menu (display) or Print OptionNot AcceptableX4X4					
 ¹ If the manufacturer declares that the primary sensing element "software" is integral, has no end user interface and no print capability, the element may be considered exempt from the marking requirement for version/revision. Example: Primary sensing element may be Positive Displacement (P.D.) meter with integral correction, digital load cell (only for reference, not limiting). ² Information on how to obtain the Version/Revision shall be included on the NTEP CC. ³ Only if no means of displaying this information is available. ⁴ Information on how to obtain Make/Model, Version/Revision shall be included on the NTEP CC. 					
Metrologically significant software	shall be clearly ident	tified with the software version	on The identification may		

Background/Discussion: In 2005 the Board of Directors established a NTETC Software Sector. The task of the Sector is to:

• Develop a clear understanding of the use of software in today's weighing and measuring instruments.

consist of more than one part but one part shall be only dedicated for the metrologically significant portion.

- Develop NIST HB 44 specifications and requirements, as needed, for software incorporated into weighing and measuring devices. This may include tools for field verification, security requirements, identification, etc.
- Develop NCWM Publication 14 checklist criteria, as needed, for the evaluation of software incorporated into weighing and measuring devices, including marking, security, metrologically significant functions, etc.
- Assist in the development of training guidelines for W&M officials in verifying software as compliant to applicable requirements and traceable to an NTEP Certificate. Training aids to educate manufacturers, designers, service technicians and end users may also be considered.

During their October 2007 meeting, the Sector discussed the value and merits of required markings for software. This included the possible differences in some types of devices and 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 make, model, S.N. to comply with G-S.1. Identification.

The Sector recommended that the recommendation to amend G-S.1. and/or G-S.1.1. be given Developmental status since additional work is needed to develop the appropriate language to amend paragraphs G-S.1. and G-S.1.1. The Sector is also interested in receiving input from the weights and measures community about this item. Working with input from the weights and measures community, the Sector plans to introduce proposed modifications to current requirements through the regional weights and measures associations and other technical committees. In the

meantime, the Sector welcomes opportunities to discuss this item at regional weights and measures associations to ensure the item is adequately addressed.

To comment on this proposal, contact Steve Patoray spatoray@mgmtsol.com (e-mail), or by telephone at (828) 859-6178 or by mail at NCWM, Inc., 15245 Shady Grove Road. Suite 130, Rockville, MD 20850.

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Professional Development Committee (PDC) Interim Agenda

Agatha Shields, Chairman Franklin County Weights and Measures Columbus, Ohio

Reference Key Number

400 INTRODUCTION

The Professional Development Committee (Committee) will address the following items at the National Conference on Weights and Measures (NCWM) January 2008 Interim Meeting.

Table A identifies the agenda items in the Report by Reference Key Number, Item Title, and Page Number. An item marked with an "**T**" after the reference key number is an informational item. An item marked with a "**D**" after the reference key number is a developing item. The developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. Table B lists the Appendices to the Agenda.

In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean that the item will be presented to the Conference for a vote. The Committee will review its agenda at the Interim Meeting and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations which will be presented for a vote at the Annual Meeting.

The recommendations are statements of proposals and are not necessarily those of the Committee	The recommendations are statement	ts of proposa	als and are not	necessarily those	of the Committee.
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F	Curriculum Package: Guide for Developing Test Questions	F1
G	Curriculum Package: National Training Curriculum Outline	G1
Η	Curriculum Package: NCWM Curriculum Work Plan	H1
Ι	Model Professional Development Training & Certification Standards Statute for Inspectors and Sea	alers of
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Details of All Items (In Order by Reference Key Number)

401 EDUCATION

401-1 I National Training Program (NTP)

Source: Carryover Item 401-1 (This item originated from the Committee and first appeared on its agenda in 2003.)

Background: For complete background information, please see the PDC's 2007 Final Report of the 92nd NCWM Annual Report.

The Committee's overall strategic direction is summarized in Appendix A.

Discussion: During the 2007 Annual Meeting, the Committee discussed the WWMA's suggestion to establish an action plan and timeline. The Committee agreed that an action plan and time line needed to be established; however, the Committee believed it is premature to establish timelines for the tasks until the curricula for the core areas were completed.

Central Weights & Measures Association (CWMA): The CWMA recommended that the regional associations continue to develop the curriculum each is currently focusing on (Retail Motor-fuel Dispensers, Class III/III L Scales, Static Electronic Weighing Devices, and HB 133 Checking the Net Contents of Packaged Goods). Then, once that task is completed, follow the curriculum work plan as prescribed in the Appendices.

Western Weights & Measures Association (WWMA): To build upon the recommendation offered by the WWMA in 2005, which was to encourage each regional association to dedicate a portion of their Annual Meeting to the National Training Program (NTP), the WWMA asked the PDC to develop a chronological timeline by which these tasks would be completed. This mechanism could be in place of the action plan suggested in 2006.

The WWMA also recommended the PDC utilize the NCWM website (www.ncwm.net) to archive PDC carryover items in order for them to be accessible to NCWM members.

Southern Weights & Measures Association (SWMA): The SWMA recommended the development of an automatic temperature compensation (ATC) training course for the testing of retail motor-fuel devices if the Conference approves ATC. The SWMA encouraged the PDC Committee to work closely with the S&T and L&R to develop the most effective and efficient training course on ATC.

401-2 I Create a Curriculum Plan

Source: Carryover Item 401-2 (This item originated from the Committee and first appeared on its agenda in 2003.)

Background: For complete background information on this item, please see the PDC Final Report of the 92^{nd} Annual Meeting of the NCWM.

Discussion: Prior to the 2007 Annual Meeting, the Committee reviewed the curriculum segments submitted by the following regions: SWMA, Class III and III L scales; WWMA, Retail Motor-fuel Dispensers; and NEWMA, Small Scales.

At the 2007 Annual Meeting the Committee decided, based on comments from several of the regions and its own assessment, that it was essential to have a standardized format to ensure uniformity. Based on a collective review of curriculum plans received, the Committee created a sample template and example for regions to use in developing other curricula. The Committee updated its curriculum (Curriculum Package) to include the NCWM Core Competency Model (Appendix C), which provides a model for improving the quality of education in a select discipline. The Committee included this information as a general guideline for the regions to use as they develop other curriculum topics. In addition, the Committee revisited the original "National Training Curriculum Outline" from its 2004 NCWM final report. The Committee prepared an accompanying "NCWM Curriculum Work Plan," which is intended to assist in the management of curriculum development; this item is included in Appendix H. The Committee also made revisions to the original curriculum outline to match the Work Plan.

The Committee's updated Curriculum Package, included in Appendices B-H (and can also be found on the PDC page of the NCWM website in Word format), includes the following:

- Cover Memorandum (guide to curriculum development) *Revised from 2004*
- NCWM Competency Guide Model *New*
- NCWM Curriculum Template (curriculum guideline) *Revised from 2004*
- NCWM Sample Curriculum (examples of desired format) *New*
- Guide to Writing Test Questions (including examples)
- National Training Curriculum Outline *Revised from 2004*
- NCWM Curriculum Work Plan (2007) New

The Committee forwarded the newly revised curriculum package to the development team in each region to make revisions based on the Committee's recommendations.

Central Weights & Measures Association (CWMA): The CWMA agreed that a curriculum package developed by the NCWM PDC would be of great value and assistance to the regions as a training framework for obtaining certification. The CWMA volunteered to sponsor the first training session of completed curriculum.

Western Weights & Measures Association (WWMA): Since the format has been decided upon for the curricula of the core competencies and the WWMA presented the plan for retail motor-fuel dispensers (RMFD), the WWMA PDC agreed to place the RMFD plan into the format outlined by the NCWM PDC prior to the 2008 Interim Meeting in Albuquerque, New Mexico.

401-3 D Instructor Improvement

Source: Carryover Item 401-3 (This item originated from the Committee and first appeared on its agenda in 2003.)

Background: For complete background information, please see the PDC Final Report of the 92nd NCWM Annual Report.

Industry has continued to support and sponsor training on their new technology for weighing and measuring devices. NIST has assured the Committee they will continue their work towards providing technical training for the trainers.

Discussion: The Committee, while recognizing the importance of this item, has maintained this item as a Developing item on its agenda until progress is made in other areas of the NTP plan.

Central Weights & Measures Association (CWMA): The CWMA recommended the curriculum plan and certification exams be developed first. They encourage states to actively pursue instructor training as offered.

Western Weights & Measures Association (WWMA): The WWMA recommends the National PDC make a recommendation to jurisdictions to participate in the NIST WMD Instructor Training program as those classes become available. Many officials who completed the Instructor Training program have left government service or retired. Having NIST-certified trainers in specific weights and measures disciplines could be a key element of the NTP. Enforcement levels as reported by jurisdictions for specific disciplines could be used to identify or target training needs and assist the PDC in prioritizing the training curricula.

401-4 D Certification

Source: Carryover Item 401-4 (This item originated from the Committee and first appeared on its agenda in 2003.)

Background: See complete background information in the PDC's Final Reports of the 2004, 2005, and 2006 NCWM Annual Reports.

Subsequent to the 2006 NCWM Annual Meeting, all states not previously contacted were sent a letter requesting the name of their State Certification Coordinator (SCC). The state director will be deemed the default SCC in the absence of a designated contact. The list of SCC contacts is posted on the PDC page of the NCWM website.

Discussion: The Committee continues to hear support from the regions concerning the establishment of a certification program. In addition, the regions support having the states meet the requirements set by NCWM and agree that the NCWM would be the appropriate entity to issue the certificate.

The Committee will contact the SCC of each state to gather information on its current training and certification programs. The Committee will develop model certification programs that will be presented to the jurisdictions to determine workability. The Committee appreciates comments received from the regions and will consider these as it develops possible models.

The Committee has included a Guide for Developing Test Questions (Appendix F) in the curriculum package referenced in Item 401-2. Test questions subsequently generated by the regional volunteers should provide a bank of questions which can be used in a certification program and in training activities. NEWMA has provided an example of a draft statute, based on the Massachusetts statute, to establish a certification program. The Committee will study the sample with the possibility that it might ultimately be used to establish model criteria for a certification program.

The Committee agreed to maintain this issue as a Developing item on its agenda as it continues work on this issue.

Central Weights & Measures Association (CWMA): The CWMA recommends that the NCWM Board of Directors address how certification tests will be administered and certificates issued. If a jurisdiction uses their own curriculum, can they take the national certification test and be nationally certified?

The certification exams should be put on the NCWM website accessible to members and other interested parties. The participant should submit his completed exam electronically for certification. The Committee recommends the Board of Directors decide how to issue certification.

Western Weights & Measures Association (WWMA): As stated previously, the WWMA supports having the states meet the requirements established by the NCWM. After demonstrating competency, the WWMA believes the NCWM would be the appropriate entity to issue the certificate. By exposing weights and measures inspectors to standardized training methodology, this certification process will lead to uniformity. However, the WWMA also

believes it is time to initiate the process of building the infrastructure of the program, i.e., the database for tracking the participants who have completed training, developing online testing and reporting, and designing the certificate. The WWMA believes a model should be developed to determine what the program will look like and what the roles of the states and NCWM should be. The WWMA understands that it is unrealistic for the NCWM to fund a complete certification program, and it is critical the states take an active role in the process if the program is to be successful.

The WWMA also recommends that the certification program not be limited to weights and measures personnel. NCWM certification could be offered, for a fee, to manufacturers, service companies, or individuals providing they meet the criteria set forth by the PDC in the NTP.

The WWMA also provided the Committee with an updated list of State Certification Contacts, along with their comments. The NCWM has updated the national database and website to reflect the changes. This Committee thanks the WWMA for supplying the Committee with the updated information.

Northeastern Weights & Measures Association (NEWMA): NEWMA recommends adoption of a model professional development training and certification standards statute for inspectors and sealers of weights and measures. With the development of professional standards by the PDC for training in the various W&M disciplines, it is important to develop a legislative model the various states can use in furthering professionalism in Weights and Measures. This would bring the professional level of competence into line with other fields such as the legal profession, accounting, medicine, and nursing.

Mandating levels of professional competency and continuing education would be consistent with other professions where minimum and enhanced standards must be maintained. It would ensure uniformity in standards within the Weights and Measures field whether at the state, county, or local levels.

NEWMA has presented a "model legislation," which could be adaptable to each state's unique legislative style and includes funding for implementation and operation. This model example is included in Appendix I.

401-5 D 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: The Board has charged the Committee with responsibility for selecting appropriate topics for the technical sessions at future Annual Meetings. The Board asked that the Committee review and prioritize possible presentations and submit those to the chairman. The chairman would then work with NCWM staff to make the arrangements and schedule the sessions.

The Committee continues to carry the following list and recommends these topics for possible training seminars, round tables, or symposia for presentation at the NCWM meetings:

- (a) Risk-based Inspections (Robert Williams, Tennessee, volunteered to present his state's RMFD testing program);
- (b) Marketplace Surveys;
- (c) Auditing the Performance of Field Staff (Will Wotthlie, Maryland, volunteered to lead the session);
- (d) Alternative Fuels (including motor-fuel trends and technology updates);
- (e) Device Inspections Using a Sampling Model;
- (f) Emerging Issues;
- (g) Proper Lifting Techniques (recommended by Ken Deitzer, Pennsylvania);
- (h) Overview of OIML and its Relationship to Standards Development (recommended by Julie Quinn, Minnesota);
- (i) Back and Stress Techniques (recommended by Don Onwiler);
- (j) Public Relations, specifically dealing with aggressive/angry people (recommended by the SWMA);
- (k) Inspector Investigative Procedures (recommended by the SWMA),
- (1) General Safety Issues (recommended by the WWMA);
- (m) Defensive Driving (recommended by the WWMA);
- (n) Administrative Civil Penalty Process (recommended by the WWMA);
- (o) Price Verification (recommended by the WWMA); and
- (p) Customer Service (recommended by the WWMA).

For the 2007 NCWM Annual Meeting Technical Education Sessions, the Committee recommended using Steve Malone and Henry Oppermann's results from the Nebraska 52-week dispenser field study, and Ross Andersen's Temperature Compensation Report. The Committee was pleased that both of these sessions were selected for presentation at the 2007 NCWM Annual Meeting.

Discussion: At the January 2008 NCWM Interim Meeting, the Committee will discuss ideas for educational sessions to be presented at the July 2008 NCWM Annual Meeting and encourages people to submit ideas for the sessions to the Committee Chair, c/o NCWM Headquarters, before the Interim Meeting.

Central Weights & Measures Association (CWMA): The CWMA recommends adding Ethics as a training topic.

Western Weights & Measures Association (WWMA): The WWMA suggests presentations on small volume provers, loading-rack meters, models for the sharing of testing equipment, safety issues, defensive driving, the Administrative Civil Penalty process, and customer service, be considered for training topics.

402 PROGRAM MANAGEMENT

402-1 I Safety Awareness

Source: Carryover Item 402-1 (This item originated from the Committee and first appeared on its agenda in 2003.)

Background: 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.

At the 2005 Annual Meeting, Past-Chairman Dennis Ehrhart recommended the committee make training its highest priority. The Voluntary Quality Assurance Assessment program, NCWM Associate Membership Scholarships, and safety awareness efforts were carryover items from the Committee on Administration and Public Affairs (A&P) and not PDC items.

Jurisdictions should send their safety reports and issues to their regional safety liaison, who in turn will forward them to Charles Gardner, the NCWM Safety Coordinator. Charles recommends the reports or report summaries be published in the NCWM newsletter. At the 2005 Interim Meeting, a CD-ROM on safety produced for the U.S. Environmental Protection Agency was made available for review. The Committee believes safety awareness should be a part of every aspect of training for NCWM stakeholders.

At the 2007 Interim Meeting, the Committee decided to reach out to the regional safety liaisons and ask that they write newsletter articles designed to raise safety awareness within and provide safety tips to the weights and measures community. These articles have also been archived on the PDC page of the NCWM website. The NCWM newsletter is published three times a year and all articles should be e-mailed to the NCWM headquarters office, at ncwm@mgmtsol.com, by the deadline dates listed below.

Association	Issue	Article Deadline
SWMA	2008, Issue 1	November 15, 2007
WWMA	2008, Issue 2	March 15, 2008
CWMA	2008, Issue 3	July 15, 2008
NEWMA	2009, Issue 1	November 15, 2008

Discussion:

Central Weights & Measures Association (CWMA): The CWMA encourages jurisdictions to submit safety incidents to their regional safety liaison.

Western Weights & Measures Association (WWMA): The WWMA recommends jurisdictions continue sending safety reports to the NCWM Safety Coordinator, Charles Gardner, to be summarized and included in the NCWM newsletter and archived on the NCWM website. The WWMA is fully prepared to comply with the suggested schedule for submitting safety-related articles for publication in the NCWM newsletter (March 14, 2008). Any published information that will aid in safeguarding our most important assets, our employees, is a worthwhile exercise.

Southern Weights & Measures Association (SWMA): The SWMA PDC received a report involving static electricity while using a three five-gallon unit to return retail motor fuel to storage. An inspector pulled the delivery hose from a PVC storage tube, inserted the hose into the area of the return storage tank, and a flash fire from the static electricity occurred. The hose and the top of the return were on fire.

The SWMA PDC recommends the following:

- 1. Replacing the PVC storage tubes with aluminum tubes.
- 2. Drill several holes in the aluminum tube to vent the hose and tube.
- 3. Connect the delivery hose to the truck to ensure grounding before approaching the storage tank.
- 4. Annual safety meetings with staff to review safety and testing procedures.
- 5. Hands-on fire extinguisher training for inspectors with a fire marshal present.
- 6. The elimination of all plastic materials (buckets, funnels) in fuel inspections.

The SWMA PDC also received a report about a ruptured hose accident that occurred during an LPG inspection. A company representative was present to help the inspector properly handle the safety issues.

The SWMA PDC recommends the following:

- 1. An attendant, company representative, or two people should be present during the testing of LPG, home heating oil, rack meters, and terminal meters for operational purposes.
- 2. Safety and test procedures should be reviewed at annual staff meetings.

The SWMA PDC encourages state and local programs to report safety incidents to Steve Hadder, the safety liaison, <u>immediately</u> so this information can be distributed to other agencies. Steve's contact information is as follows: Steve Hadder, Division of Standards, 3125 Conner Boulevard, Field Operations, Bldg. 1, Tallahassee, FL 32399-1650, Office: (850) 487-2634, Fax: (850) 922-6655 or e-mail at hadders@doacs.state.fl.us.

402-2 D PDC Publication

Source: Carryover Item 402-3 (This item originated from the Committee and first appeared on its agenda in 2005.)

As reported in Item 402-3 of the Committee's 2007 Annual Report, the PDC also maintains a PDC document archive on the "members only" PDC page of the NCWM website at www.ncwm.net/members. This archive is intended to enable NCWM members to follow the history and work of the PDC. The website will continue to be updated as new documents are developed. The documents listed below are currently archived on the PDC page of the NCWM website for easy access and downloading as needed.

This item will be removed from the PDC agenda following the 2008 Annual Meeting.

- History of the PDC
- Formal Scope of the PDC
- NCWM Board of Directors Charge to the PDC
- The PDC's Role in the NCWM Strategic Plan
- The PDC's Strategic Plan

- National Training Curriculum Outline
- Suggested Topics for the NCWM Annual Conference
- Standard Categories of Weighing and Measuring Devices (Adopted by the 92nd NCWM, July 2007)
- Safety Liaison Contact Information
- List of State Certification Coordinators and Contacts
- NCWM Issued Certification Program
- Voluntary Quality Assurance Assessment Program
- Curriculum Package (Guide for Creating a Curriculum)

Discussion:

Western Weights & Measures Association (WWMA): The WWMA recommends the PDC utilize the NCWM website (www.ncwm.net) to archive PDC carryover items in order for them to be accessible to NCWM members.

Professional Development Committee

Agatha Shields, Chair, Franklin County, Ohio Kenneth Deitzler, Pennsylvania Ross Andersen, New York John Sullivan, Mississippi Stacy Carlsen, Marin County, California Dave Wankowski, Kraft Foods, Inc., Associate Member Representative Tina Butcher, NIST, Weights and Measures Division Charles Gardner, New York, Safety Liaison Linda Bernetich, NCWM Staff Liaison

Appendix A

Strategic Direction for the Professional Development Committee

The Committee developed its strategic direction to define its roles and responsibilities to the NCWM and the weights and measures community. The Committee members wrote principles to guide them in their deliberations and defined four main areas to focus their efforts. The Committee recognizes that its direction and responsibilities may be changed by the Board of Directors.

The guiding principles of the group are:

- Keep things simple;
- Develop programs that are realistic and achievable;
- Minimize redundancy and administrative tasks;
- Recognize that no one size fits all; and
- Meet the needs of weights and measures officials, service companies, industry, and manufacturers.

The four main areas for focusing their efforts are:

National Training Program – The focus of the National Training Program (NTP) is to increase technical knowledge, strengthen credibility, and improve the professionalism of the individual weights and measures official. A strong NTP would promote uniformity across the nation.

National Certification System – Develop a national certification system to recognize or accredit weights and measures programs as competent or capable. The program would include requirements around individual training, proper test standards, use of national handbooks, and a data gathering system.

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

Uniformity of Data – The Committee would develop standard categories for devices and inspection areas so that such things as the number of devices, compliance rates, frequency of inspection and other areas could be compiled and compared at the national level. These statistics could be used to benchmark organizations and to communicate the value of weights and measures to the public and to decision makers (see Item 402-4).

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Appendix B

Curriculum Package

National Conference on Weights and Measures National Training Program COVER MEMORANDUM

TO:	Curriculum Development Volunteers
FROM:	NCWM Professional Development Committee (PDC)
DATE:	October 29, 2007
RE:	Development of Basic Level Curriculum

Thank you for volunteering to work on the curriculum for a Basic Level Inspector. We define "basic" as the competency level required for the inspector to operate without direct supervision. In this work, we are moving to an outcome-based approach for setting educational standards and away from a textbook approach. The outcome approach is widely used in primary and secondary education and in the training of many professionals. Under this model we focus on the outcomes and use these to describe the organization and coverage of the training course. The course materials become a means to an end rather than the end itself. The approach encourages innovation and creativity because it does not limit the trainer to a specific textbook or course presentation. The outcomes and milestones in the curriculum also will directly drive the certification program.

The curriculum lists the outcomes in terms of the specific knowledge and skills we expect the basic inspector to possess at the end of the training. Each outcome will be further defined by a set of milestones, or competencies, that specify the activities and tasks that will be used to measure the student's mastery of the knowledge and skills (i.e., outcomes). <u>The milestones must specify a single, clear objective, stating what the student will be able to do after the training</u>. <u>Milestones must be measurable and should lead to obvious test questions</u>. Your task is to create the curriculum for a small segment of our profession.

Since many groups will be working on selected pieces of the overall curriculum, the Committee has selected a format for the curriculum materials from the NCWM Core Competency Model based on work of the California Society of Certified Public Accountants (CACPA). In their publication, *The California Core Competency Model for the First Course in Accounting*, they provide a model accounting curriculum, a discussion of their methodology, and the rationale for using that methodology. Before beginning your work, we strongly recommend you read the short introduction to the NCWM Core Competency Model and if you would like a copy of the CACPA, we will be happy to send that to you as well. This common format will ensure that the pieces that get developed mesh together without extensive reformatting and editing.

The Committee is also asking that you review the NCWM Sample Curriculum (Appendix E). These serve as a Weights and Measures example of the format we want to use and were prepared using the CACPA model. These segments also demonstrate the level of detail we want to see in the final product. As in the NCWM Core Competency model document, our goal is to set standards rather than create a "lesson plan."

Please note the layered approach used in the small scale materials and how this limits redundancy in the curriculum. The first segment on general device inspection should be considered a prerequisite for the second segment on basic scales. Both are prerequisites for the segment on small capacity scales. The first segment is also a prerequisite for any other measuring device area. For some devices, like timing devices, only one layer below this first layer is necessary. For liquid measuring devices, we would expect there to be two layers, a general layer that applies to all dynamic volume measuring and then a number of specific disciplines below that. Above all of these is a much broader segment that will include state and local laws and regulations, administrative procedures, enforcement policies, etc that need not be included with each specific device segment.

Your task will be to identify the outcomes and the milestones that are pertinent to the area of Weights and Measures you chose to work on. We suggest a process that involves the following steps:

- 1. Brainstorm Create a bullet list of knowledge and skills expected. Ask simple questions. What should the inspector know? What should the inspector understand? What should the inspector be able to do?
- 2. Group the bullets to define a broad outcome. For a device segment consider groupings like; technology and terminology, classification and performance standards, markings and operational controls, technical requirements, user requirements, and test procedures. As a guideline, you should aim to have three to eight milestones under each outcome.
- 3. Create a concise outcome statement for each outcome. See Outcomes and Competencies of the NCWM Core Competency Model document and Appendix E, NCWM Sample Curriculum.
- 4. Group similar milestones to the extent practical into a broader category. For example, instead of listing expectations for use of zero, tare, units buttons, state a single expectation regarding typical controls on the device and consider listing specific controls parenthetically.
- 5. Create a milestone statement, i.e. competency, using a verb from the list based on the levels of cognitive learning in Bloom's Taxonomy in Inventory of Concrete Verbs from the NCWM Core Competency Model document. For the basic inspector we recommend you limit your milestones primarily to the first three levels, i.e. knowledge, understanding, and application. The higher levels of learning in Bloom's Taxonomy, analysis, synthesis, and evaluation, typically require practical experience not expected in the basic inspector.

In Bloom's Taxonomy,

- Knowledge refers to the ability to recall facts, terms, and basic concepts.
- Understanding refers to the ability to interpret or explain concepts using your own words.
- Application refers to the ability to put knowledge/understanding to practical use and demonstrate skills required to actually perform specific acts.

<u>As an added challenge to our work groups, we are asking you to draft sample test questions for your milestones</u>. Please note that there is a tendency to focus only on knowledge in the typical multiple-choice question. Please try to also write questions that also evaluate understanding and require application of knowledge. For these you might want to consider putting the candidate in a situation and asking specific questions that require multiple steps to achieve an answer. In these cases fill in the blank format may be superior to multiple choice. In addition to getting the answer also, consider asking the student to cite the specific code reference.

As a curriculum segment draft is completed, the Committee will do a quick review and suggest editing for uniformity of format. When it is ready, we will circulate the draft for review and comment. The critical questions we will ask are: What is missing from this curriculum segment and what should be removed or

moved to another segment in another level? With this review process, we hope to build a consensus of agreement on the standards being set. The same would apply to sample questions.

By using Appendix C, NCWM Competency Guide Model; Appendix D, NCWM Curriculum Template; Appendix E, NCWM Sample Curriculum, it should guide you through writing your curriculum so that the National Training Program will be uniform throughout all the courses. Appendix F, Guide to Developing Test Questions, will guide you through writing ten certification questions on the subject you have chosen.

The Committee greatly appreciates your willingness to contribute to this project. Please send your questions project comments or on the to the current chair Agatha Shields at aashield@franklincountyohio.gov of the PDC committee with a carbon copy to Linda Bernetich at NCWM Inc, lbernetich@mgmtsol.com. Ross Andersen has agreed to help with questions about the format and the NCWM Core Competency model. Please contact him at ross.andersen@agmkt.state.ny.us or by phone at 518-457-3146.

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Appendix C

Curriculum Package

The National Conference on Weights and Measures National Training Program CORE COMPETENCY MODEL

October 2007

The National Conference on Weights and Measures Professional Development Committee is proud to present this NCWM Core Competency Model for use in creating the curriculum for the NCWM National Training Program.

The idea for this model began with a grassroots movement of weights and measures educators who wanted to reverse a deteriorating articulation process for the modules in weights and measures.

The model presented here is the result of efforts of PDC members and has made extensive use of the California Core Competency Model for the First Course in Accounting. That model was developed by the California Society of CPAs' Committee on Accounting Education and was released in July 1995.

The competency-based concept and format for the NCWM curriculum was taken almost verbatim from that work. The hours of time volunteered for this project is an impressive example of professional volunteerism at its best. Even more impressive is the fact that when conflicts arose, committee members searched for creative solutions that would meet the needs of more than one point of view. Clearly, weights and measures educators consistently subordinated their individual views of the course to the greater good—the long-run improvement of education.

If you are a weights and measures educator, you are urged to share this model with your faculty and help improve weights and measures education. We hope this model will help you to facilitate your weights and measures training.

THE MISSION OF THE PROFESSIONAL DEVELOPMENT COMMITTEE

The mission of this Committee is to improve the quality of education. Since the state jurisdictions are such an integral part of the weights and measures education, our mission is to help prepare an outline for you to use in your endeavors.

ACCOMPLISHING OUR MISSION

We have accomplished our mission by identifying expected student outcomes and core competencies as a basis for articulation agreements. The diversity of emerging instructional models for weights and measures has made the process of articulation very difficult. To reduce the severity of this problem requires a dramatic change in how course equivalencies between states are measured. It is proposed, therefore, that the basis for articulation agreements shift from the current textbook/topic approach to one that focuses on identifying desirable outcomes students should achieve and core competencies that measure their achievement.

GENERAL PHILOSOPHY ABOUT HOW TO USE THIS MODEL

Identifying outcomes and core competencies is an important step in the process of improving weights and measures education. How training officers help students master these outcomes and competencies and how they simultaneously measure student mastery are equally important tasks.

Our intent is *not* to develop a "statewide lesson plan" for weights and measures. Instead, we want individual states to be creative in implementing the common set of outcomes and core competencies described in this *model*. Moreover, we hope each state program will develop a set of outcomes and special competencies that will reflect the unique perspective of its state and the special needs of its students. Thus, our philosophy encourages diversity. Although we want students to attain the educational objectives of the weights and measures training program, we do not expect them to attain these objectives in a prescribed manner.

Professional Development Committee

Agatha Shields, Franklin County, Ohio (Chair) Kenneth Deitzler, Pennsylvania Ross Andersen, New York John Sullivan, Mississippi Stacy Carlsen, Marin County, California Dave Wankowski, Kraft Foods, Inc. (Associate Member Representative) Tina Butcher, NIST, Weights and Measures Division Linda Bernetich, NCWM Staff Liaison

MILESTONES FOR IMPLEMENTING COMPETENCY-BASED ARTICULATION

The intent of the Committee on Accounting Education is to promote the widespread acceptance of essential student outcomes and competencies, while encouraging individual programs to implement these outcomes and competencies in ways that best suit their own students. The following milestones are used to evaluate progress in implementing this competency-based articulation system:

MILESTONE 1: Derive expected student outcomes (knowledge and skills).

MILESTONE 2: Create core competencies (activities expressed in behavioral terms) that are logically derived from the expected student outcomes.

MILESTONE 3: Promote a competency-based articulation approach by conducting workshops for interested faculty on how to implement and assess core competencies.

MILESTONE 4: Establish acceptance of a single set of outcomes and core competencies.

OUTCOMES AND COMPETENCIES

HOW DO YOU DISTINGUISH AN OUTCOME FROM A COMPETENCY?

An outcome is "what" you expect your students to achieve, whereas a competency demonstrates "how" your students can achieve that outcome. Think of an outcome as an end and a competency as a means to that end.

Outcomes are the knowledge and skills recommended. Competencies are the specific activities used to measure a student's mastery of the knowledge/skills or outcomes.

The outcome/competency approach is different from the traditional textbook/topic approach to accounting instruction. First, the choice of a textbook no longer dictates the organization and coverage of the course. Instead, the outcomes and competencies become the driver and the textbook becomes the vehicle. A related difference is that the course is driven by an output measure (outcomes/competencies) rather than an input measure (textbook/topics). Finally, students more clearly know the content they are expected to study and the precise activities they must perform on examinations and other forms of evaluation by studying the outcome/competency pairings and working problems that reflect them.

CHARACTERISTICS OF WELL-CONSTRUCTED COMPETENCIES

A well-constructed behavioral learning objective or competency has the following characteristics:

- it expresses one objective;
- it is specific;
- it states what the student will be able to do after the learning experience; and
- it uses a concrete verb to specify the desired activity that must be performed by the student to demonstrate competency.

INVENTORY OF CONCRETE VERBS DENOTING ACTION TAKEN IN COMPETENCIES

The following suggested verbs are arranged in the six cognitive domains identified in Bloom's Taxonomy.

1. Knowledge		2. Comprehension		3. Application	
arrange	order	classify	record	apply	operate
define	recognize	describe	report	choose	practice
duplicate	relate	discuss	restate	demonstrate	schedule
label	recall	explain	review	dramatize	sketch
list	repeat	express	select	employ	solve
memorize	reproduce	identify	tell	engage	transfer
name	_	indicate	translate	illustrate	use
		locate		interpret	

4. Analysis		5. Synthesis		6. Evaluation	
analyze	differentiate	arrange	organize	appraise	evaluate
appraise	discriminate	assemble	plan	argue	judge
calculate	distinguish	collect	prepare	assess	predict
categorize	examine	compose	present	attach	rate
compare	experiment	construct	propose	choose	score
contrast	inventory	create	setup	compare	select
convert	question	design	suggest	debate	support
criticize	test	formulate	summarize	defend	value
diagram		justify	write	estimate	
-		manage			

The model is a "living document." It will be re-evaluated annually to consider the evolving content.

Appendix D

Curriculum Package

The National Conference on Weights and Measures National Training Program GUIDE FOR DEVELOPING CURRICULUM SEGMENTS

Prepared by the NCWM Professional Development Committee First Draft - October 2007

This guide was prepared to assist those work groups preparing segments for the National Training Program Curriculum. Each curriculum segment represents a small portion of the standards for educating our weights and measures professionals. The Committee is recommending a standard format be used as described below.

The curriculum will cover the broad range of knowledge included in the field of weights and measures. It is organized in a hierarchy of segments ranging from broad topics with general information at level one to narrow topics with highly specific information at level three. These segments will be combined to provide the standards for educating our professionals. It is critical to understand that a curriculum is not a lesson plan for the trainer. Rather it is an organized set of objectives and measurable milestones that can be used to verify that the trainer has covered the subject. Since the curriculum is concerned with outcomes rather than input, the trainer must use the objectives and milestones in preparing the lesson plan for training.

Curriculum Segment Format:

- Segment Number and Title
- Overview and Scope
- Prerequisite Segments
- Objectives and Competencies

Segment Number and Title

Obtain these directly from the Curriculum Plan with the numbers and titles assigned by the Professional Development Committee. Please include a revision date under the title.

Overview and Scope

Provide a brief narrative overview and description of the scope of the segment. This should generally be a short paragraph of only a few of sentences.

Prerequisite Segments

List the segment number and title of any prerequisite segments that should be mastered before undertaking the material in this segment. Generally, this will remain within one of the four main topic areas in the curriculum. When covering device inspection topics, do not include prerequisite segments Weights and Measures General, Metrology, or Market Practices areas.

Objectives and Competencies

A curriculum segment will typically have multiple objectives, each with two to perhaps ten measurable competencies, sometimes called milestones. If the number of competencies exceeds ten, it is best to break the objective into two or more objectives.

The objective statement should follow the guidelines in the NCWM Core Competency Model. A given category or area may require more than one objective and associated competencies. Well-constructed objective statements should express a single, specific objective. For consistency, the Committee asks that objectives generally be ordered following the table below. The order is to provide a consistent feel to the curriculum. Depending on the needs of

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the particular segment, any one or more categories from this chart may not apply. Following the objective statement add a lead-in to the bulleted competencies such as, "To demonstrate this, the inspector can:"

The competencies or milestones should represent measurable actions that demonstrate a mastery of one aspect of the objective. For base level inspectors, each competency begins with an action verb from the NCWM Core Competency Model beginning with the cognitive levels of knowledge, understanding, or application. As the curriculum is expanded to journeyman and advanced levels, additional cognitive levels of analysis, integration and evaluation may be added. Please present the competencies in bullets.

Device Segment Category	Purpose		
	These sections should set standards for knowledge of the		
Technology and Terminology	technology used in this area of responsibility and understanding of		
	the common terms used to communicate effectively.		
Davias Operations and Eurotionality	These sections should set standards for knowledge of metrologically		
Device Operations and Functionality	significant operations and features of the items under inspection.		
	These sections should set standards for understanding of the		
Technical Requirements – Inspection	technical requirements (specifications) for a device or commodity		
	and for the ability to conduct inspection to verify conformance.		
	These sections should set standards for understanding of the		
User Requirements – Inspection	requirements incumbent on a device or commodity user and for the		
	ability to conduct inspection to verify conformance.		
	These sections should set standards for understanding of the		
Test Methods	physical test procedures used to verify device or commodity		
	performance and for the ability to conduct these tests.		

For assistance in working with this template, please contact the current Chair of the Professional Development Committee. A sample curriculum segment following this template is also available from the Committee.

Appendix E

Curriculum Package

The National Conference on Weights and Measures National Training Program Curriculum

Segment 3.1.1. Static Electronic Weighing Systems, General Revised: October 31, 2007

Overview

This segment sets standards for knowledge, understanding, and performance required for inspection and testing of static electronic scales. This segment will cover a wide range of information that is generic and applicable to many different static scale applications.

<u>Prerequisites</u>

- 3.0. Introduction to Device Control
- 3.0.a Safety Considerations
- 3.1. Weighing Technologies and Terminology, General

Objectives and Competencies

1. Technology of Weighing Systems

A weights and measures inspector should understand the method of operation and the primary technologies used in typical electronic weighing systems. To demonstrate this, the inspector can:

- Restate that scales measure the weight of material resulting primarily from the force exerted by gravity on the material on the scale.
- Restate that weight on a scale is a close approximation of the mass of the material on the scale in reference to reference standards used when the device is calibrated; hence, scale units are in units of mass, e.g., lb or kg.
- Describe the basic components of a weighing system: load receiver, load sensor, indicator, and peripherals like printers and computers.
- Describe the principle of operation of strain gage load cell scale technologies from the load sensors, to A to D converters, to computer-based processors, to indicators/printers.
- Explain that the digital division for a typical system is defined by the two zones of uncertainty (break points) at approximately $\frac{1}{2}$ d and $\frac{-1}{2}$ d.
- Restate that digital scale components can be packaged in multiple ways involving separate discrete elements (OIML: modules).
- Define common terms used with regard to electronic weighing systems.

2. Classes, Tolerances and Performance Requirements for Scales with a Class Mark

A weights and measures inspector should understand the classification system for static scales and be able to apply the performance standards under each class. To demonstrate this, the inspector can:

- Explain how the basic tolerances, repeatability tolerances, agreement requirements, and General Code abnormal performance requirements all work together to specify limits to deviations in scale performance.
- Describe how the concepts of accuracy, repeatability, linearity and hysteresis relate to scale performance.
- Describe the organization of accuracy classes for marked scales as specified in Table 3.
- Explain how scale class is related to typical application in Table 7a in the Scales Code.
- Appraise whether a scale conforms to the class declared by the manufacturer.
- Compute tolerances for any class marked scale as per Table 6 of the Scales Code.

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Appendix E – Curriculum Package: NCWM Sample Curriculum

- Illustrate how to find either the acceptance or maintenance tolerance for any load on a scale given the scale class, capacity and division size.
- Illustrate how repeatability requirements apply to static scales.

3. Scale Markings and Operations

A weights and measures inspector should understand the various marking requirements applicable to a static scale and demonstrate ability to operate a static scale. To demonstrate this, the inspector can:

- Recognize and interpret required identification markings on a scale as per Table S.6.3.
- Recognize and interpret required markings on the controls, indications and features of a scale.
- Demonstrate how to operate the following functions/operations on a typical scale.
 - Power on/off
 - Zero
 - Tare (both platter and keyboard tare) and Tare Clear if scale has a tare function
 - Units selector if scale indicates in more than one unit
 - Recognize and interpret the information displayed on a scale, including:
 - Gross, Net, and Tare weight indications
 - Center of Zero, Motion, pricing displays, and others
 - Underload/Overload error conditions

4. Technical Requirements

A weights and measures inspector should be able to apply the various technical requirements to a static scale and cite the applicable code reference for a deficiency. To demonstrate this, the inspector can:

- Apply the technical specifications relating to the following scale features/indications and cite the HB 44 Code paragraph.
 - Zero-load indications, zero-setting operations, and automatic zero setting (zero tracking)
 - Digital scale divisions and limit of indication
 - Level indication for portable scales
 - Motion detection requirements zero, tare, printing, etc.
 - Design requirements for weighing elements
- Interpret the rules for matching weighing elements to indicating elements (modules).

5. User Requirements

A weights and measures inspector should be able to apply the various user requirements applicable to a static scale and cite the applicable code reference for a deficiency. To demonstrate this, the inspector can:

- Assess suitability of a class marked scale for a given application, considering design, class, application and typical load in Tables 7a. and 8.
- Evaluate compliance of a scale with scale installation requirements in UR.2.
- Evaluate compliance of a scale with general use requirements in UR.3. (Subsections 3.1., 3.2., 3.3., and 3.5.)
- Evaluate compliance of a scale with maintenance requirements in UR.4.

6. Basic Test Procedures

A weights and measures inspector should be able to apply the appropriate performance tests to a static scale and evaluate compliance with the applicable tolerances and performance standards. To demonstrate this, the inspector can:

- Demonstrate how to properly use test weights and care for them when not in use.
- Determine minimum amounts of standards required for testing a given scale.
- Select appropriate test loads for an Increasing Load Test for a given scale, perform the test, and evaluate the test results for compliance with applicable tolerances.
- Select appropriate test loads for a Decreasing Load Test for a given scale, perform the test, and evaluate the test results for compliance with applicable tolerances.
- Select appropriate test loads for a Shift Test (eccentric loading) for a given scale, perform the test, and evaluate the test results for compliance with applicable tolerances and agreement requirements.
- Discuss appropriate times to perform a Discrimination Test or a Repeatability Test.

- Select appropriate test loads for a Discrimination Test for a given scale, perform the test, and evaluate the test results for compliance with the applicable standards.
- Select appropriate test loads for a Repeatability Test for a given scale, perform the test, and evaluate the test results for compliance with applicable tolerances and agreement requirements.

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Appendix F

Curriculum Package

The National Conference on Weights and Measures National Training Program GUIDE FOR DEVELOPING TEST QUESTIONS

Prepared by the NCWM Professional Development Committee First Draft - January 2007

This guide was prepared to assist those work groups preparing curriculum materials as they prepare test questions. These test questions will be used both as aids to training delivery and also as a measuring stick in any future certification effort. If the certification program is to have credibility, it is vital that the test questions adequately evaluate that the student has achieved the multiple milestones in each curriculum area.

As you write your questions, please remember that we have set the bar at a level of application, the third in Bloom's Taxonomy. Thus, we expect the trainee will KNOW certain things, UNDERSTAND other things, and be able to APPLY the remainder. We are not looking for higher learning levels in Bloom's Taxonomy for basic inspectors and we will <u>not</u> be testing for analysis, integration, or evaluation.

<u>Testing for Knowledge</u> – A test question for knowledge is usually in the form of a true/false, multiple choice, or fillin-the-blank question. At this point, the Committee is suggesting that developers focus on multiple choice and fillin-the-blank questions, such as questions 1 and 2 below. With true/false, the person has a 50-50 chance of guessing and getting the right answer. Please note that at this level the trainee need only demonstrate that he/she knows the information and not necessarily that he/she understands it or can apply it.

1. Which statement best describes the legal standing of NIST Handbook 44? (Answer: B)

- A. Handbook 44 is a federal regulation published by the National Institute of Standards and Technology that preempts the states.
- B. Handbook 44 is adopted either by act of the state legislature or through promulgation in regulation by the state.
- C. Handbook 44 is amended each year and all states agree to abide by the actions of the National Conference on Weights and Measures.
- D. Handbook 44 is adopted as part of the administrative policy by order of the state director.
- 2. A paragraph beginning with "S." in any of the NIST Handbook 44 Codes is a ______. (Answer: Specification)

<u>Testing for Understanding</u> – A test question for understanding is usually a multiple-choice question, such as questions 3 and 4 below. Questions concerning understanding often ask the trainee to pick the best response in situations where more than one answer could be correct in some respect. For example, in Question 3, answer B could be a correct answer if the equipment was manufactured after the effective date. Answer C is a better answer since it is more specific and also includes items brought into the state after the effective date. Please note for understanding the trainee needs to demonstrate that he/she knows and understands the information and not necessarily that he/she can apply it.

3. A nonretroactive requirement is best described by which of the following statements? (Answer: C)

- A. A nonretroactive requirement is enforceable on all equipment up to the terminal date.
- B. A nonretroactive requirement is enforceable only on new equipment after the effective date.
- C. A nonretroactive requirement is enforceable on equipment manufactured after the effective date or brought into the state after the effective date.
- D. A nonretroactive requirement is enforceable on equipment with an NTEP Certificate granted after the effective date.

4. Which of the following best describes the difference between "d" and "e" in the Scales Code? (Answer: D)

- A. The value of "e" is always displayed while "d" may or may not be.
- B. The value of "d" is always smaller than or equal to "e".
- C. The display of values for "d" must always be different in size or character from "e".
- D. When "d" does not equal "e", the tolerances are applied to the value of "e".

<u>Testing for Application</u> – A test question for application should be either be a multiple-choice question or a "Yes/No with reason" question, such as questions 5 and 6 below. Questions concerning application will usually require the trainee to perform multiple steps to reach the correct answer. In the field, they will not be guided to the correct section of the handbook, but will have to find it based on their knowledge and experience. For example, the question may provide information about the situation and some test results. The trainee must then decide whether to apply maintenance or acceptance tolerances and then evaluate the test results against the appropriate tolerances for that test. In question 5 below, the person must see that the scale is subject to the non-retroactive requirement in Scales Code S.1.7.(b) and then correctly deduce that the only correct response is an overload error. The Yes/No with reason question (question 6) also requires several steps but goes further in that it also requires the trainee to state the nature of any violation and cite the section of the Handbook that is violated. This is critical as this reason and citation would have to be indicated on any official stop-use order issued for the violation. Please note that the trainee needs to demonstrate that he/she knows, understands, and can apply the requirements.

- 5. You are inspecting a new price-computing sale (30 x 0.01 lb) in a deli that was placed in service last week. It has an NTEP CC # 99-205. You place a 1 lb weight on the scale and press the tare key. You then place an additional 29.2 lb of test weights on the scale. Which of the following is an acceptable indication for this test load? (Answer: A)
 - A. Overload error
 - B. 29.24 lb
 - C. 29.18 lb
 - D. 29.16 lb

6. You are inspecting the scale at right and find that it has no zero tracking. With the scale at zero as indicated, you add 0.1 d (0.002 lb) to the platform and the scale indicates a stable 0.02 lb. Is this acceptable? Capacity 100 x 0.02 lb
O.OO lb
Power Zero Tare Print

Yes or No (No must include reason and citation)

Answer: No – The digital zero indication must be maintained accurate within $\pm \frac{1}{4}$ d of true zero or the scale must have a center zero indicator. Scales Code S.1.1.1.

Initially the Committee is looking to build a bank of test questions that evaluate if the trainee has reached the milestones in each curriculum segment and cover a range of difficulty. Any exam that is prepared will include a mix of questions at each appropriate level in Bloom's Taxonomy from the curriculum, and varying levels of difficulty from easy to challenging. In that way, the test can be fair yet still differentiate those who really have mastered the discipline from those who haven't.

After the questions are prepared and tested (testing method to be developed), the Committee would then split the questions into two groups. The first group, called "sample questions," would be widely circulated for use in training programs. Instructors could use the sample questions in their training or as part of quizzes or final exams to measure effectiveness of the training. Most important, trainees would be exposed to the kinds of questions and the range of difficulty that would be included in a certification exam.

The second group of questions would be secured for use in a certification exam program. The Committee envisions charging some group to administer the certification exam and assist in the grading. That group would also create alternative exams or periodically change the questions so the exam is not the same for candidates that fail to pass the first time. Please look to set the bar so it is fair yet represents the high level of ability you want working for you.

A long journey begins with one step. We are counting on our curriculum development teams to start generating our bank of test questions (with an answer key) based on the milestones they choose in the curriculum segment(s) they are preparing. If we work together to create a good range of difficulty in those questions, we can be well on our way toward that certification program we want. There is plenty of room for creativity in this effort, including the use of graphics and photographs.

Thanks again for your willingness to contribute. Please call or e-mail Ross Andersen, New York, with questions or comments at (518) 457-3146 or ross.andersen@agmkt.state.ny.us.

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Appendix G

Curriculum Package National Conference on Weights and Measures NATIONAL TRAINING CURRICULUM OUTLINE

Revised November 2007













- Support Equipment General Enforcement Guidelines
 - General Enforcement Guidelines

Support Equipment

Appendix H

Curriculum Package

The National Conference on Weights and Measures

National Training Program CURRICULUM WORK PLAN

Revised November 2007

Segment/Subject

Level 1/Level 2/Level 3

1.0 Fundamentals of Weights and Measures

- 1.1 Introduction to W&M Programs
- 1.2 W&M Laws and Regulations
- 1.3 Field Standards & Test Equipment
- 1.4 State Program Scope and Overview

2.0 W&M Administration

- 2.1 Fundamentals of W&M Administration (Commercial System, Powers & 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 & Communications (Publicity, Public Relations, Communications)

3.0 Laboratory Metrology

- 3.1. NIST Basic Metrology
- 3.2. NIST Advance Metrology

4.0 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
 - 4.3.5 Small Capacity Weighing Systems Class III
 - 4.3.6 Medium Capacity Weighing Systems Class III
 - 4.3.7 Vehicle Scale Class III or IIIL
 - 4.3.8 Vehicle Scale Class III or IIIL Advanced
 - 4.3.9 Railroad Track Scales
 - 4.3.10 In-Motion Railroad Track Scales
 - 4.3.11 Hopper Scale Systems
 - 4.3.12 Automatic Bulk Weighing Systems
 - 4.3.13 Automatic Weighing Systems
 - 4.3.14 Belt Conveyor Weighing Systems
 - 4.3.15 In-Motion Monorail Scales
 - 4.3.16 Point-of-Sale Scale Systems

Appendix H – Curriculum Package: Curriculum Work Plan

- 4.3.17 Other Specialty Weighing Systems
- 4.4 Dynamic Measuring Systems General
 - 4.4.1 Retail Motor Fuel Dispensers
 - 4.4.2 Loading Rack and Other Stationary Metering Systems
 - 4.4.3 Loading Rack & Other Stationary Metering Systems Advanced
 - 4.4.4 Vehicle-Tank Meter Systems
 - 4.4.5 Vehicle-Tank Meter Systems Advanced
 - 4.4.6 Milk Metering Systems
 - 4.4.7 Water Meters
 - 4.4.8 LPG/Anhydrous Ammonia Liquid Metering Systems
 - 4.4.9 LPG/Anhydrous Ammonia Liquid-Metering Systems Advanced
 - 4.4.10 LPG Vapor Meter Systems
 - 4.4.11 Mass Flow Metering Systems
 - 4.4.12 Other Metering Systems (Cryogenics, Carbon Dioxide, etc.)
- 4.5 Static Volume Measuring Systems General
 - 4.5.1 Liquid Measures
 - 4.5.2 Farm Milk Tanks
 - 4.5.3 Dry Measures
- 4.6 Other Measuring Systems
 - 4.6.1 Taximeters and Odometers
 - 4.6.2 Wire and Cordage Measuring Systems
 - 4.6.3 Linear Measures
 - 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

5.0 Market Practices, Laws and Regulations (NIST HB 130), & Commodities (NIST HB 133)

- 5.1 Safety Considerations Market Practices, NIST HB 130, NIST HB 133
- 5.2 NIST Handbook 130 Laws & 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 HB 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 I

Model Professional Development Training and Certification Standards Statute for Inspectors and Sealers of Weights and Measures

Submitted by NEWMA, October 2007

DRAFT

- 1. **Definition of Terms:** Unless defined otherwise by statute, the definitions contained herein shall apply to this statute.
 - 1.1 **Commission**: The permanent advisory commission appointed pursuant to this statute to develop, plan, and certify training standards, certification, and continuing education.
 - 1.2 **Director [Commissioner or other senior state official]**: Charged by statute to administer, guide, or direct Weights and Measures activities within the state at state, county, or municipal level.
 - 1.3 Sealers and Inspectors of Weights and Measures: Those public officials appointed pursuant to existing law to inspect, approve, or condemn weighing and measuring devices or perform other activities as directed by statute or regulation. This definition shall also apply to deputy, assistant, or associate Sealers and Inspectors of Weights and Measures.
 - 1.4 **Industry Specialists**: Those individuals approved and/or licensed by the State Director to inspect, approve, or condemn specific classes or types of weighing and measuring devices.

2. Certification and Standards Commission

- 2.1 **Appointment**: There shall be a permanent standing advisory commission comprised of the director of the state weights and measures department or his designee, and a designee from each of the following organizations: the State Weights and Measures Association, the various Regional Weights and Measures Associations, and one individual representing Industry Specialists. Members of said commission shall serve without compensation. Said commission shall be chaired by the director or deputy director of weights and measures.
- 2.2 **Rule Making Authority**: The commission shall promulgate rules and regulations necessary to implement and maintain this statute consistent with existing rule-making state legislation.
- 2.3 **Duties**: The commission shall develop, and from time to time, revise the certification and continuing education requirements that are established by the Department of Weights and Measures with the advice and consent of the commission. The commission shall certify all inspectors, sealers and deputies and industry specialists in accordance with sections [insert specific statue citation covering the appointment of these officials] and regulations promulgated by the commission including, but not limited to, regulations covering initial written certification testing for inspectors, sealers and deputies and industry specialists as well as mandatory continuing education programs for inspectors, sealers and deputies, and industry specialists to maintain their certifications. Every store, retail establishment, food store or food department and all merchants within the jurisdiction of the state department of weights and measures shall provide adequate space for the display of information relative to how the state inspector, local sealer or inspector or the department of weights and measures can be contacted as provided in regulations to be promulgated by the commission. Notwithstanding any certification exemption, all sealers, inspectors, deputy sealers, deputy inspectors, and industry specialists shall participate in continuing education programs. The commission shall establish a training and education fee to be paid by the state, county, municipality, or industry specialist's organization, which employs

such sealer, inspector, deputy sealer and deputy inspector, or industry specialist sufficient to offset the cost of providing such training and education.

2.4 **Fees**: There shall be a revolving account established into which shall be deposited any training and education fees paid by the state, county, municipality, or industry specialist. These fees shall be used to offset any cost associated with providing such training and education mandated by the commission.

3. Appointment of Sealers, Inspectors, Deputy Sealers

- 3.1 **Appointment**: The sealer, inspector, and all deputies shall be certified by the commission within one year after assuming their powers and duties. Failure to become certified within one year shall be cause for termination; provided, however, sealers, inspectors or deputy sealers or deputy inspectors, employed by the state, county, or a municipality upon the effective date of this paragraph, shall become certified within two years. Sealers, inspectors or deputy sealers or deputy inspectors who pass a civil service exam for a position as a sealer, inspector or deputy sealer or deputy inspector of weights and measures, shall be exempt from initial certification requirements provided that said civil service exam contains questions and/or practices consistent with initial certification requirements.
- 3.2 **Continuing Education**: Notwithstanding any certification exemption, all sealers, inspectors and deputy sealers and deputy inspectors shall participate in continuing education programs. The commission shall establish a training and education fee to be paid by the county or municipality which employs such sealer, inspector, deputy sealer and deputy inspector sufficient to offset the cost of providing such training and education.

4. Appointment of Industry Specialists

- 4.1 **Appointment**: All industry specialists shall be certified by the commission prior to assuming their powers and duties as licensed industry specialists; provided, however, industry specialists performing such duties shall become certified within one year from the effective date of this statute. Failure to become certified prior to assuming their powers and duties as industry specialists shall render any inspections conducted null and void and such individuals shall be barred from further inspections for a period of not less than one year.
- 4.2 **Continuing Education**: Notwithstanding the appointment of industry specialists, they shall participate in continuing education programs approved by the commission. The commission shall establish a training and education fee to be paid by the business or organization employing industry specialists sufficient to offset the cost of providing such training and education.
- 5. Conflict with other Laws: Whenever the application of any provision of any other law of this state conflict with the application of any provision of sections one through four, inclusive, said sections shall prevail.
- 6. **Partial Invalidity:** If any provision of said sections one to four, inclusive, or the application of said sections shall be held invalid, the remainder of said sections, or the application of such provision to any person or circumstance other than that as to which it is invalid, shall not be affected thereby.

National Type Evaluation Program (NTEP) Committee Interim Agenda

Don L. Onwiler, Chairman Program Manager Nebraska Department of Weights & Measures

Reference Key Number

500 INTRODUCTION

The NTEP Committee will address the following items at its 2008 Interim Meeting. Except when posted, all meetings are open to the membership. The members will be invited to dialogue with the NTEP Committee on issues on its agenda. The NTEP Committee is currently working on the following issues:

	Table A Index to Reference Key Items			
Re Ke	ference y Number Title of Item	Page		
IN	TRODUCTION	1		
1.	Mutual Recognition Arrangement (MRA)	2		
2.	Mutual Acceptance Arrangement (MAA)	2		
3.	3. NTEP Participating Laboratories and Evaluations Reports			
4.	4. NTETC Sector Reports			
5.	NTEP Participation in U.S. National Work Group on Harmonization of NIST Handbook 44, NCWM Publication 14 and OIML R 76 and R 60	5		
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Table B Appendices		
Ap	ppendix Title	Page
A B C	*NTETC – Grain Analyzer Sector Meeting Summary *NTETC – Measuring Sector Meeting Summary	
D	*NTETC – Weighing Sector Meeting Summary *NTETC – Software Sector Meeting Summary	

*Drafts of the sector summaries can be viewed at - http://www.ncwm.net/ntep/index.cfm?fuseaction=meetings

BIML	Bureau of International Legal Metrology	IR	International Recommendation
CD	Committee Draft ¹	MAA	Mutual Acceptance Arrangement
CIML	International Committee of Legal	OIML	International Organization of Legal
	Metrology		Metrology
CPR	Committee on Participation Review	R	Recommendation
DD	Draft Document ²	SC	Subcommittee
DR	Draft Recommendation ²	TC	Technical Committee
DV	Draft Vocabulary ²	WD	Working Document ³
DoMC	Declarations of Mutual Confidence		

Table C Glossary of Acronyms*

¹CD: 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.

²DD, DR, DV: draft documents approved at the level of the technical committee or subcommittee concerned and sent to BIML for approval by CIML.

³WD: precedes the development of a CD; in this document, successive drafts are number 1 WD, 2 WD, etc.

*Explanation of acronyms provided by OIML.

Details of All Items (In Order by Reference Key Number)

1. Mutual Recognition Arrangement (MRA)

Background: Both Measurement Canada and the NTEP Labs are engaged in dialog to improve the data exchange under the Mutual Recognition Arrangement (MRA). During the recent NTEP Lab meeting, an entire day was spent exchanging information regarding the current MRA for weighing devices. Several areas of improvement were identified, including initial review of new applications to establish an agreed-upon test plan for the evaluation. In addition, a training session was conducted to improve the consistency of data collected by the labs. This will help to improve the ability of the various labs to exchange data more consistently.

Current Comment: Over the past several months, NTEP and Measurement Canada have been in continuous contact regarding the flow of information related to the MRA. Measurement Canada has also supplied the U.S. NTEP labs with an updated version of an Excel spreadsheet program to standardize the test report forms for devices that fall under the MRA. This updated version of the spreadsheet has been well received by the labs. There is also continued dialog between the labs and the NTEP Director.

2. Mutual Acceptance Arrangement (MAA)

Background: The NTEP Director attended the third meeting of the Committee on Performance Review (CPR) in Tsukuba, Japan, on June 7 and 8, 2007. One agenda item focused on a proposed change to the current policy of the Mutual Acceptance Arrangement (MAA) to include data submitted by a manufacturer to be included in the Evaluation Report. It is the belief of the NTEP Committee that such data are a conflict of interest and are not acceptable. The NTEP Director strongly expressed this position to the attendees of that meeting. There was no change in the current policy of not accepting a manufacturer's data.

Current Comment: In September 2007, the NCWM returned an affirmative vote regarding "Acceptance of new participants in the R 60 DoMC."

Currently, NTEP has not received any OIML Evaluation Reports for load cells.

To date, two MAA Certificates for R 76 (Japan and New Zealand) have been issued (details can be found on the OIML website, http://www.oiml.org).

Chuck Ehrlich reported that at the October 2007 CIML meeting in Shanghai, China, the "old" OIML Certificate System might be retained indefinitely to accommodate the acceptance of manufacturers' test data in that System for those countries wishing to do so. It was also reported that the registration fee for "old-style" OIML Certificates and for MAA Certificates might be set to the same value (around 250 Euros).

Dr. Ehrlich also reported that it is anticipated that a meeting of OIML TC 3/SC 5 will be held in late May 2008 to begin revision of the OIML documents on the Certificate System and the MAA. The meeting also will cover development of an OIML document on the incorporation of measurement uncertainty in conformity assessment decisions in legal metrology.

3. NTEP Participating Laboratories and Evaluations Reports

Background: At the 2007 NCWM Annual Meeting, Stephen Patoray, NTEP Director, updated the Committee on NTEP laboratory and administrative activities since October 1, 2006.

The NTEP weighing and measuring laboratories held a joint meeting in May 2007 in Sacramento, California. The NTEP weighing laboratories also met in September 2007 before the meeting of the Weighing Sector in Sacramento, California. The NTEP measuring laboratories also met in October 2007 prior to the Measuring Sector meeting in Little Rock, Arkansas.

During the 2007 NCWM Annual Meeting, the NTEP Committee Chair announced that Minnesota has been authorized by NCWM as a field laboratory to conduct evaluation on weighing/load-receiving elements.

The NTEP director reported that the backlog in the NTEP labs is now below historical levels and is approximately 25 % below the peak backlog seen during the past year. NTEP continues to assign devices to the appropriate laboratory to distribute the evaluations more evenly and continue to reduce the backlog.

Current Comment: Steve Patoray will update the Committee on any outstanding issues related to the NTEP participating labs.

With the assistance of NIST Advisor, G. Diane Lee, the NTEP director conducted a laboratory audit, based on ISO 17025, of the California NTEP lab in October 2007. Results of this audit were discussed with laboratory personnel.

Upcoming meetings: (all dates are currently tentative)

NTEP Laboratory Meeting	May 2008	Ottawa, Canada
Software Sector	May 2008	Ottawa, Canada
Grain Analyzer Sector	August 2008	Kansas City, Missouri
Weighing Sector	September 2008	Ottawa, Canada
Measuring Sector	October 2008	Atlanta, Georgia
4. NTETC Sector Reports

Background:

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 22 and 23, 2007. A draft of the final summary will be provided to the Committee prior to the 2007 NCWM Interim Meeting for review and approval.

The next meeting of the Grain Moisture Meter and NIR Protein Analyzer Sectors is scheduled for August 2008 in Kansas City, Missouri. For questions on the current status of Sector work or to propose items for a future meeting, please contact the Sector technical advisors:

Diane Lee	Jack Barber
NIST WMD	J.B. Associates
100 Bureau Drive, Stop 2600	10349 Old Indian Trail
Gaithersburg, MD 20899-2600	Glenarm, IL 62536
Phone: (301) 975-4405	Phone: (217) 483-4232
Fax: (301) 975-8091	
e-mail: diane.lee@nist.gov	e-mail: jbarber@motion.net

Measuring Sector: The NTETC Measuring Sector met October 19 and 20, 2007, in Little Rock, Arkansas. A draft of the final summary will also be provided to the NTEP Committee prior to the 2007 NCWM Interim Meeting for review and approval.

The next meeting of the Measuring Sector is scheduled for October 2008 in Atlanta, Georgia, in conjunction with the Southern Weights and Measures Association's 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:

Richard Suiter NIST WMD 100 Bureau Drive, Stop 2600 Gaithersburg, MD 20899-2600 Phone: (301) 975-4406 Fax: (301) 975-8091 e-mail: rsuiter@nist.gov

Weighing Sector: The NTETC Weighing Sector met September 6 - 8, 2007, in Sacramento, California. A final draft of the meeting summary will also be provided to the Committee prior to the 2007 NCWM Interim Meeting for review and approval.

The next Weighing Sector meeting is scheduled for September 2008 in Ottawa, Canada. For questions on the current status of Sector work or to propose items for a future meeting, please contact the Sector technical advisor:

Steven Cook NIST WMD 100 Bureau Drive, Stop 2600 Gaithersburg, MD 20899-2600 Phone: (301) 975-4003 Fax: (301) 975-8091 e-mail: steven.cook@nist.gov

NTETC Sector Summaries: The NTEP Committee will receive copies of the summaries prior to the NCWM Interim Meeting for its review and approval.

Steve Patoray reported that the previous year's Sector reports could be found on the NCWM website. He also reported that, if contacted, he could supply anyone interested with all previous Sector reports.

Current Comment: The Committee will hear an update on the activities of the NTETC Sectors at the 2008 NCWM Interim Meeting.

5. NTEP Participation in U.S. National Work Group on Harmonization of NIST Handbook 44, NCWM Publication 14 and OIML R 76 and R 60

Background: At its October 2006 meeting in Cape Town, South Africa, the 41st CIML approved DR 7: R 76-1 Non-automatic weighing instruments. Part 1: Metrological and technical requirements – Tests. The DoMC for R 76 will need to be updated to reflect the changes included in the new revision of R 76. Further updates on the current status of this project will be provided by Steve Cook.

Current Comment: Steven Cook reported that the revision of R 76 "Non-automatic Weighing Instruments" is of major importance to U.S. interests because the Recommendation serves as the foundation for a majority of the laws and regulations governing weighing instruments around the world. The revision includes new language addressing metrological controls for type evaluations, conformity, initial and subsequent inspections, suitability of separable components and requirements for metrological software. The USNWG was consulted concerning proposals to harmonize Handbook 44 and R 76. As reported at the 2007 NCWM Interim Meeting, the DR of R 76-1 was approved by the CIML in October, 2006. Most recently, the United States voted "yes" on the DR of R 76-2 "Test Report Format." It is anticipated that the revision of R 76 will be published and posted on the OIML website prior to the 2008 NCWM Interim Meeting. Once the final version of R 76 is published, the Secretariat (U.S.) to OIML R 60 – "Metrological regulation for load cells" will send a questionnaire to the members of OIML TC1 and the USNWG requesting input on whether or not to recommend a revision to R 60. The questionnaire will ask for feedback on a broad scope of topics from the basic principles of R 60 (e.g., tolerances and accuracy classes) to exploring the addition of new requirements. For more information on these efforts, please contact Steve Cook at (301) 975-4003 or steven.cook@nist.gov.

For additional background information, refer to the Committee's 2007 Annual Report.

6. Conformity Assessment Program

Background: 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: The question addresses how this would be accomplished given the limited resources of NCWM. It was suggested this item may need to continue on a "back burner" until resources can be clearly identified to proceed with the project in an efficient, thorough and accurate manner.

During the 92nd NCWM it was reported that this item continues on the "back burner" until funding can be identified for this project.

Initial Verification: During the 2007 NCWM Interim Meeting, the WG chair, Lou Straub, received data from several states on small-capacity price computing scales and reported that the pilot of Initial Verification for small-capacity scales has been completed. There were several state and local jurisdictions that submitted information. All data has been forwarded to NCWM staff for safekeeping. It was also reported that Steve Malone, Nebraska, is working on a database format for logging in the data. In addition, Lou Straub reported that the WG continues to develop a checklist for vehicle scales and retail motor-fuel dispensers (RMFDs).

During the 2007 Annual Meeting, the WG chair, Lou Straub, reported that the WG is currently looking for direction from the NTEP Committee on how to proceed to the next step since they have completed work on the checklists for both vehicle scales and RMFDs. The WG has received some data for the vehicle scales checklist. The WG is seeking volunteers for RMFDs at this time. Mr. Straub clarified that not all states or jurisdictions need to participate in submitting information to NCWM on initial verification. A subset of states would be sufficient. NTEP Committee chair, Don Onwiler, instructed the WG to proceed with development of additional checklists. The NTEP committee will also consider how to process the data generated from initial verification.

Verified Conformity Assessment Program (VCAP): The WG chairman provided the NCWM Board with a final version of the WG report at the 2006 NCWM Annual Meeting. While this report will form the basis of the technical policy, additional work will be needed. Steve Patoray reported that the NCWM Board at its October 2006 meeting directed him to form a small WG to develop the necessary details to define the program based on the final report of the VCAP WG. Steve reported that the WG had met one time and had identified seven action items. The information will be developed over the next several months and will be sent to others for comment and review.

While the WG intended to make a formal presentation of its progress at the NCWM Annual Meeting in 2007, NTEP Director, Steve Patoray, reported that further meetings of the WG did not occur since the WG believed the initial direction of developing a detailed checklist for VCAP was not the correct direction. With this new insight, actual progress on VCAP should begin over the next several months with development of final material based on the current information available and some additional information regarding the selection of a certified auditor. Mr. Patoray anticipates that beta testing of VCAP will take place over the next several months.

Current Comment: Steve Patoray will update the NTEP Committee and the NCWM Board regarding the current status of these items.

7. NTEP Certification of Residential-Type Water and Vapor Meters

Background: NTEP received a request from one state for NTEP to conduct evaluations and certify residential-type water meters and vapor meters. The main usage of such device is in sub-metering. A discussion was held on this item at the Measuring Sector meeting in October 2006. There was insufficient representation from the manufacturers of this type of device to come to consensus on this item. However, two work groups were formed consisting of interested parties regarding these device types. The Sector chair, Mike Keilty, sent a letter to manufacturers of this device type with a request for comments, recommendations, and additional information on sub-metering standards and policies from other agencies and municipalities.

Following is the position of the NTEP Committee:

Due to the need for certification of these types of devices in sub-metering applications, NTEP should proceed with development of a checklist for these types of devices. It has been noted that California currently has checklists for both of these device types and has many years of experience certifying these devices at the state level. NTEP will utilize these current checklists as much as possible in developing checklists for Publication 14.

The Sector chair for measuring devices, Michael Keilty, reported to the NTEP Committee that he has been in contact with the American Waterworks Association (AWWA) and has attended a recent meeting of this organization. He has passed along information regarding NCWM and NTEP along with contact information to this organization.

Current Comment: Steve Patoray (NTEP director) and Dick Suiter (NIST technical advisor to the Measuring Sector) will update the NTEP Committee on the status of this item. At its October 2007 meeting, the Measuring Sector discussed this item and made several recommendations regarding residential water meters. These recommendations will be presented to the NTEP Committee for approval.

8. Use of NTEP Logo

Background: The NTEP Logo is a registered trademark of NCWM. NCWM Publication 14 Administrative Policy provides some parameters on appropriate use of the logo. Over the past several months, NTEP has been attempting to resolve an issue of misuse of the NTEP logo. During this time, the NTEP Committee and the NCWM Board discussed developing a systematic method of addressing misuse of the NTEP logo in the future. A work group was formed during the 2006 Annual Meeting with the charge to develop draft form letters that could be used by NTEP to inform anyone believed to be misusing the NTEP logo. Additionally, NCWM staff was directed by the Board to obtain advice from legal counsel as to the appropriate methods of deterring misuse of the logo.

Legal counsel recommended that a license agreement be implemented between NCWM and anyone wishing to use the NTEP logo. This agreement would provide allowances and limitations on the use of the logo. The license agreement, along with form letters drawn up by legal counsel, was submitted to the NCWM Board for discussion. The Board has recognized the change in policy related to the use of the NTEP logo was significant. Therefore, the NTEP Committee presented the proposed license agreement for review and requested comment from NCWM membership during the 2007 Interim Meeting. A draft copy of the license agreement can be found in the 2007 NCWM Annual Report of the NTEP Committee, as Appendix A.

Current Comment: The documents were finalized, the policy was completed and the information regarding the use of the NTEP logo was placed on the NCWM website: http://www.ncwm.net/ntep/index.cfm?fuseaction=logo. The abbreviated license agreement was sent out to all active holders of NTEP Certificates of Conformance with the maintenance fee invoices. The NCWM received a positive response from the mailing, and several companies have been contacted regarding the misuse of the NTEP logo.

9. NTEP Policy for issuing Certificates of Conformance for Software (New Item)

Source: NTETC Software Sector

Background: Excerpts of reports from the 1995 - 1998 Executive Committee were provided to NTETC Software Sector members at their April 2006 meeting. The chair asked the Sector to review the following NTEP policy decision adopted by the NCWM in 1998 relative to the issuance of a separate Certificate of Conformance (CC) for software.

During the 1998 NCWM, the following recommendation was adopted as NTEP policy:

- "Software, regardless of its form, shall not be subject to evaluation for the purpose of receiving a separate, software Certificate of Conformance from the National Type Evaluation Program."
- "Remove all of the software categories from the index of NCWM Publication 5, NTEP Index of Device Evaluations."
- "Reclassify all existing software CCs according to their applicable device categories."

The policy is still in effect today.

Also noteworthy is a statement in Section C of NCWM Publication 14, Administrative Policy. It states:

"In general, type evaluations will be conducted on all equipment that affect the measurement process or the validity of the transaction (e.g. electronic cash registers interfaced with scales and service station consoles interfaced with retail fuel dispensers); and all equipment to the point of the first indicated or recorded representation of the final quantity on which the transaction will be based."

Software which is implemented as an add-on to other NTEP-Certified main elements to create a weighing or measuring system and its metrological functions are significant in determining the first indication of the final quantity. Such software is considered to be a main element of the system requiring traceability to a Certificate of Conformance. Current policy, however, prohibits NTEP from issuing a separate certificate just for the software. The certificate must be issued on the entire system.

The Software Sector considered the possibility of amending the 1998 policy to allow NTEP to issue separate Certificates of Conformance for software. This new policy would not change how NTEP evaluates software; it would simply change how the software is represented on the certificate. For example, software designed to act as a point-of-sale would be represented on the Certificate as "Software" with further description as "Point-of-Sale System." The certificate would allow this software to be implemented as a main element of a weighing system using compatible hardware including scanner/scale, cash register, printer, computer processor, etc. If this fundamental approach is taken, it will allow the Software Sector to move toward the other steps in the process.

The consensus of the Sector is that the current NCWM/NTEP policy should be changed.

Recommendation from the Sector to the NTEP Committee:

Software Requiring a Separate CC: Software, which is implemented as an add-on to other NTEP-Certified main elements to create a weighing or measuring system and its metrological functions, are significant in determining the first indication of the final quantity. Such software is considered a main element of the system requiring traceability to an NTEP CC.

NOTE: OEM software *may* be added to an existing CC or have a stand-alone CC with applicable applications (e.g., a manufacturer adding a software upgrade to their ECR or point-of-sale system, vehicle scale weigh-in/weigh-out software added as a feature to an indicating element, automatic bulk weighing, liquid-measuring device loading racks, etc.) and minimum system requirements for "type P" (built-for-purpose) devices (see proposed software definition below). It may be possible for a manufacturer to submit a single application for both hardware and software contained in the same device. A single CC would be issued.

In this instance, OEM refers to a third party. The request to add software could be made by the original CC holder on behalf of the third party. Alternatively, a new CC could be created that refers to the original CC and simply lists the new portions that were examined.

As further background, the proposed definition is included for reference.

Recommendation from the Sector to the S&T Committee:

The Sector recommended that the following definition be submitted to the S&T Committee as a developing item and be considered for inclusion in NIST Handbook 44. Please refer to the S&T Committee Interim Agenda Item 310-2 for additional information on the proposed definition.

Add the following definition to Appendix D.

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.

Don Onwiler, Nebraska, NTEP Committee Chair Judy Cardin, Wisconsin, NCWM Chair Jack Kane, Montana, NCWM Chair-Elect Charles Carroll, Massachusetts Randy Jennings, Tennessee

NTEP Technical Advisor: S. Patoray, NTEP Director

National Type Evaluation Program Committee

Appendix A

NTEP Draft Grain Analyzer Sector Meeting Summary

This report can be viewed on the National Conference of Weights and Measures website at:

NTEP Committee 2008 Interim Agenda Appendix A – NTEP Draft Grain Analyzer Sector Meeting Summary

Appendix B

NTETC Draft Measuring Sector Meeting Summary

This report can be viewed on the National Conference of Weights and Measures website at:

NTEP Committee 2008 Interim Agenda Appendix B – NTETC Draft Measuring Sector Meeting Summary

Appendix C

NTETC Draft Weighing Sector Meeting Summary

This report can be viewed on the National Conference of Weights and Measures website at:

NTEP Committee 2008 Interim Agenda Appendix C – NTETC Draft Weighing Sector Meeting Summary

Appendix D

NTETC Draft Software Sector Meeting Summary

This report can be viewed on the National Conference of Weights and Measures website at:

NTEP 2008 Interim Agenda Appendix D – NTETC Draft Software Sector Meeting Summary