

NATIONAL CONFERENCE ON WEIGHTS AND MEASURES



United States Department of Commerce

Technology Administration

National Institute of Standards and Technology



Committee Reports for the 90th Annual Meeting July 10-14, 2005 - Orlando, Florida

National Conf and Measures Weights 100 YEARS OF EQUITY IN THE MARKETPLACE



The National Conference on Weights and Measures Overview

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

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

A major objective of the National Conference on Weights and Measures is to foster understanding and cooperation among weights and measures officials and all industrial, business, and consumer interests. The Conference has been cited on numerous occasions for its outstanding success.

The National Institute of Standards and Technology has statutory responsibility for "cooperation with the States in securing uniformity of weights and measures laws and methods of inspection." In partial fulfillment of this responsibility, the Institute is pleased to publish this document for the Conference.

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



Committee Reports for the 90th National Conference on Weights and Measures

Prepared in coordination and cooperation with the NIST Weights and Measures Division and the National Conference on Weights and Measures 2005

Editors:

Henry V. Oppermann, Chief Linda Crown Lynn Sebring Technical Advisors to the Standing Committees

NIST Weights and Measures Division Gaithersburg, MD 20899-2600

National Conference on Weights and Measures

100 YEARS of EQUITY IN THE MARKETPLACE

U.S. Department of Commerce Carlo M. Gutierrez, Secretary

> **Technology Administration** Phillip J. Bond, Under Secretary of Commerce for Technology

National Institute of Standards and Technology Hratch Semerjian, Acting Director



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

National Conference on Weights and Measures

Annual Meeting of the 90th NCWM

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National Conference on Weights and Measures

"One hundred years of consumer protection through standard setting"

15245 Shady Grove Rd., Suite 130 • Rockville, MD 20850 • (240)632-9454 • FAX (301)990-9771 • Email: mcwm@mgmtsol.com

To: Weights and Measures Officials Representatives of Business, Industry and Consumer Organizations Federal Agency Representatives Parties Interested in Legal Metrology

"100 Years of Equity in the Marketplace"

I would like to invite one and all to the NCWM 90^{th} Annual Meeting, July 10 - 14, 2005 at the Hilton in Walt Disney World, Orlando, Florida.

This year's Annual Meeting theme is "100 years of Equity in the Marketplace". The theme recognizes the hundred- year anniversary of the National Conference on Weights and Measures. As a standards writing organization, we have protected both the buyer and seller in the marketplace. We have been successful in this endeavor because of the participation of weights and measures officials, regulated industries and other interested parties in our rule adoption process. I believe if there is one thing of which the Conference can be most proud it is the due process in its standards developing system.

The NCWM continues to gain recognition internationally. This year the Conference has become more active in the international arena. To support some of our industry stakeholders, we are participating in OIML's provisional Committee on Participation Review with a goal of becoming an "issuing participant." I believe OIML was depending on NCWM's participation to make this committee feasible. We were also invited to attend a meeting in Japan to explain how the National Type Evaluation Program worked in the United States. In turn, a delegation from Japan visited two NTEP Laboratories and met with me to discuss the legal metrology system in our country.

While the work of the Conferences goes on year round, it culminates at our Annual Meeting. The work of many of our stakeholders and partners is reflected in this publication. I urge you to study the issues and take the opportunity to participate in the 90th Annual Meeting of the NCWM.

I look forward to seeing you in July.

A. Waston Augre

G. Weston Diggs Chairman, National Conference on Weights and Measures

Past Chairmen of the Conference

44th	1959	C. M. Fuller, CA	67th	1982	Edward C. Heffron, MI
45th	1960	H. E. Crawford, FL	68th	1983	Charles H. Greene, NM
46th	1961	R. E. Meek, IN	69th	1984	Sam F. Hindsman, AR
47th	1962	Robert Williams, NY	70th	1985	Ezio F. Delfino, CA
48th	1963	C. H. Stender, SC	71st	1986	George E. Mattimoe, HI
49th	1964	D. M. Turnbull, WA	72nd	1987	Frank C. Nagele, MI
50th	1965	V. D. Campbell, OH	73rd	1988	Darrell A. Guensler, CA
51st	1966	J. F. True, KS	74th	1989	John J. Bartfai, NY
52nd	1967	J. E. Bowen, MA	75th	1990	Fred A. Gerk, NM
53rd	1968	C. C. Morgan, IN	76th	1991	N. David Smith, NC
54th	1969	S. H. Christie, NJ	77th	1992	Sidney A. Colbrook, IL
55th	1970	R. W. Searles, OH	78th	1993	Allan M. Nelson, CT
56th	1971	M. Jennings, TN	79th	1994	Thomas F. Geiler, MA
57th	1972	E. H. Black, CA	80th	1995	James C. Truex, OH
58th	1973	George L. Johnson, KY	81st	1996	Charles A. Gardner, NY
59th	1974	John H. Lewis, WA	82nd	1997	Barbara J. Bloch, CA
60th	1975	Sydney D. Andrews, FL	83rd	1998	Steven A. Malone, NE
61st	1976	Richard L. Thompson, MD	84th	1999	Aves D. Thompson, AK
62nd	1977	Earl Prideaux, CO	85th	2000	G. Weston Diggs, VA
63rd	1978	James F. Lyles, VA	86th	2001	L. Straub, MD
64th	1979	Kendrick J. Simila, OR	87th	2002	Ron Murdock, NC
65th	1980	Charles H. Vincent, TX	88th	2003	Ross J. Andersen, NY
66th	1981	Edward H. Stadolnik, MA	89th	2004	Dennis Ehrhart, AZ

National Conference on Weights and Measures, Inc. Organization Chart 2004/2005

Board of Directors			
Office Representation	Name/Affiliation	Term Expires	
Chairman:	G.W. Diggs, VA*	2005	
Chairman-Elect:	D. Onwiler, NE*	2005	
NTEP Committee Chair:	J. Truex, OH*	2006	
Treasurer:	T. Geiler, MA	2005	
Active Membership/Northeastern:	C. Carroll, MA*	2009	
Active Membership/Central:	J. Cardin, WI	2005	
Active Membership/Southern:	S. Pahl, TX*	2008	
Active Membership/Western:	M. Cleary, CA	2007	
At-Large:	C. Guay, Proctor & Gamble	2008	
At-Large:	M. Pinagel, MI	2006	
Associate Membership:	D. Flocken, Mettler-Toledo	2007	
*National Type Evaluation Program (NTEP) Committee Mer	nber		
Honorary NCWM President:	H. Semerjian, Acting NIST Dir	ector	
NCWM Executive Secretary:	H. Oppermann, NIST W&M Division		
NCWM Executive Director:	B. Palys, CAE, NCWM Headquarters		
BOD Advisor:	G. Vinet, Measurement Canada		
NTEP Director:	S. Patoray, NCWM Headquarters		
NTEP Committee Technical Advisor:	S. Cook, NIST W&M Division		

Committees			
Laws & Regulations Committee		Specifications & Tolerances Committee	
Position	Name/Affiliation (Term Expires)	Position	Name/Affiliation (Term Expires)
Chair: Members:	J. Gomez, (2005) J. Benavides, TX (2006) J. Cassidy, MA (2007) V. Dempsey, OH (2008) D. Johannes, CA (2009)	Chair: Members:	J. Kane, MT (2005) C. Cooney, OR (2006) M. Sikula, NY (2007) Carol Fulmer, SC (2008) Todd Lucas, OH (2009)
Associate Member Rep:	V. Orr, ConAgra Foods	Associate Member Rep:	TBD
Canadian Tech Advisors:	D. Hutchinson B. Lemon	Canadian Tech Advisor:	T. Kingsbury
NIST Tech. Advisors:	T. Coleman K. Dresser S. Cook	NIST Tech. Advisors:	R. Suiter J. Williams

	Committees	(continued)			
Professional Development Committee		Metrology Committee			
Chair: Members:	 K. Deitzler, PA (2006) C. Bennett, MI (2006) A. Shields, OH (2008) J. Buendel, WA (2009) W. Wotthlie, MD (2009) S. Strnad, TX 	Chair: Co-Chair: Members:	S. Sumner, NM D. Newcombe, ME L. F. Eason, NC A. Gruneisen, CA M. Harwitz, WI J. Rothleder, CA J. Torres, PR		
Safety Liaison	C. Gardner, NY				
Staff Liaison	B. Levy, NCWM		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
Associate Member Rep:	TBD	NIST Tech Advisor:	V. Miller		
Nominat	ing Committee	Legisla	tive Liaison		
Chair: Members:	R. Andersen, NY W. Diggs, VA D. Onwiler, NE A. Thompson, AK D. Flocken, Mettler-Toledo G. Prince, Kroger Company L. Straub, Fairbanks Scales	Chair: Members:	TBD TBD		
Credentials Committee		Appoin	Appointed Officers		
Chair: Members:	TBD TBD TBD NCWM Staff	Parliamentarian: Chaplain: Sergeants-At-Arms: Presiding Officers:	A. Thompson, AK M. Belue, Belue Associates TBD J. Stump, IN		
Coordinator.	Associata Mamba	mehin Committee	D. Stamp, IIV		
Vice Chair: Secretary/Treasurer: Members:		G. Lameris, Hobart Corpo S. Langford, Cardinal Sca R. Murnane, Jr., Seraphin W. Sveum, Kraft Foods (2	SA (2006) pration (2007) le (2008) Test Measures (2006) 2007)		
		 D. Flocken, Mettler-Toled C. Frye, International Dain V. Orr, ConAgra Foods (2 P. Lewis, Rice Lake Weig M. Gaspers, Farmland Food 	lo (2008) ry Foods Association (2008) 2009) ching Systems (2009) ods, Inc. (2009)		

Regional Weights and Measures Association Contacts			
Northeastern Weights and Measures Assn. (NEWMA):	William J. Wilson		
Annual Meeting: May 16-19, 2005	Clinton County, New York, Weights & Measures		
Best Western Airport Inn - Albany, NY	(518) 565-4681		
	clinton.wts@yahoo.com		
Southern Weights and Measures Assn. (SWMA):	Randy F. Jennings		
Annual Meeting: October 23-26, 2005	Tennessee Dept. of Agriculture		
Hotel: TBD - Memphis, TN	(615) 837-5747		
	randy.jennings@state.tn.us		
Central Weights and Measures Assn. (CWMA):	Judy Cardin		
Annual Meeting: May 1-5, 2005	Wisconsin Dept. of Agriculture & Consumer Protection		
Best Western Inn on the Park - Madison, WI	(608) 224-4945		
	judy.cardin@datcp.state.wi.us		
Western Weights and Measures Assn. (WWMA):	Debra E. Rader		
Annual Meeting: September 11-15, 2005	Arizona Dept. of Weight & Measures		
Ritz-Carlton - Phoenix, Arizona	(623) 463-9955		
	drader@azdwm.gov		

National Type Evaluation Technical Committees (NTETC)			
	Weighing Sector		Measuring Sector
Chair:	D. Flocken, Mettler-Toledo	Chair:	M. Keilty, Endress & Hauser Flowtec AG
Technical Advisor:	S. Cook, NIST/WMD	Technical Advisor:	R. Suiter, NIST/WMD
Public Sector Members:	 C. Ainsworth, GIPSA R. Andersen, NY W. Bates, GIPSA L. Burtini, Measurement Canada A. Buie, MD C. Carter, OK G. Castro, CA T. Davis, KS G. W. Diggs, VA J. Kane, MT D. Onwiler, NE D. Parks, CA J. Truex, OH J. Vanderwielen, GIPSA W. West, OH R. Wyckoff, OR 	Public Sector Members: Private Sector Members:	 R. Andersen, NY J. Butler, NC G. Castro, CA S. Hadder, FL T. Kingsbury, Measurement Canada J. Makin, Measurement Canada J. Makin, Measurement Canada S. Malone, NE C. Nelson, CA W. West, OH R. Wotthlie, MD F. M. Belue, Belue Associates J. Beyer, Liquid Controls M. Buttler, Emerson Process Management - Micro Motion J. Buxton, Daniel Measurement & Control R. Cooper, Actaris Neptune
Private Sector Members:	 D. Biette, Sartorius North America J. Elengo, Contractor R. Feezor, Norfolk Southern Corp. W. GeMeiner, Union Pacific RR D. Hawkins, Thurman Scale Co. J. Hughes, Avery Weigh-Tronix, Inc. R. Jimenez, Association of American Railroads G. Lameris, Hobart Corp. S. Langford, Cardinal Scale Mfg. P. Lewis, Rice Lake Weighing Systems L. E. Luthy, Brechbuhler Scales, Inc. N. Puri, NMB Technologies, Inc. L. Straub, Fairbanks Scales, Inc. J. Wang, A&D Engineering, Inc. O. Warnlof, Consultant W. Young, Emery Winslow Scale 		 M. Forkert, Tuthill Transfer Systems M. Gallo, Clean Fueling Technologies P. Glowacki, Murray Equipment M. Hankel, MCH Engineering Assoc. D. Hoffman, TopTech Systems G. Johnson, Gilbarco, Inc. Y. Katselnik, Dresser Wayne, Inc. R. Kretzler, Dresser Wayne, Inc. D. Long, RDM Industrial Electronics W. Mattar, Invensys/Foxboro R. Miller, FMC Measurement Solution R. Murnane, Jr., Seraphin Test Measure A. Noel, Neptune Technology J. Parrish, Brodie Meter Company, LLC D. Rajala, Veeder-Root Company O. Warnlof, Consultant

	National Type Evaluation Technic	cal Commit	tees (NTETC) (cont'd)
Bel	t Conveyor Scales Sector		Grain Analyzer Sector
Chair:	TBD	Chair:	C. Eigenmann-Pierson, DICKEY-john Corp.
Technical Advisor:	S. Cook, NIST/WMD	Technical Advisors:	G. Diane. Lee, NIST/WMD J. W. Barber, J. B. Associates
Public Sector Members: Private Sector Members:	 A. Buie, MD R. Jimenez, Association of American Railroads L. Marmsater, Merrick Industries B. Ripka, Thermo Electron P. Sirrico, Thayer Scale - Hyer Industries, Inc. 	Public Sector Members:	 R. Burns, AR T. Butcher, NIST A. Gruneisen, CA D. Onwiler, NE R. Pierce, GIPSA E. Szesnat, Jr., NY C. Tew, NC R. Wittenberger, MO
	T. Vormittag, Sr, SGS Minerals Services O. Warnlof, Consultant	Private Sector Members:	 J. Bair, NA Miller's Association H. Biermann, Bizerba GmbH & Co KG M. Clements, The Steinlite Corp. V. Gates, Shore Sales Company A. Gell, Foss North America C. Hurburgh, Jr., Iowa State University D. Krejci, Grain Elevator & Processing Society T. O'Connor, National Grain & Feed Assn. T. Runyon, Seedboro Equipment



NCWM 90th Annual Meeting Schedule of Events

July 10-14, 2005 • Orlando, Florida

Na 100 YEARS of EQUITY IN THE MARKETPLACE

(as of February 18, 2005 – final schedule to be distributed on-site)

Saturday, July 9, 2005 8:30 am - 5:00 p.m.	NCWM Board of Directors Meeting
Sunday, July 10, 2005	
8:30 a.m 4:30 p.m.	Registration and Table-top Exhibits
9:30 a.m 1:00 p.m.	Standing Committees' Agenda Review
	Board of Directors Meeting
	Laws & Regulations Committee
	Professional Development Committee
	Specifications & Tolerances Committee
1:00 p.m 3:00 p.m.	Break
3:00 p.m 3:30 p.m.	Orientation for New Members
	This session is designed to help new members become acquainted with the organization and procedures of the National Conference on Weights and Measures.
	G.W. (Wes) Diggs, Conference Chairman Program Supervisor, Virginia Product & Industry Standards, Richmond, VA
	Mark Galletta, Chairman, Associate Membership Committee Quality Systems Manager, Nestle USA, Glendale, CA
	Henry V. Oppermann, Executive Secretary <i>Chief, Weights and Measures Division, NIST, Gaithersburg, MD</i>
3:30 p.m 4:30 p.m.	Open Hearings
Note: Times of each hearing are not firm; when one Committee finishes, the next Committee will begin	Professional Development Committee Kenneth Deitzler, Committee Chairman <i>Chief, Bureau of Ride & Measurement Standards, Harrisburg, PA</i>
begin.	Specifications & Tolerances Committee
	Jack Kane, Committee Chairman Bureau Chief, Montana Bureau of Weights & Measures, Helena, MT Laws & Regulations Committee Joe Gomez, Committee Chairman Division Director Standards & Consumer Services Division New Mexico Department of Agriculture, Las Cruces, NM
	Board of Directors G.W. (Wes) Diggs, Chairman Program Supervisor, Virginia Product & Industry Standards, Richmond, VA
	NTEP Committee James C. Truex, Committee Chairman Chief, Division of Weights & Measures Ohio Department of Agriculture, Reynoldsburg, OH
5:30 p.m 7:00 p.m.	National Conference on Weights and Measures and the International Society of Weighing and Measurement Joint Reception



NCWM 90th Annual Meeting Schedule of Events

National Conference on Weights and Measure 100 YEARS of EQUITY IN THE MARKETPLACE

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(as of February 18, 2005 – final schedule to be distributed on-site)

Monday, July 11, 2005

7:30 a.m 8:30 a.m.	Industry Committee on Packaging & Labeling			
7:30 a.m 5:00 p.m.	Registration and Table-top Exhibits			
8:30 a.m 5:00 p.m.	Official Session – Standing Committee Open Hearings			
Note: Times of each hearing are	Specifications & Tolerances Committee			
finishes, the next Committee will	Laws & Regulations Committee			
begin.	Board of Directors			
	NTEP Committee			
12:00 Noon - 1:30 p.m.	Associate Membership Committee			
12:00 Noon - 2:00 p.m.	Lunch (on your own) and please visit the ISWM Exhibits in Grand Ballroom IV-V			
2:00 p.m 4:30 p.m.	Committee Work Sessions			
	Professional Development Committee			
	Laws & Regulations Committee			
	Specifications & Tolerances Committee			
5:00 p.m 7:00 p.m.	NCWM 100th Anniversary Reception in the ISWM Exhibit Hall hosted by the International Society of Weighing & Measurement			
Tuesday, July 12, 2005				
7:30 a.m 4:30 p.m.	Registration and Table-top Exhibits			
8:30 a.m 12 Noon	Joint NCWM/ISWM Technical Sessions			
12:00 Noon - 2:00 p.m.	Lunch (on your own) and please visit the ISWM Exhibits in Grand Ballroom IV-V			
2:00 p.m 4:30 p.m.	General Session			
	Pledge of Allegiance & Invocation			

President's Address

Chairman's Address



NCWM 90th Annual Meeting Schedule of Events

July 10-14, 2005 • Orlando, Florida

Nat 100 YEARS of EQUITY IN THE MARKETPLACE

(as of February 18, 2005 – final schedule to be distributed on-site)

Wednesday, July 13, 2005

8:00 a.m 3:30 p.m.	Registration and Table-top Exhibits
8:30 a.m 12:00 Noon	Regional Association Meetings Northeastern Weights & Measures Association Southern Weights & Measures Association
	Central Weights & Measures Association Western Weights & Measures Association
12:00 Noon - 1:00 p.m.	Lunch (on your own)
1:00 p.m 3:30 p.m.	General Voting Session
	The Voting Sessions are held Wednesday afternoon through Thursday morning. Committee Chairs reserve the right to group items and select their sequence for presentation on voting. There will be no break between committee reports; registrants should plan to attend an entire voting session to ensure their presence within items of interest are likely to be under consideration.
	Voting on Committee Reports
	Board of Directors / NTEP Committee
	Laws & Regulations Committee
	Specifications & Tolerances Committee
Evening	Special Event co-sponsored by the Associate Membership
Thursday, July 14, 2005	
9:00 a.m 12:00 Noon	General Voting Session (continued)
	Voting on Committee Reports (continued)
	National Type Evaluation Program Committee
	Board of Directors
	Nominating Committee
	CLOSING CEREMONY
	Passing of the Gavel
	G.W. (Wes) Diggs, Outgoing Chairman
	New Chairman's Message
	Don Onwiler, Program Manager Nebraska Division of Weights & Measures, Omaha, NE
	BENEDICTION

General Conference Information

Purpose

The purpose of the Annual Meeting is to provide:

- (1) All members the opportunity to offer comments to the committees on items printed in the Interim Reports.
- (2) All voting delegates an opportunity to vote on committee recommendations.

Orientation for First-time Attendees

Sunday, July 10, 2005 3:00 p.m. - 3:30 p.m.

All attendees, particularly those participating for the first time, are encouraged to attend the orientation meeting on Sunday morning. This session acquaints attendees with the organization and procedures of the Conference and is open to all registered attendees.

Guide to the Interim Committee Reports

The Interim Committee Reports are provided in order for members to know the recommendations of Committees prior to the Annual Meeting. The Reports include Reference Key numbers for the following Committees:

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
Nominating	800 series

The Committee Reports contain recommendations and information on items discussed at the Interim Meeting held during the week of January 23-26, 2005 in Santa Monica, CA. These reports form the basis for conduct of the committee meetings. Each committee will discuss the items in its report during the committee sessions beginning Sunday, July 10, 2005.

Item Categories

The items contained in the Committee Reports are organized into three major categories:

- 1. **Information Items** report on subjects and/or actions under consideration by the committee but not proposed for voting. An "I" follows the item number.
- 2. Voting Items are items for which the committee is making recommendations requiring voting by the Active Members. The recommended language to be voted on is in **bold face type.** A "V" follows the item number.

Some voting items are considered individually; the remainder may be grouped in a "Consent Calendar." **Consent Calendar Items** are voting items that the committees, just prior to the voting sessions, assemble as a single voting item on the assumption that they are non-controversial. The voting items that have been grouped into the Consent Calendar items will be listed on the Addendum Sheets; they are designated only as voting items in this book.

3. Withdrawn Items. Item numbers track those assigned in the Interim Agenda. Items that the committee has withdrawn from the report are marked with a "W."

Each committee reserves the right to shift items among the three categories (voting, information, and withdrawn), except that items which are marked information or withdrawn are not shifted to the voting category. Prior to making a motion for a vote, a committee may move selected items from the Consent Calendar to be voted on individually. However, any change from the Interim Report (as contained in this document) or from what appears on the Addendum Sheets will be explained to the attendees prior to a motion and will be acted upon by the membership prior to calling for the vote.

Modifications to Committee Reports will be documented in the form of Addendum Sheets prepared by the committees following the general sessions and will be available to the attendees no later that 8:00 p.m. on Tuesday, July 12. Committee Reports may be further modified as a result of actions taken by the membership at the voting sessions on July 13-14, 2005.

Written Comments or Oral Statements

Any person or organization wanting to present a prepared statement at one of the committee sessions should make the request in writing to the Executive Secretary. Reasonable limitations on time allotted for presentations will be imposed. (**Note**: Only registered attendees may make presentations.)

Written comments, suggestions, and data relative to these reports must be received by the Executive Secretary or appropriate Technical Advisor by June 10, 2005. Address all comments to the National Institute of Standards and Technology, Weights and Measures Division, 100 Bureau Drive, STOP 2600, Gaithersburg, MD 20899-2600.

Final Report

Final Committee Reports will be prepared by the committees and published in the Report of the 90th Annual Meeting of the National Conference on Weights and Measures, 2005. Each member of the National Conference on Weights and Measures will receive a copy of this publication; other interested parties can receive a copy by request to the Executive Secretary.

All Meetings Are Open Unless Posted

On Sunday Committees review their agendas. All sessions of Conference meetings are normally open to members of the Conference. If a committee must discuss any issue that involves proprietary information (e.g., NTEP appeals) or other confidential material, 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; (2) the Executive Secretary is notified; and (3) an 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 a one-day notice will not be possible if a closed meeting is called on Sunday. Since participants may make their travel reservations in order to attend agenda reviews scheduled for Sunday, every effort will be made to limit any required closed meetings to only part of Sunday.

Interim Report of the Laws and Regulations Committee

Joe Gomez, Chairman New Mexico Weights and Measures

Reference Key Number

200 INTRODUCTION

The Committee on Laws and Regulations (hereinafter referred to as "Committee") submits its Interim Report for consideration by the National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during its Interim Meeting in Santa Monica, California, January 23-26, 2005.

Table A identifies the agenda items in the Report by Reference Key Number, Item Title, and Page Number. The item numbers are those assigned in the Interim Meeting Agenda. A voting item is indicated with a "V" after the item number. An item marked with an "P" after the reference key number is an information item. An item marked with a "D" after the key number is a developing issue. The developing designation indicates an item has merit; however, the item is returned to the submitter for further development before any action can be taken at the national level. An item marked with a "W" was withdrawn by the Committee. An item marked with a "W" generally will be referred to the regional weights and measures associations because it either needs additional development, analysis, and input or does not have sufficient Committee support to bring it before the NCWM.

This Report contains many recommendations to revise or amend National Institute of Standards and Technology (NIST) 130 (HB-130), 2004 Edition, "Uniform Laws and Regulations" and/or Handbook 133 (HB-133), 2003 Edition, "Checking the Net Contents of Packaged Goods." Proposed revisions to the handbook(s) are shown in **bold face print** by **striking out** information to be deleted, and **underlining** information to be added. "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, § 1.2. Weight.) When used in this report, the term "weight" means "mass."

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.

Subject Series	
Introduction	200 Series
NIST Handbook 130 - General	
Uniform Laws	220 Series
Weights and Measures Law (WML)	
Weighmaster Law (WL)	
Engine Fuels, Petroleum Products, and Automotive Lubricants Inspection Law (EFL)	
Uniform Regulations	
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221 UNIFORM WEIGHTS AND MEASURES LAW

221-1 V Update Terminology

Source: Southern Weights and Measures Association (SWMA)

Recommendation: Amend and add the following sections in Handbook 130.

Amend the Table of Contents as follows:

Table of Contents

Section	Page
1. Definitions	
1.4. Primary Standards, Primary	
1.5. Secondary Standards, Secondary	
· <u> </u>	
1.14. Standards, Field	
1.15. Accreditation	
1.16. Calibration	
1.17. Traceability	
1.18. Uncertainty	
1.19. Verification	
1.20. Recognition	
1.21. Standards, Reference	
1.22. Standards, Working	

Amend Sections 1.4 and 1.5 as follows:

1.4. Primary Standards, Primary. --- The term "primary standards" means the physical standards of the State that serve as the legal reference from which all other standards for weights and measures are derived. <u>A</u> standard that is designated or widely acknowledged as having the highest metrological quality and whose value is accepted without reference to another standard of the same quantity.

(Amended 200X)

1.5. Secondary-Standards, Secondary, --- The term "secondary standards" means the physical standards that are traccable to the primary standards through comparisons, using acceptable laboratory procedures, and used in the enforcement of weights and measures laws and regulations. <u>A standard whose value is assigned by comparison with a primary standard of the same quantity.</u>

(Amended 200X)

Add Sections 1.14, 1.15, 1.16, 1.17, 1.18, 1.19, 1.20, 1.21, and 1.22 as follows:

1.14. Standard, Field. -- A physical standard that meet specifications and tolerances in NIST 105-series standards (or other suitable and designated standards) and is traceable to the reference or working standards through comparisons, using acceptable laboratory procedures, and used in conjunction with commercial weighing and measuring equipment (1.13).

(Added 200X)

<u>1.15.</u> Accreditation. -- A formal recognition by a recognized Accreditation Body that a laboratory is competent to carry out specific tests or calibrations or types of tests or calibrations. NOTE: Accreditation does not ensure compliance of standards to appropriate specifications.

(Added 200X)

<u>1.16.</u> Calibration. -- A set of operations which establish, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system, or values represented by a material measure, and the corresponding known values of a measurand.

Also: Comparison of a measurement standard or instrument with another standard or instrument to detect, correlate, report, or eliminate by adjustment any inaccuracy of the compared.

(Added 200X)

1.17. Traceability. -- The property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties.

(Added 200X)

<u>1.18.</u> Uncertainty. -- A parameter associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measurance.

(Added 200X)

<u>1.19. Verification. -- The formal evaluation of a standard or device against the specifications and tolerances</u> for determining conformance.

(Added 200X)

1.20. Recognition. -- A formal recognition by NIST Weights and Measures Division that a laboratory has demonstrated the ability to provide traceable measurement results and is competent to carry out specific tests or calibrations or types of tests or calibrations.

(Added 200X)

1.21. Standard, Reference. -- A standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived. The term "reference standards" means the physical standards of the State that serve as the legal reference from which all other standards for weights and measures within that State are derived.

(Added 200X)

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

(Added 200X)

Amend Section 3 as follows:

Section 3. Physical Standards

Weights and measures that are traceable to the U.S. prototype standards supplied by the Federal Government, or approved as being satisfactory by the National Institute of Standards and Technology, shall be the State **primary reference and working** standards of weights and measures, and shall be maintained in such calibration as prescribed by the National Institute of Standards and Technology **as demonstrated through laboratory accreditation or recognition.** All **secondary field** standards may be prescribed by the director and shall be verified upon their initial receipt, and as often thereafter as deemed necessary by the director.

(Amended 200X)

Amend Sections 12a, 12h, and 12p as follows:

Section 12. Powers and Duties of the Director

The Director shall:

a. maintain traceability of the State standards to the national standards in the possession of the National Institute of Standards and Technology as demonstrated through laboratory accreditation or recognition;

(Amended 200X)

h. **test annually the verify the field** standards for weights and measures used by any **city or county jurisdiction** within the State, **before being put into service, tested annually or as often thereafter as deemed necessary by the director based on statistically evaluated data,** and approve the same when found to be correct;

(Amended 200X)

p. provide for the training of weights and measures personnel, and may establish minimum training and performance requirements which shall then be met by all weights and measures personnel, whether county, municipal, or State. The director may adopt the training standards of the National Conference on Weights and Measures' National Training Program <u>and the laboratory metrology standards specified by the NIST accreditation and/or recognition requirements</u>; and

(Added 1991<u>: Amended 200X)</u>

Discussion: This item came to the Southern Weights and Measures Association from the NIST Handbook Update Work Group in conjunction with Item 234-1, and Specifications and Tolerances (S&T) Committee Item 360-2. It is the intent of the Work Group that these three items be considered together.

One of the reasons for these proposals is to update the terminology used in Handbooks 130 and 44 to conform to international definitions. Terms such as "primary standard" and "secondary standard" have been updated to reflect the international usage of these terms. Terms like "reference standard," "field standard," "traceability," and "uncertainty" have been added to reflect their use within these documents. The proposed changes also allow state directors to exercise more discretion when evaluating calibration intervals, referencing documentary standards, and accepting calibration reports.

This particular proposal allows state directors to change the calibration interval for field standards (which are now required to be calibrated annually). This proposal permits a jurisdiction to collect historical calibration data, including "as-found" measurements, to evaluate whether or not an annual calibration interval is appropriate for a particular type of standard. Based on a statistical analysis of its historical data, a lab may find that its stainless steel field weights only need to be calibrated once every 5 years, while their cast iron weights need to be calibrated every 6 months. The intent is to save jurisdictions time and money by setting calibration intervals at suitable frequencies rather than at arbitrary fixed intervals. This should also lead to improved inspection accuracy by ensuring field standards are within tolerance during

the entire calibration interval. Laboratory metrologists should be familiar with adjusting calibration intervals for laboratory standards, and may be a useful resource for both providing data and doing the statistical analysis. Jurisdictions that need more information or assistance with statistical approaches to changing calibration intervals may consult the National Conference of Standards Laboratories International (NCSLI) Recommended Practice (RP) #1, "Establishment & Adjustment of Calibration Intervals."

These proposed changes would have relatively little effect on state and local weights and measures programs. There is no mandate for a jurisdiction to change the way that it currently operates. The proposed changes would serve only to increase control and flexibility when evaluating field standard calibration intervals, the acceptance of accredited private lab calibration reports, and other similar topics. Much of what is being proposed reflects practices already occurring in jurisdictions across the country.

The Committee did not receive any comments opposing this item. The Committee recommends that this item be adopted.

232 METHOD OF SALE REGULATION

232-1 D Temperature Compensation for Petroleum Products

Source: Southern Weights and Measures Association (SWMA). (See item 232-4 in the Report of the 89th NCWM Annual Meeting in 2004.)

Recommendation: Amend the Method of Sale Regulation in Handbook 130 by adding the following:

2.XX. Temperature Correction For Petroleum Products Other Than LPG. - All petroleum products other than LPG shall be sold by liquid volume.

2.XX.1. Petroleum products sold in volumes greater than 18,927 liters (5,000 U.S. gallons) may be corrected to the volume at 15 °C (60 °F), provided:

2.XX.1.1. The correction is made through automatic means; and

2.XX.1.2. The measuring device and all associated documents clearly indicate the volume has been corrected for temperature.

2.XX.2. Petroleum products sold in volumes less than or equal to 18,927 liters (5,000 U.S. gallons) through (*list specific device(s)*) may be corrected to the volume at 15 °C (60 °F), provided:

2.XX.2.1. The correction is made through automatic means;

2.XX.2.2. The measuring device and all associated documents clearly indicate the volume has been corrected for temperature; and

2.XX.2.3. All sales by the same vendor within a state are corrected over at least a 12month period.

2.XX.3. The volume of petroleum products sold through retail motor fuel devices and in all transactions not covered in 2.XX.2. or 2.XX.3. shall be the volume at the conditions at the time of sale. Products shall not be artificially heated prior to sale.

Discussion: Selling fuel adjusted to the volume at 15 $^{\circ}$ C (60 $^{\circ}$ F) throughout the distribution system is the most equitable way fuel can be sold without the buyer or seller gaining a competitive advantage. Allowing a distributor to buy product at wholesale by gross volume and sell it at retail by net volume is not equitable. A single method of sale should be required so a prospective customer can make a value comparison. There is no practical way customers can make value

comparisons when some locations sell product temperature compensated and other locations sell the same product without temperature compensation.

This item is considered in conjunction with a temperature compensation item that is before the Specifications and Tolerances (S&T) Committee, Item 331-1, although the S&T Committee's item is limited to vehicle-tank meters. The Committee believes this is an important issue that should be given careful consideration. The Committee also believes this item needs to be discussed with parties that may be affected by its adoption. The Committee has requested authorization and funding from the Board of Directors to establish a Work Group to bring together interested parties and build a consensus on the best way to resolve this issue.

A similar proposal was made by the NEWMA in 2000 that mirrored a temperature compensation item before the S&T Committee at the time. In 2000 the NEWMA noted that Pennsylvania, New Hampshire, Maine, and Canada permit temperature compensation in sales of products like home heating fuel and retail gasoline. In 2001 the Committee withdrew this item after hearing testimony from several jurisdictions that opposed it.

The Committee heard several comments opposing the language of this item. The Committee received an alternate recommendation from NEWMA, which it voted to accept and circulate for comments. The Committee decided to keep this item on its agenda as a developing item until a consensus can be reached on the language to be adopted.

234 UNIFORM REGULATION FOR THE VOLUNTARY REGISTRATION OF SERVICEPERSONS AND SERVICE AGENCIES

234-1 V Update Terminology

Source: Southern Weights and Measures Association

Recommendation: Amend Sections 1 (Policy), 5 (Minimum Equipment), 8 (Placed in Service Report), and 9 (Examination of Calibration or Certification of Standards and Testing Equipment) in Handbook 130 as follows:

Section 1. Policy

For the benefit of the users, manufacturers, and distributors of commercial weighing and measuring devices, it shall be the policy of the Director of Weights and Measures, hereinafter referred to as "Director," to accept registration of (a) an individual and (b) an agency providing acceptable evidence that he, she, or it is fully qualified by training or experience to install, service, repair, or recondition a commercial weighing or measuring device; has a thorough working knowledge of all appropriate weights and measures laws, orders, rules, and regulations; and has possession of, or has available for use, and will use **suitable and** calibrated weights and measures **field** standards and testing equipment appropriate in design and adequate in amount. (An employee of the government shall not be eligible for registration.)

The Director will check the qualifications of each applicant. It will be necessary for an applicant to have available sufficient **<u>field</u>** standards and equipment (see § 5).

It shall also be the policy of the Department to issue to qualified applicants, whose applications for registration are approved, a "Certificate of Registration." This gives authority to remove rejection seals and tags placed on Commercial and Law-Enforcement Weighing and Measuring Devices by authorized weights and measures officials, to place in service repaired devices that were rejected, or to place in service devices that have been newly installed.

The Director is NOT guaranteeing the work or fair dealing of a Registered Serviceperson or Service Agency. He will, however, remove from the registration list any Registered Serviceperson or Service Agency that performs unsatisfactory work or takes unfair advantage of a device owner.

Registration with the Director shall be on a voluntary basis. The Director shall reserve the right to limit or reject the application of any Serviceperson or Service Agency and to revoke his, her, or its permit to remove rejection seals or tags for good cause.

This policy shall in no way preclude or limit the right and privilege of any individual or agency not registered with the Director to install, service, repair, or recondition a commercial weighing or measuring device. (see § 7).

(Added 1966; Amended 1984 and 200X)

Section 5. Minimum Equipment

Applicants must have available sufficient standards and equipment to adequately test devices as set forth in the Notes section of each applicable code in NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices." When applicable, t<u>T</u>his equipment will meet the specifications of National Institute of Standards and Technology Handbook 105-1, "Specifications and Tolerances for Reference Standards and Field Standard Weights (NIST Class F)," National Institute of Standards and Technology Handbook 105-2, "Specifications and Tolerances for Reference Standards and Tolerances for Reference Standard Weights (NIST Class F)," National Institute of Standards and Technology Handbook 105-2, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Field Standard Measuring Flasks," or National Institute of Standards and Field Standards and Technology Handbook 105-3, "Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures, Specifications and Tolerances for Graduated Neck Type Volumetric Field Standards," series standards (or other suitable and designated standards). This section shall not preclude the use of additional field standards and/or equipment, as approved by the Director, for uniform evaluation of device performance. See also § 9.

(Added 1984<u>; Amended 200X</u>)

Section 8. Placed in Service Report

The Director shall furnish each Registered Serviceperson and Registered Service Agency with a supply of report forms to be known as "Placed in Service Reports." Such a form shall be executed in triplicate, shall include the assigned registration number, and shall be signed by a Registered Serviceperson or by a serviceperson representing a Registered Agency for each rejected device restored to service and for each newly installed device placed in service. Within 24 hours after a device is restored to service or placed in service, the original of the properly executed Placed in Service Report, together with any official rejection tag removed from the device, shall be **mailed forwarded** to the Director at (address). The duplicate copy of the report shall be handed to the owner or operator of the device, and the triplicate copy of the report shall be retained by the Registered Serviceperson or Registered Service Agency.

(Added 1966<u>; Amended 200X</u>)

Section 9. Examination and Calibration or Certification of Standards and Testing Equipment

All <u>field</u> standards that are used for servicing and testing weights and measures devices for which competence is registered shall be submitted to the Director for <u>initial and subsequent</u> examination and certification <u>verification</u> <u>and calibration</u> at intervals determined by the director. A Registered Serviceperson or Registered Service Agency shall not use in servicing commercial weighing or measuring devices any <u>field</u> standards or testing equipment that have not been <u>certified calibrated or verified</u> by the Director. Equipment calibrated by another State weights and measures laboratory that can show evidence of measurement traceability to the National Institute of Standards and Technology will also be recognized as equipment that is suitable for use by Registered Servicepersons or Registered Service Agencies in this State. The Director may accept calibration and/or verification reports from any laboratory that is formally accredited or recognized. The Director shall maintain a list of organizations from whom the State will accept calibration reports under reciprocity agreements. The State shall retain the right under reciprocity agreements to periodically monitor calibration results and/or to verify field standard compliance to specifications and tolerances when field standards are initially placed into service or at any intermediate point between calibrations.

(Added 1966; Amended 1984, and 1999, and 200X)

Discussion: This item came to the Southern Weights and Measures Association from the NIST Handbook Update Work Group in conjunction with Item 221-1, and Specifications and Tolerances (S&T) Committee Item 360-2. It is the intent of the Work Group that these three items be considered together.

One of the reasons for these proposals is to update the terminology used in Handbooks 130 and 44 to conform to international definitions. Terms such as "primary standard" and "secondary standard" have been updated to reflect the international usage of these terms. Terms like "reference standard," "field standard," "traceability," and "uncertainty" have been added to reflect their use within these documents. The proposed changes allow state directors to exercise additional discretion when evaluating calibration intervals, referencing documentary standards, and accepting calibration reports.

This particular proposal grants state directors the freedom to reference ASTM, OIML, or other suitable documentary standards, in addition to NIST documents, when defining specifications for field standards. Currently, some standards being used in the field have no corresponding NIST document defining their specifications. Allowing ASTM, OIML, or other suitable documentary standards to be referenced would fill this void. State directors must be able to evaluate the impact of a field standard that deviates from documentary standards and assess how it might affect measurement results, functionality, efficiency, and safety. State directors would have the authority and flexibility to accept and designate field standards and to grandfather or otherwise allow deviations from standard specifications. State directors may choose to require unique calibration intervals for these deviant field standards, or they may reject and/or confiscate the deviant standard based on evaluation results. For further guidance on documentary standards that may be used as specifications and tolerances for field standards, please see Appendix A.

In addition, this proposal would allow state directors to accept calibration reports from accredited industry laboratories in addition to NIST WMD-recognized state laboratories. If a private laboratory is accredited by a National Cooperation for Laboratory Accreditation (NACLA)-approved accreditation body, or recognized by NIST WMD as capable of providing traceable measurement results, a state director may decide whether or not s/he wants to accept the calibration reports of the lab after evaluating the scope of accreditation and assessing the lab's measurement uncertainty. Initial verification of field standards may still be required; however, since a calibration report provides no guarantee the equipment meets specifications. Accreditation is not conformity assessment and should not be used for that purpose. State metrologists and technical experts at NIST may be able to assist in evaluating the acceptability of outside calibration reports.

These proposed changes would have relatively little effect on state and local weights and measures programs. There is no mandate for a jurisdiction to change the way that it currently operates. The proposed changes would serve only to increase local control and flexibility when evaluating things like field standard calibration intervals and the acceptance of accredited private lab calibration reports. Much of what is being proposed reflects practices already occurring in jurisdictions across the country.

The Committee did not receive any comments opposing this item. The Committee recommends that this item be adopted.

237 ENGINE FUELS, PETROLEUM PRODUCTS, AND AUTOMOTIVE LUBRICANTS REGULATION

237-1 V Biodiesel Fuel Identification and Labeling

Source: Central Weights and Measures Association (CWMA). (See item 237-3B in the Report of the 89th NCWM Annual Meeting in 2004.)

Recommendation: Amend Handbook 130 Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation by adding the following.

3.15. Biodiesel.

3.15.1. 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: B5; B20; B100)

<u>3.15.2.</u> 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:

3.15.2.1. The capital letter B followed by the numerical value representing the volume percentage of biodiesel fuel and ending with 'biodiesel blend.' (Examples: B5 biodiesel blend; B20 biodiesel blend), or;

3.15.2.2. The phrase "biodiesel blend between 5 % and 20 %" or similar words.

3.15.3. 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)

<u>3.15.4.</u> Documentation for Dispenser Labeling Purposes. - The retailer shall be provided, at the time of delivery of the fuel, with a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labeling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.

<u>3.15.4.</u> Exemption. - Biodiesel blends containing 5 % or less biodiesel by volume are exempted from requirements 3.15.2., 3.15.3., and 3.15.4.

Discussion: The Committee has been working on this item since 2002 and has been monitoring the activities of the American Society for Testing and Materials (ASTM) with regard to biodiesel fuels. The Committee has decided to continue moving forward with identification and labeling requirements for biodiesel blends containing more than 5 % biodiesel by volume. The Committee agrees it is important for consumers to be properly informed about what is being offered for sale so they can make informed purchases. The Committee has been informed that ASTM is considering changing the "Fill and Go" specifications in D 975 to include biodiesel blends of 5 % or less. Existing laws and regulations require accurate and adequate information to be placed on commodities to allow consumers to make price and quantity comparisons. For our economy to function properly, consumers must also be able to rely on manufacturers' product "claims."

When the first biodiesel specification was introduced at ASTM in 1993, it proposed a specification for biodiesel used as a pure fuel, called B100. However, several engine manufacturers had reservations about B100 biodiesel because they had no experience using blends over 20 % (B20). Engine manufacturers recommend that users consult with their engine manufacturer before using biodiesel blends above 5 % (B5) as concerns related to costs, rubber and gasket compatibility, and cold flow properties exist with these blends. While experience over the last 10 years and 40 million on-road miles has shown that biodiesel blends up to 20 % (B20) do not require modifications to the fuel systems of conventional diesel engines, the manufacturers of these engines still promote caution when using biodiesel blends over 5 % (B5). In 2002 ASTM adopted ASTM D 6751, Standard Specification for Biodiesel Fuel (B100) Blend Stock for Distillate Fuels. This specification is for use as a blend component with diesel fuel oils defined in Specification D 975.

ASTM is considering classifying biodiesel blends up to B5 as "Fill and Go" since generally they do not require changes to the engine or fuel system. ASTM is also considering adding a separate specification for B20 blends. Biodiesel levels higher than B20 may need to have different gaskets and hoses. While blends of biodiesel over 20 % are not readily available in today's marketplace, they may be in the not too distant future. Therefore, the biodiesel industry supports accurate labeling for all fuel dispensers and encourages the NCWM to adopt these recommendations.

An issue that remains, however, is the opportunity for the facilitation of fraud by claiming inaccurate percentages of biodiesel. Biodiesel blends cost significantly more than conventional diesel fuels. As such, there is the possibility that unscrupulous fuel distributors may advertise a higher concentration of biodiesel than they are delivering and thus derive

undue profits. If a distributor claims that they are selling B20 and they are putting in only 1 %, then the distributor is misrepresenting the product. The biodiesel industry claims this is not a pump labeling issue but an enforcement issue.

Part of the problem with a strict percentage labeling requirement is that as biodiesel blends become more "mainstream" the percentage of biodiesel added may vary from day to day depending on the needs of the distributor. Currently this practice is discouraged by the relatively high cost of biodiesel. However, as the price of biodiesel moves closer to the price of diesel fuel, it becomes just one of the myriad of compounds which could make up conventional diesel fuel. Refiners could blend in biodiesel to reduce the sulfur content or aromatic content of the finished blend. They could use it to replace their existing lubricity additives. If the price of biodiesel was more equal to diesel, then they may add 1 % today, 5 % the next day, and 20 % the following day. Theoretically, as long as the finished blend meets the ASTM D 975 "Fill and Go" specification, the level of biodiesel could range as high as 5 % without consequence. Labeling requirements that are too restrictive would eliminate the flexibility of the "Fill and Go" concept and could significantly reduce the amount of biodiesel that is eventually used.

ASTM is currently developing a Biodiesel "Fill and Go" specification for D 975 that is not based on the parent fuels, but on the finished fuel and what is satisfactory for operation in a diesel engine. This may also mean changes to D 6751, which is a stand-alone specification. The current thinking is that the upper biodiesel concentration limit for the D 975 "Fill and Go" specification will be 5 % although it is possible that it could ultimately be higher or lower. Whatever the concentration of biodiesel, if the finished blend meets the D 975 "Fill and Go" specification the fuel is D 975-grade diesel fuel and would have to be labeled as such. Some industry members believe that existing labeling requirements in Handbook 130 are sufficient to address this situation.

The National Biodiesel Board supports this proposal. The Committee did not receive any comments opposing this item. The Committee recommends that this item be adopted.

237-2 I Premium Diesel Lubricity

Source: Southern Weights and Measures Association (SWMA)

Recommendation: Forward the following proposal to the Petroleum Subcommittee to review and consider.

Amend § 2.2.1. in Handbook 130 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 D 613.
- (b) Low Temperature Operability A cold flow performance measurement which meets the ASTM D 975 tenth percentile minimum ambient air temperature charts and maps by either ASTM Standard Test Method D 2500 (Cloud Point) or ASTM Standard Test Method D 4539 (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 D 6468 (180 min, 150 °C).
- (d) Lubricity A maximum wear scar diameter of 520 μm as determined by ASTM D 6079. If an enforcement jurisdiction's singe test of more than 560 μm is determined, a second test shall be conducted. If the average of the two tests is more than 560 μm, the sample does not conform to the requirements of this part.

Discussion: A member of the petroleum industry believes that the test and associated tolerances for lubricity on premium diesel specified in 2.2.1.(d) are inconsistent with that for regular diesel. Effective January 1, 2005, the test tolerance for regular diesel lubricity will be the ASTM D 6079 reproducibility of 136 µm (see ASTM D 975-04b). The

NCWM has chosen to accept the ASTM reproducibility limits for all diesel (D 975) and gasoline (D 4814) properties (see § 7.2.2., Reproducibility), but has chosen a different reproducibility limit for premium diesel lubricity without providing any explanation as to why the ASTM reproducibility limit is insufficient. If the NCWM intends to impose a stricter lubricity requirement for premium diesel, it should designate a tighter specification for this property instead of a different test tolerance (e.g., for regular and premium gasoline, premium has a different octane specification than regular but the test tolerance is the same). ASTM reproducibility limits are, by definition, based on establishing a 95 % probability that product that should pass, will pass. Applying an average test as specified in 2.2.1.(d) reduces this probability to only 80 %.

The Committee received comments from several members of the Premium Diesel Work Group (Work Group) who do not support the item as presented by the petroleum industry member. The Work Group members felt that the process that led to the current definition was very thorough and complete, and that the premium diesel lubricity requirements were established with a full understanding of their implications. The Work Group members felt that very knowledgeable individuals provided input to the process, which lead to the consensus position contained in the current regulation. The work being done by the Work Group was reported at meetings of ASTM Subcommittee E-2 every six months. The current regulation has been endorsed by the American Petroleum Institute, 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 had concluded that a limit of 520 microns 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 microns.

The Work Group members reported that when this regulation was being written fuels with adequate lubricity provided a functional benefit to the end user. The Work Group agreed with the ASTM Lubricity Task Force that 520 microns was the correct limit to set for premium diesel. However, the Work Group's review process also indicated increased pump wear for fuels with High-Frequency Reciprocating Rig (HFRR) values greater than 560 microns. The current reproducibility value of the HFRR test method would have placed enforcement well beyond the 560 micron level, essentially allowing fuels with little lubricity protection to be sold as Premium. The Work Group felt they could not recommend a premium fuel standard that would permit excessive pump wear. Using the statistical tools provided in ASTM D 3244, the Work Group evaluated an enforcement limit of 560 microns. 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 90 % 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 exceeds 560 microns, then a second test must be run. The average of the two tests must exceed 560 microns before a violation would occur. At this time, the Work Group members believe this remains the best approach.

The Committee believes that it lacks the expertise necessary to adequate evaluate this proposal. The Committee voted to forward this proposal to the Petroleum Subcommittee for its review and consideration, and requests that the Subcommittee provide the Committee with a recommendation and justification.

260 NIST HANDBOOK 133, CHECKING THE NET CONTENTS OF PACKAGED GOODS

260-1 D Amend § 2.3 Basic Test Procedure, and Table 2-5

Source: Central Weights and Measures Association (CWMA). (See item 260-4 in the Report of the 89th NCWM Annual Meeting in 2004.)

Recommendation: Amend Handbook 133 § 2.3 as follows:

Where are Maximum Allowable Variations found?

Find the MAV values for packages labeled by weight, volume, count, and measure in the tables listed below in Appendix A.

•	Packages labeled by weight	See Table 2-5
•	Packages labeled by volume liquid or dry	See Table 2-6
•	Packages labeled by count	See Table 2-7
•	Packages labeled by length (width), or area	See Table 2-8
•	Packages labeled with <u>bearing a</u> USDA seal of inspection - Meat and Poultry when labeled weight is provided by the USDA inspected facility	See Table 2-9
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• Textiles, polyethylene sheeting and film, mulch and soil labeled by volume, See Table 2-10 packaged firewood, and packages labeled by count with less than 50 items

Amend the Header of Table 2-5 in Handbook 133 as follows:

Table 2-5. Maximum Allowable Variations (MAVs) for Packages Labeled by Weight Do Not Use This Table fF Provided by USDA-Inspected Facility Provided by USDA-Inspected Facility – Use Table 2-9 Each Packages Table 2-10 Face Table 2-10

For Polyethylene Sheeting and Film, see Table 2-10. Exceptions to the MAVs.

Discussion: This proposal was originally intended to more clearly define when the USDA lower limits should apply (Table 2-9) and when MAVs should apply (Table 2-5) to packages of meat and poultry. This item was informational on the Committee's agenda in 2004 and NIST was granted editorial privileges to amend Handbook 133 to include this proposal. However, after researching the issue NIST believes this proposal is in conflict with language adopted by the USDA. The USDA requires that Table 2-9 lower limits be applied to any "meat and poultry product subject to USDA requirements." The language adopted by the USDA does not distinguish between packages packed and weighed at a USDA plant and packages packed at a USDA plant but weighed elsewhere; it simply requires that any package subject to USDA jurisdiction be tested with the USDA lower limits. NIST cannot include language in Handbook 133 that is in conflict with federal regulations.

NIST has contacted the USDA about this item and has been informed that the USDA opposes the changes suggested by this proposal. The Committee would like to receive an opinion letter from the USDA on this proposal, and voted to maintain this item on its agenda pending the receipt of such a letter.

260-2 W Amend § 3.11 and MAV Table 2-10

Source: Western Weights and Measures Association (WWMA). (See item 260-6 in the Report of the 89th NCWM Annual Meeting in 2004.)

Recommendation: Amend the application and header of Handbook 133 Table 2-10 as follows to allow the MAVs that apply to Mulch and Soil to also apply to similar products, such as Wood Shavings and Animal Bedding:

Table 2-10. Exceptions to the Maximum Allowable Variations for Textiles, Polyethylene Sheeting and Film, Mulch and, Soil<u>, and Other Similar Products</u> Labeled by Volume, Packaged Firewood, and Packages Labeled by Count with Less than 50 Items

Amend Handbook 133 § 3.11 to read:

3.11. Mulch and, Soil, and Other Similar Products Labeled by Volume

Discussion: A manufacturer of wood fiber products believes wood shavings, labeled by volume, should receive the same MAV exceptions as mulch, soils or peat moss. The wood fiber products in question could conceivably be used as

animal bedding, insulation, mulch (a horticultural above-ground dressing), etc. Item 250-10, which was adopted at the 83rd National Conference on Weights and Measures in 1998 and was entitled "Bark Mulch and Other Organic Products - Maximum Allowable Variations," discussed the reasoning and the necessity for expanded MAVs in certain circumstances, and some of this rationale may apply to other wood fiber products.

The Committee believes that the manufacturer seeking this additional allowance has not provided sufficient data to support its position. There is an established procedure for evaluating MAVs and the manufacturer has not followed it. The Committee feels this item needs to be further developed by the manufacturer in conjunction with a regulatory agency to provide reliable data upon which to base any decision.

In addition, concerns have been raised about the expansion of the mulch, soil, and peat moss sections to "Other Similar Products." What are "Other Similar Products?" Are they products that are used in similar applications? If so, and if "Other Similar Products" is intended to extend to pet beddings made of wood shavings, should it also be extended to pet beddings made of paper (also a wood product)? What about pet beddings made from other substances (clay, straw, etc.)? It is believed that the language proposed is overly broad and needs to be better defined to capture the product under consideration without including products that do not require the larger MAV.

The Committee has received several comments opposing this item. The Committee has neither heard nor received additional information from the original proponent of this item to justify its adoption. The Committee voted to withdraw this item.

260-3 D Make MAV Tables More Uniform

Source: Northeast Weights and Measures Association (NEWMA)

Recommendation: To evaluate whether or not the MAV tables in Handbook 133 should be revised to be more uniform with other national and global standards.

Discussion: The Committee heard from several manufacturers and packers that meeting the different MAVs in the global marketplace is not generally a problem for them. While most of the comments heard did not directly oppose this item, the overall sentiment was that this was not a high priority issue for manufacturers and packers. The Committee voted not to pursue the establishment of new MAVs through the collection of data. However, the Committee did believe there may be merit in seeking to make Handbook 133 MAVs more uniform with other MAVs in the global marketplace. The Committee voted to keep this item developmental and work towards establishing more uniform MAVs.

270 OTHER ITEMS

270-1 W Tare on Case-Ready Packages of Meat

Source: Central Weights and Measures Association (CWMA)

Recommendation: The NCWM should petition the USDA to request a rule change that would require packers of caseready consumer-sized packages of beef and pork to print the individual consumer package tare weights on the outside of the shipping case.

Discussion: For several years the USDA has required packers of case-ready poultry to print the individual consumer package tare weights on the outside of the shipping case. This proposal would extend this requirement to packers of case-ready meat (beef and pork) products.

As retail stores reduce or eliminate on-site meat cutting and processing, weights and measures officials are seeing more packages of meat that are shipped case-ready (i.e., the meat is already portioned into individual packages, wrapped, and labeled with all required information except weight). Retailers are required to label these packages with the correct weight before making them available for sale. However, retailers don't know what tare deduction to take and are reluctant to open a reasonable sample of packages to determine an average tare weight. This has led to inaccurate tares being used with these products.

NIST believes that the current requirement for poultry has taught us that placing tare weights on shipping cases is an imperfect system. Inspections have shown that tare weights printed on poultry shipping cases are often inaccurate -- packers use unused dry tare for this determination and don't always include the weight of all the tare materials. Retailers often rely on these tares to their detriment. Jurisdictions may have difficulty determining from whom to seek compliance -- the retailer (for selling a short-weight product) or the packer (for declaring an inaccurate tare). The fact that the packer falls under USDA jurisdiction and oversight may also cause additional hurdles. In addition, NIST is also concerned that inspectors may mistakenly rely on the accuracy of these tares when performing inspections. If the tares are inaccurate but inspectors rely on them to perform audit tests, will the inaccuracy ever be discovered? Inspectors must remain vigilant about checking the actual tare of these packages and not rely on the packer for this information. Enforcement action must only be taken on packages where the average used or unused dry tare has been determined.

The Committee heard several comments opposing this item. Several manufacturers and packers stated that tare materials and weights change on a regular basis and would be difficult to pre-stamp on cases. In addition, packers stated that tare weight information is already provided to the retailers and recommended that retailers who are not receiving this information should contact the packer. A national retailer stated that they receive updated tare information from their packers in an electronic format on a regular basis, and that putting tare information on the shipping case would provide little benefit to them. The Committee voted to withdraw this item.

Joe Gomez, New Mexico, Chairman Joe Benavides, Texas James Cassidy, Cambridge, Massachusetts Vicky Dempsey, Montgomery County, Ohio Dennis Johannes, California

Vince Orr, ConAgra Foods, Associate Member Representative Brian Lemon, Canada, Technical Advisor Doug Hutchinson, Canada, Technical Advisor Kathryn Dresser, NIST, Technical Advisor

Committee on Laws and Regulations

Appendix A

Physical Standard	Documentary Standard	Device	Calibration Interval	Notes
Cast Iron Weights	Handbook 105-1	Class III, III L, IV scales	6 months to 1 year	
Stainless Steel Weights	Handbook 105-1	Class III, III L, IV scales	5 years	
Class F1 Weights Class 2 Weights	OIML R111 ASTM E 617-97	Class II scales	1 year	
Glassware	Handbook 105-2	Package testing	10 years	
Test Measures (hand-held and 5-gallon truck or trailer mounted)	Handbook 105-3	Gas pumps	1 year	
Large Provers	Handbook 105-3	Meters	1 year	
LPG Provers	Handbook 105-4	LPG meters	1 year	
Stopwatches	Handbook 105-5	Taxi meters, timing devices, parking meters, laundromats	1 year	
Thermometers	Handbook 105-6	Temperature corrections, refrigeration specifications, package checking	5 years	Annual inspection required
Small Volume Provers	Handbook 105-7	Meters	6 months to 1 year	Need EPO for field testing
Master Meters	API document in development	Master meters for petroleum		
Proving Rings and Load Cells	ASTM E 74	Wheel load weighers, weight carts, large mass standards	Rings: 5 years Cells: 6 months if used for wheel load weighers; evaluate with use for substitution weighing	Depends on use
Weight Carts	Handbook 105-8	Vehicle scales	6 months to 1 year	Needs to be recalibrated with any repair. Need EPO for field use
Hydrometers	ASTM E 100	Petroleum products; bulk oil meters	1 year	
Length Standards, Tapes	GGG-standard	Taxi meters, fabric scale decks, firewood, lobster gauges	5 years	Inspect before use
Containers	Handbook 133	Bulk mulch		
Berry Baskets	Handbook 44	Berry quantity		

Sample List of Documentary Standards for Item #221-1

Interim Report of the Committee on Specifications and Tolerances

Jack Kane, Chairman Bureau of Weights and Measures Department of Labor and Industry Montana

300 INTRODUCTION

The Specifications and Tolerances (S&T) Committee (hereinafter referred to as "Committee") submits its Interim Report for consideration by the National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during its Interim Meeting in Santa Monica, California, January 23 -26, 2005.

Table A identifies the agenda items in the Report by Reference Key Number, Item Title, and Page Number. The item numbers are those assigned in the Interim Meeting Agenda. A voting item is indicated with a "V" after the item number. An item marked with an "P" after the reference key number is an information item. An item marked with a "D" after the reference key number is a developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. An item marked with a "W" was withdrawn by the Committee and generally will be referred to the regional weights and measures associations because it either needs additional development, analysis, and input or does not have sufficient Committee support to bring it before the NCWM.

This Report contains many recommendations to revise or amend National Institute of Standards and Technology (NIST) Handbook 44 (HB-44), 2005 Edition, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices." Proposed revisions to the handbook(s) are shown in **bold face print** by striking out information to be deleted and <u>underlining</u> information to be added. Requirements that are proposed to be nonretroactive are printed in **bold-faced** *italics*.

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

310 GENERAL CODE

310-1 I G-S.1. Identification; Built-for-Purpose Software Based Devices, Table G-S.1. Identification, G-S.1.1. Location of Marking Information for Not Built-For-Purpose, Software-Based Devices, and Appendix D; Definition of Not-Built-for-Purpose Device

Source: Carryover Item 310-1.

Recommendation: Amend General Code paragraph G-A.1. Commercial and Law Enforcement Equipment as follows:

G-A.1. Commercial and Law Enforcement Equipment. - These specifications, tolerances, and other technical requirements apply as follows:

- (a) To commercial weighing and measuring devices or systems equipment; that is, to weights, and measures, and weighing and measuring devices or systems commercially used or employed in establishing the size, quantity, extent, area, 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 <u>quantity determination</u> weight or measure.
- (b) To any accessory attached to or used in connection with a commercial weighing or measuring device when such accessory is so designed that its operation affects the accuracy of the device.
- (c) To weighing and measuring <u>devices or systems</u> equipment in official use for the enforcement of law or for the collection of statistical information by government agencies.

(These requirements should be used as a guide by the weights and measures official when, upon request, courtesy examinations of noncommercial equipment are made.) (Amended 200X)

Amend General Code paragraph G-S.1. Identification as follows:

G-S.1. Identification. - All equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect, shall be clearly and permanently marked <u>in accordance with Table G-S.1.</u> for the purposes of identification with the following information:

- (a) the name, initials, or trademark of the manufacturer or distributor;
- (b) a model designation that positively identifies the pattern, or design, or metrological version or revision of the device in accordance with Table G-S.1.;
 - The model designation shall be prefaced by the term "Model," "Type," or "Pattern." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals or all lower case. [Nonretroactive as of January 1, 2003] (Added 2000) (Amended 2001)

(Amended 200X)

 (c) a nonrepetitive serial number, except for equipment with no moving or electronic component parts and not built-for-purpose, software-based electronic devices; [Nonretroactive as of January 1, 1968]

(Amended 2003)

- 1. The serial number shall be prefaced by words, and abbreviation, or a symbol, that clearly identifies the number as the required serial number. [Nonretroactive as of January 1, 1986]
- Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No., and S. No.).
 [Nonretroactive as of January 1, 2001]

(d) the current software version designation for not built-for-purpose, software-based devices; [Nonretroactive as of January 1, 2004] (Added 2003)

 (e) an NTEP Certificate of Conformance (CC) number or a corresponding CC Addendum Number for devices that have a CC. The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.)
 [Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device. (Amended 1985, 1991, 1999, 2000, 2001 and 2003)

Delete General Code paragraph G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Softwarebased Devices and renumber G-S.1.2. Remanufactured Devices and Remanufactured Main Elements as follows:

G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-based Devices. - For not-builtfor-purpose, software-based devices, the following shall apply:

- (a) the manufacturer or distributor and the model designation shall be continuously displayed or marked on the device (see note below), or
- (b) the Certificate of Conformance (CC) Number shall be continuously displayed or marked on the device (see note below), or
- (c) all required information in G-S.1. Identification. (a), (b), (c), and (e) shall be continuously displayed. Alternatively, a clearly identified "view only" System Identification, G-S.1. Identification, or Weights and Measures Identification shall be accessible through the "Help" menu. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated.

Note: Clear instructions for accessing the remaining required G-S.1. information shall be listed on the CC. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated. [Nonretroactive as of January 1, 2004]

(Added 2003)

G-S.1.<u>1</u>2. Remanufactured Devices and Remanufactured Main Elements. - All remanufactured devices and remanufactured main elements shall be clearly and permanently marked for the purposes of identification with the following information:

(a) The name, initials, or trademark of the last remanufacturer or distributor;

(b) The remanufacturer's or distributor's model designation if different than the original model designation. [Nonretroactive as of January 1, 2002] (Added 2001)

Note: Definitions for "manufactured device," "repaired device," and "repaired element" are also included (along with definitions for "remanufactured device" and "remanufactured element") in Appendix D, Definitions.

Add new Table G-S.1. Identification as follows:

Table G-S.1. Identification			
	<u>Built-for-Purpose</u> Instruments, Elements, or Systems	<u>Not-Built-for-Purpose</u> <u>Devices or Elements</u>	
Name, initials, or trademark of the manufacturer or distributor	<u>M</u>	<u>D</u> ²	
Model designation	$\underline{\mathbf{M}}^{\underline{1}}$	<u>D</u> ²	
Specific model designation ³	<u>M¹ or D</u>		
<u>Serial number</u>	<u>M</u>	Not required	
Metrological version or revision designation ³	<u>N/A</u>	D	
Certificate of Conformance (CC) number	<u>M or D</u>	<u>D</u> ²	

<u>M:</u> Physically and permanently marked

D: Either: (1) displayed by accessing a clearly identified view only System Identification, G-S.1. Identification, or Weights and Measures Identification accessible through the "Help" menu. Required information includes that information necessary to identify the software in the device is the same type that was evaluated, or (2) continuously displayed. Note: For revision or software version number, clear instructions for accessing this information shall be listed on the CC in lieu of the "Help" menu. Required information includes that information necessary to identify the software in the device is the same or subsequent type that was evaluated.

(Nonretroactive as of January 2004)

Note 1: <u>As a minimum, the model designation (positively identifying the pattern, design, type, series, generic, or</u> <u>trademark designation) must be marked on the device.</u> If the model designation changes with differing <u>parameters such as size, features, options, intended application, not Handbook 44 compliant, construction,</u> <u>etc., the specific model designation shall be physically marked or continuously displayed or be capable of</u> <u>being displayed.</u>

(Nonretroactive as of January 200X)

Note 2: <u>As a minimum, either the manufacturer or distributor and the model designation, or the CC Number shall be</u> <u>continuously displayed.</u> <u>Clear instructions for accessing the remaining required G-S.1.information shall be</u> <u>listed on the CC, which may be available as an unaltered copy of the CC or printed by the device or</u> <u>through another on-site device.</u> (Nonretroactive as of January 200X)

<u>Note 3:</u> <u>Metrological version or revision designation for devices with downloadable or field programmable software.</u> (Added 200X)

Add new General Code Terms and Definitions as follows:

<u>measuring device (general) – A device (instrument) intended to be used to make measurements, alone or in</u> <u>conjunction with supplementary devices. (VIM)</u>

measuring system (general) - An instrument or group of instruments that serves to make measurements, alone or in conjunction with supplementary devices. (VIM)

<u>electronic devices – A device operating by the principles of electronics, which may consist of one or more</u> <u>subassemblies and performs a specific function(s). (ASTM)</u>

<u>not-built-for-purpose device -- Any electronic peripheral or auxiliary device or element which was not</u> <u>originally manufactured with the intent that it be used as, or part of, a weighing or measuring device or</u> <u>system.</u>

<u>metrological software version (revision) – A designation that specifically defines the metrological software</u> version used in a measuring instrument, system, or peripheral/auxiliary device with field programmable or downloadable metrological software).

weighing device (instrument) -- A measuring instrument that serves to determine the mass of a body by using the action of gravity on said body. The instrument may also be used to determine other quantities, magnitudes, parameters or characteristics related to the determined mass. According to its method of operation, a weighing instrument is classified as an automatic or non-automatic instrument. (OIML R76)

Amend the definition for built-for-purpose device as follows:

built-for-purpose device – Any main, <u>peripheral</u>, <u>or auxiliary</u> device or element which was manufactured with the intent that it be used as, or part of, a weighing or measuring device or system.

Background/Discussion: In 2003, G-S.1.1. was added to allow the manufacturers of "not-built-for-purpose" devices to "display" the markings required in G-S.1., as an alternative to physically marking the required information on the device. Manufacturers of "built-for-purpose" devices have requested that G-S.1. be amended to provide a similar option for the "display" of the G-S.1. required markings on "built-for-purpose" devices.

At the 2004 NCWM Annual Meeting, the Committee made this proposal an information item because of manufacturer's concerns and returned it to both Sectors for further discussion. The Committee asked that the Sectors develop language acceptable to both weighing and measuring device manufacturers.

At its fall 2004 meeting, the Weighing Sector reviewed the information from the Committee, previous Sector recommendations, and information regarding international requirements. The Sector also reviewed an alternate recommendation for S&T Item 310-1 from NIST Weights and Measures Division (WMD), which includes changes to G-A.1. The most significant change to G-A.1. is the elimination of the term "weighing" and utilization of the more general term "measuring" for devices or systems that measure mass, length, or volume. The WMD alternate proposal included new and amended definitions and addressed concerns raised during the Committee's deliberations on this item. The WMD proposed definition for a "weighing device" describes it as a "measuring instrument" that serves to determine the mass of a body by using the action of gravity on said body. Although this change is a departure from conventional terminology for "scales," it is consistent with OIML recommendations and facilitates harmonization between Handbook 44 and international standards. WMD revised the definition for "not-built-for-purpose" devices to clarify that they are auxiliary or peripheral equipment devices and systems, but they are part of the weighing or measuring system process. Some of the private Sector members repeated their previous comments that current technology permits required identification information to be displayed electronically and there is no technical justification for treating built-forpurpose devices differently than not-built-for-purpose devices. Additionally, WMD's proposed definitions would reclassify most measuring devices according to the physical property being measured. Since WMD's proposed definition for measuring devices applies to all types of devices, some concern was expressed that laws and regulations would need to be changed because many state statutes refer to "weighing and measuring" devices. The Weighing Sector supported the WMD alternate recommendation with changes in the marking requirement for metrological version or revision designation in Table G-S.1. for "built-for-purpose" instruments, elements, or systems from "marked or displayed (M or D)" to "not applicable (NA)" and the added "weighing device" definition. The Weighing Sector agreed to send the WMD alternate proposal to the NTETC Measuring Sector and regional associations for their review and comments.

At the October 2004 Northeastern Weights and Measures Association Meeting, several participants indicated that the requirements for "built-for-purpose" and "not-built-for-purpose" devices should be the same. An Associate member commented that for a manufacturer to report to NTEP every time a metrological change is made to software is

unnecessary. A certain amount of trust must be placed in the manufacturer. This member also explained that manufacturers want to be innovative with software development and expressed concern that requirements for a current software version number may hamper future innovations.

At its October 2004 meeting, the Measuring Sector reviewed the original alternate recommendation developed by WMD; that proposal was similar to the proposal in the recommendation above, with the exception of the marking requirement for metrological version or revision designation in Table G-S.1. for "built-for-purpose" instruments, elements, or systems and the addition of a "weighing device" definition. In the recommendation above, the metrological designation requirement is not applicable or "N/A;" in the version on the agenda of both Sectors the requirement was for the designation to be "M or D." The members agreed that the majority of the changes proposed to include "built-for-purpose" devices concern weighing devices and are not applicable to measuring devices. One member objected to the proposal to eliminate references in G-A.1. to the term "weighing" and the dual use of the term "measuring" to refer to all forms of measurement including weighing. The member stated that the proposal was in conflict with the historic use of the term "measurement" in the United States. The Sector agreed to forward a recommendation to the Committee that the proposal include marking requirements for "built-for-purpose" devices in G-S.1. Identification be withdrawn from the S&T agenda.

At its October 2004 meeting, the Southern Weights and Measures Association (SWMA) S&T Committee did not include this item on its agenda for a vote of the members; however, it did accept comments during the open hearings. The SWMA learned that the Scale Manufacturers Association (SMA) wanted the requirements in Table G-S.1. for "built-for purpose" instruments, elements, or systems to allow either physically marked (M) or displayed (D) for marking name, model, and serial number just like requirements in the table for specific model designation or CC. One manufacturer of retail motor-fuel dispensers supported the recommendation provided the requirement for metrological revision designation for "built-for purpose" instruments, elements, or systems is changed from M or D to N/A as recommended by the Weighing Sector. The SWMA forwarded its comments to the Committee without a position.

At the 2005 NCWM Interim Meeting, the Committee heard the SMA opposed this item in its current format and recommended the NCWM form a Work Group to further develop the proposal. The Committee heard support for the alternate proposal developed by WMD for consideration as modified by the Weighing Sector. The Committee considered withdrawing this item from its agenda due to a lack of support from the group of manufacturers that originally submitted the proposal, but agreed to retain the Weighing Sector's latest alternate language as an information item and strongly urges the NTETC Sectors and SMA to develop a proposal they all support prior to the 2006 Interim Meeting. If the NTETC Sectors and SMA do not provide an alternative proposal that resolves their concerns with the current proposal, the Committee may withdraw this item from its agenda.

Editor's note: The proposals in S&T Item 310-1 that appeared in the 2005 edition of NCWM Publication 15 "Interim Meeting Agenda" did not reflect editorial changes made to paragraph G-S.1. in the 2005 edition of Handbook 44. The recommendation shown above has been modified to reflect those changes.

For more background information, refer to the 2003 and 2004 S&T Final Report and the 2005 edition of Publication 15 on the WMD home page at www.nist.gov/owm.

310-2 V G-T.1. (e) Acceptance Tolerances

Source: National Type Evaluation Technical Committee (NTETC) Measuring Sector:

Recommendation: Modify Section 1.10 Paragraph G-T.1. (e) Acceptance Tolerances as follows:

G-T.1. Acceptance Tolerances. - Acceptance tolerances shall apply to:

- (a) equipment to be put into commercial use for the first time;
- (b) equipment that has been placed in commercial service within the preceding 30 days and is being officially tested for the first time;

- (c) equipment that has been returned to commercial service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service;
- (d) equipment that is being officially tested for the first time within 30 days after major reconditioning or overhaul; and
- (e) equipment undergoing type evaluation <u>(special test tolerances are not applicable)</u>. (Amended 2005)

Discussion/Background: At its October 2004 Meeting, the NTETC Measuring Sector noted that the intent of paragraph G-T.1. (e) is to specify that acceptance tolerances apply to all equipment undergoing type evaluation; however, the language is not clear about how it relates to special test tolerances.

Special test tolerances recognize that a larger tolerance for test drafts conducted at a slow flow rate is appropriate for meters in normal service. Normal wear of the measuring elements frequently produces larger performance errors when testing at a slow flow, compared to testing at full flow. The Sector agreed that devices submitted for NTEP evaluation should be held to a higher standard than devices in normal service and special test tolerances should not be applicable during an NTEP evaluation. The Sector also agreed to forward a proposal to modify Handbook 44 paragraph G-T.1. (e) Acceptance Tolerances, as shown above, to the NCWM and Southern Weights and Measures Association (SWMA) S&T Committees for consideration.

At its October 2004 Meeting, the SWMA reviewed the recommendation and agreed to forward it to the Committee with the recommendation that it be a voting item on the 2005 NCWM S&T Agenda.

At the 2005 NCWM Interim Meeting, the Committee received no opposition to this item and therefore agreed to present it for a vote at the Annual Meeting.

320 SCALES

320-1 V S.1.1. (c) Zero Indication; Requirements for Markings or Indications for Other than Digital Zero Indications

Source: Carryover Item 320-8. (This item originated from the NCWM S&T Committee and first appeared on the Committee's 2004 agenda.)

Recommendation: Amend paragraph S.1.1. (c) as follows:

- S.1.1. Zero Indication.
 - (a) On a scale equipped with indicating or recording elements, provision shall be made to either indicate or record a zero-balance condition.
 - (b) On an automatic-indicating scale or balance indicator, provision shall be made to indicate or record an out-of-balance condition on both sides of zero.
 - (c) A zero-balance condition may be indicated by other than a continuous digital zero indication, provided that an effective automatic means is provided to inhibit a weighing operation or to return to a continuous digital indication when the scale is in an out-of-balance condition <u>and is marked or includes supplemental</u> <u>indications or markings to indicate that the "other than digital zero indication" represents a no-load</u> <u>condition of the scale</u>.

Added 1987 (Amended 1993 and 2005)

<u>Note:</u> The markings or supplemental indications in S.1.1.(c) are not required if, prior to the start of a transaction: (1) operator intervention is required to verify the zero balance condition with a digital zero

indication, or (2) the scale automatically represents the zero-balance condition with a digital zero indication. (Added 2005) (Amended 1987)

Background/Discussion: The Committee proposes to modify paragraph S.1.1.(c) to clarify the requirement's original intent for marking zero indications on scales and point-of-sale systems where a zero-balance condition is represented by other than a digital zero indication. The proposal is the Committee's response to the 2003 NTETC Weighing Sector's request for clarification on whether scales that use scrolling messages, dashes, etc., to indicate zero require additional markings or indications (1) to inform customers that the scales are at a zero-balance condition and (2) to properly identify the feature as specified in General Code paragraph G-S.6. Marking Operational Controls, Indications, and Features.

The proposal is consistent with other Handbook 44 code requirements adopted to ensure that customers have sufficient information to make an informed decision during a direct sale weighing transaction. These codes require marking and/or identification of values, graduations, units, and indications in the displayed and recorded transaction information. Handbook 44 includes requirements for clearly identifying operational controls and features used in weighing applications. Additionally, Handbook 44 requirements specify that the size, proximity, and position of that information shall be such that it is easily read and is appropriate for that application.

In 2003 the Weighing Sector reported there was ongoing disagreement among NIST Weights and Measures Division (WMD), the NTEP Participating Laboratories, and manufacturers regarding the interpretation of NIST Handbook 44 General Code paragraph G-S.6. Marking Operational Controls, Indications, and Features, Scales Code paragraph S.1.1. Zero Indication, and the interpretation of related discussions in the 78th (1993) NCWM Specifications and Tolerances (S&T) Final Report Item 320-1 S.1.1. Zero Indication. This resulted in inconsistent type evaluations and weights and measures code enforcement for scales and point-of-sale systems interfaced with scales that use methods such as screen savers, power savers, scrolling displays, and modes of operation to indicate that a device is at a no-load condition. NIST and some of the NTEP Participating Laboratories agreed that General Code paragraph G-S.6. requires weighing devices to be marked or an indication provided that states zero-balance is represented by other than a digital zero indication. NIST and those same laboratories noted this interpretation was supported by the 1993 S&T Final Report and NCWM Publication 14 clearly stated such markings are required. Other Participating Laboratories and some manufacturers stated that the markings were not necessary because Handbook 44 paragraph S.1.1. (c) does not specifically state that the additional markings are required and the actions of the 78th NCWM to amend paragraph S.1.1.(c) provided sufficient customer protection for devices that use this feature.

Weights and measures officials indicated there may be "not-built-for-purpose" devices that do not comply with the proposed interpretation. These "not-built-for-purpose" devices are interfaced with approved devices; however, the system continues weighing when the scale is off zero. Consequently, officials questioned whether the proposed changes to paragraph S.1.1.(c) are intended to be nonretroactive requirements.

In July 2004 the Committee agreed that its proposal to modify paragraph S.1.1.(c) was consistent with the original intent of the requirement. After hearing comments about how some systems are designed to operate, the Committee took the position that additional language was needed to clarify that no marking is required if operator intervention is necessary to verify a zero condition before the start of a transaction. In July 2004 the Committee made the proposal an information item to provide sufficient time for input from the Weighing Sector (that did not have the proposal available at its 2003 meeting) and to receive any language that addresses operator intervention.

The Committee believes the proposal provides a record of how to apply the requirement. The Committee agreed that the original intent of the requirement was that all primary indicators comply with paragraph S.1.1., therefore, the proposal should be a retroactive requirement.

At its August 2004 meeting the Weighing Sector agreed with the Committee's interpretation, but did not find it necessary to modify paragraph S.1.1.(c) because NCWM Publication 14 was further expanded in 2003 to include checklist procedures to verify digital electronic scales equipped with other than a continuous digital zero indication comply. Publication 14 test procedures specify methods for defining the zero indication when the zero condition of the

scale is represented by other than a continuous digital zero indication. The Weighing Sector agreed the proposal represents an S&T Committee agenda item and the type evaluation aspects of this issue have been resolved.

The Northeastern Weights and Measures Association (NEWMA) indicated there is little support for this proposal. Many at NEWMA believe the NTEP laboratories already have the necessary information to properly perform evaluations.

The Central and Western Weights and Measures Associations recommended the proposal be withdrawn because appropriate protections and labeling criteria are applied during type evaluation.

The Scale Manufacturers Association agreed that the current type evaluation process that is based on paragraph S.1.1.(c) prevents facilitation of fraud.

During the 2005 NCWM Interim Meeting, the Committee agreed that past inconsistencies in the interpretation of paragraph S.1.1.(c) warrant clarifying the intent of the paragraph in Handbook 44. Even though the regional weights and measures associations recommended a different approach, their positions do not disagree with the technical content of the proposal. The Committee further modified paragraph S.1.1. to include a new note recommended by NIST to clarify that no markings are necessary when operator intervention is required to return the indication to a digital zero before conducting a transaction.

320-2 V S.1.8.4. Recorded Representations, Point-of-Sale Systems; Footnote 1

Source: National Type Evaluation Technical Committee (NTETC) Weighing Sector

Recommendation: Amend paragraph S.1.8.4. Recorded Representations, Point-of-Sale Systems; Footnote 1 as follows:

S.1.8.4. Recorded Representations, Point-of-Sale Systems. - The sales information recorded by cash registers when interfaced with a weighing element shall contain the following information for items weighed at the checkout stand:

- (a) the net weight, 1
- (b) the unit price, 1
- (c) the total price, and
- (d) the product class or, in a system equipped with price look-up capability, the product name or code number.

¹Weight values shall be identified by kilogram, kg, grams, g, ounces, oz, pound, <u>or</u> lb, or the sign "#." <u>The</u> <u>"#"symbol is not acceptable.</u> For devices interfaced with scales indicating in metric units, the unit price may be expressed in price per 100 grams. [Nonretroactive as of January 1, 2006] (Amended 1995 and 2005)

Discussion/Background: In 1976 the Committee reviewed numerous examples of transaction information and provided clarification on how that information should be formatted on recorded representations. At that time the Committee indicated the "#" symbol was an acceptable representation for "pound" on point-of sale system's receipts. The Committee noted that the "#" symbol was acceptable because it was recognized in a widely used reference dictionary. In addition, printer technology could better accommodate the "#" symbol since it required only one column whereas the two characters in "lb" needed two columns.

Currently, NCWM Publication 14 "NTEP Technical Policy, Checklists and Test Procedures," Section 75, List of Acceptable Abbreviations/Symbols recognizes the "#" symbol as acceptable, but discourages using the "#" symbol for recorded representations for electronic cash registers (ECR) and point-of-sale (POS) systems. One manufacturer reasoned that if the symbol is suitable for recorded representations for ECRs, then there is no justification for prohibiting use of the "#" symbol for other recorded representations or markings. The manufacturer concluded that the "#" symbol

should be acceptable in all instances or not acceptable in any weighing applications. The Weighing Sector disagreed with this manufacturer's position.

The Committee considered several proposals to modify paragraph S.1.8.4. Footnote 1 including a recommendation from the Western and Central Weights and Measures Association outlined in the proposal above and a proposal from the Weighing Sector to remove any reference to the # symbol as follows:

¹Weight values shall be identified by kilogram, kg, grams, g, ounces, oz, pound, <u>or</u> lb, or the sign "#." For devices interfaced with scales indicating in metric units, the unit price may be expressed in price per 100 grams. (Amended 1995 and 200X)

The Weighing Sector proposed removing the "#" symbol from paragraph S.1.8.4. footnote 1 because the symbol represented a multitude of terms used in many unrelated disciplines and because of advances in printer technology.

The Western, Central, Northeastern, and Southern Weights and Measures Associations and Scale Manufacturers Association agreed the "#" symbol was no longer acceptable, but this should not be applied retroactively.

The Committee heard unanimous support for removing all reference to "#" from the list of acceptable symbols used to identify weight values. The Committee agreed that the appropriate effective date for the requirement is for new equipment manufactured on or after January 1, 2006. The Committee made the proposal a voting item.

320-3 V UR.1.6. Computing Scale Interfaced to a Cash Register

Source: Southern Weights and Measures Association (SWMA)

Recommendation: Add a new paragraph UR.1.6. to the Scales Code as follows:

<u>UR.1.6.</u> <u>Computing Scale Interfaced to a Cash Register. – A computing scale may interface with a cash register provided all displayed and recorded indication agree:</u>

- (a) the cash register only records (serves as printer) the information received from the scale,
- (b) the computing scale has tare capability,
- (c) the computing scale is not equipped with PLU capability,

(d) The electronic cash register does not have any input to the computing scale in the process of determining the total price of a weighed item. (Added 200X)

Discussion: The proposal was intended to add new device-specific code requirements to the Scales Code to address the proper interface of computing scales with electronic cash registers (ECR). The current Handbook 44 General Code provisions that specify equipment and its associated devices shall not facilitate fraud are not sufficient to clarify how a computing scale interfaced with an ECR should operate. The proposal is intended to add new language to the Scales Code to clarify how each component must display transaction information, function in taking tare, and operate with Price-Look-Up (PLU) capability.

The Committee considered a SWMA proposal for a specification that identifies how computing scales and electronic cash registers must function when interfaced as follows:

S.1.8.5. Computing Scale Interfaced to a Cash Register. – A computing scale may interface with a cash register provided:

- (a) the cash register only records (serves as printer) the information received from the scale,
- (b) the computing scale has tare capability,

- (c) the computing scale is not equipped with PLU capability,
- (d) The electronic cash register does not have any input to the computing scale in the process of determining the total price of a weighed item.

Weights and measures field officials report they find computing scales interfaced with ECRs, where the ECR accepts weighing results from the computing scale and uses the ECR's price look-up (PLU) feature to retrieve tare and unit price information, and calculates the total price. Officials report that a different unit price, tare, and total price may already be manually entered and displayed on the computing scale. What the customer views on the computing scale as the net weight, unit price, and total price may not be what is actually used by the ECR to calculate the customer's charge.

The proposed new code language is taken from existing type evaluation criteria. The NTEP Participating Laboratories agreed the problems observed occur only in devices not held to this criteria. In this instance, the NTEP Certificate of Conformance (CC) did not list the interface as an approved application.

The Western Weights and Measures Association withdrew this item from its agenda because there was only minimal support for the proposal in the Weighing Sector.

The SWMA believes the proposal provides specific guidance for weights and measures field officials that is clearer and easier to enforce than the General Code requirements for facilitation of fraud and agreed to forward the proposal to the NCWM S&T Committee for consideration as a voting item.

The Scale Manufacturers Association opposed the proposal, but recommended the following alternate language because the proposal as written inadvertently imposed design restrictions on the device:

S.1.8.5. Computing Scale Interfaced to a Cash Register. – A computing scale may interface with a cash register provided all displayed and recorded indications agree:

The Committee acknowledged that the proposed text is borrowed from criteria applied by the Participating Laboratories during type evaluation. Consequently, the field official may not be as familiar with the language even though jurisdictions already apply the proposed criteria during field verification. The Committee agreed it would make it easier for the field official if corresponding information based on the proposed text appeared in test procedures. This information would ensure that equipment is operating in an approved manner after installation and upgrades. The language should clarify that it is acceptable for the ECR and computing scale to communicate the total price, but not to the point where the input process involves the ECR calculating the total price. The Committee recommended that jurisdictions, if they have not already done so, establish clear examination procedures (e.g., enter a new price per pound at the ECR) so that all field officials have procedures to verify the ECR and computing scale interface complies with the General Code and the proposed specific Scale Code requirements intended for this situation.

The Committee recognized the proposal written as a specification might limit future technology used to interface equipment. All sectors agree type evaluation already verifies that equipment was designed for a particular interface with compatible equipment. The Committee agreed that what was needed was a requirement to ensure equipment is properly interfaced as intended by the manufacturer's design once it is in commercial use. Consequently, the Committee modified the proposal making it a user requirement with voting status.

320-4 V S.2.1.3. Scales Equipped with an Automatic Zero-Setting Mechanism (Zero Tracking), S.2.1.3.1. For Scales Manufactured Before January 1, 2006; Maximum Load Rezeroed, S.2.1.3.2. For Scales Manufactured After January 1, 2006; Maximum Load Rezeroed, and S.2.1.3.3. Automatic Zero-Setting Mechanism (Zero Tracking) on Class III L Devices

Source: National Type Evaluation Technical Committee (NTETC) Weighing Sector

Recommendation: Modify paragraphs S.2.1.3.and S.2.1.3.1. and add new paragraphs S.2.1.3.2.and S.2.1.3.3.as follows:

S.2.1.3. Scales Equipped with an Automatic Zero-Setting Mechanism (Zero Tracking). - Under normal operating conditions

<u>S.2.1.3.1. For Scales manufactured before January 1, 2006</u>, the maximum load that can be "rezeroed" when either placed on or removed from the platform all at once <u>under normal operating conditions</u>, shall be:

(a) for bench, counter, and livestock scales: 0.6 scale division;

(b) for vehicle, axle-load, and railway track scales: 3.0 scale divisions; and

(c) for all other scales: 1.0 scale division. [Nonretroactive and enforceable as of January 1, 1981]

<u>S.2.1.3.2.</u> For Scales manufactured after January 1, 2006, the maximum load that can be "rezeroed" when either placed on or removed from the platform all at once under normal operating conditions, shall be:

(a) for vehicle, axle-load, and railway track scales: 3.0 scale divisions; and

(b) for all other scales: 0.5 scale division. (Added 2005)

*S.2.1.3.***43**. Automatic Zero-Setting Mechanism (Zero Tracking) on Class III L Devices - Class III L devices equipped with automatic zero setting mechanisms shall be designed with a sealable means to allow the automatic zero setting to be disabled during the inspection and test of the device. [Nonretroactive as of January 1, 2001] (Added 1999) (Amended 2005)

Discussion: This proposal revisits the 2003 Weighing Sector's concerns about holding the same device to different AZSM requirements solely based on whether the device is located on a counter or on the floor. The confusion over how to apply AZSM requirements is compounded when a family of scales covered on an NTEP Certificate of Conformance includes both bench/counter scales and other platform type scales. Currently, paragraph S.2.1.3. specifies a different maximum load that can be rezeroed under normal operating conditions for bench/counter scales (0.6 scale division) from that for all other scales (1.0 scale division)

The proposal is also intended to partially align the automatic zero tracking requirements in paragraph S.2.1.3. with those of Measurement Canada and OIML R76 "Non-automatic Weighing Instruments." AZSM requirements for Class III L scales remain unchanged.

The Weighing Sector asked that the proposal become a developing item on the NCWM S&T Agenda while the regional weights and measures associations consider its effect on field evaluations. The Weighing Sector's public members questioned how the field official will determine the date of manufacture and whether training is needed. The Weighing Sector's industry members requested a delayed enforcement date to allow sufficient time for changes to devices nearing the end of their production cycle.

The Western Weights and Measures Association (WWMA) believes there is sufficient time between now and July 2005 to gather data to determine if there will be enforcement issues. The WWMA agreed that while input from field officials is necessary the proposal can move forward as a voting item.

The Central Weights and Measures Association hearing no comments on the proposal recommended it move forward and become a voting item.

The Southern Weights and Measures Association agreed with the concern stated by public members of the Weighing Sector that it is difficult for field officials to determine when a device was manufactured and recommended the proposal be an information item.

NIST Weights and Measures Division believes field officials will have no difficulty with enforcing the proposal based on equipment manufacture date since they already successfully establish that criteria when enforcing other nonretroactive requirements.

The Scale Manufacturers Association (SMA) believes the proposal has no technical merit and is only an attempt to harmonize United States and OIML requirements. SMA is concerned about the potential for unnecessarily increasing evaluation costs. The SMA does support this effort toward harmonization provided NTEP waives the resulting additional evaluation of existing devices.

The Committee believes the proposal is a good move in the direction of harmonization of standards and should not lose momentum. The Committee believes sufficient data can be easily gathered by July 2005 on new production lots of existing products to demonstrate that a January 1, 2006 effective date is appropriate. The Committee encourages manufacturers, officials, and Participating Laboratories to gather data since it is easy for each group to verify if bench, counter, livestock scales and scales classified as other types can meet the proposed ASZM requirement during their regular duties. The Committee indicated it is willing to modify the date to January 1, 2007, if any group can submit data at the July 2005 NCWM Annual Meeting that supports extending the period in which manufacturers have to comply. The Committee agreed with NIST's assessment that jurisdictions continually prove their ability to determine manufacture dates when equipment is subject to nonretroactive requirements. The Committee indicated its full support of an NTEP policy that does not require additional evaluation for existing equipment since the proposal appears to have little effect on most bench and counter scales.

The Committee agreed the proposal was ready for a vote at the 2005 NCWM Annual Meeting unless it hears otherwise.

320-5 V Table S.6.3.b. Notes For Table S.6.3.a.Note 3; Nominal Capacity and Value of the Scale Division and Appendix D; Definition of Reading Face

Source: National Type Evaluation Technical Committee (NTETC) Weighing Sector

Recommendation: Amend Table S.6.3.b. Notes For Table S.6.3.a. Note 3 and revise the definition for "reading face" to include a reference to Scales Code Section 2.20 as follows:

3. The nominal capacity and value of the scale division shall be shown together (e.g., 50 000 x 5 kg, 100 000 x 10 lb, 15 x 0.005 kg, or 30 x 0.01 lb) adjacent to the weight display in a clear and conspicuous manner and be readily apparent when viewing the reading face of the scale indicator unless when the nominal capacity and value of the scale division are not immediately already apparent by the design of the device. Each scale division value or weight unit shall be marked on multiple range or multi-interval scales. [Nonretroactive as of January 1, 1983]
(Amended 200X)

reading face. That portion of an automatic-indicating weighing or measuring device that gives a visible indication of the quantity weighed or measured. A reading face may include an indicator and a series of graduations or may present values digitally, and may also provide money-value indications. [1.10, 2.20] (Added 200X)

Discussion: The proposed change is intended to eliminate any differences in the interpretation of where to place the required nominal capacity and scale division information on equipment. Currently, Table S.6.3.b. Note 3 specifies that the nominal capacity and the scale division shall be shown together adjacent to the weight display. In 1990 the Committee was unable to arrive at definitive guidelines on what is meant by "adjacent" and left the interpretation to NTEP Participating Laboratories. Any manufacturer's challenges to the laboratory's interpretation were to be heard by the NTEP Board of Governors (now the NCWM NTEP Committee).

NCWM Publication 14, "NTEP Technical Policy, Checklists, and Test Procedures" for Digital Electronic Scales Section 2.13. states:

2.13. The nominal capacity by minimum scale division shall be clearly and conspicuously marked adjacent to the weight display. (Acceptable location depends on conspicuousness).

Ongoing attempts by the NTEP Laboratories and manufacturers to apply the marking requirements result in conflicting interpretations. The NTEP Laboratories believe the criteria in paragraph 2.13. implies that "conspicuousness" should be the primary objective, rather than "adjacent." However, the NTEP Laboratories agree that until the term "adjacent" is removed from Handbook 44 Table S.6.3.b. Note 3, the Laboratories are tied to requiring the nominal capacity and scale division values be marked adjacent to the weight display as shown below in Example 1.

The NTEP Laboratories maintain that the information shall be marked next to the weight display on the face of a scale, as shown below in Example 1, but continue to receive devices with the required markings located elsewhere on the face of the scale such as shown below in Example 2:



Example 1

The NTEP Laboratories agreed that at this point in time Example 2 shown above is incorrect according to Handbook 44 because the markings do not appear adjacent to or as close as practical to the weight display as required in General Code paragraph G-S.5.2.4. Values. The NTEP Laboratories believe that the operator is already familiar with the device and the customer does not fully understand the significance of this information. The NTEP Laboratories also believe that the markings in the examples above are "conspicuous" enough for the inspector and service technician who rely most heavily on the information. However, Example 2 is only acceptable if Note 3 could be amended to allow for placing the markings conspicuously on the face of the indicating portion of the scale.

The Weighing Sector agreed with the Laboratories that both Example 1 and 2 represent the acceptable placement of markings since they are either adjacent to or conspicuously on the reading face of the weight display. The Weighing Sector also proposed to modify the existing definition of "reading face" to include a reference to Section 2.20. Scales Code since the term would also apply to scale indications.

The Central Weights and Measures Association and Scale Manufacturers Association (SMA) supported the Weighing Sector proposal shown in the recommendation above. The Scale Manufacturers Association asked for further clarification on the meaning of the phrase "already apparent by the design."

The Western Weights and Measures Association (WWMA) discussed how paragraph G-S.5.2.4. requirements for values are not intended to apply to the nominal capacity statement and do little to help the customer determine the acceptability of a weight value. The WWMA agreed to the same wording shown in the Weighing Sector's proposal and recommended the proposal move forward as a voting item.

The Northeastern Weights and Measures Association concluded this is an NTEP issue and "adjacent" is the correct terminology since it represents "abutting" or "next to."

The Southern Weights and Measures Association (SWMA) agreed with the Weighing Sector's proposal provided the unit of weight is identified in a manner is consistent with requirements in paragraph G-S.5.2.4. Values for placing, as close as practicable, adequate and sufficient information to define graduations, indications, or recorded representations. The SWMA agreed Example 1 is an example of "adjacent to," but also provided Example 3 shown below, which is an illustration of the correct placement of the markings when they are not "adjacent to" the weight display and additional markings for the unit of weight are necessary.



Example 3

The NIST technical advisor to the Weighing Sector requested the Weighing Sector consider an alternate proposal amending Note 3 in Table S.6.3.b to require markings "near" the weight display that do not reference the reading face as follows:

3. The nominal capacity and value of the scale division shall be shown together (e.g., 50 000 x 5 kg, 100 000 x 10 lb, 15 x 0.005 kg, or 30 x 0.01 lb) near adjacent to the weight display when the nominal capacity and value of the scale division are not immediately apparent. Each scale division value or weight unit shall be marked on multiple range or multi-interval scales. [Nonretroactive as of January 1, 1983]
(Amended 200X)

Additionally, the NIST proposal would more closely align U.S. terminology with that used in OIML R76 "Non-automatic Weighing Instruments" paragraph 7.1.4 Presentation of descriptive markings, which specifies the descriptive markings shall be grouped together shall identify the Max, Min, e, and d, if d does not equal e, and shall be shown near the display of the weight result if they are not already located there.

The NIST Weights and Measures Division (WMD) commented that it was concerned that the proposal deviates from the intent of General Code paragraph G-S.5.2.4 Values which specifies that values shall be adequately defined and placed as close as practicable to the corresponding indication. WMD noted the Weighing Sector's proposal allows information to be placed further away from the display and this becomes more difficult to locate as the font size of the lettering decreases. NIST had additional concerns about the premise that the consumer does not value this information. The information should be available to the customer as well as the regulatory official and service representative. Currently as written Note 3 is not in conflict with the General Code paragraph G-S.5.2.4. Values. However, the proposal creates a conflict since it would permit markings that may not be placed as close as practical to the weight display.

The Committee agreed that the Weighing Sector's proposal shown in the recommendation above is acceptable and ready for a vote since it provides guidelines on the required information, yet allows some flexibility in the placement of that information. The Committee concurred with weights and measures officials that the phrase "already apparent by the design" is a carryover from language developed to address mechanical beam and dial type scales, where the beam capacity and its "d" and the complete revolution of the dial and its "d" provided the nominal capacity and value of the scale division without the need for additional markings. The Committee concluded that Example 1 and Example 3 both comply with the proposal and show acceptable ways to mark the nominal capacity and value of the scale division (d) even though there is a difference in where the information is placed on the display. The Committee also noted that Example 2 was not an acceptable demonstration of nominal capacity and d markings.

320-6 I N.1.3.1. Bench or Counter Scales, N.1.3.8. All Other Scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel–Load Weighers, and Portable Axle-Load Weighers, and Appendix D; Definitions of Bench Scale and Counter Scale

Source: National Type Evaluation Technical Committee (NTETC) Weighing Sector

Recommendation: Delete paragraph N.1.3.1. and renumber subsequent paragraphs as follows:

N.1.3. Shift Test.

N.1.3.1. Bench or Counter Scales. - A shift test shall be conducted with a half-capacity test load centered successively at four points equidistant between the center and the front, left, back, and right edges of the load-receiving element.

Renumber and amend paragraph N.1.3.8. All Other Scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel–Load Weighers, and Portable Axle-Load Weighers as follows:

N.1.3.8<u>7</u>. All Other Scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel-Load Weighers, and **Portable Axle-Load Weighers**. A shift test shall be conducted using the following prescribed test loads and test patterns.

- (a) For livestock scales, the with a nominal capacity greater than 150 kg (300 lb), a shift test load shall not exceed one-half the rated section may be conducted by either using one-third nominal capacity or one-half the rated concentrated load test load centered as nearly as possible at the center of each quadrant of the load-receiving element as shown in Figure 1 below, or by using one-quarter nominal capacity, whichever is applicable. A shift test shall be conducted using either: load centered as nearly as possible, successively over each corner of the load-receiving element as shown in Figure 2 below.
- (ab) A one-quarter For scales with a nominal capacity of 150 kg (300 lb) or less, a shift test load shall be conducted using one-third nominal capacity test load. The centered as nearly as possible, successively over each main load shall be applied centrally in the quadrant if a single weight is used, or applied uniformly over the quadrant, if several weights are used. support as shown in the diagram below; or
- (bc) A one-half nominal capacity For livestock scales, the shift test load centered as nearly as possible, successively at the center of each quarter of the load-receiving element shall not exceed one-half the rated section or concentrated load capacity using the prescribed test pattern as shown in the diagram Figure 1, or one quarter the section or concentrated load capacity as shown in Figure 2 below.

(Added 2003)



(Amended 1987<u>, and 2003, and 200X)</u>

Delete Appendix D definitions for "bench scale" and "counter scale" as follows:

bench scale. See "counter scale."[2.20]

counter scale. One that, by reason of its size, arrangement of parts, and moderate nominal capacity, is adapted for use on a counter or bench. Sometimes called "bench scale."[2.20]

The Central Weights and Measures Association (CWMA) recommended an alternate proposal to modify paragraph N.1.3.8. as follows:

N.1.3.87. All Other Scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel-Load Weighers, and Portable Axle-Load Weighers. A shift test shall be conducted using the following prescribed test loads and test patterns.

- (a) For livestock scales, the with a nominal capacity greater than 150 kg (300 lb) a shift test load shall not exceed one-half the rated section may be conducted by either using one-third nominal capacity or one-half the rated concentrated load test load centered as nearly as possible at the center of each quarter of the load-receiving element as shown in Figure 1 below, or by using one-quarter nominal capacity, whichever is applicable. A shift test shall be conducted using either: load centered as nearly as possible, successively over each corner of the load-receiving element as shown in Figure 2 below.
- (ab) A one-quarter For scales with a nominal capacity of 150 kg (300 lb) or less, a shift test load shall be conducted using one-third nominal capacity test. The centered as nearly as possible, successively over each main load shall be applied centrally in the segment if a single weight is used, or applied uniformly over the segment, if several small weights are used support as shown in the diagram Figure 1 below; or.
- (bc) A one-half nominal capacity For livestock scales the shift test load centered as nearly as possible, successively at the center of each quarter of the load-receiving element shall not exceed one-half the rated section or concentrated load capacity using the prescribed test pattern as shown in the diagram Figure 1, or one-quarter of the section or concentrated load capacity as shown in Figure 2 below.

(Added 2003)

(Amended 1987, and 2003, and 200X)



Discussion: The Committee was requested to revisit the Weighing Sector's revised 2003 proposal intended to clarify the appropriate shift test pattern and test loads for bench/counter scales and other platform type scales. Currently, bench and counter scale shift tests are conducted with a half capacity test load centered successively at four points equidistant between the center and the front, left, back, right edges of the load-receiving element. Other platform scale shift tests are conducted with a one-half capacity test load centered, as nearly as possible, successively at the center of each quadrant. The proposal eliminates the bench and counter scale device types and bases the shift test on the scale's nominal capacity or those devices intended for livestock applications. It should be noted that the proposal does not permit corner testing for scales with a nominal capacity less than or equal to 150 kg. Corner testing is allowed within permissible load limits if there are not enough test weights to perform the shift test, or if the scale has four load supports. Table 4 Minimum Test Weights requires that scales with a capacity of 150 kg or less have test weights up to 100 % of the scale capacity.

The Scale Manufacturers Association (SMA) supported the Weighing Sector's proposal, but questioned whether Figure 2 is in error or is inconsistent with the proposed requirement that describes the location of the test load. Consequently, the SMA recommended an alternate Figure 2 that is shown in the recommendation above. The SMA also noted that there were also inconsistencies in the terminology in the proposal. Proposed paragraph N.1.3.7.(a) included the term "quarter," whereas proposed paragraph N.1.3.7.(b) specified the term "segment." The SMA recommended replacing both terms with the word "quadrant."

The SMA agreed that the Weighing Sector's proposal provided a shift test that is independent of the device's design. The proposal is an improvement over the corresponding R76 requirement, which is design dependent. In keeping with the spirit of harmonization, the SMA recommended that NIST Weights and Measures Division submit a similar proposal to OIML.

The Committee heard similar comments from all regional weights and measures associations indicating that additional study is needed before presenting the issue for a vote. Comments indicate that additional data should be collected on shift tests to verify that the proposed test loads and positions are equivalent to existing test loads. On a general note

regarding harmonization with OIML, the Northeastern Weights and Measures Association believes there may be instances where OIML should harmonize with U.S. requirements. All shift test data comparing existing and proposed test loads and positions should be sent to Steve Cook, NIST Technical Advisor to the NTETC Weighing Sector, at steven.cook@nist.gov, by fax at 301-926-0647 or mailed to NIST WMD, 100 Bureau Drive MS 2600, Gaithersburg, MD 20899-2600.

The Committee made the proposal an information item to allow sufficient time for comparison of data using existing and the proposed shift test procedures to ensure that devices passing the proposed requirements also pass current tests. The Committee acknowledged that the Weighing Sector proposal addresses its 2004 requests for a procedure where the official was not required to determine the scale's design in order to conduct a shift test. The Committee recognized the proposal is a good item for posting on the Weights and Measures List Server to generate further discussion and data. The Committee agreed that the corrections noted by SMA to the Figure 2 diagram and terminology are appropriate and, therefore, modified the proposals accordingly.

320-7 I Table 6 Tolerances

Source: NIST Weights and Measures Division (WMD)

Recommendation: Amend Table 6 Maintenance Tolerances as follows:

Table 6. Maintenance Tolerances (All values in this table are in <u>verification</u> scale divisions <u>e</u>)						
		Toleran	ce in <u>verific</u>	<u>ation</u> scale divisions <u>e</u>		
	1	2		3		5
Class		Test Load				
Ι	0 - 50 000	50 001 -	200 000	200 001 +		
II	0 - 5 000	5 001 -	20 000	20 001 +		
III	0 - 500	501 -	2 000	2 001+ -	4 000	4 001 +
IIII	0 - 50	51 -	200	201+ -	400	4 01 +
III L	0 - 500	501 -	1 000	(Add 1 de for each add	litional 500 d	e or fraction thereof)

(Amended 200X)

Discussion: During an August 2003 meeting, the U.S. National Work Group (USNWG) for R76 "Non-automatic Weighing Instruments" discussed the differences in the tolerances for Class III and IIII weighing instruments. The USNWG reconfirmed that the original intent of the step tolerances was to provide a relationship between scale accuracy and scale resolution. The USNWG agreed that NIST Handbook 44 Class III and Class IIII tolerances should be aligned with OIML R-76. The manufacturers present reported that they build identically performing instruments and load cells for both U.S. and international markets.

In September 2004 Hobart Corporation provided additional "production data" comparing the different Class III tolerances. Hobart's data demonstrated that production scales would comply with Handbook 44 Table 6 tolerances up to 10 000 e and OIML R76 tolerances up to approximately 7000 e. Hobart also reported that many scales and load cells with an n_{max} greater than 5000 e would have difficulty in complying with the temperature effect on zero in both Handbook 44 and OIML R76 standards. Currently, a scale's performance takes advantage of the extra step in Handbook 44, and that is contrary to the intended relationship of scale resolution to accuracy.

The NIST technical advisor to the Weighing Sector requested the Weighing Sector discuss whether or not there is any technical justification to retain the Handbook 44 Accuracy Class III L tolerance or for proposing this tolerance be incorporated into OIML R76. The Class III L tolerance structure in Handbook 44 deviates from the intent of step tolerances since there is little relation of the value of the scale division (i.e., e = 20 lb resolution) to the accuracy required

(i.e. ± 8 e at 80 000 lb maintenance tolerance). It should be noted that the tolerance values, zero-tracking limit, and motion detection requirements in Handbook 44 are roughly equivalent to a R76 instrument when e = 50 lb.

The NTETC Weighing Sector withdrew this proposal from its agenda since the proposal was not developed in response to problems encountered with Publication 14 test procedures and, hence, not under its purview. The Weighing Sector recommended the NIST and USNWG proposal become either an information item or developing item that is reviewed by the regional weights and measures associations as well as the NCWM S&T Committee.

Several regional weights and measures associations recommended that more data is needed before the proposal can move to a vote. Additional test data is needed to verify the effect of the proposed tolerances on Class III and IIII scales. This data is required to determine the effect of the proposed tolerances on the apportionment errors for single and multiple load cell applications. It is also recommended that consideration be given to the international recommendations for the apportionment of error and that further analysis be made on the proposal's possible impact on load cells, separable weighing elements, and existing scales. One regional association noted that the Class III L scale tolerances for test loads greater than the proposed 1000 verification scale divisions (e) are based on a test load value measured in scale divisions (d) rather than the proposed e. The regional association questioned whether these tolerances should be in e; however, any further modification may add to the confusion.

The Scale Manufacturers Association (SMA) opposes the proposal. The SMA believes a change of this magnitude to harmonize requirements is premature and should not take precedence over other harmonization issues.

The Committee made the proposal an information item in response to requests for more time to examine data from test results using the proposed tolerances and to determine if there are devices that cannot comply, unless they are granted the 5 d tolerance being eliminated from Table 6. The Committee also modified the Class III L tolerance structure for test loads greater than 1000 e to include units of "e" rather than "d" since it is appropriate to have like units in Table 6.

320-8 V T.N.4.5. Time Dependence, General, T.N.4.5.1. Time Dependence; Class II, III, and IIII Nonautomatic Weighing Instruments, T.N.4.5.2. Time Dependence; Class III Non-automatic Weighing Instruments, T.N.4.6. Time Dependence (Creep) for Load Cells During Type Evaluation, T.N.4.6.1. Permissible Variations of Readings, T.N.4.6.2. Apportionment Factors, and Definitions of D_{max}, E_{max}, and Non-automatic Weighing Instrument

Source: Western Weights and Measures Association (WWMA)

Recommendation: Amend paragraph T.N.4.5. as follows:

T.N.4.5. Time Dependence, General. - <u>At constant test conditions, the indication 20 seconds after the application of a load and the indication after 1 hour shall not differ by more than:</u> <u>A time dependence test shall be conducted during type evaluation.</u>

(a) one-half of the absolute value of the applicable tolerance for the applied load for class III L devices; and

(b) the absolute value of the applicable tolerance for the applied load for all other devices. (Amended 1989 <u>and 2005</u>)

Add new paragraphs T.N.4.5.1. and T.N.4.5.2. as follows:

T.N.4.5.1. Time Dependence; Class II, III, and IIII Non-automatic Weighing Instruments. - A non-automatic weighing instrument of class II, III, and IIII shall meet the following requirements at constant test conditions:

(a) When any load is kept on an instrument, the difference between the indication obtained immediately after placing a load and the indication observed during the following 30 minutes shall not exceed 0.5 e.

- (b) However, the difference between the indication obtained at 15 minutes and that at 30 minutes shall not exceed 0.2 e. If these conditions are not met, the difference between the indication obtained immediately after placing a load on the instrument and the indication observed during the following four hours shall not exceed the absolute value of the maximum permissible error at the load applied.
- (c) The deviation on returning to zero as soon as the indication has stabilized, after the removal of any load which has remained on the instrument for one half hour, shall not exceed 0.5 e.

For a multi-interval instrument, the deviation shall not exceed 0.5 e₁ (first weighing segment).

On a multiple range instrument, the deviation on returning to zero from Max_i (load in the applicable weighing range) shall not exceed 0.5 e_i (interval of the weighing segment). Furthermore, after returning to zero from any load greater than Max_1 (capacity of the first weighing range) and immediately after switching to the lowest weighing range, the indication near zero shall not vary by more than e_1 (interval of the first weighing range) during the following 5 minutes. (Added 2005)

- T.N.4.5.2. Time Dependence; Class III Non-automatic Weighing Instruments. A non-automatic weighing instrument of class III L shall meet the following requirements:
 - (a) When any load is kept on an instrument, the difference between the indication obtained immediately after placing a load and the indication observed during the following 30 minutes shall not exceed 1.5 e.
 - (b) However, the difference between the indication obtained at 15 minutes and that at 30 minutes shall not exceed 0.6 e. If these conditions are not met, the difference between the indication obtained immediately after placing a load on the instrument and the indication observed during the following four hours shall not exceed the absolute value of the maximum permissible error at the load applied.

<u>The deviation on returning to zero as soon as the indication has stabilized, after the removal of any</u> <u>load which has remained on the instrument for one half hour, one-half of the absolute value of the</u> <u>applicable tolerance for the applied load for class III L devices.</u> (Added 2005)

Add new paragraphs T.N.4.6., T.N.4.6.1., T.N.4.6.2., T.N.4.6.3 and Table T.N.4.6.2 to include tolerances for load performance and zero repeatability that are aligned with OIML R 60.

T.N.4.6. Time Dependence (Creep) for Load Cells During Type Evaluation. – A load cell (force transducer) marked with an accuracy Class, shall meet the following requirements at constant test conditions:

T.N.4.6.1. Permissible Variations of Readings - With a constant maximum load for the measuring range, D_{max} , between 90 % and 100 % of maximum capacity, E_{max} , applied to the load cell, the difference between the initial reading and any reading obtained during the next 30 minutes shall not exceed the absolute value of the maximum permissible error (mpe) for the applied load (see N.4.6.2.). The difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes shall not exceed 0.15 times the absolute value of the mpe (see N.4.6.2.).

T.N.4.6.2. Apportionment Factors - The mpe for creep shall be determined from Table T.N.4.6.2. Loading Times using the following apportionment factors (p_{LC}):

 $p_{LC} = 0.7$ for load cells marked with S (single load cell applications), and $p_{LC} = 1.0$ for load cells marked with M (multiple load cell applications) (Added 2005)

	<u>Table T.N.4.6.2.</u> Maximum Permissible Errors (mpe) On Type Evaluation				
Tolerance		Load (1	<u>m)</u>		
<u>(mpe)</u>	Class I	<u>Class II</u>	Class III	Class IIII	
<u>p_{LC} x 0.5 v</u>	<u>0 # m # 50 000 v</u>	<u>0 # m # 5 000 v</u>	<u>0 # m # 500 v</u>	<u>0 # m # 50 v</u>	
<u>p_{LC} x 1.0 v</u>	<u>50 001 v # m # 200 000v</u>	<u>5001 v # m # 20 000 v</u>	<u>501 v # m # 2000 v</u>	<u>51 v # m # 200 v</u>	
<u>p_{LC} x 1.5 v</u>	<u>200 001 v □ m</u>	<u>20 001 v # m # 100 000 v</u>	<u>2 001 v # m # 10 000 v</u>	<u>201 v # m # 1 000 v</u>	
	Load m, Class III L				
<u>p_{LC} x 0.5 v</u>	<u>0 # m # 500v</u>				
p _{LC} <u>x 1.0 v</u>	<u>501 v # m # 1 000 v*</u>				
*Add 0.7 to the tolerance for each 500 v of load or fraction thereof up to a maximum load of 10 000 v for load cells					
marked with S.					
*Add 1.0 to the tolerance for each 500 v of load or fraction thereof up to a maximum load of 10 000 v for load cells					
marked with M.					
<u>p_{LC} represents the apportionment factors</u>					
v represents the load cell verification interval					

(Added 2005)

Add new definitions of D_{max}, E_{max}, and amend non-automatic weighing systems as follows:

$\underline{D_{max}}$ (maximum load of the measuring range). Largest value of a quantity (mass) which is applied to a load cell during test or use. This value shall not be greater than \underline{E}_{max}

$\underline{\mathbf{E}_{max}}$ (maximum capacity). Largest value of a quantity (mass) which may be applied to a load cell without exceeding the mpe.

non-automatic weighing <u>system</u> <u>instrument</u>. A weighing instrument or system that requires the intervention of an operator during the weighing process to determine the weighing result or to decide that it is acceptable. [2.20, 2.24]

Notes: Determining the weighing result includes any intelligent action of the operator that affects the result, such as deciding and taking an action when an indication is stable or adjusting the weight of the weighed load.

Deciding that the weighing result is acceptable means making a decision regarding the acceptance of each weighing result on observing the indication or releasing a print out. The weighing process allows the operator to take an action which influences the weighing result in the case where the weighing result is not acceptable. (Added 2004) (Amended 2005)

Background/Discussion: The NIST Weights and Measures Division acknowledges this recommendation is a small step in the work to align U.S. and international requirements. Another possible alternative for aligning Handbook 44 and Publication 14 with OIML R60 is to consider incorporating OIML R60 chapters 1 through 7 by reference into Handbook 44 and OIML R60 Annexes A through E into Publication 14. Handbook 44 and Publication 14 could further include paragraphs that state which requirements are not adopted, are different than, or are in addition to OIML R60.

The following background information on the development of Handbook 44 Scales Code T.N.4.5. Time Dependence is provided by Mr. John Elengo (NIST Consultant) who is working on the comparison of Handbook 44, OIML R76 "Non-automatic Weighing Instruments" and OIML R60 "Load Cells."

Prior to the adoption of Handbook 44 paragraph T.N.4.5., the United States had not established any requirements for "creep." At that time, the OIML requirement for creep was based on a 4-hour period, which was considered excessive since the error is primarily contributed by the load cells used in a scale. Generally, the greatest amount of load cell creep

occurs during a short period (minutes) immediately following the application of the load on the scale. After that point, the output becomes increasingly constant. Hence, the United States adopted a requirement which specifies a 1-hour period rather than a 4-hour period. Years later, during the revision of OIML R60, it became evident that most international evaluation laboratories were not conducting the 4-hour test but a shorter one, and the creep proved to stabilize sufficiently during this shorter test. The assumption was made that the device would meet the 4-hour requirement. This assumption was verified by sample tests. Based on this experience and that gained in the international comparison of load cell evaluations, the OIML International Work Group for R60 concluded that a 30-minute test is sufficient provided that, in addition to measuring the difference over a 30-minute period, the difference occurring in the last 10 minutes of this period is also measured. A more restrictive allowance than the total allowance for the 30-minute period is applied to the 10-minute period difference in order to assure that the creep is becoming increasingly constant and not increasing. The R60 30-minute requirement has been incorporated into OIML R76. Thus, the requirement now applies not only to the load cell, but also to the instrument as a whole. If main components other than the load cell are a source of creep, they can be accounted for using the principle of apportionment of errors (including the assignment of fractions " p_i " to those various separate main components of an instrument that can be evaluated separately). [refer to R76-1, 3.5.4]

The NTEP Laboratories discussed this at the 2004 NTEP Participating Laboratories meeting and agreed to forward a proposal to align Handbook 44 with R76 and R60.

The National Type Evaluation Technical Committee (NTETC) Weighing Sector withdrew this proposal from its agenda since it was not developed in response to problems with Publication 14 test procedures (and, hence, not under its purview) and due to time constraints. A member of the Weighing Sector also noted that the proposal does not recognize tolerances for Class I scales.

The Western Weights and Measures Association recommended this item move forward as a voting item, but did not indicate its rationale for taking this position.

The Central Weights and Measures Association (CWMA) agreed the proposal is an issue for the Weighing Sector requiring further development. Consequently, CWMA recommended the proposal move forward as an information item.

The Northeastern Weights and Measures Association (NEWMA) recommended for consistency that the U.S. terms should be followed by the OIML equivalent terminology in parentheses. NEWMA also found that this is an example of the need for revising Handbook 44 into separate sections for field verification and type evaluation test procedures.

The Southern Weights and Measures Association recommended that the proposal become a developing item on the NCWM S&T Agenda.

The Scale Manufacturers Association (SMA) recommended only the proposed modification to current Scales Code paragraph T.N.4.5. shown in the recommendation above. The SMA agreed with the proposed tolerances and recommended that the remaining proposed new subparagraphs be added to NCWM Publication 14 through the Weighing Sector. The SMA agreed that Publication 14 requirements should be traceable to NIST Handbook 44; however, there is no need to overload Handbook 44 to provide that same traceability. The SMA agreed that its alternate proposal provides the necessary traceability.

The SMA believes this is a harmonization issue. The SMA supports harmonization of U.S. and international requirements, but is concerned about the potential for unnecessarily increasing evaluation costs. The SMA does support this effort toward harmonization provided NTEP waives the resulting additional evaluation of existing devices.

The Committee notes that the proposed tolerances are absent from NIST Handbook 44. Generally, tolerances appear in Handbook 44 rather than Publication 14. One added benefit to adopting the proposed creep test tolerances is that it harmonizes U.S. and international requirements. The Committee agreed with SMA's recommendation that time dependence test be performed as a type evaluation test and modified the proposal accordingly. Class I scales were intentionally omitted from the proposal because of the device's sensitivity to even minimal changes in environmental factors. The Committee agreed that it supports an NTEP policy where existing devices are not required to be reevaluated since it expects most devices to comply with the proposal. To clarify all terminology in the proposed requirements that is not already defined in Handbook 44, the Committee made editorial changes to several terms, added two new

definitions (D_{max} and E_{max}), and amended the term "non-automatic weighing system" to read "non-automatic weighing instrument" and include a reference to such (2.20.) to the Scales Code.

320-9 V List of International Symbols Noted as Acceptable

Source: Southern Weights and Measures Association (SWMA)

Recommendation: Add a new list of international symbols that are acceptable as follows:

Appendix E

List of Acceptable Abbreviations/Symbols

Device Application	<u>Term</u>	Acceptable	<u>Not Acceptable</u>		
The following symbols are intended for operator controls, indications, and features. When they are also intended for the customer (including customer operated devices) they cannot be used without additional descriptions					
for the customer (including directions, or marks display	for the customer (including customer-operated devices) they cannot be used without additional descriptions, directions, or marks displayed or marked on the device				
directions, or marks allow,	<u>zero key or center of</u> <u>zero indicator</u>		"z" alone is not acceptable unless term is defined on device		
	Off (Power)				
	On (Power)				
	On/Off (Power)				
<u>Operational Controls,</u> <u>Indications, Features:</u>	Print	\odot			
	Weighing	$\Delta^{\bullet}\Delta$			
	<u>Scale n (n = 1. 2)</u>	Δ'nΔ			
	<u>Range n (n = 1, 2,)</u>	→n←			
	High resolution	HR			
	<u>enter key</u>	4			
	<u>tare enter key</u>	- (T)			
<u>Operational Controls,</u> <u>Indications, Features:</u>	<u>tare clear key</u>	т			
	<u>tare enter/tare clear</u>	↔Ĵ>			
	<u>verify tare</u>	₹			

Device Application	Term	Acceptable	<u>Not Acceptable</u>
The following symbols are i for the customer (including	ntended for operator controls customer-operated devices) t	s, indications, and features. V hey cannot be used without a	<u>Vhen they are also intended</u> dditional descriptions,
directions, or marks display	ed or marked on the device.		
	<u>Not for direct sales to the public</u>		
	<u>Combined zero/tare – See</u> <u>S.2.1.6. for additional</u> <u>information</u>	→ []/ [<	
	<u>Taring</u>	→ <u></u>	
	Mass/Weight		
	Money	₿ B	
	<u>Price Per weight unit</u>	°∂∕₽	
	Piece count	•••	
	Counter		
	<u>Read Counter</u>		
	Print certificate		
	Information	Ĩ	

Discussion: The proposed list of symbols introduces the U.S. weights and measures official to a set of international symbols for use in marking operator controls, indications, and device features. Recognition and use of these symbols is consistent with efforts to harmonize U.S. and international device requirements.

Currently, the list of symbols is part of NTEP Publication 14 "Technical Policy, Checklists, and Test Procedures" for Weighing Devices. NTEP uses international symbols whenever possible. Style differences such as variations in the shape of arrows are acceptable.

The Southern Weights and Measures Association (SWMA) heard several concerns about the initial use of international symbols. Most weights and measures officials do not have access to Publication 14 or other international documents. Consequently, it was suggested that NCWM and NIST post the list on their websites and incorporate the symbols into bulletins, examination procedure outlines, and inspector training modules. The increased number of customer-operated devices would require additional markings or descriptions along with the symbols. This is especially true for symbols that represent "Not for Direct Sales," "Total Money," and "Price per Unit Weight," which are not well known in the United States. Once customers become familiar with the symbols, descriptions would no longer be necessary and the list of symbols would not be necessary in Handbook 44 or other documents.

The SWMA agreed that the proposed list of symbols would best serve field officials if placed in NIST Handbook 44 as an appendix.

The Committee agreed with SWMA on the need to familiarize U.S. officials with international symbols and also recommended the proposed list of acceptable new symbols become New Appendix E in Handbook 44. The Committee made several editorial changes and corrected the reference for the "combined zero tare" term to the appropriate corresponding Handbook 44 paragraph S.2.1.6. Combined Zero-Tare ("0/T") Key. The Committee agreed the proposal should be a voting item at the 2005 NCWM Annual Meeting.

321 BELT-CONVEYOR SCALE SYSTEMS

321-1 V UR.3.4. Diversion of Measured Product

Source: Western Weights and Measures Association (WWMA)

Recommendation: Add new paragraph UR.3.4. as follows:

<u>UR.3.4.</u> Diversion or Loss of Measured Product. – There shall be no operations or conditions of use that result in loss or diversion that adversely affects the quantity of measured product. (Added 2005)

Discussion: This proposal is intended to help ensure that all product measured on the scale is delivered to the customer. There are several circumstances where the final amount of a commodity weighed on the system's scale can be affected by operator practices. For instance, taking commodity samples or movement of commodities on belt conveyors over long distances where product slippage from the belt can result in product loss before the customer has custody of the commodity. Without records, any major spillage results in an inaccurate payment for delivered product. The chain of custody of weighed material between the scale and the end point of a conveyor system should be maintained at all times. The diversion of a measured commodity by as much as 0.1 % becomes significant over a period of time and can affect royalty payments and taxes and can even have an environmental impact for some commodities.

Originally, the Western Weights and Measures Association (WWMA) and Central Weights and Measures Association (CWMA) considered an industry proposal to amend existing paragraphs UR.3.2. Maintenance and UR.3.3. Retention of Maintenance, Test, and Analog or Digital Recorder Information to address diversion of commodities by requiring this material be measured and recorded.

The WWMA heard comments from a manufacturer that supported the concept, but found the "measurable diversion of weighed material" somewhat ambiguous. The WWMA believes the intent of the proposal could be better stated and simplified. Consequently, the WWMA modified industry's proposal as shown in the recommendation above by only adding a new paragraph UR.3.4. titled Diversion of Measured Product rather than suggesting changes to existing paragraphs UR.3.2. and UR.3.3.

The CWMA withdrew the issue from its agenda because no data was provided to demonstrate there is an issue with diverted product.

At the 2005 NCWM Interim Meeting, the Committee further modified the language proposed by WWMA to clarify the requirements intent to apply under conditions where weighed product slips off the belt or is sampled and not returned to the end customer. The Committee agreed the proposal should be a voting item at the 2005 NCWM Annual Meeting.

322 AUTOMATIC BULK WEIGHING SYSTEMS

322-1 I Tolerances

Source: Carryover Item 322-1. (This item originated from the Northeastern Weights and Measures Association (NEWMA) and first appeared on the Committee's 2002 agenda.)

Recommendation: Delete paragraphs T.1.4., T.2., T.2.1, T.3.2. and T.3.3.as follows:

T.1.4. To Tests Involving Digital Indications or Representations. - To the tolerances that would otherwise be applied, there shall be added an amount equal to one-half the value of the scale division. This does not apply to digital indications or recorded representations that have been corrected for rounding using error weights.

T.2. Minimum Tolerance Values. - The minimum tolerance value shall not be less than half the value of the scale division.

T.2.1. For Systems used to Weigh Construction Materials. - The minimum maintenance and acceptance tolerance shall be 0.1 % of the weighing capacity of the system, or the value of the scale division, whichever is less.

T.3.2. For Systems used to Weigh Grain. - The basic maintenance tolerance shall be 0.1 % of test load.

T.3.3. For all Other Systems. - The basic maintenance tolerance shall be 0.2 % of test load.

Renumber paragraph T.3. and renumber and modify T.3.1. as follows:

T.<u>3.2</u>. Basic Tolerance Values.

T.3.2.1. Acceptance Tolerance. -The basic acceptance tolerance shall be one-half the basic maintenance tolerance, but never less than 1 division. (Amended 200X)

Add new paragraphs T.2.2., T.2.3., and T.2.3.1. and Table 1. and Table 2. as follows:

T.2.2. General. - The tolerance applicable to devices not marked with an accuracy class shall have the tolerances applied as specified in Table 1. below.

Table 1. Tolerance for Unmarked Scales				
Type of Device Tolerance		<u>Decreasing Load</u> <u>Multiplier</u>	Other applicable <u>Requirements</u>	
Grain Hoppers	Class III, T.2.3 (table 2)	<u>1.0</u>	<u>T.2.1., T.2.3.1</u>	
Other Systems	Class III L, T.2.3 (table 2)	<u>1.0</u>	<u>T.2.1., T.2.3.1</u>	

(Added 200X)

T.2.3. Tolerances Applicable to Devices Marked III or III L.

T.2.3.1. Maintenance Tolerance Values - The maintenance tolerance values are specified in Table 2 below.

<u>Table 2. Maintenance Tolerance for Marked Scales</u> (All values in this table are in scale divisions)				
Tolerance in scale divisions				
	1 2 3 5			
Class	Class Test Load			
III	<u>0 - 500</u>	<u>501 - 2000</u>	<u>2001 - 4000</u>	<u>4001 +</u>
III L	<u>0 - 500</u>	<u>0 - 500</u> 501 - 1000 (Add 1d for each additional 500 d or fraction		
	thereof)			

(Added 200X)

Add a new footnote to Section 2.20 Scales Code Table 1.1.1. Tolerances for Unmarked Scales as follows:

XAutomatic bulk weighing systems see Section 2.22 for specifications and tolerances. (Added 200X)

Discussion: Since 2002, the Committee has considered a proposal to change the automatic bulk weighing systems tolerances from a percentage basis to division values, which are based on the device's accuracy class. The proposal was intended to align tolerances in the Automatic Bulk Weighing Systems (ABWS) Code and the Scales Code.

The Committee has kept the proposal as an information item to allow interested parties sufficient time to work through issues surrounding the permissible system errors and other concerns. The U.S. Grain Inspection, Packers and Stockyard Administration (GIPSA) indicated opposition to the proposed tolerances because of concerns about the allowable

cumulative error in a system's performance. GIPSA also noted that NEWMA indicated that some asphalt and cement plants use hopper scales that are considered ABWS by officials because these devices are capable of weighing single and multiple drafts, while other jurisdictions classify these devices as hopper scales, which are held to different tolerances. During past discussions, the Committee questioned whether training would help clarify any confusion that exists over which systems fall under the ABWS Code. The Committee noted that a hopper modified to include a controller and only capable of weighing several drafts is an automated hopper, not an ABWS.

Grain Inspection, Packers and Stockyard Administration Position

In 2004, GIPSA submitted the following position to the Committee for consideration. In 1986 when the ABWS Code was established, those systems were recognized as a special type and design. The tolerances for grain scales in this code were kept as a percentage so they would be proportional throughout the entire test load. The proposed step tolerance structure is not proportional throughout the system's entire weighing range and would double the allowable tolerance for test loads in some scale configurations. GIPSA believes the proposed structure might encourage scale owners to inappropriately select a scale configuration that permits the greater tolerance. Furthermore, under the proposed step tolerance structure, if some weights and measures jurisdictions do not apply the tolerance to the grain and test weights (test load) when conducting substitution tests, then the allowable error may double through the entire system's capacity.

Since 1986, the ABWS Code percentage tolerance for grain scales has served the grain industry well and there has not been any interest in changing the tolerance structure. In view of GIPSA's 17-year history of successful implementation of the ABWS Code in grain scale applications and the high level of understanding and acceptance of the code, GIPSA believes that the rationale behind NEWMA's proposal does not warrant a change to grain scale tolerances. GIPSA provided three tables (see S&T Item 322-1 in the 2004 Final Report) of test data to demonstrate its position. The data was intended to show a comparison of a 0.1 % tolerance and the Table 6 Accuracy Class III tolerance applied to a 120 000 lb x 20 lb and 50 000 lb x 10 lb device, given a specific amount of test weights and using the substitution test method during the increasing load test. The data illustrated that the accumulated error in the scale's performance using the proposed tolerance was greater than the error that occurred when the current permissible 0.1 % tolerance was applied to a device under test at comparable test loads.

Western Weights and Measures Association (WWMA) Position

The WWMA heard no comments on the proposal, but remains concerned about the potential cumulative effect of allowable errors that are the result of the proposed step tolerances.

Northeastern Weights and Measures Association (NEWMA) Position

NEWMA does not intend the proposal to require operators of grain hopper scales replace their scales. NEWMA indicated there are apparent similarities between a 0.1 % and Accuracy Class III tolerance structures. NEWMA finds the tolerance structures are closely aligned, yet slightly different at various points. Consequently, it will always be possible to cite borderline examples where the test results at selective test loads may produce differing "pass" or "fail" results on a particular scale. This difference can work both ways where application of percent tolerances may pass a scale when Class III tolerances would fail that same device and vice versa.

NEWMA believes the 0.1 % tolerance structure in the current ABWS Code emphasizes accuracy primarily at the device's lower capacity ranges. Manufacturers may indicate they are only concerned with a device's performance at 500 d because if the device can pass at that point then it will pass throughout its entire capacity range. In contrast, the Class III tolerance structure places an emphasis on accuracy at the higher scale capacities, which is typically where the scale will be used. For example, at 4000 d the Class III tolerance is actually 1 d tighter than the 0.1 % tolerance. NEWMA finds these differences to be minor.

The concerns heard in 1986 about a less stringent tolerance for loads slightly above 500 d are not the same today because officials know how to properly conduct a substitution test. This is due, in part, to work in 2003 to clarify the definition for substitution test.

NEWMA provided a graph to demonstrate the slight differences in the scale tolerance structures. The graph (see S&T Item 322-1 in the 2004 Final Report) includes a plotted scale error of 0.12 %. NEWMA noted that it is unlikely that

either tolerance structure would result in a failure rate until the test load exceeds 50 000 lb. The graph also included a "load cell curve" that often appears on high resolution electronic scales like those in the GIPSA examples. NEWMA contends that, if you examine the population rather than the individual scale, the overall outcome of a test will be the same in the end for both tolerance structures. It also is unlikely that device users could take advantage of the tolerance if adjustments are made as close as practicable to zero error.

NEWMA also contends that there is no significant difference in the design of a manual hopper scale or a hopper scale used in an ABWS. NEWMA does not see manufacturers offer two different models of hopper or use different load cells based on whether or not a device is evaluated under the Scales Code or ABWS Code. History seems to indicate that the 0.1 % tolerance was retained in the ABWS Code in 1986 not because these were unique devices, but primarily because it was too great of a change for many at that time. History also indicates that the 5 d tolerance step for Accuracy Class III was a compromise to those who did not want to lose the 0.1 % tolerance structure and the use of scales with small division sizes. NEWMA believes that in 1986 a majority of ABWSs were mechanical analog devices, whereas today they are predominantly electronic.

NEWMA noted that the change in applicable tolerances from 0.1 % tolerance to an Accuracy Class tolerance structure did not seem to pose a significant problem for a large number of other weighing devices. Between 1990 and 1993, the NCWM made a number of changes to the Scales Code Table T.1.1. Tolerances for Unmarked Scales. These changes brought most of the unmarked scales, initially grandfathered in 1986 at a 0.1 % tolerance, under the Class III tolerance structure. As part of those changes the old decreasing load multiplier was reduced from 1.5 to 1.0. NEWMA does not remember a significant increase in device rejections following these transition periods.

NEWMA cites the major reason for its proposal is to make the application of tolerances easier for the inspector. NEWMA finds that applying a percent tolerance is difficult and somewhat subjective since the official is faced with the difficulty in understanding and correctly applying the minimum tolerance and in dealing with rounding errors at intermediate test loads.

NEWMA believes one more compelling reason to move to Class III tolerances is that of international trade to gain the most appropriate requirement through harmonizing U.S. requirements with OIML requirements. The United States and the rest of the world should use a single standard to verify the measurement of grain at all levels of commerce.

NEWMA continues to welcome the opportunity for more discussion with the S&T Committee and GIPSA. NEWMA strongly believes the very minor differences in tolerance applications on a few borderline cases do not justify having a unique code for a device that is identical in design and performance to devices evaluated under the Scales Code. Anyone wishing to discuss this proposal with NEWMA should contact Bill Wilson (Clinton County, New York) at 518-565-4681, by fax at 518-565-4694, or by email at wilsonperu@aol.com or Ross Andersen (New York) at 518-457-3146, by fax at 518-457-5693, or by email at ross.andersen@agmkt.state.ny.us.

The Central Weights and Measures (CWMA) Position

The CWMA is concerned that the proposal may not have technical merit and is the result of each regulatory agencies' preference for a particular code format. The CWMA is also concerned that adopting the proposal will effect step tolerances to the point that older devices with an n_{max} greater than 4000 d will not comply.

NCWM S&T Committee Position

In July 2004, the Committee stressed that a system, to be considered an ABWS, must meet all ABWS Code specifications such as interlocks and overfill sensors as well as performance requirements. There is ongoing work to harmonize many U.S. requirements with OIML standards; however, R107 "Discontinuous Totalizing Automatic Weighing Instruments (Totalizing Hopper Weighers)," unlike the ABWS Code, requires a material test. The U.S. and OIML procedures for substitution tests consider the use of error weights to determine the scale's true performance and to avoid introducing uncertainties in the test process. If error weights are not used, the potential does exist for introducing additional error when the known test load falls between tolerance break points.

The Committee heard testimony from GIPSA that all issues that might arise from the proposal have not been examined, especially those affecting the grain industry. GIPSA understands the need to harmonize U.S. and OIML requirements,

but recommended a closer examination of the grain industry's concerns. The Committee believes that a U.S. National Work Group (USNWG) should be given serious consideration as a possible forum to work on suitable ABWS tolerances. USNWGs bring together public and private sector representatives that have experience and expertise in a particular device area to work to resolve items on a limited and device specific agenda. NIST USNWGs have made great strides and have had multiple successes in tackling many specific device issues.

During the 2005 NCWM Interim Meeting, the Committee heard that NEWMA continues its work on a survey to determine how weights and measures officials apply the ABWS Code tolerances. GIPSA did not provide further comments on its position. The Committee decided to keep the proposal an information item to allow GIPSA, NEWMA, the grain industry, and all other parties affected by the proposed changes to the ABWS tolerances additional time to compare data and agree on an appropriate set of tolerances for systems that fall under the ABWS Code. GIPSA did not provide any comments at the meeting. The Committee anticipates NEWMA will have the results of its survey at the 2005 NCWM Annual Meeting. If additional information is not provided by that time, the Committee plans to move the proposal to a developing item.

For more background information, refer to the 2002, 2003, and 2004 S&T Final Reports.

330 LIQUID-MEASURING DEVICES

330-1 V S.1.6.1.1. Inhibition of Indication, Electronic; Until Normal Delivery Conditions.

Source: National Type Evaluation Technical Committee (NTETC) Measuring Sector

Recommendation: Modify Section 3.30. paragraph S.1.6.1. Indication of Delivery and add new paragraph S.1.6.1.1. for inhibiting measurement and indication of delivery as follows:

S.1.6.1. Indication of Delivery. - The device shall automatically show on its face the initial zero condition and the quantity delivered (up to the nominal capacity).

However, the first 0.03 L (or 0.009 gal) of a delivery and its associated total sales price need not be indicated.

S.1.6.1.1. Inhibition of Indication, Electronic; Until Normal Delivery Conditions. – After the suppression of up to 0.03 L (or 0.009 gal), the measurement, indication of delivered quantity, and the indication of total price shall be inhibited until the fueling position reaches normal delivery conditions. (Added and 2005) [Nonretroactive as of January 1, 2006]

[Nonretroactive as of January 1, 2006]

Discussion/Background: At the 2004 NTETC Measuring Sector meeting, Maryland Weights and Measures stated that as the price for motor fuel nears or exceeds \$2.00 per gallon, the number of complaints it receives regarding computer jump have increased. NIST Weights and Measures Division (WMD) has received numerous calls from jurisdictions related to this problem. It appears that the actual amount of jump or meter creep occurring because of internal pressure changes related to changes in temperature has not increased. However, at the higher unit prices this relatively small meter creep results in an indication of several cents. One concern was that there was no guidance in Handbook 44 providing criteria or tolerances for "computer jump." Prior to 1987 Handbook 44 had a test note N.4.3. and tolerances T.2.4. in the LMD Code for conducting an elapsed time test. At the 1986 NCWM Annual Meeting the Conference voted to delete those paragraphs. The discussion of the item says that a suggestion was received that all references to an elapsed time test should be removed because: (1) none are being conducted, and (2) the conditions that caused their inclusion have for the most part been eliminated. In 1986 if a consumer experienced a computer jump that resulted in an indication of money value prior to opening the nozzle, the consumer normally could return the dispenser to the off position and start the delivery from "zero." Currently, if a customer is making a fuel purchase using a credit or debit card at the pump, any indication of delivery is automatically charged to the customer's account; therefore returning the dispenser to the off position and starting the delivery from "zero" does not resolve the problem. Maryland and WMD provided a proposal to eliminate the indication of computer jump for the Sector to consider. The Sector agreed with the proposal in principle, but recommended some changes to the language (including the use of the term "fueling position",) as indicated in the Recommendation and agreed to forward it to the NCWM and the Southern Weights and Measures Association (SWMA) S&T Committees for consideration. A manufacturer of retail motor-fuel dispensers stated that

"fueling position" is a recognized industry term that is preferable in this case to the term "dispenser." Dispensers typically have hoses on two sides. The term "fueling position" is applicable to only one side at a time.

At its October 2004 meeting, the SWMA heard no opposition to the Measuring Sector proposal. The SWMA agreed to forward the proposal to the Committee with the recommendation that it be a voting item on the 2005 NCWM S&T Agenda. The SWMA also recommended that the Committee consider adding similar requirements to Handbook 44 Sections 3.30. and 3.32. as appropriate.

At the 2005 Interim Meeting, several dispenser manufacturers expressed concern with the term "normal delivery pressure," which was used in the original proposal, since the pressure within the system can vary during normal use. The Committee met with three dispenser manufacturers to develop new nonretroactive language in which the word "pressure" is changed to "condition" as indicated in the Recommendation. The new requirement does not allow the measurement of product until the fueling position reaches normal delivery condition (packed hose) up to the nozzle. If the system meets the new requirement, the dispenser will indicate zero until the nozzle is opened and product begins to flow. The Committee agreed that making the requirement nonretroactive was appropriate to provide manufacturers some time to develop a mechanism for eliminating computer jump on new devices. For devices already in the field, officials can use paragraph UR.3.1. and G-S.2. to require that the primary indicating element be returned to zero prior to the start of each delivery. The Committee agreed this item should go forward for a vote at the 2005 NCWM Annual Meeting.

330-2 V N.4.2.2. Retail Motor-Fuel Devices

Source: National Type Evaluation Technical Committee (NTETC) Measuring Sector

Recommendation: Modify Sec. 3.30 Paragraph N.4.2.2. Retail Motor-Fuel Devices as follows:

N.4.2.2. Retail Motor-Fuel Devices.

- (a) Devices with<u>out</u> a <u>marked minimum</u> flow-rate capacity less than 100 L (25 gal) per minute shall have a "special" test performed at the slower of the following rates:
 - (1) 19 L (5 gal) per minute, or
 - (2) the minimum discharge rate marked on the device, or
 - (3) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting.
- (b) Devices marked with a <u>minimum</u> flow-rate eapacity 100 L (25 gal) or more per minute shall have a "special" test performed at <u>or near</u> the <u>marked minimum flow rate</u>. slowest of the following rates:

(1) the minimum discharge rate marked on the device, or

(2) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting. (Added 1984) (Amended 2005)

Discussion/Background: At its October 2004 meeting, the NTETC Measuring Sector discussed a test scenario in which a retail motor-fuel device (RMFD) was marked with flow rates of 60 gpm maximum and 12 gpm minimum and where the actual flow rate on the lowest setting of the automatic nozzle was 6 gpm. The laboratory posed the following questions regarding this situation:

If a 10-gal test measure is used, what is the appropriate tolerance applicable? Table T.2. in the Liquid-Measuring Device (LMD) Code stipulates that the special test tolerance is 0.5 %. This would equate to 11.55 cubic inches on a ten-gallon test draft; however, there is a footnote that states that the applicable acceptance tolerance when using a 10-gallon test draft is 5.5 cubic inches. Which tolerance should be applied during an NTEP evaluation? If a prover with a capacity

greater than 10 gallons is used, would it provide a tolerance advantage over tests conducted with a 10-gallon test measure?

Paragraph S.4.4.1. requires that RMFDs with a designed maximum flow rate of 30 gpm or greater be marked with a minimum and maximum flow rate. RMFDs with a designed maximum flow rare of less than 30 gpm are not required to have a maximum and minimum flow rate marking, but such a marking is not precluded. N.4.2.2. (b) in the LMD Code states "Devices marked with a flow-rate capacity of 100 L (25 gal) or more per minute shall have a "special" test performed at the slowest of the following rates: (1) the minimum discharge rate marked on the device, or (2) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting." If a RMFD is marked with a minimum flow rate, is it appropriate to operate the device below the marked minimum flow rate?

There appears to be a potential conflict between the test notes and the user requirements for RFMDs that are marked with a maximum and minimum flow rate. S.4.4.1. requires marking of maximum and minimum flow rates on *higher flow* devices, but nothing precludes such marking if a manufacturer wants to include it. G-UR.3.1. is a user requirement that states that a device is to be used in the manner that is indicated by instructions on the equipment. N.4.2.2. (a) and (b) both contain testing recommendations that could encourage a weights and measures official to conduct a test of a dispenser at a flow rate that is less than the minimum flow rate that may be marked on the device. The manufacturers of RMFDs present at the 2004 Measuring Sector meeting stated that it is not appropriate to require accuracy for a device when it is operated below the marked minimum flow rate.

The Sector agreed that officials should not test below the minimum flow rate marked on the device because the device is not designed to operate accurately at lesser flow rates. The Sector also agreed that the flow rate of 25 gpm in N.4.2.2. should be changed to 30 gpm to agree with the marking requirements in S.4.4.1. Discharge Rates. The Sector agreed to forward a proposal to the NCWM and Southern Weights and Measures Association (SWMA) for consideration.

At its October 2004 meeting, the SWMA heard concerns with the proposed changes to N.4.2.2. Retail Motor-Fuel Devices (a) (3) and (b) (2) and recommended that officials not test at a flow rate less than the minimum flow rate marked on a device. The Sector's proposal also conflicts with other requirements in N.4.2.2. The SWMA agreed that the proposal should not be forwarded to the Committee.

Following the SWMA meeting, NIST Weights and Measures Division (WMD) developed the alternative recommendation shown above to address the concerns of the SWMA with the original Measuring Sector's proposal to modify N.4.2.2.

When first adopted, N.4.2.2. contained only two test criteria which stipulated that the slow flow test be made at the slower of 19 L (5 gal) per minute or the minimum flow rate marked on the device. In 1971, the Committee received several communications that RMFDs equipped with an automatic nozzle were often operated at a discharge rate established by the automatic nozzle when set at its slowest setting. Paragraph N.4.2.2. was modified to include the provision for testing with an automatic nozzle set on the lowest notch, if the flow rate at the setting was less than 19 L (5 gal) per minute or the minimum flow rate marked on the device. In 1971 few, if any, RMFDs were marked with a minimum flow rate and the information provided by the manufacturer typically stated that the device was accurate at any flow rate.

In 1984, when "high gallonage" dispensers gained popularity in the marketplace, paragraph S.4.4. Marking Requirements/For Retail Devices Only, (now S.4.4.1. Discharge Rates), was added to require dispensers with a maximum flow rate of 25 gpm or greater to be marked with a maximum and minimum flow rate. At that time N.4.2.3., which later became the present N.4.2.2. (b), was added. It was the view of the Committee that the minimum flow rate for these dispensers would be greater than 5 gallons per minute so that flow rate was not included in the test criteria of new paragraph N.4.2.2.

Technical advisor's note: G-UR.2.3. states "that equipment shall be operated only in the manner that is indicated by instructions on the equipment (minimum flow rate)." Some dispensers are equipped with a latch on the nozzle lever which, when set at its lowest setting, may cause the dispenser to operate below the marked minimum flow rate. The NCWM may want to consider a User Requirement in the LMD Code that does not allow a latch on the nozzle to create this situation since such a component would facilitate inappropriate and inaccurate use of the device.

At the 2005 Interim Meeting, the Committee received no comments on this item. The Committee agreed that the alternate proposal prepared by WMD correctly resolved the issue of what flow rates are appropriate when conducting a field examination of a RMFD and agreed to present the item for a vote at the 2005 NCWM Annual Meeting.

331 VEHICLE-TANK METERS

331-1 I Temperature Compensation

Source: Carryover Item 331-1 (This item originated from the Western Weights and Measures Association (WWMA) and first appeared on the Committee's 2000 agenda.)

Recommendation: Modify Section 3.31. Vehicle-Tank Meters (VTM) Code by adding the following new paragraphs to recognize temperature compensation as follows:

S.2.4. Automatic Temperature Compensation for Refined Petroleum Products.

S.2.4.1. Automatic Temperature Compensation for Refined Petroleum Products. - A device may be equipped with an automatic means for adjusting the indication and registration of the measured volume of product to the volume at 15 °C (60 °F), where not prohibited by State Law.

S.2.4.2. Provision for Deactivating. - On a device equipped with an automatic temperature-compensating mechanism that will indicate or record only in terms of liters (gallons) compensated to 15 °C (60 °F), provision shall be made for deactivating the automatic temperature-compensating mechanism so that the meter can indicate and record, if it is equipped to record, in terms of the uncompensated volume.

S.2.4.3. Gross and Net Indications - A device equipped with automatic temperature compensation shall indicate and record, if equipped to record, both the gross (uncompensated) and net (compensated) volume for testing purposes. If both values cannot be displayed or recorded for the same test draft, means shall be provided to select either the gross or net indication for each test draft.

S.2.4.4. Provision for Sealing Automatic Temperature-Compensating Systems. - Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or physically applying security seals in such a manner that an automatic temperature-compensating system cannot be disconnected and that no adjustment may be made to the system.

S.2.4.5. 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. (Added 200X)

S.5.6. Temperature Compensation for Refined Petroleum Products. - If a device is equipped with an automatic temperature compensator, the primary indicating elements, recording elements, and recording representation shall be clearly and conspicuously marked to show that the volume delivered has been adjusted to the volume at 15 °C (60 °F). (Added 200X)

N.4.1.3. Automatic Temperature-Compensating Systems for Refined Petroleum Products. - On devices equipped with automatic temperature-compensating systems, normal tests shall be conducted:

(a) by comparing the compensated volume indicated or recorded to the actual delivered volume corrected to 15 °C (60 °F); and

(b) with the temperature-compensating system deactivated, comparing the uncompensated volume indicated or recorded to the actual delivered volume.

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. (Added 200X)

N.5. Temperature Correction for Refined Petroleum Products. - Corrections shall be made for any changes in volume resulting from the differences in liquid temperatures between the time of passage through the meter and time of volumetric determination in the prover. When adjustments are necessary, appropriate petroleum measurement tables should be used. (Added 200X)

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

(a) 0.4 % for mechanical automatic temperature-compensating systems; and

(b) 0.2 % 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. (Added 200X)

UR.2.5. Temperature Compensation for Refined Petroleum Products.

UR.2.5.1. Automatic.

UR.2.5.1.1. When to be Used. - In a State that does not prohibit, by law or regulation, the sale of temperature-compensated product a device equipped with an operable automatic temperature compensator shall be connected, operable, and in use at all times. An electronic or mechanical automatic temperature-compensating system may not be removed, nor may a compensated device be replaced with an uncompensated device, without the written approval of the responsible weights and measures jurisdiction.

[Note: This requirement does not specify the method of sale for product measured through a meter.]

UR.2.5.1.2. Invoices. - An invoice based on a reading of a device that is equipped with an automatic temperature compensator shall show that the volume delivered has been adjusted to the volume at 15 °C (60 °F).

(Added 200X)

Discussion/Background: When this item was originally submitted, several officials reportedly were confused about the specific meter applications are covered by an NTEP Certificate of Conformance for a meter that included the temperature-compensation feature. The Western Weights and Measures Association (WWMA) acknowledged some jurisdictions permit temperature compensated deliveries in applications that are not addressed by NIST Handbook 44. Some states do not allow the use of automatic temperature compensation for the delivery of products using a VTM.

At the 2002 and 2003 NCWM Annual Meetings, this item did not pass or fail and was returned to the Committee for further consideration.

At the 2004 NCWM Annual Meeting, the Committee stated its position on Item 331-1 as follows:

The Committee believed that the Specifications, Test Notes, Tolerances, and User Requirements contained in the proposal are technically correct and provide both weights and measures officials and the NTEP laboratories with the proper criteria to use when evaluating a vehicle tank meter (VTM) with temperature compensation capability. The addition of this language to the VTM Code does not require, approve, nor solicit any jurisdiction to either prohibit or accept the use of temperature compensation in that jurisdiction. The Committee further stated that the adoption of a nationally accepted method of sale for temperature compensation by all jurisdictions will not be obtainable in the foreseeable future and encouraged each jurisdiction to adopt by either statute, rule, or regulation requirements that prohibit, permit, or require temperature compensation in their jurisdiction.

The Committee agreed there were a sufficient number of states that needed the new requirements as an inspection tool to warrant adding the proposal to NIST Handbook 44 at that time without waiting for method of sale requirements to be added to NIST Handbook 130.

At the 2004 NCWM Annual Meeting, this item did not pass or fail and was returned to the Committee for further consideration.

At its September 2004 meeting, the Central Weights and Measures Association (CWMA) agreed with the Committee that nothing in this proposal requires a jurisdiction to permit or prohibit the sale of petroleum products that have been temperature compensated. The CWMA recognized the technical merit of the proposal and felt that requirements are needed in Handbook 44; however, the CWMA further agreed that this is also a "method of sale" issue and that the proposal should be retained as an information item until an accompanying method of sale requirement is added to Handbook 130.

At its September 2004 meeting, the WWMA agreed with the Committee that nothing in this proposal requires a jurisdiction to permit or prohibit the sale of petroleum products that have been temperature compensated. The WWMA continues its strong support of this proposal and recommends that this item go forward for adoption by the NCWM.

At its October 2004 meeting, the Northeastern Weights and Measures Association (NEWMA) members were informed that the L&R Committee requested the Board of Directors fund a work group to determine if requirements for temperature compensation should be added to Handbook 130 and, if so, what wholesale and retail areas should be covered. Several participants believed a work group was unnecessary and that work groups should not be created just because a subject is controversial. These members felt there were other items where work groups could be better used. NEWMA suggested removing the words "recognition of" from the title of Item 331-1.

At the 2005 NCWM Interim Meeting, the Committee participated in a combined open hearing with the L&R Committee for discussion of this item and L&R Item 232-1. There also was a special forum held on the first day of the Interim Meeting to discuss temperature compensation issues. At the forum and the open hearings, the Committee received little or no new information on this item and considered withdrawing it from its agenda; however, the Committee was informed that the L&R Committee kept its Item 232-1 as a developing issue. The L&R Committee modified Item 232-1 to become two separate Items: 232-1A and 232-1B. Item 232-1A addresses VTMs and Item 232-1B addresses other meter types. Therefore, the Committee agreed to keep this item as informational pending further development of 232-41A.

(See L&R Item 232-1A and B.)

For additional background on this item, see the NCWM 2000 through 2004 S&T Final Reports and the 2005 edition of NCWM Publication 15 on the WMD home page at www.nist.gov/owm.

331-2 V S.1.4.1. Display of Unit Price

Source: National Type Evaluation Technical Committee (NTETC) Measuring Sector

Recommendation: Modify Section 3.31. paragraph S.1.4.1. Display of Unit Price as follows:

S.1.4.1. Display of Unit Price. - In a device of the computing type, means shall be provided for displaying on the outside of the device, in a manner clear to the operator and an observer, the unit price at which the device is set to compute. <u>The unit price is not required to be displayed continuously.</u> (Amended 2005)

Discussion/Background: At the 2004 Sector meeting, a manufacturer of vehicle-tank meters (VTM) asked the Sector to provide input on the intent of Handbook 44 Section 3.31. paragraph S.1.4.1. Display of Unit Price. The Sector was asked to determine whether or not the unit price must be displayed continuously. The manufacturer referred to the final report of the 1983 NCWM S&T Committee. In the discussion of S&T Item 304-2 the Committee stated its view that it is appropriate for a digital electronic indicating element associated with a VTM to utilize a shared display; that is, the same display area can be used to indicate the volume delivered, the unit price, and the total price. The Sector agreed the intent of the S&T Committee was clear and further agreed to forward to the NCWM and the Southern Weights and Measures Association (SWMA) for consideration the Recommendation to add text to clarify S.1.4.1.

At its October 2004 meeting, the SWMA agreed with the Measuring Sector's interpretation of the intent of S.1.4.1. and agreed to forward the recommendation shown above to the Committee as a voting item.

At the 2005 NCWM Interim Meeting, the Committee heard no opposition to this item and agreed to present it for a vote at the 2005 NCWM Annual Meeting.

331-3 V S.2.4. Zero Set-Back Interlock, Vehicle-Tank Meters, Electronic.

Source: Carryover Item 331-3. (This item originated from the Southern Weights and Measures Association (SWMA) and first appeared on the Committee's 2002 agenda.)

Recommendation: Add a new paragraph S.2.4. to Section 3.31. Vehicle-Tank Meters (VTM) as follows:

S.2.4. Zero-Set-Back Interlock, Vehicle-Tank Meters, Electronic. – Except for aircraft fueling, a device shall be so constructed that after an individual or multiple deliveries at one location have been completed, an automatic interlock system shall engage to prevent a subsequent delivery until the indicating and, if equipped, recording elements have been returned to their zero position. For individual deliveries, if there is no product flow for 3 minutes the transaction must be completed before additional product flow is allowed. The 3 minute timeout shall be a sealable feature on an indicator. [Nonretroactive as of January 1, 2006]

(Added 2005)

Background/Discussion: The original proposal applied to both mechanical and electronic registers in VTM applications. The manufacturers of VTM registers agreed that it is not economically practical to modify existing mechanical registers to include a zero set-back interlock or to add that feature to new production of mechanical registers. At its October 2004 meeting of the Measuring Sector, the members developed an alternative recommendation to add a new paragraph S.2.4. to Handbook 44, Section 3.31. Vehicle-Tank Meters that applied only to electronic registers. The Sector agreed to forward the proposal to the NCWM S&T and the SWMA Committees for consideration.

At its October 2004 meeting, the SWMA reviewed the Measuring Sector's recommendation. The SWMA heard comments that the 3-minute time-out feature should be required to be a sealable feature and the word "may" needed to be changed to "shall" in the last sentence of the Sector's proposal. The SWMA agreed to forward its recommendation to the S&T Committee with the recommendation that it be a voting item on the Committee's 2005 Agenda.

At the 2005 NCWM Interim Meeting, one official stated that mechanical registers should be included in the requirement for a zero-set-back interlock. The Committee believes it is not practical to modify the mechanical registers currently in use in vehicle-tank meter applications and that attempting to include that requirement in this proposal would only significantly delay adoption of any requirement for a zero-set-back interlock. The Committee also believes the number of new mechanical registers being installed is declining and will continue to do so. The Committee recognizes that, while it is more difficult to detect and take enforcement action, UR.2.3. provides a mechanism for stopping the "riding of tickets" between deliveries. The Committee agreed with the SWMA recommendation to modify the Measuring Sector's

proposal and to present the modified proposal as indicated in the Recommendation for a vote at the 2005 NCWM Annual Meeting.

For additional background on this item, see the NCWM 2000 through 2004 S&T Final Reports and the 2005 edition of Publication 15 on the WMD home page.

331-4 V N.4.2. Special Tests (Except Milk-Measuring Systems), N.4.5. Product Depletion Test, and T.4. Product Depletion Test

Source: Carryover Item 331-2. (This item originated from the Northeastern Weights and Measures Association (NEWMA) and first appeared on the Committee's 2003 agenda.)

Recommendation: Amend paragraph N.4.2. Special Tests (Except Milk-Measuring Systems) as follows:

N.4.2. Special Tests (Except Milk-Measuring Systems). - "Special" tests shall be made to develop the operating characteristics of a measuring system and any special elements and accessories attached to or associated with the device. Any test except as set forth in N.4.1. <u>and N.4.5.</u> shall be considered a special test. Special tests of a measuring system shall be made <u>as follows:</u>

(a) at a minimum discharge rate of 20 % of the marked maximum discharge rate or at the minimum discharge rate marked on the device whichever is less;

(b) to develop operating characteristics of the measuring system during a split compartment delivery.

Add new paragraphs N.4.5. Product Depletion Test and T.4. Product Depletion Test and Table T.4. Tolerances as follows:

N.4.5. Product Depletion Test. - The effectiveness of the vapor eliminator or vapor elimination means shall be tested by dispensing product at the normal flow rate until the product supply is depleted and continuing until the lack of fluid causes the meter indication to stop completely for at least 10 seconds. If the meter indication fails to stop completely for at least 10 seconds, continue to operate the system for 3 minutes. Finish the test by switching to another compartment with sufficient product on a multi-compartment vehicle, or by adding sufficient product to a single compartment vehicle. When adding product to a single compartment vehicle, allow appropriate time for any entrapped vapor to disperse before continuing the test. (Added 2005)

T.4. Product Depletion Test. - The difference in the delivered volumes for the normal test and the product depletion test shall not exceed the tolerance shown in Table T.4. Test drafts shall be of the same size and run at approximately the same flow rate.

Note: The result of the product depletion test may fall outside of the applicable test tolerance.

<u>Table T.4. Tolerances For Vehicle Tank Meters</u> On Product Depletion Tests, Except Milk Meters			
Meter size Maintenance and acceptance tolerances			
Up to but not including 50 mm (2.0 in)	<u>1.70 l (104 in³)¹</u>		
From 2.0 up to but not including 75 mm (3.0 in) $2.25 l (137 in^3)^1$			
$\frac{75 \text{ mm} (3.0 \text{ in}) \text{ or larger}}{3.751(229 \text{ in}^3)^{\frac{1}{2}}}$			
^{1} Based on a test volume of at least 1 minute flow in accordance with N.3.			

(Added 2005)

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Discussion: The measurement of vapor when product is depleted during the vehicle-tank meter (VTM) "split compartment" test (product depletion test) is a system problem and the amount of vapor measured is not related to the size of the test draft. The proposal requires a product depletion test for single compartment vehicles to verify the performance of the air elimination mechanism. Currently paragraph N.4.2.(b) refers only to a "split-compartment" delivery, implying that the test should only be conducted on multi-compartment vehicles. The proposal recommends modifying the tolerances such that the applicable tolerance is based on the meter's flow rate and remains constant regardless of the size of the test draft.

At its October 2004 meeting, the NTETC Measuring Sector reviewed an alternate proposal for a new Table T.4. developed by Maryland Weights and Measures and NIST WMD based on the Measurement Canada tolerance structure that categorizes meters by size (pipe diameter) for product depletion tests. The VTM manufacturers present at the meeting verified that there is a definite correlation between the meter size and the achievable maximum flow rate. The Sector agreed with the alternate proposal and provided an example of how the product depletion test would be applied and a note stating that the results of the product depletion test could fall outside of the applicable tolerance if the meter being tested were included in Table T.4. as indicated in the Recommendation. The Sector agreed to forward the alternate proposal to the Southern Weights and Measures Association (SWMA) and the Committee for consideration.

At the October 2004 NEWMA meeting, New York proposed that an NCWM work group be formed to research this item and supplied a discussion paper in support of the proposal. NEWMA agreed to forward the recommendation and the discussion paper to the Committee for consideration.

At its October 2004 Meeting, the SWMA heard no opposition to the Measuring Sector's proposal. One official asked if a similar requirement should be added to the Section 3.30. Liquid-Measuring Devices for wholesale meters and to Section 3.32. LPG and Anhydrous Ammonia Liquid-Measuring Devices. The SWMA agreed to forward the proposal to the NCWM S&T Committee with the recommendation that it be a voting item on the Committee's 2005 Agenda. The SWMA also recommended that the Committee consider adding similar requirements to Sections 3.30. and 3.32. for testing the effectiveness of vapor elimination means, as appropriate.

Following the 2004 fall meetings of NEWMA, SWMA, and the NTETC Measuring Sector, New York Weights and Measures worked with WMD to add an additional category of meter sizes to the proposed Table T.4. from the NTETC Measuring Sector as shown in the recommendation above. This change was based on New York's concern that a large number of vehicle-tank meters less than 2.0 inches are still in use in that state. The tolerance for meters smaller than 2.0 inches was developed based on the current tolerance for a draft of at least one minute's flow for a typical meter of that size. However, the tolerance is not directly related to draft size and remains the same even if the draft size is increased.

At the 2005 NCWM Interim Meeting, the Committee heard support for the proposal with the changes recommended by New York and WMD and agreed to present the modified proposal for a vote at the Annual Meeting.

For additional background on this item see the NCWM 2003 and 2004 S&T Committee Final Reports.

336 WATER METERS

336-1 I Table N.4.2. Flow Rate and Draft Size for Water Meters Special Tests

Source: Northeastern Weights and Measures Association (NEWMA)

Recommendation: Amend Table N.4.2. as follows:
Table N.4.2. Flow Rate and Draft Size for Water Meters Special Tests						
Madamatin	I	ntermediate Rate			Minimum Rate	
(inches)	Rate of flow	Meter indicatio	n/Test Draft	Rate of flow	Meter indicat	ion/Test Draft
(Intenes)	(gal/min)	gal	ft ³	(gal/min)	gal	ft ³
Less than or equal to 5/8	2	10	1	1/4	5 <u>10</u>	1
3/4	3	10	1	1/2	5<u>10</u>	1
1	4	10	1	3/4	5<u>10</u>	1
1 1/2	8	50	5	1 1/2	10	1
2	15	50	5	2	10	1
3	20	50	5	4	10	1
4	40	100	10	7	50<u>100</u>	5
6	60	100	10	12	50 100	5

(Table Added 2003) (Amended 200X)

Discussion/Background: At the fall 2004 NEWMA meeting, a manufacturer submitted the above proposal. The manufacturer stated that a test draft of 5 gallons is not large enough to provide repeatability for dial indicating water meters sized 1 inch and smaller. The dial indicator for these devices has 100 graduations of 1/10 gallon, which means one complete revolution equals 10 gallons. The effect of parallax on the reading and gear backlash both contribute to the lack of repeatability of indications when using a 5-gallon test draft. The manufacturer recommended that any test of the device include, at a minimum, at least one complete revolution of the dial indicator. None of the jurisdictions represented at the NEWMA meeting routinely test water meters; therefore, they could not provide any input on the technical merits of the proposal. However, NEWMA agreed to forward the proposal to the Committee for consideration.

At the 2005 NCWM Interim Meeting, the only concern the Committee heard was that the time required for some tests would increase significantly. The manufacturer that submitted the proposal to NEWMA was not at the Interim Meeting. The Committee agreed to make the proposal an information item to provide the opportunity for review and comment from the regional associations, especially jurisdictions routinely conducting water meter tests. If additional support and comments are not received, the Committee may withdraw this item.

360 OTHER ITEMS

360-1 V Proposed Section 5.59. Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices-Tentative Code

Source: Southern Weights and Measures Association (SWMA)

Recommendation: Add a Tentative Code Section 5.59. Livestock, Meat, and Poultry Evaluation Systems and/or Devices as follows:

Sec. 5.59. Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices – Tentative Code

This tentative code has only a trial or experimental status and is not intended to be enforced. The requirements are designed for study prior to the development and adoption of a final Code for Livestock, Meat, and Poultry Evaluation Systems and/or Devices. Officials wanting to conduct an official examination of a device or system are advised to see paragraph G-A.3. Special and Unclassified Equipment.

A. Application

A.1. - This code applies to electronic devices or systems for measuring the composition or quality constituents of live animals, livestock and poultry carcasses, and individual cuts of meat or a combination thereof for the purpose of determining value.

A.2. - See also Sec. 1.10; General Code requirements.

A.3. - This code does not apply to scales used to weigh live animals, livestock and poultry carcasses, and individual cuts of meat unless the scales are part of an integrated system designed to measure composition or guality constituents. Scales used in integrated systems must also meet NIST Handbook 44 Section 2.20. requirements.

S. Specifications

S.1. Design and Manufacture - All design and manufacturing specifications shall comply with ASTM Standard F 2342 Standard Specification for Design and Construction of Composition or Quality Constituent Measuring Devices or Systems.

N. Notes

<u>N.1. Method of Test. – Performance tests shall be conducted in accordance with ASTM Standard F 2343 Test</u> <u>Method for Livestock, Meat, and Poultry Evaluation Devices.</u>

<u>N.2. Testing Standards. – ASTM Standard F 2343 requires device or system users to maintain accurate</u> reference standards that meet the tolerance expressed in NIST Handbook 44 Fundamental Considerations, paragraph 3.2. (i.e., one third of the smallest tolerance applied.)

<u>N.3. Verification. – Device or system users are required to verify and document the accuracy of a device or system on each production day as specified by ASTM Standard F 2341 Standard Practice of User Requirements for Livestock, Meat, and Poultry Evaluation Devices or Systems.</u>

N.3.1. Official Tests. – Officials are encouraged to periodically witness the required "in house" verification of accuracy. Officials may also conduct official tests using the on-site testing standards or other appropriate standards belonging to the jurisdiction with statutory authority over the device or system.

T. Tolerances

T.1. Tolerances on Individual Measurements. - Maintenance and acceptance tolerances on an individual measurement shall be as shown in Table T.1.

Table T.1. Tolerances					
Individual linear measurement of a single	∀ 1 mm (0.039 in)				
constituent					
Measurement of area	\forall 1.6 cm ² (0.25 in ²)				
For measurements of other constituents	As specified in ASTM Standard F 2343				

User Requirements

UR.1. Installation Requirements.

<u>UR.1.1.</u> Installation. – All devices and systems shall be installed in accordance with manufacturer's instructions.

UR.2. Maintenance of Equipment.

<u>UR.2.1.</u> Maintenance. – All devices and systems shall be continually maintained in an accurate condition and in accordance with the manufacturer's instructions and ASTM Standard F 2341.

UR.3. Use requirements.

UR.3.1. Limitation of Use. – All devices and systems shall be used to make measurements in a manner specified by the manufacturer.

UR.4. Testing Standards. – The user of a commercial device shall make available to the official with statutory authority over the device testing standards that meet the tolerance expressed in Fundamental Considerations, paragraph 3.2. (i.e., one third of the smallest tolerance applied). The accuracy of the testing standards shall be verified annually or on a frequency as required by the official with statutory authority and shall be traceable to a national standard.

Discussion: In 2000 the Grain Inspection, Packers, and Stockyards Administration (GIPSA) branch of the United States Department of Agriculture (USDA) approached NIST Weights and Measures Division (WMD) and the NCWM to discuss the development of standards for devices used to measure fat content in animal carcasses. Because neither the NCWM nor NIST had the resources needed to develop such a standard, the American Society for Testing and Materials (ASTM) was contacted as a potential standards-writing body to guide the task of developing the desired standard. The ASTM agreed to develop standards known as ASTM Standard F10 on Livestock, Meat, and Poultry Evaluation Systems for the measurement of fat and other quality constituents in animal carcasses. Some devices or systems will measure only a single constituent, which will be used to determine the value of the carcasses or primal cuts. Other systems may integrate the measurement of several constituents such as fat, lean, marbling, pH, and color, to determine carcass value.

The NCWM agreed that if USDA was able to develop standards for these devices outside of the NCWM, the NCWM would consider adopting these standards as a tentative code in NIST Handbook 44. The code in Handbook 44 is needed to provide an enforcement tool for USDA and other jurisdictions wanting to have a mechanism for conducting inspections of these devices and approving or rejecting them according to the results of the inspection. The ASTM Standards are voluntary standards that only have the effect of law when they are adopted into regulation by a jurisdiction with statutory authority over these devices. Including or referencing such standards in Handbook 44 provides a method for that adoption.

At its October 2004 meeting, the SWMA reviewed a draft tentative code for livestock, meat, and poultry evaluation systems and devices prepared by WMD. The SWMA agreed to forward the proposal to the Committee for addition to Handbook 44 as a tentative code with the recommendation that it be a voting item on the 2005 NCWM S&T Agenda.

At the 2005 NCWM Interim Meeting, the Committee heard no opposition to this proposal and agreed to present it for a vote at the 2005 NCWM Annual Meeting.

360-2 V Appendix A Fundamental Considerations 3. Testing Apparatus; 3.1 Adequacy, 3.2 Tolerances for Standards and Footnote 2, and 3.3 Accuracy of Standards

Source: Western Weights and Measures Association (WWMA)

Recommendation: Amend Appendix A Fundamental Considerations 3. Testing Apparatus as follows:

Add amended Footnote 2 to paragraph 3.1 Adequacy as follows:

3. Testing Apparatus

3.1. Adequacy.² - Tests can be made properly only if, among other things, adequate testing apparatus is available. Testing apparatus may be considered adequate only when it is properly designed for its intended use, when it is constructed that it will retain its characteristics for a reasonable period under conditions of normal use, when it is

available in denominations appropriate for a proper determination of the value or performance of the commercial equipment under test, and when it is accurately calibrated.

²Recommendations regarding the specifications and tolerances for suitable field standards may be obtained from the Weights and Measures Division of The numerical values of the tolerances recommended by the National Institute of Standards and Technology, for the sStandards will meet the specifications of length, mass, and capacity used by weights and measures officials, may be obtained upon request from the Office of Weights and Measures of the National Institute of Standards and Technology Handbook 105-Series standards (or other suitable and designated standards). This section shall not preclude the use of additional field standards and/or equipment, as approved by the Director, for uniform evaluation of device performance.

Amend paragraphs 3.2 Tolerances for Standards and 3.3 Accuracy of Standards as follows:

3.2. Tolerances for Standards.² - The error in a standard used by a weights and measures official should be known and corrected for when the standard is used; or if the standard is to be used without correction, its error should be not greater than one-third of the smallest tolerance to be applied when the standard is used. The reason for this is to keep at a minimum the proportion of the tolerance on the item tested that will be used up by the error of the standard. Expressed differently, Except for work of relatively high precision, it is recommended that the accuracy of standards used in testing commercial weighing and measuring equipment be established and maintained so that the use of corrections is not necessary. When the standard is used without correction, its combined error and uncertainty must be less than one-third of the applicable device tolerance.

Device testing is complicated to some degree when corrections to standards are applied. When using the correction of the standard, the uncertainty associated with the corrected value must be less than one-third of the applicable device tolerance. \mathbf{t} The reason for this requirement is to give the item device being tested as nearly as practicable the full benefit of its own tolerance.

Field testing operations are complicated to some degree when corrections to standards are applied. Except for work of relatively high precision, it is recommended that the accuracy of standards used in testing commercial weighing and measuring equipment be so established and maintained that the use of corrections is not necessary. Also, whenever it can readily be done, it will be desirable to reduce the error on a standard below the one-third point previously mentioned.

3.3. Accuracy of Standards. - Prior to the official use of testing apparatus, its accuracy should invariably be verified. <u>Field</u> Sstandards should be **re-verified** <u>calibrated</u> as often as circumstances require. By their nature, metal volumetric <u>field</u> standards are more susceptible to damage in handling than are standards of some other types. A <u>field</u> standard should be **re-**calibrated whenever damage is known or suspected to have occurred or significant repairs have been made. In addition, <u>field</u> standards, particularly volumetric standards, should be **re-**calibrated with sufficient frequency to affirm their continued accuracy, so that the official may always be in an unassailable position with respect to the accuracy of his testing apparatus. Secondary <u>field</u> standards, such as special fabric testing tapes, should be verified much more frequently than such basic standards as steel tapes or volumetric provers to demonstrate their constancy of value or performance.

Accurate and dependable results cannot be obtained with faulty or inadequate <u>field</u> standards. If either the service person or official is poorly equipped, their results cannot be expected to check consistently. Disagreements can be avoided and the servicing of commercial equipment can be expedited and improved if service persons and officials give equal attention to the adequacy and maintenance of their testing apparatus.

Discussion: In July 2000, the Metrology Subcommittee began discussions on inconsistencies in laboratory calibration practices for ensuring the traceability of field standards. The Subcommittee's work resulted in proposals to modify NIST Handbook 44 indicated in the above Recommendation and corresponding proposals for changes to requirements in NIST Handbook 130 "Uniform Laws and Regulations" to include guidelines for suitable reference standards, test procedures, and practices for determining whether or not to allow the use of field standards as test apparatus.

Both Handbooks require updating for consistency and to recognize current accepted accreditation and recognition practices for field standards, where applicable. The Handbooks should be modified to internationally and nationally align metrological terminology and adequately define or clarify terms already in use that relate to field standard verification such as accreditation, calibration, recognition, standards (field, primary, reference, secondary, and working), traceability, uncertainty, and verification. The proposal adds the term "field" to distinguish the type of physical standard in use for testing of devices. The proposal also specifies the appropriate documentary standards and specifies that the field standard's combined error and uncertainty must be less than one-third of the applicable device tolerance.

The Subcommittee recommends corresponding modifications to Handbook 130 (see L&R Agenda Item 221-1 and Item 234-1). Metrological terminology would be updated and, where permitted, calibration interval adjustments based on statistical data would be allowed to improve the accuracy of field standards in use and provide more cost-effective use of resources. The Subcommittee further recommends that Handbook 130 reference the entire Handbook 105 Series as well as other suitable designated standards. To expedite matters and recognize the latest technology, proposed amendments would permit "Placed in Service Reports" for registered service agencies to be forwarded electronically to the State Director rather than mailed. Finally, to ensure measurements are allowable, organizations issuing calibration reports must be recognized by NIST WMD or approved by an accreditation body.

The WWMA recommended the proposal as a voting item.

The Central Weights and Measures Association (CWMA) believes that device tolerances already allow for uncertainties, which field officials find difficult to determine. The CWMA also believes that use of the term "calibrated" changes the intent of paragraph 3.3. Consequently, the CWMA withdrew the proposal from its Interim Agenda.

The Northeastern Weights and Measures Association recommended the proposal become a developing item, but did not provide a rationale for taking this position.

During the 2005 NCWM Interim Meeting, the Committee met jointly with the L&R Committee to discuss and to take testimony on this proposal. The Committee heard only a request that the terms "initial verification" and "subsequent verification" be identified in the corresponding L&R proposal. Both Committees agreed that the proposal will eliminate inconsistencies and provide for recognition of current metrological practices. Consequently, the Committee agreed that the issues should move forward for a vote in July 2005. L&R Item 221-1 will be modified to include definitions of "initial verification" and "subsequent verification" since both terms are referenced in the proposed guidelines for examination and calibration or certification of standards and testing equipment.

The L&R and S&T Committees plan to address the proposal jointly during the 2005 NCWM Annual Meeting agenda review, open hearing, and voting session. All three proposals will be voted on as a single block of items.

360-3 I International Organization of Legal Metrology (OIML) Report

The complete OIML Report is included as part of the NCWM OIML Board of Director's 2005 Interim Agenda.

Many issues before the OIML, the Asian-Pacific Legal Metrology Forum (APLMF), and other international groups are within the purview of the S&T Committee. Additional information on OIML activities is available in Appendix A of the Board of Directors Interim Report and on the OIML website at http://www.oiml.org. NIST Weights and Measures Division (WMD) provided updates on OIML activities during the open hearing session on Monday, January 24, 2005.

For more information on specific OIML related device activities contact the WMD staff listed in the table below:

NIST Weights and Measures Division Contact List							
Staff	Telephone	Email	Device Type	Postal Mail or Fax			
Steven Cook (LMD)	301-975-4003	steven.cook@nist.gov	Automatic Weighing Systems Weighing Devices	NIST WMD			
Richard Harshman (LMD)	301-975-8107	richard.harshman@nist.gov	R134 "Weighing Road Vehicles In-Motion" R60 "Load Cells"	100 Bureau Dr MS 2600 Gaithersburg, MD			
Diane Lee McGowan (LMD)	301-975-4405	diane.lee@nist.gov	R51 Grain Moisture Meters Near Infrared Grain Analyzers	20899-2600			
Ralph Richter (ILMG)	301-975-4025	ralph.richter@nist.gov	R117 "Measuring Systems for Liquids Other Than Water"	Fax: 301-926-0647			
			R105 "Direct Mass Flow				
			Measuring Systems for Quantities of Liquids" and Gas Meters				
Wayne Stiefel (ILMG)	301-975-4011	s.stiefel@nist.gov	Measuring Devices				
Dr. Ambler Thompson (ILMG)	301-975-2333	ambler@nist.gov	Electronic Measuring Devices				
Juana Williams (LMD)	301-975-3989	juana.williams@nist.gov	R21 Taximeters				
LMD - Legal Metrolo ILMG - International	LMD - Legal Metrology Devices Group ILMG - International Legal Metrology Group						

360-4 I Add International Terms that are Synonymous to NIST Handbook 44 Terms in Appendix D; Definitions

Source: Carryover Item 360-4. (This item originated from the Northeastern Weights and Measures Association (NEWMA) and first appeared on the Committee's 2002 agenda.)

Discussion: Many Handbook 44 and OIML technical concepts and procedures are in harmony, yet there are significant differences in the terminology used. The harmonization of language is not necessary to harmonize requirements, provided a state of equivalence exists; however, improvements should be promoted where the language is confusing or has the potential for misinterpretation. Currently, the U.S. National Work Group (USNWG) on R76 "Non-automatic Weighing Instruments" is working on a proposal to amend NIST Handbook 44 Appendix D, Definitions to include international terminology that is synonymous with Handbook 44 definitions. This item is intended to familiarize the public and private sectors with the proposed approach to modify Appendix D. The USNWG will identify Handbook 44 terms or definitions that are equivalent to international vocabulary by placing the corresponding OIML term in parentheses adjacent to the Handbook 44 term.

The full development of this proposal to amend Appendix D will also clarify terminology for international participants in the proposed Mutual Acceptance Arrangement (MAA) (see Board of Directors Interim Report, Appendix A for more information), where it is imperative that all affected parties are aware of and understand each other's requirements. Terms can have an entirely different meaning in Handbook 44 than they do in R76. Handbook 44 is also inconsistent in the use of many terms such as "division," "increment," and "interval." One additional goal is to eliminate any confusion about the use of other frequently used terms such as device, element, mechanism, scale, weigher, and balance.

NEWMA supports this item and views it as a first step toward educating weights and measures officials. Future efforts should include work to place terms in Handbook 44 text with the ultimate goal of having one mutually acceptable set of terminology.

At its 2004 meeting, the Western Weights and Measures Association requested that the USNWG continue to develop the terms and asked that the proposal remain an information item.

The Central Weights and Measures Association (CWMA) believes international terms serve no purpose for the field official. The CWMA believes this is an issue for NCWM Publication 14, "NTEP Technical Policy, Checklists, and Test Procedures;" therefore, the proposal should be withdrawn from the S&T Agenda.

The Scale Manufacturers of Association supports the efforts of the USNWG and looks forward to reviewing the final proposal as an information item.

The Committee concurred with NEWMA's assessment that the proposal is a necessary step for harmonizing U.S. and international terminology and later standards. The Committee heard support from industry for the proposal. Industry requested an opportunity to review the final product. The Committee decided to keep this proposal as an information item on its agenda to update the weights and measures community on this important work in the harmonization of standards and to allow the work group sufficient time to complete its comparison of Handbook 44 General Code and Scales Code terms with equivalent international terminology.

360-5 D Developing Issues

The NCWM established a mechanism to disseminate information about emerging issues which have merit and are of national interest. Developing issues have not received sufficient review by all parties affected by the proposal or may be insufficiently developed to warrant review by the NCWM S&T Committee. The developing issues are currently under review by at least one regional association or technical committee.

The developing issues are listed in Appendix A according to the specific NIST Handbook 44 Code Section under which they fall.

The S&T 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 weights and measures associations and National Type Evaluation Technical Committee Sectors continue their work to fully develop each proposal. Should an association or Sector decide to discontinue work on a developmental item, the Committee asks that it be notified.

Jack Kane, Montana, Chairman Clark Cooney, Oregon Carol P. Fulmer, South Carolina Todd R. Lucas, Ohio Michael J. Sikula, New York

Ted Kingsbury, Canada, Technical Advisor Richard Suiter, NIST, Technical Advisor Juana Williams, NIST, Technical Advisor

Committee on Specifications and Tolerances

Appendix A

Item 360-5: Developing Issues

Part 1, General Code

Source: Western Weights and Measures Association (WWMA)

Recommendation: Modify paragraph G-S.5.6.1. as follows:

G-S.5.6.1. Recorded Representation of Metric Units on Equipment with Limited Character Sets <u>Acceptable</u> <u>Abbreviations for Recorded and Indicated Representation of Units on Equipment</u>. - The appropriate defining symbols are shown in Table 1.

Add the following new abbreviations to Table 1 Representation of Units to the General Code:

Name of Unit	Common Use	<u>Representation</u>		Name of Unit	<u>Common</u> Use	Representation			
	Symbol				<u>Unit</u>	Symbol			
		Form I	For	m II			Form I	For	m II
		(double	(single	(single			(double	(single	(single
		<u>case)</u>	lower	<u>case</u>			<u>case)</u>	lower	<u>case</u>
			<u>case)</u>	<u>upper)</u>				<u>case)</u>	<u>upper)</u>
Inches	<u>in</u>	In	<u>in</u>	IN	<u>deciliter</u>	<u>dL</u>	dL		
Foot	ft	ft	ft	FT	Kiloliter	<u>kL</u>	<u>kL</u>		
Yard	yd	<u>yd</u>	<u>yd</u>	YD	cubic meter	<u>M³</u>	<u>m³</u>	<u>m³</u>	<u>M³</u>
milligram	mg	mg	mg		cubic inches	<u>in³</u>	<u>in³</u>	<u>in³</u>	<u>IN³</u>
megagram	Mg	Mg			cubic foot	<u>ft³</u>	<u>ft³</u>	<u>ft³</u>	<u>FT³</u>
Grain	gr	gr	gr		cubic yard	<u>yd³</u>	<u>yd³</u>	<u>yd³</u>	$\underline{YD^3}$
Dram	dr	dr	dr		Gills	gi	gi	Gi	GI
Ounce	<u>0Z</u>	<u>0Z</u>	OZ	<u>OZ</u>	<u>Pint</u>	<u>pt</u>	<u>pt</u>	<u>pt</u>	PT
Pound	lb	lb	lb	LB	Quart	<u>qt</u>	<u>qt</u>	qt	QT
hundredweight	cwt	cwt	cwt	CWT	Gallon	gal	gal	gal	GAL
pennyweight	dwt	dwt	dwt	DWT	Ampere	<u>A, I</u>	<u>A, I</u>		<u>A, I</u>
ounce troy	oz t	oz t	oz t	OZ T	resistance	ohms	ohms	ohms	OHMS
milliliters	mL	mL							
<u>centiliter</u>	<u>cL</u>	<u>cL</u>							

Discussion: The WWMA notes that the current General Code Table 1 Representation of Units does not include many units that are in common use today.

At its 2004 meeting, the WWMA indicated that unless it receives a report on the development of the table, the proposal will be withdrawn from its 2005 agenda.

To provide input on this proposal, contact Gary Castro, California Division of Measurement Standards, by telephone at 916-229-3018, by fax at 916-229-3015, or by email at gcastro@cdfa.ca.gov.

Part 2, Scales

Source: Northeastern Weights and Measures Association (NEWMA)

Table 4. Minimum Test Weights and Test Loads ¹						
	Minimums (in terms of device ca	pacity)				
Device capacity	Test weights (greater of)	Test loads ²	(where practicable)			
0 to 150 kg (0 to 300 lb)	100 %					
151 to 1 500 kg (301 to 3 000 lb)	25 % or 150 kg (300 lb)	75 %	Test weights to dial face capacity,			
1 501 to 20 000 kg (3 001 to 40 000 lb)	12.5 % or 500 kg (1 000 lb)	50 %	greater than minimums specified			
20 001 kg+ <u>to</u> <u>250 000 kg</u> (40 001 lb+ <u>to 500 000 lb</u>)	12.5 % or 5000 kg (10 000 lb)	25 % ³	During initial verification, a scale should be tested to capacity.			

Recommendation: Modify Table 4. Minimum Test Weights and Test Loads as follows:

¹ If the amount of test weight in Table 4 combined with the load on the scale would result in an unsafe condition, then the appropriate load will be determined by the official with statutory authority.

²The term "test load" means the sum of the combination of field standard test weights and any other applied load used in the conduct of a test using substitution test methods. Not more than three substitutions shall be used during substitution testing, after which the tolerances for strain load tests shall be applied to each set of test loads.

³ The scale shall be tested from zero to at least 12.5 % of scale capacity using known test weights, and then to at least 25 % of scale capacity using either a substitution or strain load test that utilizes known test weights of at least 12.5 % of scale capacity. Whenever practical, a strain load test should be conducted to the used capacity of the scale. When a strain load test is conducted, the tolerances apply only to the test weights or substitution test loads. (Amended 1988, 1989, 1994, and 2003)

Discussion: Jurisdictions encounter scales with 1 000 000 lb nominal capacity and must determine the minimum test load. NEWMA finds that NIST Handbook 44 is flexible, but does not provide any definitive guidelines on test loads for large capacity scales. NEWMA modified its original proposal by reducing the scale maximum capacity from 1 000 000 lb to 500 000 lb and removing a proposed new footnote that permitted officials to establish the minimum test load. NEWMA supports the proposal as a voting item.

The Committee agreed that Table 4 is the appropriate place in Handbook 44 to provide guidance on the appropriate minimum test load for tests on scales that exceed capacities of 400 000 lb. The Committee believes at the issue warrants a high priority but requires further review and input from both the public and private sectors.

The Western Weights and Measures Association (WWMA) agreed the proposal does not address the minimum load for scales with nominal capacities greater than 500 000 lb. A 500 000 lb capacity scale could be tested with a test load less than that required to test a 400 000 lb scale since Handbook 44 is silent on a minimum test load at a nominal capacity at or greater than 500 000 lb. The WWMA recommends 62 500 lb minimum test weights and a 125 000 lb minimum test load for scales with capacities greater than 500 000 lb.

The Central Weights and Measures Association (CWMA) and Scale Manufacturers Association questioned why the maximum nominal capacities under the device capacity column is 500 000 lb since current Table 4 does not specify the top of the range. In fact, current Table 4 lists device capacities that are 40 001 lb plus. The CWMA recommends withdrawing the proposal based on the way the language is written.

To provide input on this proposal contact Michael Sikula, New York Bureau of Weights and Measures, by telephone at 518-457-3452, by email at mike.sikula@agmkt.state.ny.us, or by fax at 518-457-2552.

Interim Report of the Professional Development Committee

Kenneth Deitzler, Chairman Pennsylvania Department of Agriculture Bureau of Ride and Measurement Standards Harrisburg, Pennsylvania

Reference Key Number

400 INTRODUCTION

The Professional Development Committee (Committee) submits its Interim Report for consideration by the National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during its Interim Meeting in Los Angeles, California, January 23- 26, 2005.

Table A identifies the agenda items in the Report by Reference Key Number, Item Title, and Page Number. The item numbers are those assigned in the Interim Meeting Agenda. A voting item is indicated with a "V" after the item number. An item marked with an "P" after the reference key number is an information item. An item marked with a "D" after the reference key number is a developing issue. The developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. An item marked with a "W" was withdrawn by the Committee and generally will be referred to the regional weights and measures associations because it either needs additional development, analysis, and input or does not have sufficient Committee support to bring it before the NCWM.

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

401 EDUCATION

401-1 I National Training Program (NTP)

Source: The Committee

The Board of Directors established the Committee at the 2003 NCWM Annual Meeting in Sparks, Nevada. The first critical charge given to the Committee was to develop a national weights and measures professional development program in cooperation with its partners including:

- State and local weights and measures departments;
- Private industry at all levels from manufacturer to repair service personnel; and
- Technical advisors from NIST Weights and Measures Division and Measurement Canada

The NTP will address the following tasks in order of priority:

- 1. The education and professional development of weights and measures officials and the promotion of uniformity and consistency in the application of weights and measures laws and regulations;
- 2. The education of industry personnel with regard to weights and measures laws and regulations, including all areas from device manufacturer to service technician;
- 3. Quality standards for weights and measures activities and programs;
- 4. Safety awareness for weights and measures-related activities; and
- 5. Development of a firm partnership with the state and local weights and measures departments, private industry at all levels from manufacturer to repair service personnel, and the NCWM. It is critical that NIST Weights and Measures Division (NIST WMD) partner with the Committee and, where appropriate, provide technical advice. Measurement Canada is also encouraged to participate in Committee activities.

Discussion: The Committee began developing the concept of a National Certification Program for weights and measures officials during the 2004 NCWM Annual Meeting (see developmental Item 401-8 below). In December 2004 several Committee members met in Harrisburg, Pennsylvania to further develop the concept, the Committee's overall strategic direction. The participants agreed that the NTP should take the following directions:

- The training responsibility should fall directly on state and local jurisdictions.
- Administrator training must be added to the curriculum.
- The Committee should consider looking outside the NCWM for training and structure.
- The Central Weights and Measures Association (CWMA) will assist the Committee in determining what knowledge and prerequisites are required for three tiers of the NTP: beginning, intermediate, and advanced.
- The Western Weights and Measures Association (WWMA) recommended the Committee establish identifiable course outlines that would result in shorter training courses.

The strategic direction is also summarized in Appendix B.

401-2 W Professional Development

Source: The Committee

Discussion: This item has been withdrawn because the scope and content of this item is inherent in the tasks outlined in the information items on the agenda.

The Committee created and distributed an informational survey during the 2004 Annual Meeting to identify the needs of jurisdictions and to create a consensus position in the development of the National Training Program. The Committee reported the results of the survey at the 2005 Interim Meeting. The data showed that a Handbook 44 course was a top

priority followed by a course on small scales. The state of California offered its support and the training material used in that state. The CWMA agreed Committee efforts to establish a training and certification program should be the first step of providing professional development for all NCWM stakeholders.

401-3 W Identify Partners

Source: The Committee

Identify appropriate roles for each of the partners (e.g., NCWM, state and local weights and measures departments, private industry at all levels, NIST Weights and Measures Division, and Measurement Canada) in implementing an educational process.

Discussion: The development of a training program should follow the steps listed below:

- 1. Study training programs of outside agencies, as well as those of state and local jurisdictions.
- 2. Establish knowledge goals for weights and measures officials and administrators.
- 3. Develop curriculum based upon the findings and results of the steps 1 and 2.
- 4. Develop exams or tests.

The Committee moved "the development of training program steps" to 401-4 and withdrew this item.

401-4 I Create a Curriculum Plan

Source: The Committee

The Committee agreed the following steps need to be addressed for the NTP to be viable:

- (a) Develop and maintain a curriculum plan in cooperation with our partners that establishes uniform and consistent training objectives for weights and measures professionals in all fields and at all levels, from novice to seasoned veteran.
- (b) The objectives of the curriculum plan should represent a consensus of our partners and should be organized by scope, sequence, and level of complexity to assist those developing the curriculum materials.

The development of a training program should follow the steps below:

- 1. Study training programs of outside agencies, as well as those of state and local jurisdictions.
- 2. Establish knowledge goals for weights and measures officials and administrators.
- 3. Develop curriculum based upon the findings and results of the steps 1 2 above.
 - (a) Coordinate the development of curriculum materials to be used in the delivery of training (i.e., lesson plans, digital presentation, slide shows, testing guides, etc.) using a variety of formats (e.g., self-study, traditional instruction).
 - (b) Consider creating a network of interested parties to establish priorities, share training resources, foster cooperation to reduce redundancy, and promote uniformity and consistency.
- 4. Develop examinations, quizzes or tests based on the content of the materials developed under Item 3.
- 5. Gather and share information from trainers on highly effective techniques, visual aids and other materials that have been used to facilitate learning. Use as many of these resources as available.

The Committee reviewed the notes from the NIST-sponsored administrators workshops held in Denver, Colorado and Baltimore, Maryland and plans to explore many of these ideas.

Discussion: During the 2004 Annual Meeting, the Committee discussed the idea of using working groups to develop courses that could be used for self-study or for traditional classroom settings. The Committee agreed that the initial priority should be high profile devices (e.g., motor-fuel dispensers and retail computing scales). The Committee will study the survey results to determine the membership's needs and desires.

There were several recommendations submitted by the regional associations. The CWMA commented the Committee should draw upon other sources, both external and internal, for establishment of curricula. The WWMA recommended the Committee review current training courses on the NIST website at *http://www.nist.gov/owm* to establish and identify various levels of training. They also suggested the Committee review and update all existing NIST training courses and post them on the NIST website. The Northeast Weights and Measures Association (NEWMA) recommends the Committee set standards for education that include provisions for field tests.

During the 2005 Interim Meeting the Committee received recommendations to develop course curriculum with specific learning objectives and develop tests to determine mastery of the learning objectives. The responsibility for providing training to meet the objectives would rest with the jurisdictions. It was also recommended the Committee develop tests to be administered at the end of each course. Upon successful completion of the tests individuals would be issued certificates. Schemes for controlling the tests and preserving the integrity of the system would need to be developed.

401-5 W Curriculum Coordination

Source: The Committee

In order to achieve the goal of curriculum development, the Committee discussed the following:

- (a) Coordination of the development of curriculum materials to be used in the delivery of training (i.e., testing guides, digital presentations, slide shows, lesson plans, etc.) using a variety of formats (e.g., self-study, traditional instruction).
- (b) Creation of a network of interested parties to establish priorities, share training resources, foster cooperation to reduce redundancy, and promote uniformity and consistency.

The Committee should consider curricula from other sources to develop a National Training Program. The CWMA agreed that the Committee should draw upon several sources, both external and internal, for the establishment of curricula.

Discussion: This item had substantial overlap with the preceding item so the Committee withdrew it and placed portions of it in Item 401-4.

401-6 W Training Innovations

Source: The Committee

To achieve the objective of developing creative training innovations, the Committee agreed to gather and share information from trainers on highly effective techniques, visual aids, etc., that have been used to facilitate learning and to use as many resources as available. The Committee reviewed the notes from the NIST-sponsored administrators' workshops held in Denver and Baltimore and plans to explore many of these ideas.

The CWMA Professional Development Committee recommends that focus groups be used to identify training innovations and that each group be assigned at least one person with teaching or training background to ensure different learning styles are recognized and utilized in developing the final product.

Discussion: The Committee incorporated some information from Item 401-6 into Item 401-4 and withdrew this item.

401-7 D Instructor Improvement

Source: The Committee

One goal of the Committee is to coordinate with all interested parties activities to improve the competence of instructors and the uniformity of delivery of the curriculum.

Discussion: The Committee concluded there are two parts of an instructor improvement strategy. The first part is educating trainers in effective methods of instruction. A variety of courses and training methods are available from state, federal and private sources to develop instructional skills and techniques. Jurisdictions are encouraged to seek out and send selected staff to this type of training.

The second area of instructor improvement is to provide trainers with the knowledge of the technical aspects of all types of devices. The Committee will look to NIST WMD for leadership and participation as a valuable asset in this aspect of training and recommends that WMD assume the task of providing the technical training of instructors. The Committee will look to WMD as a resource to consult with trainers and to work with the Committee on keeping the curricula current as changes to the Handbooks occur, new technologies are deployed, and emerging issues develop. The Committee invites discussion from WMD on this topic. The Committee decided this is currently a low priority for 2005. However, the item will be retained as a developing item.

401-8 D Certification

Source: The Committee

The Committee believes that an NCWM certification program should be developed based on the curriculum plan with measurable levels of competency.

Discussion: The Committee agrees that weights and measures officials must pass written examinations to receive certification. Certificates could be presented at the Annual Meeting to administrators and weights and measures officials who complete training classes and pass the course examination. In 2004 Chairman Dennis Ehrhart expressed his support for certification and indicated the Board of Directors would consider requests to fund training. The Committee is exploring certification of weights and measures officials as a means to demonstrate competency. The WWMA and CWMA submitted extensive comments and recommendations regarding this item prior to the 2004 NCWM Annual Meeting. The Committee has designated this item as developmental.

401-9 W NCWM Training

Source: Western Weights and Measures Association (WWMA)

Recommendation: The WWMA recommended that the NCWM should establish and maintain a database of classroom training programs completed by individual weights and measures officials where the training uses NCWM courses (or equivalent) and certified trainers. The NCWM should also issue certificates to individual weights and measures officials for course completion.

Background: The WWMA recognized the value of formal training for inspection staff and the credibility these programs provide. Some jurisdictions have formal licensing programs for weights and measures staff and rely on informal programs. The WWMA recognized that the NCWM is a logical entity to provide standardized training and accreditation programs.

Discussion: The Committee acknowledges the comments from WWMA. Such comments will be taken under advisement during the formulation of any training effort. The Committee would like to know if NIST will participate in the NCWM training and certification program and would like to see a NIST liaison added to the Committee. The Committee would like to maintain NIST involvement with the National Training Program. NIST reported they have and will continue to develop training materials that will be made available for use in a wide variety of training classes. The standards used to inspect devices are technical; therefore, the training and development of these standards require a wide

variety of technical expertise. NEWMA stated technical and administrative support for the Committee should come from NIST. The Committee will solicit partnerships with other interested parties.

The Committee withdrew this item. During the 2005 Interim Meeting it appeared there was a consensus among the membership that this should be a responsibility of the states.

402 PROGRAM MANAGEMENT

402-1 W Voluntary Quality Assurance Assessment

Source: The Committee

The Committee will continue to promote the development of quality programs through the Voluntary Quality Assurance Assessments (VQAA). The Committee would like to see more participation in the VQAA. The Committee discussed the use of the ISO/IEC/EN 17025 "General Requirements for the Competence of Calibration and Testing Laboratories" for state and local field enforcement programs but concluded that the ISO 17025 standard does not apply to state and local field enforcement programs. The Committee recommends that the NCWM develop its own certification standards for state and local field enforcement programs. The Committee encourages all member states to utilize the VQAA and provide information to the Committee. The assessments can be a valuable tool in determining training needs. The Committee noted that in 2003 several certificates were presented at the Annual Meeting, but no requests for review were received in 2004. The Committee would like to remind the membership that the VQAA forms and other information are available on the NCWM web site and the results are confidential. The CWMA believes jurisdictions interested in having the assessments made have already done so and reported that there is no interest among its membership in developing additional VQAAs checklists.

Discussion: The Committee has withdrawn this item because of inactivity or lack of interest for the past three years. The forms can still be obtained on the NCWM web site or by contacting one of the Committee members.

402-2 W NCWM Associate Membership Scholarships

Source: The Committee

In past years when funding was available from the Associate Membership Committee (AMC), the Committee oversaw a system to evaluate applications and award scholarships. The Committee then provided a report on the scholarships awarded each year. No funds were made available for scholarships for the calendar year 2004. Guidelines for the Associate Membership Committee scholarships can be found in NIST Special Publication 992, Report of the 87th NCWM (2003). Continued interest in scholarships has been expressed by several state and local jurisdictions. The WWMA expressed appreciation to the AMC for its continued support of various NCWM needs and encourages the Associate Membership to fund training scholarships in the future if possible.

Discussion: The Committee withdrew this item. The Associate Membership Committee will decide how its money is to be used and define the criteria for applying for the funds and the NCWM's management company will provide administrative support.

402-3 I Safety Awareness

Source: The Committee

In the past the Committee's responsibility extended to the identification of safety issues in the weights and measure field and included efforts to increase safety awareness.

Recommendation: This is an area where activities should be increased to promote safety awareness.

Discussion: Past-Chairman Dennis Ehrhart explained that the Voluntary Quality Assurance Assessment program, the NCWM Associate Membership Scholarships, and Safety Awareness efforts were carryover items from the Committee on Administration and Public Affairs and recommended that the Committee make training its highest priority.

The Committee encourages jurisdictions to send the safety reports and issues to their regional safety liaison, who in turn forwards them to Charles Gardner, the NCWM Safety Coordinator, who recommends the reports or summaries of the reports 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 agreed to ensure that safety awareness is a part of every aspect of training for NCWM stakeholders.

402-4 I Standard Categories of Weighing and Measuring Devices

Source: Western Weights and Measures Association

Recommendation: See Appendix A

Discussion: The Western Weights and Measures Association (WWMA) Administration and Public Affairs (A&P) Committee recommended that standard categories of weighing and measuring devices be adopted to facilitate development of technical standards, inspector training, data collection, and program management.

Background: The final report of the *Survey of Inspection Statistics Collected by State Weights and Measures Programs* [2002] conducted during mid-2003 observed the absence of standard categories for weighing and measuring devices was a serious obstacle to data collection. For example, the way weights and measures programs categorize scales by type, use, or capacity, and capacity ranges often vary considerably. Retail motor-fuel dispensers are currently being counted either by dispenser, grade, or number of hoses or meters. The need for reliable weights and measures statistics is summarized in the final report conclusion as follows:

Accurate statistics would be helpful in many ways at both the state and national level. For instance, it is difficult to develop performance measures without statistics. Also, work plans require accurate and detailed statistics. In addition, budget, staffing, and other elements of each state program demand statistics on inspection workloads. Finally, neither individual states nor the NCWM will be able to estimate and advertise the value of the nation's weights and measures programs unless reliable statistics are available.

To correct this problem, the WWMA has developed *Standard Categories for Weighing and Measuring Devices* and recommends that standard categories for weighing and measuring devices be adopted to facilitate the development of technical standards, inspector training, inspection data collection, and weights and measures program management.

The Committee agreed this item should remain informational at this time because standardized categories of weighing and measuring devices have merit and should be considered in the future.

Kenneth Deitzler, Pennsylvania, Chairman Celeste Bennett, Michigan Jerry Buendel, Washington Agatha Shields, Franklin County, Ohio Stuart Strnad, Texas Richard W. Wotthlie, Maryland C. Gardner, Suffolk County, New York, Safety Liaison NCWM Executive Staff: Beverly I. Levy, CAE

Professional Development Committee

Appendix A

Standard Categories of Weighing and Measuring Devices

The WWMA Administrative and Public Affairs Committee drafted the following recommendation for consideration by the Committee. The standard categories of weighing and measuring devices are based on capacity ranges rather than type or use. It is assumed that the inspection test procedures for scales and meters within these capacity ranges are generally similar. Weights and measures programs can adopt the recommended standard categories without changing the manner in which they presently keep records of device inspections by simply adding an extra data field.

NCWM DEVICE CATEGORY CODES

DEVICE CODE	CATEGORY	CAPACITY	EXAMPLES
SP	Scale, Precision	< 5 g scale division	jewelry, prescription scales
SS	<u>S</u> cale, <u>S</u> mall	< 100 lbs.	retail computing scales
SM	<u>S</u> cale, <u>M</u> edium	100 – 5,000 lb	dormant, platform scales
SL	<u>S</u> cale, <u>L</u> arge	> 5,000 lb	livestock, recycler scales
SV	<u>S</u> cale, <u>V</u> ehicle	>40,00 lb	vehicle, railway track scales
MS	<u>M</u> eter, <u>S</u> mall	$<30 \text{ gpm}^1$	retail motor fuel dispensers
MM	<u>M</u> eter, <u>M</u> edium	30-100 gpm	loading rack, vehicle-tank meters
ML	<u>M</u> eter, <u>L</u> arge	>100 gpm	agri-chemical meters
MF	<u>M</u> eter, <u>M</u> ass Flow	All	heated tanks of corn syrup (soft drinks)
MW	<u>M</u> eter, <u>W</u> ater	All	water sub-meters for mobile homes & apartments
MG	<u>M</u> eter, LP <u>G</u>	All	propane sales
MT	<u>M</u> eter, <u>T</u> axi	All	Taximeters
DT	<u>D</u> evice, <u>T</u> iming	All	clocks in parking garages
DL	Device, Length Measuring	All	cordage meters

Two-letter device category codes could be employed to categorize devices in weights and measures jurisdictions for reporting to the NCWM during annual surveys. Otherwise, the data collection procedures already in place would be unaffected. It would be helpful also to add the two-letter device category code to inspection reports.

Other measuring devices [e.g., MFM, LPG, LMD, etc.] may not require capacity-based categories like scales or liquid measuring devices.

This briefing paper was provided by the WWMA to serve as a basis for further discussion and development of this item.

¹ Retail motor-fuel dispenser counts should be based on meters except that mid-grades should be added for blenders.

Appendix B

Strategic Direction for the Professional Development Committee

The Committee developed their strategic direction in an effort 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 were:

- Keep things simple
- Develop programs that are realistic and achievable
- Minimize redundancy and administrative tasks
- Recognize that no one size fits all
- Meet the needs of W&M officials, service companies, industry and manufacturers

The four main areas for focusing their efforts were:

National Training Program – the focus of the national training program would be to increase technical knowledge, strengthen credibility and improve the professionalism of the individual weights and measures officials. A strong national training program will work to promote uniformity across the nation.

National Certification System – a national certification system would be developed 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 conference. These topics would provide a forum for the exchange of ideas and discussion of changes in the marketplace (see Appendix C).

Uniformity of Data – the Committee would work to 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.

Appendix C

Recommended Topics for Conference Training

During the 2005 Interim Conference, the Committee recommended a number of topics for possible training seminars, round tables or symposia that would be suitable for presentation at the 2005 National Conference.

They are:

- Risk Based Inspections
- Marketplace Surveys
- Auditing the Performance of Field Staff
- Device Inspections Using a Sampling Model
- Emerging Issues

Will Whottlie, MD, volunteered to lead a session on Auditing Field Staff. Robert Williams, TN, volunteered to present their state's RMFD testing program. Jerry Buendel, WA, volunteered to lead a session on Marketplace Surveys.

All members are encouraged to submit their ideas for topics to the Committee members and to volunteer to lead, present or moderate a topic.

Interim Report of the National Type Evaluation Program (NTEP) Committee

Don L. Onwiler Program Manager Nebraska Department of Agriculture, Weights & Measures

INTRODUCTION

The National Type Evaluation Program (NTEP) Committee (hereinafter referred to as "Committee") submits its Interim Report for consideration by the National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during its Interim Meeting in Santa Monica, CA, January 23-26, 2005.

Table A identifies the agenda items in the Report by Reference Key Number, Item Title, and Page Number. The item numbers are those assigned in the Interim Meeting Agenda. A voting item is indicated with a "V" after the item number.

An item marked with an "**T**" after the reference key number is an information item. An item marked with a "**D**" after the reference key number is a developing issue. The developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. An item marked with a "**W**" was withdrawn by the Committee and generally will be referred to the regional weights and measures associations because it either needs additional development, analysis, and input or does not have sufficient Committee support to bring it before the NCWM.

This Report contains many recommendations to revise or amend National Conference on Weights and Measures (NCWM) Publication 14, Administrative Procedures, Technical Policy, Checklists, and Test Procedures or other documents. Proposed revisions to the publication(s) 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 *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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Details of All Items (In Order by Reference Number)

1. I Test Data Exchange Agreements

Background/Discussion: This item was included on the Committee's agenda in 1998 to provide an update on NTEP's work to establish bilateral and multilateral agreements. Under such agreements and arrangements, manufacturers would be able to submit their equipment to any of the participating countries for testing to OIML-recommended requirements. The resulting test data would be accepted by other participants as a basis for issuing each country's own type approval certificate. Following is a report on the three types of test data exchange agreements.

Mutual Acceptance Arrangement (MAA): NTEP Director, Stephen Patoray, attended an MAA workshop, OIML Conference and CIML meeting in Berlin, Germany, in October 2004. Details on this item are contained within the NCWM Board of Directors' report as agenda item 10.

Bilateral Agreements: No additional discussions have been held on this topic. Additional discussions may be held pending the outcome of the MAA discussions.

NTEP-Canada Mutual Recognition Program: No additional discussions or meetings have been held on this subject. Future discussions may include Multiple Dimension Measuring Devices.

2. I Adoption of Uniform Regulation for National Type Evaluation by States

Background/Discussion: The Scale Manufacturers Association (SMA) has hosted NTEP adoption and implementation meetings for state directors at each regional weights and measures association conference. These meetings enable jurisdictions to share information about adopting and implementing NTEP in their respective jurisdictions, encourage non-NTEP jurisdictions to adopt the regulation, and allow current NTEP jurisdictions to share ideas on how to make enforcement more effective and uniform among the States. The meetings also provide NTEP management with information related to areas in which the operation and implementation of the program can be improved. Several questions have been posed at these meetings regarding issues associated with NTEP interpretation or practice. Comments from 1997 to 2004 have been summarized, without attribution, and are available for review and download on the SMA web site at http://www.scalemanufacturers.org.

SMA representative, Darrell Flocken, updated the NTEP Committee on the status of SMA's drive to assist States to adopt the Uniform Regulation for National Type Evaluation (URNTE) and the Uniform Regulation for the Voluntary Registration of Servicepersons and Service Agencies (VRSA). Mr. Flocken indicated the SMA decided it would be more useful to show which States require NTEP Certificates before allowing weighing and measuring devices to be certified as legal for trade regardless of their adoption of the NIST/NTEP URNTE. SMA developed a new map that shows that status. The SMA, deciding that it would be more useful to show which States require Registration of Service Agencies and Service Personnel regardless of their adoption of VRSA, developed separate maps that show that status. Such maps are available for review and download on the SMA web site at http://www.scalemanufacturers.org.

3. I NTEP Participating Laboratories and Evaluations Reports

At the 2005 NCWM Interim Meeting, Stephen Patoray, NTEP Director, updated the Committee on NTEP laboratory and administrative activities since October 1, 2004. A report from the NCWM Interim meeting 2005 is attached. See Appendix "A."

The next laboratory meeting is planned for April 2005 in Columbus, OH.

4. I NTETC Sectors Reports

The Committee received an update on the activities of the National Type Evaluation Technical Committee (NTETC) Sectors at the 2005 NCWM Interim Meeting. Outlined below is a brief summary of Sector activities since the 2004 NCWM Annual Meeting.

The NTEP Committee accepted recommendations from the Weighing Sector, the Measuring Sector, and the Grain Analyzer Sector.

There was additional discussion on editorial updates to the Taximeter section of NCWM Publication 14. These were reviewed and accepted by the NTEP Committee.

There was also discussion on the accepted section of NCWM Publication 14 Checklist for Cash Acceptors for weighing devices. After the sector recommended cash acceptor checklist language, a device incorporating cash acceptors was submitted for evaluation. During the evaluation, it became evident to the NTEP laboratory evaluator that some items in the recommended checklist were either vague or missing from the proposed Publication 14 language. The items identified by the laboratory were:

- (1) insufficient paper to print a receipt and complete a transaction, and
- (2) insufficient funds to return the correct change or return the correct amount inserted into the machine should a transaction be canceled.

The NIST Technical Advisor, Steve Cook, proposed some additional language. This language attempts to ensure that in case of an error the customer would receive information regarding the error in a printed receipt or be informed that they need to contact an attendant or store manager. The NTEP Committee agreed to add the additional language as "ad hoc" language in the 2005 update of NCWM Publication 14. The Committee discussed several additional "cash acceptor" issues that may require clarification or additional checklist requirements. An agenda item will be presented during the 2005 meeting of the Weighing Sector to address these issues. These items may also need to be addressed in other sections of NCWM Publication 14.

The NTEP Committee discussed an additional issue brought forward by a manufacturer regarding the title of Section 8.2 of NCWM Publication 14 Digital Electronic Scales, Additional criteria for vehicle scales, railway track scales, combination vehicle/railway track scales, and other platform scales greater than 200 000 lb. Information from the 1998 and 2000 Sector meetings was reviewed. The NTEP Committee instructed the NTEP Director to correct the Publication 14 language to reflect previous decisions of the sectors, identify the changes clearly in the Publication 14, and place this item on the agenda for the 2005 meeting of the Weighing Sector for additional comments and recommendations.

The NTEP Committee reviewed a request from the Grain Moisture Meter and Near Infrared Protein Analyzer Sectors to combine the two sectors and change the name to "Grain Analyzer Sector." The Committee accepted these recommendations.

Grain Analyzer Sector: The NTETC Grain Moisture Meter and NIR Protein Analyzer Sectors held a joint meeting in Kansas City, MO on August 26-27, 2004.

The next meeting of the Grain Analyzer Sector is scheduled for August 24-25, 2005, in Kansas City, MO. 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 NIST WMD 100 Bureau Drive – Stop 2600 Gaithersburg, MD 20899-2600 Phone: 301-975-4405 Fax: 301-926-0647 e-mail: diane.lee@nist.gov Jack Barber J.B. Associates 10349 Old Indian Trail Glenarm, IL 62536 Phone: 217-483-4232 e-mail: jbarber@motion.net Measuring Sector: The NTETC Measuring Sector met October 21-22, 2004, in Gulfport, MS.

The next meeting of the Measuring Sector is scheduled for October 21-22, 2005, (tentative) in Memphis, TN 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: 301-926-0647 e-mail: rsuiter@nist.gov

Weighing Sector: The NTETC Weighing Sector met August 29-31, 2004, in Ottawa, Canada.

The next Weighing Sector meeting is scheduled for September 25-27, 2005, in Columbus, OH. 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: 301-926-0647 e-mail: stevenc@nist.gov

NTETC Sector Summaries: Past NTETC Sector summaries are available upon request from NCWM and the NIST Sector Technical Advisors:

NCWM Inc. or Phone: 240-632-9454 email: ncwm@mgmtsol.com NIST WMD Technical Advisor, Steve Cook (See contact information above)

5. I NTEP Participation in U.S. National Work Group on Harmonization of NIST Handbook 44, NCWM Publication 14, and OIML R 76 and R 60.

Steve Cook of NIST reported that the Secretariat for OIML TC9/SC1 recently submitted the 1st Committee Draft (1CD) of OIML R 76-1 "Non-automatic Weighing Instruments" to the participating members of TC9/SC1 for review, comment, and vote. NIST is looking for input from the U.S. National Work Group on whether or not a meeting should be held in March 2005 to discuss the contents of the 1CD and help NIST develop a U.S. position and vote.

6. I Mix and Match Elements

There is no additional information on this item.

7. I Software Evaluation

General comments from the floor were supportive of developing this issue further.

The NTEP Committee discussed the pros and cons of software evaluation. General concerns relate to difficulties identifying software and determining traceability to an NTEP Certificate of Conformance during field verification and providing NTEP laboratories with a meaningful and functional checklist for evaluating software security and functions.

NCWM staff will gather the costs involved with forming a Sector and the costs to conduct a Sector meeting. This information, along with a detailed action plan for the development of the sector charges, will be presented and reviewed by the NCWM Board of Directors at its next regularly scheduled meeting in March 2005.

G. Weston Diggs, Virginia, NCWM Chair Don Onwiler, Nebraska, NCWM Chairman-Elect Stephen Pahl, Texas Charles Carroll, Massachusetts

NTEP Technical Advisor: S. Patoray, NTEP Director NTEP Technical Advisor: S. Cook, NIST WMD

National Type Evaluation Program Committee

Appendix A

NTEP Participating Laboratories and Evaluation Reports

	Previous Quarter	Current Quarter	Total to Date
	10/1/03-1/4/04	10/1/04-1/4/05	10/1/00-1/4/2005
Total Applications Processed	58	61	1027
Applications Completed	48	4	782
New Certificates Issued:	51	29	975
Certificates Distributed to State Directors	57	40	961
Certificates Posted to Web Site	65	51	3509
Active NTEP Certificates:			1508
		Average	Median
Time for NCWM to assign an evaluation:		12 days	8 days
Time for NCWM to review a draft CC:		6 days	6 days
Time for complete evaluation:		158 days	109 days

Appendix B

National Type Evaluation Technical Committee (NTETC) Grain Moisture Meter (GMM) and NIR Sector Annual Meetings

August 26-27, 2004 - Kansas City, Missouri Draft Summary of Decisions

Agenda Items

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Note: Because of common interest, agenda items 8 through 12, above, were considered in a joint session of the NIR Grain Analyzer and the Grain Moisture Meter Sectors

1. Report on GIPSA/NIST Interagency Agreement Renewal

Background: The current five-year Interagency Agreement between GIPSA and NIST that provides funding for the Grain Moisture Meter On-going Calibration Program (OCP) expires at the end of the Federal Government's Fiscal Year (FY) 2004 (September 30, 2004). Under the terms of the present agreement NIST and GIPSA each contribute one-third the cost of the program subject to an annual maximum of \$18,000 each. The balance of costs is borne by manufacturers and depends on the number of meter models in the NTEP "pool" according to a fee schedule. The fee schedule has remained fixed since October 1, 1999. NIST and GIPSA have reviewed costs associated with the program and a revised fee schedule has been proposed. At the Sector's 2003 meeting Dr. Richard Pierce, GIPSA, briefed the Sector on the proposed fee schedule, a draft of which is shown below. Implementation of the proposed fee schedule, which would become effective at the start of FY 2005 (October 1, 2004), is subject to approval by both agencies. Dr. Pierce reported that the fee schedule in the proposed agreement has been the subject of serious discussion at GIPSA. GIPSA has had to increase its hourly fees for services by 50 % to 100 % over the rates used when the proposed fee schedule was calculated. However, at the time of the Sector meeting, it appeared likely that GIPSA would agree to absorb the added costs at least for the coming year. Costs will be reviewed at the end of each year and manufacturers are likely to see a fee increase in subsequent years even if the number of meters remained constant. A copy of the proposed agreement has been forwarded for signing, but as of September 11, 2004, no signatures were in place.

Proposed NTEP On-Going Calibration Program Fee Schedule							
For Fiscal Year 2005 to 2009							
(1)	(2)	(3)	(4)	Funding Contribution from Participants			
Total Meters	Meters in	Cost per	Total	(5)	(6)	(7)	(8)
(including	NTEP	NTEP Pool	Program	NIST	GIPSA	Manufacturers	Cost per
official meter)	Pool	Meter	Cost			(total funding from mfg's)	Meter Type
2	1	19,875	19,875	6,625	6,625	6,625	3,315
3	2	19,875	39,750	13,250	13,250	13,250	4,415
4	3	19,875	59,625	19,875	19,875	19,875	4,970
5	4	19,875	79,500	26,500	26,500	26,500	5,300
6	5	19,875	99,375	26,500	26,500	46,375	7,730
7	6	19,875	119,250	26,500	26,500	66,250	9,465
8	7	19,875	139,125	26,500	26,500	86,125	10,765
9	8	19,875	159,000	26,500	26,500	106,000	11,775

2. Report on OCP (Phase II) Testing

Phase II Ongoing Calibration Program (OCP) data for the 2003 crop year was in manufacturers' hands by February 1, 2004. Cathy Brenner of the Grain Inspection, Processors and Stockyards Administration (GIPSA, formerly FGIS), the NTEP Participating Laboratory for Grain Moisture Meters, reported that billing for the 2004 cycle was sent out in June 2004 based on the Interagency Agreement currently in place. Five models will be enrolled in Phase II for the 2004 harvest.

DICKEY-john	GAC2100
Foss	Infratec 1229, Infratec 1241
Seedburo	1200A
Steinlite	SL95

3. Publication 14 – GMM Tolerances for Calibration Performance

Background: To address concerns that different meter types were not as closely aligned with the air oven as they could be, the Sector, at their August 2003 meeting, recommended a change to Publication 14 that would require a calibration to meet Phase I tolerances (without the application of a confidence interval) for each 2 % interval of the basic 6 % moisture range in order for that calibration to remain on the Certificate of Conformance.

During the discussion on this issue, Dr. Charles Hurburgh, Jr., Iowa State University, pointed out that if there is a statistically significant bias between two meters and both meet "Approved" tolerances, then the tolerance is too broad. It was suggested that statistics are needed to show that meters as a cluster are aligned with each other in addition to aligning with the air oven. A subcommittee was formed to look at approval tolerances and uniformity among meters. When the subcommittee met, it became clear that a major obstacle to further study this matter by the committee would be greatly hindered by the fact that manufacturers consider Ongoing Calibration Program (OCP) data proprietary, and the NTEP Laboratory is not free to release this data. Dr. Richard Pierce, GIPSA (the NTEP Laboratory), offered to look further into the matter and have GIPSA's statistician prepare a report.

Discussion: Dr. Pierce presented data showing the performance of NTEP meters compared to the air oven. These data were based on the last three crop years (2001 - 2003) using calibrations updated for use during the 2004 harvest season. Dr. Pierce reported that the data for the most recent three-year period is similar to data presented to the Sector five years ago. Addressing the results for corn, Dr. Pierce conceded that alignment (between meters) could be improved. With the exception of one model, agreement between meters was good over the basic 6 % moisture range. Dr. Hurburgh pointed out that each point on the graphs represents an average of a significant number of samples; thus, there is an implied "error bar" for each point. As a result, on individual samples there could be a wide dispersion in measurements between two different meter models. The results for corn, soybeans, and hard red winter wheat are shown graphically below.



Moisture Meter Comparison - Corn 2001-2003 Crop Years

Moisture Meter Comparison - Soybeans 2001-2003 Crop Years







Moisture Meter Comparison - Hard Red Winter Wheat 2001-2003 Crop Years

Dr. Pierce explained that wet corn is a problem. Above 20 % moisture, the number of available samples drops significantly with each 2 % interval of increasing moisture. In addition, year-to-year variability can be significant. In response to a suggestion that a tighter tolerance be applied to a three-year rolling average of the bias for each 2 % interval above 20 % moisture, Dr. Pierce replied that the problem lies in the imperfect sample set for moistures above 20 % moisture where meters show the most year-to-year variability. There are a limited number of samples, and the samples are not fully representative of the population. As a result, even three-year rolling averages may vary from year to year for each 2 % interval above 20 % moisture. This is the reason that Publication 14 applies confidence intervals to the tolerances for each 2 % interval above the basic 6 % moisture range.

Calling attention to the substantial difference between Models 1 and 5 on corn, Rich Flaugh, GSF, Inc., urged the Sector to work harder on this issue, noting that GSF had performed studies showing that the discrepancies above 20 % moisture (on corn) have been present for a number of years. He also pointed out that 2 to 4 million bushels of corn run through one meter (with a + 0.6 % bias) could cost producers \$250,000 in excess shrink and drying charges.

It was suggested that the alignment problem could be solved if comparative data identifying each model by manufacturer were to be published. (Such data is presently considered proprietary according to the terms of the interagency agreement.) An informal poll of manufacturers indicated they were generally opposed to publishing this data or including a chart or graph of biases for their individual meters on the Certificate of Conformance. There was concern that this data might be misinterpreted and might lead to unnecessary calibration changes. Dr. Pierce cautioned that tolerances should not be so tight as to require calibration changes every year. Calibration changes to the official meter are upsetting to the grain trade as they can have a substantial effect on the value of grain inventories.

As presently written, there is nothing in the Grain Moisture Meter chapter of Publication 14 to force a calibration change for a meter exhibiting bias characteristics similar to those shown for meter Model 1 on corn moisture. Dr. Pierce suggested the Sector might want to consider an "overall bias" requirement similar to GIPSA's "Rule for sustained biases" cited below, but with a 0.20 limit on overall bias:

A calibration is considered for bias correction when all of the following conditions are met:

- (1) The three-year average calibration bias (the three-year average bias over the entire range) exceeds 0.15 % moisture,
- (2) The most recent three-year average calibration bias exceeds twice the standard deviation of past three-year average calibration biases.

One Sector member originally opposed an "overall bias" rule, believing this would not improve performance of meters in the field. This opposition was withdrawn when it was explained that: 1) moisture meter calibrations are always based on historical data; 2) although based on raw data collected over a three-year period, a calibration having a smaller bias with respect to air oven on that data has a greater probability of exhibiting a smaller bias on next year's crop; and 3) assuming that meters of like type in the field are aligned with the NTEP laboratory meter, the bias of meters in the field will also be reduced. Another member originally opposed an "overall bias" rule on the grounds that it was trying to hit a moving target. This objection was also withdrawn after considering that any proposed rule would incorporate a bias tolerance wider than the 0.15 % moisture used by GIPSA. The Sector then agreed to consider a written proposal to add an "overall bias" rule to Publication 14.

During discussion of proposed wording, questions were raised about handling new meters where less than three years of data was available. It was recognized that calibrations for a new meter might have to change each year until enough data could be accumulated. One Sector member recalled that this, in fact, did happen for some meters in the first few years of the OCP. The Sector agreed that an "overall bias" rule should apply to all available OCP data for the most recent three-year period. If only one year of data is available, the rule will apply to that year's data. The requirement that the most recent three-year average calibration bias exceed twice the standard deviation of past three-year average calibration bias limit of 0.20 would catch the worst offenders and would not cause unnecessary calibration changes.

Conclusion and Recommendation: The Sector agreed to recommend the addition of an overall calibration bias requirement based on up to three years of available Ongoing Calibration Program data collected by the NTEP Laboratory to § **IV. Tolerances for Calibration Performance** of the Grain Moisture Meter Chapter of the 2004 edition of Publication 14 as shown below:

IV. Tolerances for Calibration Performance

Calibration performance must be tested against established criteria at the following stages of the type evaluation process:

- 1. Evaluation of the calibration data supplied by the manufacturer with the application for type evaluation.
- 2. Evaluating instrument and calibration performance over the 6 % moisture range for corn, HRW wheat and soybeans (accuracy test discussed earlier).
- 3. Initial calibration approval for grains other than corn, HRW wheat, and soybeans.
- 4. Review of ongoing calibration data collected as part of the national calibration program.
- •
- •

New calibrations will be approved based upon the re-predicted moisture values. Approval tolerances will be onehalf of the Handbook 44 acceptance tolerance and will be applied in 2 % intervals over the range of available data. Additionally, for up to three years of available data:

a. The difference between the average bias to air oven for all samples in a given year and the average bias to air oven for any other year shall not exceed: 0.90 for corn; 0.80 for rice, oats, sunflowers and sorghum; and 0.70 for wheat, soybeans, and barley.

- b. The range of year-to-year differences in bias to air oven shall not exceed the H-44 tolerances for three or more consecutive 2 % moisture intervals. Only moisture intervals consisting of five or more samples per year will be considered for this comparison.
- c. The average calibration bias with respect to air oven shall not exceed 0.20 % moisture, calculated using the most recent calibration and all available raw data collected within the last 3 years for the entire moisture range.

Failure to meet the requirements in either item a, b, or c above will cause a "No Longer Approved for Use" status to be assigned to the affected grain type(s) on the NTEP Certificate of Conformance (CC) for that instrument. Calibration coefficients will not be listed for any calibration failing these requirements.

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4. Proposed Change to Publication 14 – Test Weight per Bushel Range for Test Weight Accuracy, Precision and Reproducibility Tests

Background/Discussion: Publication 14 stipulates that samples used for Test Weight per Bushel (TW) type approval tests for accuracy, precision, and reproducibility are to be selected to meet the following conditions:

- a) A total of 12 samples are required per grain type
- b) Samples should be selected from the same 6 % moisture range used for GMM Phase I tests;
- c) No less than 8 samples should come from the lowest two-thirds of the 6 % moisture range;
- d) No less than 2 samples should come from the highest one-third of the 6 % moisture range;
- e) The range of sample TWs should be no less than the range that is grade determining; and
- f) Samples should represent a distribution of Test Weights per Bushel (TW) that minimizes the correlation between TW and moisture.

The specific requirements for the test samples are spelled out for each grain type in a table in § VII. B. of the 2004 Edition of the Grain Moisture Meters chapter of Publication 14.

In an attempt to assemble a set of test samples, the NTEP Laboratory screened a group of samples from the 1998 – 2003 Phase II moisture survey supplemented by additional samples collected from GIPSA field offices to eliminate those not within the specified 6 % moisture range. From the remaining samples, attempts were made to meet the distribution requirements by first selecting those with TWs close to the low end of the specified TW range in each 2 % moisture interval. There were problems locating samples of sufficient volume (the quart kettle reference method for TW requires "enough grain to overflow the kettle) within the specified moisture range, test weight range, and correlation requirements. The following table shows the current Publication 14 TW ranges, the percentage of Phase II samples in those ranges, and the actual TW range of the sets the Lab was able to use for evaluation purposes.

Type of Grain	Moisture Range	Publication 14 Min Test Weight per Bushel Range	% Useable Within Current TW Range	Range used for Sets
Corn	12 - 18 %	52 - 56	8	52.6 - 57.3
Soybeans	10 - 16 %	52 - 56	11	51.5 - 56.9
Hard Red Winter Wheat	10 - 16 %	56 - 60	17	57.2 - 61.4
Durum Wheat	10 - 16 %	56 - 60	21	57.3 - 61.9
Soft White Wheat	10 - 16 %	56 - 60	22	57.1 - 62.1
Hard Red Spring Wheat	10 - 16 %	55 - 58	6	55.2 - 59.5
Soft Red Winter Wheat	10 - 16 %	56 - 60	37	55.6 - 60.1
Hard White Wheat	8 - 14 %	56 - 60	4	56.6 - 63.6
Two-Row Barley	10 - 16 %	43 - 47	4	45.8 - 52.6
Six-Row Barley	10 - 16 %	43 - 47	31	43.5 - 48.6
Oats	10 - 16 %	30 - 36	31	31.4 - 38.2
Sunflower Seed	6 - 12 %	24 - 27	3	26.5 - 31.3
Long Grain Rough Rice	10 - 16 %	42 - 46	50	42.0 - 46.7
Medium Grain Rough Rice	10 - 16 %	44 - 48	56	44.2 - 48.6
Grain Sorghum	10 - 16 %	53 - 57	4	56.0 - 60.9



The difficulty in locating samples of sufficient size for the quart kettle reference test weight measurement within the moisture range, test weight range, and correlation requirement can be seen by examining graphs of TW vs. moisture for Phase II samples from the six most recent crop years (1998 – 2003) for corn, soybeans, and hard red winter wheat. It is even more difficult to locate qualified samples for some of the less widely traded grains. Samples represented by diamonds on the graphs are samples that meet the current selection criteria.



By changing the TW Range required for the test sample sets, many more samples could be made available for selection. The following chart shows the grade-determining minimum TWs for grades 1, 2, and 3 (or in parenthesis the current Publication 14 range if different); the proposed TW range (which in most cases includes the minimum TWs for grades 1 and 2); and the percentage of 1998-2003 Phase II samples that would be available for selection with the proposed TW range compared to the percentage available with the current range.

Grain Type	Minimum TW for Grade (pounds/bushel)			Proposed Range	Percent Available with Proposed Range	Percent Available with Current Range
	Grade 3	Grade 3 Grade 2 Grade 1				
Corn	52	54	56	54 - 58	26	8
Soybeans	52	54	56	55 - 59	73	11
Hard Red Winter Wheat	56	58	60	59 - 63	54	17
Durum Wheat	56	58	60	59 - 63	50	21
Soft White Wheat	56	58	60	58 - 62	50	22
Hard Red Spring Wheat	55	57	58	58 - 61	37	6
Soft Red Winter Wheat	56	58	60	56 - 60	37	37
Hard White Wheat	56	58	60	60 - 64	28	4
Two-Row Malting Barley (43-47)	48	48	50	47 - 51	32	4
Six-Row Barley	43	45	47	43 - 47	31	31
Oats	30	33	36	33 - 39	47	31
Sunflower Seed (24-27)		25	25	28 - 31	32	3
Long Grain Rough Rice	(42-46)			43 - 47	60	50
Medium Grain Rough Rice	(44-48)		44 - 48	56	56	
Grain Sorghum	53 55 57		58 - 62	56	54	

One Sector member expressed concern that meters won't be evaluated in the range where (for corn) discounts are most likely to be applied. The user presumes that the meter has been evaluated over the entire operating range, when, in fact, it will have been evaluated only at the upper range of operation. Dr. Hurburgh, explained that the main use of test weight (for corn) is in certifying warehouse volume. Test weight (TW) is not widely discounted for corn. Low TW for corn is a rare occurrence, which is why low TW corn samples are difficult to obtain. Furthermore, in contrast to moisture, the measurement of TW is inherently linear. There is not a problem extrapolating to lower TWs.

The Sector agreed to the following recommendation.

Recommendation: Change the Minimum Test Weight per Bushel Range in the Table in §VII.B. of the 2004 Edition of the Grain Moisture Meters chapter of Publication 14 on the following page:

Type of Grain	Moisture Range	Minimum Test Weight per Bushel Range	Criteria for Sample Selection
Corn	12 - 18 %	54 - 58	a). No less than 8 samples
Soybeans	10 - 16 %	55 - 59	lowest two-thirds of the
Hard Red Winter Wheat	10 - 16 %	59 - 63	6 % moisture range.
Durum Wheat	10 - 16 %	59 - 63	b) No less than 2 samples
Soft White Wheat (except White Club)	10 - 16 %	58 - 62	should come from the highest one-third of the
Hard Red Spring Wheat (and White Club)	10 - 16 %	58 - 61	6 % moisture range.
Soft Red Winter Wheat	10 - 16 %	56 - 60	a distribution of Test
Hard White Wheat	8 - 14 %	60 - 64	Weights per Bushel (TW)
Two-Row Barley	10 - 16 %	47 - 51	that minimizes the
Six-Row Barley	10 - 16 %	43 - 47	and moisture.
Oats	10 - 16 %	33 - 39	
Sunflower Seed (Oil Type)	6 - 12 %	28 - 31	
Long Grain Rough Rice	10 - 16 %	43 - 47	
Medium Grain Rough Rice	10 - 16 %	44 - 48	1
Grain Sorghum or Milo	10 - 16 %	58 - 62	1

5. Proposed Change to Publication 14 – Repeatability Tolerances for Test Weight

Discussion: The tolerance for the Test Weight per Bushel repeatability test of Publication 14 is marginally too tight for corn and for oats. The present limit is 0.4 times the absolute value of the Handbook 44 acceptance tolerance of 0.8 pounds per bushel for corn and oats. At the time the Sector recommended a multiplier of 0.4 for repeatability, which translates to a tolerance of 0.32 pounds per bushel, it was a "best estimate" value with little data available to show if this limit would be marginal with the sample test set specified in Publication 14. Subsequent testing indicates that 0.40 pounds per bushel is a more realistic repeatability tolerance for corn and oats.

Certificates of Conformance have been issued for the 2004 crop year. One device met the present repeatability tolerance for corn (admittedly by a very small margin). No devices have met the present repeatability tolerance for oats.

The Sector agreed by consensus to recommend the following change in repeatability tolerances for Test Weight in Publication 14.

Recommendation: Change tolerances for repeatability for corn and oats in § VII. B. of the Grain Moisture Meter chapter of the 2004 edition of Publication 14 as follows:

Tolerances for repeatability for all grain types except corn and oats are 0.4 x the absolute value of the Handbook 44 acceptance tolerance. The tolerance for repeatability for corn and oats is 0.5 x the absolute value of the Handbook 44 acceptance tolerance. Specific tolerances are:
Grain Type	Tolerance
<u>Corn, oats</u>	0.40 pounds per bushel
All wheat classes	0.20 pounds per bushel
Soybeans, barley, rice, sunflower, sorghum	0.28 pounds per bushel

6. Handbook 44, § 5.56(a) Paragraph S.2.6. Determination of Quantity and Temperature

Background: In August 2002 the Sector considered whether their recommended changes to NIST Handbook 44, § 5.56(a), paragraph S.2.6., relating to a means of sensing adequate sample volume, should be retroactive or nonretroactive. Discussion centered on the requirement that meters measuring TW must provide some means to ensure that measurements of TW are not allowed to be displayed or printed when insufficient sample volume has been supplied. (Although the code does not specify how this is to be accomplished, it is generally assumed that the means will include a sensor of some sort installed in either the sample hopper or the test cell.)

Those favoring making the proposed code retroactive reminded the Sector that although moisture measurements are not significantly affected when samples are not of sufficient size to completely fill the measuring cell of a GMM, the TW measurement is greatly affected when the cell is not filled. Measurement of TW requires determination of two parameters: volume and mass. The vast majority of GMM's with TW capability presently in the field do not have means to assure that the measuring cell is completely full. If the cell is not filled completely, TW indications will be lower than they should be to the disadvantage of the producer selling grain. Some sector members favoring making the code nonretroactive felt that GMM's with a window, through which the test cell could be seen, provided adequate means to verify that the cell had been filled. A grain industry member expressed the belief that compared to how test weight measurements are being made now, the worry about a sensor was trivial. As long as the GMM could produce an accurate TW measurement when properly used, whether or not the hopper had a sensor, was not important. Some thought this was a facilitation of fraud issue and favored making the sensor requirement retroactive. Others thought that making the code retroactive would unfairly penalize users of existing NTEP meters with TW capability. By a vote of 9 to 4, the Sector agreed that the addition to paragraph S.2.6. relating to a means of sensing adequate sample volume should be nonretroactive. As adopted by the Conference, this paragraph currently reads:

S.2.6. Determination of Quantity and Temperature. - The moisture meter system shall not require the operator to judge the precise volume or weight and temperature needed to make an accurate moisture determination. External grinding, weighing, and temperature measurement operations are not permitted. In addition, if the meter is capable of measuring test weight per bushel, determination of sample volume and weight for this measurement shall be fully automatic *and means shall be provided to ensure that measurements of test weight per bushel are not allowed to be displayed or printed when an insufficient sample volume is available to provide an accurate measurement.* (Added 1994)(Amended 1995 and 2003)

[Nonretroactive as of January 1, 2004]

Discussion: Handbook 44, §1.10. General Code, Paragraph G-A.6. states:

Nonretroactive Requirements. "Nonretroactive" requirements are enforceable after the effective date for:

- (a) devices manufactured within a State after the effective date;
- (b) both new and used devices brought into a State after the effective date; and
- (c) devices used in noncommercial applications which are placed into commercial use after the effective date.

Nonretroactive requirements are not enforceable with respect to devices that are in commercial service in the State as of the effective date or to new equipment in the stock of a manufacturer or a dealer in the State as of the effective date.

(Nonretroactive requirements are printed in italic type)] (Amended 1989) Thus, as Handbook 44 is currently written, a State can test the TW feature of any GMM placed into commercial service in that State prior to January 1, 2004, and approve or reject it, whether or not the device has the means to ensure that sufficient volume is available for an accurate test. However, some States have indicated they will not allow the use of a TW feature unless an active Certificate of Conformance (CC) covers the TW feature of the device. NCWM, Inc., is accepting applications for NTEP testing for TW capability for only those GMMs incorporating a volume sensor.

During development of the Handbook 44 Code relating to TW, several Sector members made a strong case for requiring that GMMs with TW capability be able to prevent a TW indication and printout if insufficient volume of grain is present for an accurate reading.

The Sector considered the following questions:

- How are states enforcing this requirement?
- Are meters without a volume sensor being tested for TW?
- If a volume sensor is important for accurate TW measurement, should this requirement be retroactive (perhaps with a future effective date) or should it remain nonretroactive?

Diane Lee, NIST WMD, reported that based on the calls she had received from State W&M personnel, the states were not enforcing this portion of the code uniformly. One State W&M representative reported that to date they have not been approving meters for TW if they did not have volume sensors. For survey purposes, they had tested a group of meters not having volume sensors. A large portion of that group did not pass the tests for TW. It was suggested that these failures were most likely due to poor maintenance rather than inadequate volume of sample. Although a W&M representative was not present from Illinois, it was reported that Illinois was conducting TW tests on all meters in place before January 1, 2004, whether or not they had volume sensors. Illinois was reportedly testing only with wheat. There was concern that testing with a single grain might not be adequate indication the device would perform accurately on other grains as some devices are adjusted to grain type. This "adjustment to type" frequently takes the form of grain specific TW calibration constants (slope or bias terms) that compensate for differences in packing density between the GMM test cell and the standard TW quart cup for each grain. This concern is most serious with devices that haven't received NTEP approval for TW. Devices that have been NTEP approved for TW will be using TW calibrations that have been evaluated for each grain type, so testing with a single grain at least verifies the weighing mechanism is functioning properly.

Conclusion: The Sector agreed that its earlier decision to make the requirement for a volume sensor nonretroactive was correct and will stand.

7. Report on OIML IR 59 "Moisture Meters for Cereal Grains and Oilseeds"

Background: At an OIML TC17/SC1 meeting in Berlin on June 22, 2001, the U.S. Delegation put forth a series of proposals to revise OIML IR59 "Moisture Meters for Cereal Grains and Oilseeds." These proposals were well received, and it was requested that the U.S. prepare a draft based on the U.S. NTEP program. A rough draft of this document was reviewed at the August 2002 GMM Sector meeting. A working draft, incorporating changes suggested by the Sector, was submitted to U.S. and International Work Groups in February 2003 for comment. NIST Weights and Measures Division (WMD), now responsible for U.S. participation and representation in the technical activities of the OIML, compiled comments to the working draft for review by representatives of the U.S. National Work Group (USNWG). The working draft was modified to address comments where it was judged appropriate. The modified working draft and a table of responses to the comments received to the working draft were distributed to USNWG members May 28, 2003. Subsequently, the Secretariat (the Peoples Republic of China) distributed the revised working draft as the "First Committee Draft" to OIML TC17/SC1 for review and comment by the member states of the subcommittee. Comments to the "First Committee Draft," dated April 2004 incorporating changes agreed to at the Beijing meeting has been distributed to member countries. USNWG members were asked to return their comments on the latest draft to Diane Lee, NIST WMD, no later than July 30, 2004.

A meeting of TC17/SC1 was held September 20 –21, 2004, in Paris to discuss the latest draft of R59.

NTEP Committee 2005 Interim Report Appendix B – NTETC - GMM and NIR Sectors

Discussion: Diane Lee reported that Japan had objected to the required minimum sample size of 100 g or 400 kernels or seeds, which ever is smaller, for dielectric meters (and 20 g for near infrared meters), because it ruled out meters based on the electrical resistivity of grain. These meters are used mainly for small grains, but at least one type can also measure moisture in soybeans. About 70 % of the grain moisture meters in Asia are of this type. During the Sector's discussion of this issue, it was reported that the sample size for these meters, on small grains, was 0.5 g. Some members questioned this size, wondering if a larger sample might be ground up and mixed before 0.5 g was extracted and placed between electrodes for measurement. Subsequent to the meeting, at least two models of resistive meters were found to utilize only 18 - 22 kernels when measuring short grain brown or white rice, which approximates 0.4 g.. The April 2004 draft had included the following note to address Japan's concerns about sample size:

(Note: if another meter technology is used which requires a smaller sample size than noted above, additional testing is required to ensure that proper sampling techniques can be applied to the measurement to ensure that the measurement is representative of the grain sample.)

It was suggested that a class of "small sample size" instruments might be needed to address Japan's concerns with that class being excluded from use in the U.S. Steve Patoray, NTEP Director, pointed out that should the U.S. enter into a grain moisture meter mutual recognition agreement with OIML, the U.S. would have to have sound technical basis for excluding this class from U.S. use.

Subsequent to the Sector meeting, comments on the April 2004 draft of R59 were received from other OIML member countries. Comments were for the most part positive. The most serious objections were from Japan. They included:

- 1) In clause 6.1.5 the meaning of "representative size grain sample" is not clear because the statistical population is not defined in this draft. Meters could not be designed to measure the moisture content of representative size of grain samples because representativeness does not depend on the size of sample but on preparation such as mixing sample and on way of measurement. Therefore this clause should be deleted, or we should just note that the sample should be homogeneous.
- 2) The present draft seems to require all types of grain moisture meters to measure the temperature of a loaded sample. As we pointed out at the meeting in Beijing it is almost impossible for resistance type moisture meters to comply with the requirement due to geometrical and mechanical restriction. Therefore the present descriptions concerning temperature measurement of the sample, if they are not changed, would lead to exclude the resistance type moisture meters, whose market share is about 70 % in Asian countries.

Japan proposed removing all requirements regarding inhibiting display of moisture value when certain grain or instrument temperature limits had been exceeded.

Diane Lee has compiled the comments received from other OIML member countries and circulated a comment form to the U.S. Work Group soliciting comments in hopes of receiving feedback on the comments prior to the next meeting of OIML TC17/SC1 scheduled for September 20-21, 2004 in Paris, France.

8. Report on NTEP Type Evaluations

Cathy Brenner of the Grain Inspection, Processors and Stockyards Administration (GIPSA, formerly FGIS), the NTEP Participating Laboratory for Grain Analyzers (Grain Moisture Meters and Near Infrared Grain Analyzers) reported on Type Evaluation activity. In addition to regular grain moisture meter calibration updates, two certificates were updated to add new features following successful evaluations:

- 1. CC 01-063A4 Foss Infratec 1241
 - a) added protein and oil for corn and soybeans
 - b) added protein for the following wheats: Durum, HRS, HRW, Hard White, SRW, Soft White; and for both 6-row and 2-row Barley
- 2. CC 97-073A7 Steinlite SL95 (only units with funnel sensor are approved for TW)
 a) added test weight per bushel for all grains except Oats

Evaluations are currently underway for two additional devices: one for test weight per bushel and one for protein and oil combined.

9. Should the Grain Moisture Meter Sector and the NIR Grain Analyzer Sectors Merge?

Discussion: The Grain Moisture Meter Sector and the Near Infrared Grain Analyzer Sector (originally the Near Infrared Protein Analyzer) first met in Kansas City in December of 1991. Since their beginning, the two Sectors have met separately on successive days, often meeting jointly for part of that time to consider items of common interest. The advent of CCs listing multiple applications evaluated under either or both the Grain Moisture Meter Code and the Near Infrared Analyzer Code has increased the number of issues common to both groups. Furthermore, the Sector Chair, the technical advisors, and the vast majority of Sector members are common to both Sectors. These facts suggested that it would be more efficient for the two Sectors to merge into a single new Sector called the "Grain Analyzer Sector." In the past, when items required in-depth consideration of technical matters or development of detailed procedures, *ad hoc* subcommittees or work groups were formed to develop background information and to suggest action for consideration by the Sectors. It is envisioned that such sub-committees or work groups can be of equal or greater importance to a merged Sector dealing with more mature issues.

Following are few of the benefits of merging into a single sector:

- One meeting agenda instead of two
- One meeting summary instead of two
- More flexibility in dealing with items of common interest
- Consistency between GMM and NIR Code and Checklists

Recommendation: By consensus the Sector agreed to recommend that the NCWM Board of Directors merge the Grain Moisture Meter Sector and the Near Infrared Grain Analyzer Sector into a new Sector to be called the Grain Analyzer Sector.

10. Report on the 2004 NCWM Annual Meeting

Background/Discussion: The 89^{th} Annual Meeting of the National Conference on Weights and Measures (NCWM) was held July 11 - 15, 2004, in Pittsburgh, Pennsylvania.

No Grain Moisture Meter (GMM) or Near Infrared (NIR) Grain Analyzer items appeared in the Specifications and Tolerances (S&T) Committee Interim Report for consideration by the NCWM at the 2004 Annual Meeting.

The National Type Evaluation Program (NTEP) Committee Interim Report contained an item relating to NTEP's work to establish bilateral and multilateral test data exchange agreements. Under such agreements and arrangements, manufacturers would be able to submit their equipment to any of the participating countries for testing to OIML recommended requirements. The resulting test data would be accepted by other participants, as a basis for issuing each country's own type approval certificate. One such agreement or arrangement is the Mutual Acceptance Arrangement (MAA) on OIML Type Evaluations recently adopted by the International Committee on Legal Metrology (CIML) at their November 2003 meeting. For additional background refer to *Committee Reports for the 89th Annual Meeting*, NCWM Publication 16.

By way of background, Steve Patoray, NTEP Director, explained that the U.S. and Canada have a bilateral MAA covering weighing devices. Under this MAA, a U.S. NTEP test report on a weighing device can be sent to Canada where a Canadian Certificate of Approval will be issued without further testing (and vice versa). A bilateral MAA agreement covering retail motor-fuel dispensers has been signed recently between the U.S. and Canada, but to date no dispensers have been evaluated under this MAA.

Steve also reported that progress was being made to establish an OIML MAA program. An additional International Bureau of Legal Metrology (BIML) staff member will be hired by January 1, 2005, to undertake the new tasks resulting from the implementation of the MAA. Initially this MAA will cover R76 (Non-automatic weighing devices) and R60 (Load Cells). A four-year time plan has been set for implementation. This will be a multilateral agreement with many countries signing a declaration of mutual confidence. Much work has yet to be done to harmonize NTEP requirements

with the OIML recommendations for these devices. A major issue in establishing MAAs is confidence in the data. Testing laboratories will be assessed either by accreditation or peer assessment using criteria that comply with ISO/IEC 17025.

With OIML International recommendations still in the draft stage for GMMs and NIR analyzers, it will be some time before MAAs are in place for these devices. This is, however, an issue that the Sector members may want to watch closely to see how MAAs might impact future type evaluation testing and certification of GMMs and NIR Grain Analyzers.

11. Multiple Application Certificates

Background: During the 2003 NCWM Interim Meeting in Jacksonville, Florida, the NTEP Committee reviewed the Sectors' recommendation to issue a single Certificate of Conformance to devices evaluated using two inter-related codes. Since that time there has been the possibility of dual certification for moisture plus protein and oil, and now test weight per bushel. The first dual certificates became effective July 1, 2004, (97-073A7 and 01-063A4). The two areas of change are in the "For:" box on page 1 and on the last page with the calibration information.

In the "For:" box, the certificates now identify the device as a Grain Analyzer instead of a Grain Moisture Meter or Near Infrared Grain Analyzer. The device type is then followed by the Application(s) that the device is approved for, in alphabetical order (Moisture, Oil, Protein, Starch, Test Weight). This information matches the current NTEP Certificate of Conformance searchable database.

The page for the calibration information also lists the applications in alphabetical order. For example, if a meter were approved for moisture, oil, protein, and test weight per bushel for corn, the calibration listing for corn would be listed as:

Corn Designation: CORN Moisture: ABC123 Moisture Range - Approved: 10 - 30 % Moisture Range - Pending: 8 - 40 % Oil: BCD234 Protein: CDE345 Native Moisture Basis: 0 % Test Weight per Bushel: Approved

Discussion: The Sectors reviewed the new dual certificates. The Sector agreed that the revised certificates generally looked good and commended Cathy Brenner for a job well done. The following suggestions were made to clarify some of the information on the Calibration page:

- a. Separate the moisture calibration information from the information on calibrations for other constituents (Protein, Oil, Starch), perhaps using a dotted line.
- b. Make it clear that the Approved and Pending moisture ranges apply only to moisture measurements. An approved moisture range of 8-40 % does NOT mean that accurate Protein measurements can be made on samples having 40 % moisture.
- c. Make it clear that the Intercept (Bias) note "Varies by instrument" applies only to calibrations for constituents other than moisture (e.g., Protein, Oil, Starch). It does NOT apply to the Moisture calibration. If a moisture bias term is used, it MUST be part of the grain moisture calibration and be the same for all instruments of like type. [Ref., Handbook 44, §5.56(a), Paragraph S.2.4.3.].

In a related matter, it was pointed out that the revised application form for NTEP testing is unclear. Steve Patoray, NTEP Director, suggested that information could be added to the "Evaluation Description" section to indicate which parts of the form must be completed when a box was checked for the type of evaluation being requested.

Questions were also raised about fees involved in Phase I evaluations and Phase II (Ongoing Calibration Program). These fees (for NCWM members) and their frequency are summarized in the table below:

			NTEP Laboratory fees	Frequency
Phase I NTEP Evaluation	Non-refundable application fee \$800	Certificate processing fee \$150	At NTEP Lab hourly rates based on actual hours. (\$10,000 -\$25,000 and up depending on tests involved.)	Once per type/pattern.
Maintenance fee	\$350			Annually
Phase II Ongoing Calibration Program. (applicable to grain moisture meters only)		Certificate processing fee \$150	Per Interagency Agreement. Depends on total number of meter types in the OCP	Annually

12. Time and Place for Next Meeting

The next meeting is tentatively planned for the week of August 22, 2005, in the Kansas City, MO, area. Meetings will be held in one of the meeting rooms at the National Weather Service Training Center if available. The meeting room will be reserved for Wednesday, August 24 and Thursday, August 25. Sector members are asked to hold both these days open pending determination of exact meeting times and meeting duration. Final meeting details will be announced by late April 2005.

If you would like to submit an agenda item for the 2005 meeting, please contact Steve Patoray, NTEP technical director, at spatoray@mgmtsol.com, G. Diane Lee, NIST technical advisor, at diane.lee@nist.gov, or Jack Barber, technical advisor, at jbarber@motion.net by April 1, 2005.

Appendix A – NTETC Grain Moisture Meter Sector Recommendations for Amendments to Publication 14

Grain Moisture Meters Bacommonded Amondments and Changes to the 2004 Edition of Publication 14			
Section Number	Amendment/Change	Page	Source
Section IV. Tolerances for	Add item c. to establish an overall calibration bias	GMM-5	08/04 GMM
Calibration Performance	requirement based on up to three years of available data.	through	Sector Item 3
	Change wording in paragraph preceding item a. and in	GMM-6	
	paragraph following item c. to reflect addition of item c.		
Section VII.B. Accuracy,	Change the Minimum Test Weight per Bushel Ranges	GMM-11	08/04 GMM
Precision, and Reproducibility	in the Table in §VII.B. to facilitate selection of test-set		Sector Item 4
	samples.		
Section VII.B. Accuracy,	Change tolerances for repeatability (precision) for Corn	GMM-13	08/04 GMM
Precision, and Reproducibility	and Oats to more realistic value.		Sector Item 5

National Type Evaluation Technical Committee (NTETC) Near Infrared (NIR) Grain Analyzer Sector Annual Meeting

August 26-27, 2004 - Kansas City, Missouri Draft Summary of Decisions

Agenda Items

1.	Report on NTEP Type Evaluations	17
2.	Should the Grain Moisture Meter Sector and the NIR Grain Analyzer Sectors Merge?	17
3.	Report on the 2004 NCWM Annual Meeting	18
4.	Multiple Application Certificates	18
5.	Time and Place for Next Meeting	19
6.	Report on OIML TC17/SC8 IR for Protein Measuring Instruments for Cereal Grain	20

Note: Because of common interest, items 1 through 5, above, were considered in a joint session of the NIR Grain Analyzer and the Grain Moisture Meter Sectors

1. Report on NTEP Type Evaluations

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6. Report on OIML TC17/SC8 IR for Protein Measuring Instruments for Cereal Grain

Background:

OIML TC17/SC8, charged with developing an International Recommendation (IR) for Protein Measuring Instruments for Cereal Grain, held its first meeting May 31 and June 1, 2004, in Sydney, Australia. Representatives from Australia, Japan, New Zealand, and the United States attended the meeting. Australia, as the secretariat of the subcommittee, developed an outline of the Recommendation on Protein Measuring Instruments for Cereal Grain (March 2004) that was circulated to participating nations (Australia, Brazil, Canada, Czech Republic, Germany, Japan, Poland, Republic of Korea, Russia and the United States) for comments. In the U.S. the document was circulated to the U.S. National Work Group (USNWG) for comments. The comments received from the U.S. and Germany were discussed at the TC17/SC8 meeting in Australia. The comments for the most part were accepted. Additionally, TC17/SC8 agreed to the following changes:

- a. The scope will be expanded to include wheat, barley, corn, soybeans and rice
- b. Maximum permissible errors (MPE) and Moisture Basis: Publication 14 will be used to establish the maximum permissible errors for wheat, barley, corn and soybeans. China will provide information for tolerances on rice. Moisture basis will be determined by the national measurement authority.
- c. The section for sampling will be updated to address the U.S. comments.
- d. The technology for protein measurements will not be specific.
- e. The standard will incorporate appropriate sections of OIML D9
- f. The instrument monitoring process will be left up to the national measurement authority.
- g. The document will be updated so that the April 2004 Final Draft of the **International vocabulary of basic and** general terms in metrology (VIM) definitions are included.
- h. The reference method will be determined by the national measurement authority.
- i. The Recommendation on protein measuring instruments will be drafted as close as possible with the latest draft of OIML R59.
- j. The document will include susceptibility to dust.
- k. Decision to test non-indirect measuring devices will be at the discretion of the national measurement authority.

Discussion: A revised draft incorporating the changes agreed upon at the Sydney meeting was distributed with the Agenda for the Sector's August 2004 meeting. Australia, the Secretariat of TC17/SC8, used portions of the NIR Grain Analyzer Chapter of Publication 14 in this draft outline recommendation. As of the Sector meeting, Diane Lee, NIST WMD reported that comments had been received only from Randy Burns, Arkansas Bureau of Standards. Randy's comments were mostly editorial in nature. Dr. Charles Hurburgh, Iowa State University, mentioned that **NIR 2005**, the 12th International Conference on Near Infrared Spectroscopy, would be held April 10-15, 2005, in Auckland, New Zealand. He suggested that this would be an ideal time for TC17/SC8 to meet because all the recognized names in the field of Near Infrared Spectroscopy would be present. Dr. Hurburgh offered the following comments on the latest draft:

- There should be explicit mathematical descriptions in addition to statements for many terms.
- The MEPS in the table of tolerances are extremely tight for the U.S. where there is not variety release control and therefore much more variation in germplasm.
- There are many places where the basis of determination (i.e., the number of samples used) is not stated. The background statistics are always based on some number of observations.
- The draft defines a networked instrument as one that is linked, either electronically or manually under a quality system, to a certified measuring instrument and/or a whole grain certified reference material and/or the reference method of Annex A so that its performance may be monitored on a daily basis or according to a schedule set by the quality system administrator. I don't think the U.S. is ready to accept that a company with a certified quality management system is metrologically the same as if the instruments are actually electronically linked. This would be a huge policy change/modification for the U.S. I think it is the way to move, but not sure we are ready yet.
- The draft also states that networked instruments subject to a quality control system may be adjusted within the range of MPES to improve the accuracy of the instrument. This would not be consistent with U.S. metrological practice.
- The draft does not cover the case where calibrations have been derived on a moisture basis equal to Mref.
- Only one unit is required for type evaluation. One unit is not sufficient to verify that production meets type, nor does it allow testing for calibration transfer methods.

Dr. Hurburgh will be sending a complete write-up of his comments with detailed comments/suggestions to Diane Lee.

Because several of the members of TC17/SC8 are also members of TC17/SC1 (OIML R 59 Moisture Meters For Cereal Grain and Oilseeds), which met in Paris in September 20-21, 2004, it had been proposed that the next meeting of TC17/SC8 to discuss the latest draft of the "Outline of a Recommendation on Protein Measuring Instruments for Cereal Grain" be held in Paris the day following the TC17/SC1 meeting. The TC17/SC8 meeting was not held following the TC17/SC1 meeting.

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Appendix C

National Type Evaluation Technical Committee Measuring Sector Annual Meeting

October 21-22, 2004, Gulfport, Mississippi Draft Summary of Decisions

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1. Recommendations to Update to NCWM Publication 14 to Reflect Changes to NIST Handbook 44

Source: NIST/WMD

Background: The 89th National Conference on Weights and Measures (NCWM) adopted the following items that will be reflected in the 2005 Edition of NIST Handbook 44 and NCWM Publication 14. These items are part of the agenda to inform the Measuring Sector of the NCWM actions and recommend changes to NCWM Publication 14.

Recommendation: The Sector will review and, if acceptable, recommend to the NTEP Committee adoption of the following changes to Publication 14 based on changes to NIST Handbook 44:

A. S.2.2.1. Multiple Measuring Devices with a Single Provision for Sealing

Background: During its 2004 Annual Meeting, the NCWM agreed to add a new paragraph to NIST Handbook 44, Section 3.30. Liquid-Measuring Devices S.2.2.1. Multiple Measuring Elements with a Single Provision for Sealing as follows:

<u>S.2.2.1.</u> Multiple Measuring Elements with a Single Provision for Sealing. - A change to the adjustment of any measuring element shall be individually identified. [Nonretroactive as of January 1, 2005]

<u>Note:</u> Examples of acceptable identification of a change to the adjustment of a measuring element include but are not limited to:

- (a) a broken, missing, or replaced physical seal on an individual measuring element,
- (b) a change in a calibration factor for each measuring element,
- (c) <u>display of the date of or the number of days since the last calibration event for each measuring element or,</u>
- (d) <u>a counter indicating the number of calibration events per measuring element.</u>

Recommendation: Add a new Code Reference S.2.2.1. to Section 9, of the Liquid-Measuring Devices Checklist and Test Procedures of NCWM Pulication14, Measuring Devices, 2004 edition as follows:

Code Reference: S.2.2.1. Multiple Measuring Devices with a Single Provision for Sealing

9.6 S.2.2.1. Multiple Measuring Elements with a Single Provision for Sealing. - A change to the adjustment of any measuring element shall be individually identified.

<u>Note:</u> Examples of acceptable identification of a change to the adjustment of a measuring element include but are not limited to:

- (a) a broken, missing, or replaced physical seal on an individual measuring element,
- (b) a change in a calibration factor for each measuring element,
- (c) <u>display of the date of or the number of days since the last calibration event for each</u> <u>measuring element or</u>,
- (d) a counter indicating the number of calibration events per measuring element.

Renumber succeeding Section 9 paragraphs accordingly.

B. S.4.4.2. Location of Marking Information

Background: During its 2004 Annual Meeting, the NCWM agreed to amend Handbook 44 Section 3.30 Liquid-Measuring Devices paragraph S.4.4.2. Location of Marking Information as follows:

S.4.4.2. Location of Marking Information; Retail Motor-Fuel Dispensers. - The required marking information in the General Code, Paragraph G-S.1. shall appear as follows:

- (a) Placement of this information shall not be on a portion of the device that can be readily removed or interchanged without the use of a tool separate from the device.
 shall be within 24 to 60 inches from the base of the dispenser;
- (b) The information shall appear 24 to 60 inches from the base of the dispenser when placed on the outside of the device.
 may be internal and/or external provided the information is permanent and easily read;

(c) When placed behind an access door or panel the information shall appear 24 inches to 60 inches from the base of the dispenser in a readily legible position. The use of a dispenser key shall not be considered a tool separate from the device.
 shall be on a portion of the device that cannot be readily removed or interchanged (i.e., not on a service access panel).

Note: the use of a dispenser key or tool to access internal marking information is permitted.

[Nonretroactive as of January 1, 2003] (Added 2002) (Amended 2004)

Recommendation: Modify Section 11, paragraph 11.3. of the Liquid-Measuring Devices Checklist and Test Procedures of NCWM Pulication14, Measuring Devices, 2004 edition as follows:

Code Reference: S.4.4.2. Location of Marking Information

- **<u>11.3.</u>** The required marking information in the General Code, paragraph G-S.1. shall be located as follows:
 - (a) Placement of this information shall not be on a portion of the device that can readily removed or interchanged without the use of a tool separate from the device. shall be within 24 to 60 inches from the base of the dispenser;
 - (b) When placed on the outside to the device the information shall appear 24 to 60 inches from the base of the dispenser. may be internal and/or external provided the information is permanent and easily read;
 - (c) When placed behind an access door or panel the information shall appear 24 inches to 60 inches from the base of the dispenser in a readily legible position. The use of a dispenser key shall not be considered a tool separate from the device. shall be on a portion of the device that cannot be readily removed or interchanged (i.e., not on a service access panel).

<u>Note: the use of a dispenser key or tool to access internal marking information is</u> <u>permitted.</u>

Decision: The Sector reviewed, accepted, and recommends the NTEP Committee adopt the proposed changes to NCWM Publication 14.

Carry-over Items:

2. On-Screen Display of G.S.1. Requirements for Software-Based Built- for-Purpose Devices

Source: Returned from NCWM S&T Committee

Background: At its 2003 Annual Meeting, the NCWM adopted a proposal that provides alternate methods, other than physical marking, for meeting some of the requirements of Handbook 44 G-S.1. for "not-built-for-purpose" devices. At that meeting the NCWM S&T Committee also reviewed an SMA proposal that provided similar alternate marking methods for "built-for-purpose" devices. The S&T Committee concluded that the proposal for "built-for-purpose" devices required further review and development by the NTETC Technical Sectors and the regional weights and measures associations.

Prior to the October 2003 NTETC Measuring Sector Meeting, the WMD NTETC technical advisors developed an alternate proposal to modify G.S.1. and add a Table G.S.1. that provided alternate methods other than physical markings for meeting some of the requirements of G-S.1. for both "not-built-for-purpose" and "built-for-purpose" devices.

At its 2003 meeting, the Measuring Sector agreed with the WMD proposal in principle, but recommended some small changes to simplify the table. The Sector agreed to forward the modified proposal for G-S.1. in tabular format to the NCWM S&T Committee for consideration.

At the 2004 NCWM Annual Meeting during the open hearing, the SMA stated that S&T Item 310-1, the proposal to modify G-S.1., should not go forward for a vote because a ballot of the Weighing Sector on the proposal failed to provide clear support for the item. A manufacturer stated that the term "microprocessor" is not appropriate because their devices contain numerous microprocessors. Another manufacturer stated that the requirement for marking the current software version number would place an unrealistic burden on their company. The Committee agreed that sufficient opposition and questions were raised during the open hearing to demonstrate the item is not sufficiently developed to be a voting item at that meeting. The Committee agreed to make Item 310-1 an information item to be returned to the Weighing and Measuring Sectors for further development.

Recommendation: G-S.1. Identification. - WMD has revised language in the 2004 S&T Agenda Item 310-1. Additions and changes to the proposal to the 2004 S&T Agenda Item 310-1 are highlighted in gray text.

Add new General Code Terms and Definitions as follows:

measuring device (general) – a device (instrument) intended to be used to make measurements, alone or in conjunction with supplementary devices. (VIM)

measuring system (general) - an instrument or group of instruments that serve to make measurements, alone or in conjunction with supplementary devices. (VIM)

electronic devices – a device operating by the principles of electronics, which may consist of one or more subassemblies and perform a specific function(s). (ASTM)

or

electronic measuring device – a measuring instrument intended to measure a quantity using electronic means and/or equipped with electronic devices. (D11)

not-built-for-purpose device. Any electronic peripheral or auxiliary device or element which was not originally manufactured with the intent that it be used as, or part of, a weighing or measuring device or system.

metrological revision – a revision to a measuring instrument, device, or system that affects its metrological integrity (e.g., physical modifications or modifications to embedded, programmable, or downloadable software).

Amend the definition of built-for-purpose device as follows:

built-for-purpose device – any main, <u>peripheral</u>, <u>or auxiliary</u> device or element which was manufactured with the intent that it be used as, or part of, a weighing or measuring device or system.

Amend General Code paragraph G-A.1. Commercial and Law Enforcement Equipment as follows:

G-A.1. Commercial and Law Enforcement Equipment. - These specifications, tolerances, and other technical requirements apply as follows:

- (a) To commercial weighing and measuring <u>devices or systems</u> equipment; that is, to weights and measures weighing and measuring devices <u>or systems</u> commercially used or employed in establishing the <u>size</u>, quantity, <u>extent</u>, <u>area</u>, or measurement of quantities, <u>things</u>, <u>produce</u>, <u>or articles</u> for <u>distribution</u> 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 <u>quantity determination</u> weight or measure.
- (b) To any accessory attached to or used in connection with a commercial weighing or measuring device when such accessory is so designed that its operation affects the accuracy of the device.

(c) To <u>weighing and measuring devices or systems</u> equipment in official use for the enforcement of law or for the collection of statistical information by government agencies.

(These requirements should be used as a guide by the weights and measures official when, upon request, courtesy examinations of noncommercial equipment are made.)

Amend General Code paragraph G-S.1. Identification as follows:

G-S.1. Identification. - All equipment, except weights and separate parts necessary to the measurement process, but not having any metrological effect, shall be clearly marked <u>in accordance with Table G-S.1</u>. for the purposes of identification, with the following information:

- (a) the name, initials, or trademark of the manufacturer or distributor;
- (b) a model designation that positively identifies the pattern, or design, or metrological revision of the device;
- (c) the model designation shall be prefaced by the term "Model," "Type," or "Pattern." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod."

[Nonretroactive January 1, 2003] (Added 2000) (Amended 2001)

[Note: Prefix lettering may be initial capitals, all capitals or all lower case.]

 (d) except for equipment with no moving or electronic component parts and not-built-for-purpose, softwarebased electronic devices, a nonrepetitive serial number;
 [Nonretroactive as of January 1, 1968]

(e) for not-built-for purpose, software-microprocessor based devices the current software version designation or revision number; (Added 2003)

- (<u>e</u>f) the serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number; and [Nonretroactive as of January 1, 1986]
- (fg) the serial number shall be prefaced by the words "Serial Number" or an abbreviation of that term. Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No, and S No.). [Nonretroactive as of January 1, 2001]
- (gh) Ffor devices that have an NTEP Certificate of Conformance (CC), the CC Number or a corresponding CC addendum number-shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).
 [Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device. (Amended 1985, 1991, 1999, 2000, 2001 and 2003)

Delete General Code paragraph G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices and renumber G-S.1.2. Remanufactured Devices and Remanufactured Main Elements as follows:

G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices. - For not-built-forpurpose, software-based devices, the following shall apply:

- (a) the manufacturer or distributor and the model designation shall be continuously displayed or marked on the device (see note below), or
- (b) the Certificate of Conformance (CC) Number shall be continuously displayed or marked on the device (see note below), or
- (c) all required information in G-S.1. Identification. (a), (b), (c), (c), and (h) shall be continuously displayed. Alternatively, a clearly identified "view only" System Identification, G-S.1. Identification, or Weights and Measures Identification shall be accessible through the "Help" menu. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated.

Note: Clear instructions for accessing the remaining required G-S.1. information shall be listed on the CC. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated.

[Nonretroactive as of January 1, 2004] (Added 2003)

G-S.1.12. Remanufactured Devices and Remanufactured Main Elements. - All remanufactured devices and remanufactured main elements shall be clearly and permanently marked for the purposes of identification with the following information:

(a) the name, initials, or trademark of the last remanufacturer or distributor;

(b) the remanufacturer's or distributor's model designation if different than the original model designation. [Nonretroactive as of January 1, 2002] (Added 2001)

Note: Definitions for "manufactured device," "repaired device," and "repaired element" are also included (along with definitions for "remanufactured device" and "remanufactured element") in Appendix D, Definitions.

Add new Table G-S.1. Identification as follows:

Table G-S.1. Identification			
	<u>Built-for-Purpose</u> Instruments, Elements, or Systems	<u>Not-Built-for-Purpose</u> Devices or Elements	
<u>Name, initials, or trademark of the</u> <u>manufacturer or distributor</u>	<u>M</u>	$\underline{\mathbf{D}}^2$	
Model designation	$\underline{\mathbf{M}}^{\underline{1}}$	$\underline{\mathbf{D}}^2$	
Specific model designation	<u>M¹ or D</u>		
<u>Serial number</u>	M	Not required	
Metrological revision designation ³	<u>M or D</u>	<u>D</u>	
Certificate of Conformance (CC) number	M or D	<u>D</u> ²	
M: Physically and permanently marked			

	Ta	ble G-S.1. Identification		
		Built-for-Purpose	Not-Built-for-Purpose	
		Instruments, Elements, or Systems	Devices or Elements	
D:	Either: (1) displayed by accessing a cle	<u>early identified ''view only'' System Iden</u>	tification, G-S.1.	
	Identification, or Weights and Measur	es Identification accessible through the	"Help" menu. Required	
	information includes that information	necessary to identify that the software in	n the device is the same type	
	that was evaluated, or (2) continuously	displayed. Note: For revision or softwo	are version number. clear	
	instructions for accessing this informa	tion shall be listed on the CC in lieu of	the "Help" menu. Required	
	information includes that information	necessary to identify that the software i	n the device is the same or	
	subsequent type that was evaluated	necessary to wentify that the software th	the actice is the same or	
	(Nonretroactive as of January 2004)			
	<u>(Nonrenouclive us of Junuary 2004)</u>	/ •,• • • • • • • • • • • • • • •		
<u>Note 1:</u>	As a minimum, the model designation	(positively identifying the pattern, desig	n, type, series, generic, or	
	trademark designation) must be marke	d on the device. If the model designation	on changes with differing	
	parameters such as size, features, optic	ons, intended application, not Handbook	x 44 compliant, construction,	
	etc., the specific model designation shall be physically marked or continuously displayed or be capable of			
	<u>being displayed.</u>			
	(Nonretroactive as of January 200X)			
Note 2.	As a minimum, either the manufacture	er or distributor and the model designati	on, or the CC Number shall be	
11000 21	continuously displayed. Clear instruct	ions for accessing the remaining requir	ed G-S.1. information shall be	
	listed on the CC, which may be availab	le as an unaltered conv of the CC printe	ed by the device or through	
	another on-site device.		<u> </u>	
	(Nonretroactive as of January 200X)			
Note 3:	Metrological revision designation may	include hardware or software revision	(version).	

Decision: The Sector discussed the amended WMD proposal and the recommendations of the 2004 Weighing Sector and agreed to forward a recommendation the NCWM S&T Committee that Item 310-1 be withdrawn from the 2005 S&T Agenda.

3. Testing Required for an Electronic Indicator with a CC Interfaced with a Measuring Element with a CC Not Previously Evaluated Together

Source: Returned from NCWM S&T Committee

Background: Prior to the October 2003 Measuring Sector Meeting, a work group submitted a proposal to add a new paragraph N.X. to Handbook 44 Sections 3.30., 3.31., 3.32., and 3.37. and an alternate proposal to add a new Section T. to Publication 14, for consideration. The work group proposed a new section 44 to be added to the Liquid-Measuring Devices Checklist and Test Procedures of Publication 14, 2003 Edition.

At its 2003 meeting, the Measuring Sector agreed to forward the following Proposal 1 for addition to Publication 14 to the NCWM NTEP Committee for consideration, and the following Proposal 2 to the NCWM S&T Committee for consideration. The Sector strongly believed that, for the benefit of weights and measures officials, the proposed test notes for determining the compatibility of the various components of a weighing of measuring system need to be added to the General Code Section of Handbook 44.

Proposal 1. Add a new section "T" to Publication 14 to guide NTEP Inspectors as to when additional testing is necessary to determine compatibility between components as follows:

Testing Required to Interface Components with Individual CC's that were Not Previously Tested Together.

Additional testing by an NTEP Participating Laboratory is not required if an electronic indicator is interfaced to a measuring element provided all of the following are true:

a) the communication means for the input to the electronic indicator (pulse, frequency, serial, etc.) has been previously tested with a measuring element listed on a CC;

- b) the communication means for the output of the measuring element (pulse, frequency, serial, etc.) has been previously tested with an electronic indicator listed on a CC;
- c) the communication means to be used for the electronic indicator input is the same as the communication means to be used for the measuring element output (pulse-pulse, frequency-frequency, serial-serial, etc.) and both devices are being used within the current parameters listed on their respective CCs;
- d) the devices are communicating with each other and the system in which they are installed can be accurately calibrated; and
- e) if required, Handbook 44 compliant tickets can be printed.

Note: NTEP may require initial or complete evaluation of new technologies or applications.

Add additional checklist section 44 (Page LMD XX) to Publication 14 as follows:

44. Additional Checklist and Test Procedures for Interfacing Components

When examining the interface between electronic indicator and a measuring element, the following must be considered:

44.1	Does the electronic indicator have a CC?	Yes 🗌	No 🗌
44.2	Is the electronic indicator being used within the application limits of the CC?	Yes 🗌	No 🗌
44.3	Does the measuring element have a CC?	Yes 🗌	No 🗌
44.4	Is the measuring element being used within the application limits of the CC?	Yes 🗌	No 🗌
44.5	Can the system in which both devices are installed be accurately calibrated?	Yes 🗌	No 🗌
44.6	Can a ticket (if required) be properly printed?	Yes 🗌	No 🗌
44.7	Are interfaces, other than mechanical or pulse interfaces (e.g., 4-20 mA or frequency interfaces), being used as defined by the appropriate CC?	Yes 🗌	No 🗌

Proposal 2. Add a new paragraph G-N.3. Compatibility of Indicators and Weighing or Measuring Elements to Handbook 44 to clarify what requirements must be met to interface an indicating element and a weighing or measuring element when each element has its own CC listing compatible communication specifications, but such elements have not been previously evaluated together on a single NTEP CC.

G-N.3. Compatibility of Indicators and Weighing or Measuring Elements. – To be considered compatible, the following conditions shall be met:

- (a) the communication means used for the input to the electronic indicator (analog, digital, pulse, frequency, serial, etc.) has been previously evaluated with a weighing or measuring element;
- (b) the communication means used for the output of the weighing or measuring element (analog, digital, pulse, frequency, serial, etc.) has been previously evaluated with an electronic indicator;
- (c) the communication means used for the electronic indicator input is the same as the communication means used for the weighing and measuring element output (analog-analog, digital-digital, pulse-pulse, frequency-frequency, serial-serial, etc.);
- (d) the elements are communicating with each other and the device or system into which they are installed can be accurately calibrated; and
- (e) if required, Handbook 44 compliant tickets can be printed.

At the 2004 NCWM Interim Meeting, the NTEP Committee approved the addition of the information contained in Proposal 1 above to the 2004 Edition of Publication 14. The S&T Committee heard several comments indicating that the proposal to add a new paragraph G-N.3. Compatibility of Indicators and Weighing or Measuring Elements to Handbook 44 is not sufficiently developed to move forward. One manufacturer stated that his company manufactures measuring and indicating elements or components that can be interfaced to provide a complete measuring system. He believes this item needs to be in Handbook 44 for the use of the field official and that the proposal as written provides at least some guidance on compatibility of components. The Committee agreed that the item is not sufficiently developed to move forward. The Committee decided to withdraw the proposal from the S&T Committee agenda until it is further developed and resubmitted by the NTETC Weighing and Measuring Sectors.

Recommendation: The Sector needs to determine if it wants to continue to develop language to be added to Handbook 44 or if the information added to Publication 14 is sufficient to address the original concerns of manufacturers regarding when additional testing is necessary to determine compatibility between components.

Decision: The members generally agreed that the language added to Publication 14 last year was sufficient to address the original concerns of manufacturers regarding when additional testing is necessary to determine compatibility between components. The Sector did not propose any new language for Handbook 44 be submitted to the NCWM S&T Committee for consideration. The Sector agreed that the item should be dropped from the Measuring Sector's Agenda.

4. Tolerance for Product Depletion Test

Source/Background: At its October 2003 meeting, the Sector agreed to forward the following proposal to the NCWM S&T Committee for consideration.

N.4.2. Special Tests (Except Milk-Measuring Systems), N.4.5. Product Depletion Test, and T.5. Product Depletion Test

N.4.2. Special Tests (Except Milk-Measuring Systems). - "Special" tests shall be made to develop the operating characteristics of a measuring system and any special elements and accessories attached to or associated with the device. Any test except as set forth in N.4.4.1. <u>or N.4.5.</u> shall be considered a special test. Special tests of a measuring system shall be made as follows:

(a) Aat a minimum discharge rate of 20 % of the marked maximum discharge rate or at the minimum discharge rate marked on the device, whichever is less.

(b) To develop operating characteristics of the measuring system during a split compartment delivery.

N.4.5. Product Depletion Test. - The effectiveness of the vapor eliminator shall be tested by depleting the product supply and continuing until the lack of fluid causes the meter indication to stop completely for at least 10 seconds. If the meter indication fails to stop completely for at least 10 seconds, continue to operate the system for 3 minutes. The test shall be completed by switching to another compartment with sufficient product on a multi-compartment vehicle, or by adding sufficient product to a single-compartment vehicle. When adding product to a single-compartment vehicle, allow appropriate time for any entrapped vapor to disperse before continuing the test.

(Added 200X)

T.5. Product Depletion Test. - The difference in the delivered volumes for the normal test and the product depletion test shall not exceed the tolerance shown in Table T.5., and all test results shall be within applicable tolerances.

Table T.5. Tolerances For Vehicle Tank Meters On Product Depletion Tests, Except Milk Meters		
Manufacturer's rated capacity (Maximum gpm) Maintenance and acceptance tolerances		
<u>Up to 125</u>	<u>125 in³</u>	
<u>126 to 250</u>	<u>200 in³</u>	
<u>251 to 500</u>	<u>300 in³</u>	
501 to 750	<u>400 in³</u>	
<u>Over 751</u>	<u>600 in³</u>	

At the 2004 NCWM Interim Meeting, the Meter Manufacturers Association (MMA) voiced support for the intent of the alternative proposal submitted by the NTETC Measuring Sector provided T.4. is modified by removing the words "and all test results shall be within applicable tolerances." A Maryland Weights and Measures official noted that the proposal if modified as the MMA recommends provides a substantial change in tolerance; however, Maryland is in favor of the concept because the tolerance for a given meter is not linked to the size of the prover used for testing. A New York official stated that a product depletion test should be viewed as the test of a "disturbance," similar to a test for radio frequency interference (RFI) on a scale. New York preferred a tolerance expressed as a flat percentage and suggested a tolerance of 0.5 % of the meter's marked maximum flow rate over the step tolerances in the proposed Table T.5. A representative from Measurement Canada indicated there is an opportunity for the United States and Canada to harmonize the requirement for a product depletion test. Canada is currently using a tolerance of 0.25 % of the meter's marked maximum flow rate results; however, Measurement Canada is still conducting a study to determine if the 0.25 % tolerance is appropriate. The Committee agreed that Item 331-2 should remain an information item and be returned to the NTETC Measuring Sector for review and further development at its fall 2004 meeting.

Recommendation: Will Wothlie (Maryland NTEP Laboratory) and Dick Suiter (NIST) have developed a new proposal for consideration by the Sector. The amended proposal will harmonize Handbook 44 tolerances for product depletion tests with the Measurement Canada tolerances. The Sector was asked to review the following proposal and if the members agreed forward it to the NCWM S&T Committee for consideration.

N.4.2. Special Tests (Except Milk-Measuring Systems). - "Special" tests shall be made to develop the operating characteristics of a measuring system and any special elements and accessories attached to or associated with the device. Any test except as set forth in N4.4.1. <u>or N.4.5.</u> shall be considered a special test. Special tests of a measuring system shall be made as follows:

(a) Aat a minimum discharge rate of 20 % of the marked maximum discharge rate or at the minimum discharge rate marked on the device whichever is less;

(b) To develop operating characteristics of the measuring system during a split compartment delivery.

N.4.5. Product Depletion Test. - The effectiveness of the vapor eliminator shall be tested by depleting the product supply and continuing until the lack of fluid causes the meter indication to stop completely for at least 10 seconds. If the meter indication fails to stop completely for at least 10 seconds, continue to operate the system for 3 minutes. The test shall be completed by switching to another compartment with sufficient product on a multi-compartment vehicle, or by adding sufficient product to a single compartment vehicle. When adding product to a single compartment vehicle, allow appropriate time for any entrapped vapor to disperse before continuing the test. (Added 200X)

T.5. Product Depletion Test. - The difference in the delivered volumes for the normal test and the product depletion test shall not exceed the tolerance shown in Table T.5.

<u>Table T.5. Tolerances For Vehicle Tank Meters</u> <u>On Product Depletion Tests, Except Milk Meters</u>			
Meter size Maintenance and acceptance tolerances			
Up to but not including 75 mm (3.0 inches) $2.25 \text{ liters } (137 \text{ in}^3)^1$			
<u>75 mm (3.0 inches) or larger</u> <u>3.75 liters (229 in³)²</u>			
¹ Based on a test volume of approximately 900 liters (238 gal) ² Based on a test volume of approximately 1500 liters (396 gal)			

Example: "+25 cu in" error normal test, + or – 137 cu in, for product depletion total error; + 162 cu in or – 112 cu in.

Note: The result of the product depletion test may fall outside of the applicable test tolerance.

Decision: The Sector agreed to forward the proposal to the NCWM and Southern Weights and Measures Association S&T Committees for consideration, with the addition of an example and a note stating that the result of the product depletion test may fall outside of applicable tolerance as shown above.

5. Product Family Tables for MAG Meters

Source: Liquid Controls LLC

Background/ Discussion: At the 2002 Sector Meeting, a working group was formed to address the issue of product family criteria. The Sector will consider the recommendations of the work group.

Prior to the 2003 Sector Meeting the technical advisor was informed that this work group was not ready to present a recommendation; however the work group requested that the item remain on the agenda for further development.

At the 2003 Sector Meeting, the Sector agreed that an expanded work group should be formed to develop family product tables for Mag Meters, Ultrasonic Meters, and Turbine Meters for consideration by the Sector at its next meeting. The members of the new work group are: Charlene Numrych (Liquid Controls), Chair; Richard Miller (FMC); Joe Buxton (Daniel Measurement & Control); and Randy Byrtus (Measurement Canada). Charlene volunteered to contact other manufacturers to invite them to participate in the work group.

The work group formed at the 2003 Sector Meeting identified four turbine meter manufacturers that could provide data on a variety of products measured using this type of meter. Only one mag meter manufacturer of three manufacturers identified has a certificate for products other than milk. No information has been gathered regarding manufacturers of ultrasonic meters. The work group does not have a proposal to present at this time, but plans to continue its work. A new Chair is needed for the work group because Charlene Numrych (Liquid Controls) is no longer available to perform that function.

Decision: The Sector agreed that a work group to develop a family products table limited to only turbine meters should be formed. The members of the new work group are: Joe Buxton (Daniel Measurement & Control), Chair; Ray Kalivoda (FMC); Joseph Beyer (Liquid Controls); Gary Castro (California NTEP); and Christian Lachance (Measurement Canada).

The Sector also agreed to form a separate work group to develop a family products table for mag meters. The members of the Mag Meter work group are: Joseph Beyer (Liquid Controls), Chair; Wade Matar (Invensys/Foxboro); Christian Lachance (Measurement Canada); and Michael Keilty (Endress+Hauser).

6. Acceptable Symbols or Wording to Identify Unit Price, Total Price, and Quantity on a Retail Motor-Fuel Dispenser

Source: Maryland NTEP Laboratory

Background: At the June 2002 NTEP Laboratory Meeting, one of the participating laboratories requested guidance on acceptable symbols or wording to identify the unit price, total sale, and quantity delivered on a retail motor-fuel dispenser. The laboratories recommended the question be added to the 2002 Measuring Sector Agenda.

At the 2002 Sector Meeting, a work group was formed to address this issue. The Sector will consider the recommendations of that working.

No input has been received from the work group assigned to develop this issue following the 2002 Sector Meeting. If the Sector agrees, this item will be dropped from the agenda until a proposal is submitted for consideration.

Decision: The Sector agreed the work group should be disbanded and the NTEP Laboratories should develop a list of acceptable symbols at the next laboratory meeting. The Sector will review and consider the list of symbols at its 2005 meeting.

New Items:

7. Section E Meter Sizes to be Included on a Certificate of Conformance

Source: NTEP Director and NIST/WMD

Background: Section E states that "based upon the test of a meter (or meters) of only one size, meters one size larger and one size smaller than the meter that is tested and meeting the following criteria may be covered by the Certificate." In several cases Certificates of Conformance have been issued for a family of meter sizes where one meter size larger and/or one meter size smaller has been included above and/or below the largest and smallest meters that were actually tested. In some cases a manufacturer has asked to add an additional meter size to an existing CC where the "one size smaller or larger" has already been included and an additional larger or smaller meter, not on the existing CC, was submitted for evaluation.

Recommendation: The Sector is asked to determine if the current practice of adding additional sizes is acceptable and if Section E should be amended to provide criteria for adding additional sizes to a family of meter sizes based on meters tested.

Decision: The Sector agreed to forward the following amended Section E to the NTEP Committee for consideration.

E. Meter Sizes to be Included on a Certificate of Conformance

To cover a family of meters on a Certificate of Conformance, if there are more than three meter sizes in a family, the largest and smallest meters in the family shall be submitted for evaluation. It is suggested that these meters represent the meter with the lowest minimum rated flow and the meter with the highest rated flow rate. Depending upon the range between the largest and smallest meters, additional meters may be required to be submitted for testing.

Based upon the test of a meter (or meters) of only one size, meters one size larger and one size smaller than the meter(s) that is tested and meeting the following criteria may be covered by the Certificate:

- 1. meter sizes with rated maximum flow rates of 50 % to 200 % of the rated maximum flow rate of the meter tested; and
- 2. meter sizes with rated minimum flow rates of 50 % to 200 % of the rated minimum flow rate of the meter tested.

The maximum flow rate achieved in an installation is considered to be 80 % of the maximum flow rate to be listed on the Certificate of Conformance.

8. Products to be covered on a Certificate of Conformance for a Meter Tested with Gasoline and/or Diesel Fuel

Source: NTEP Laboratories

Background: Several Certificates of Conformance have been issued with a statement in the application section that states that the Retail Motor-fuel Device (RFMD) is approved for dispensing all motor fuels based on the testing of gasoline and diesel fuel. In many cases the RMFDs have been used for dispensing blends of gasoline and oxygenates such as ethanol, methanol, or MTBE with no problems. More recently RMFDs have been used for blends of petroleum diesel fuel and vegetable oil referred to as Biodiesel. The product family tables in Publication 14 have family categories and subgroups for refined petroleum products, vegetable oils, and for alcohols; however, there is no family or subgroup for blended products. Most gasoline ethanol blends (gasohol) are a blend of approximately 90 % gasoline and 10 % ethanol. For methanol blends and MTBE the percentage of oxygenate is typically less than 5 %. Biodiesel is typically a blend of up to 20 % vegetable-based oil with petroleum-based diesel fuel. However, there are alcohol/gasoline blends available where the ratio is reversed, such as E85 and M85 which are comprised of 85 % alcohol and 15 % gasoline. The question from the laboratories is "at what point is a Certificate no longer applicable to a blended product?"

The Sector was asked to provide guidelines on testing required for adding products, such as alcohol blends up to 10 % or Biodiesel blends up to 20 % to an existing certificate for a meter tested with gasoline and/or diesel fuel. Additional subgroups for the product family tables may be required to provide guidance as to when devices must be reevaluated to include the higher ratios of blended alcohols or vegetable oils.

Decision: The Sector agreed to forward the following amended product family tables for positive displacement meters in NCWM Publication 14 to the NTEP Committee for consideration.

Product Family	Product Subgroup	Typical Products ¹	Viscosity (Centipoise)	Specific Gravity ²	% Abrasive Solids
<u>Fuel</u> Lubricant, Oil Products and	<u>Refined</u> <u>Products</u>	Diesel Fuel, Distillate ³ , Gasoline ^{3.4} , Fuel Oil, Kerosene, Light Oil, Spindle Oil, Lubricating Oils, SAE Grades, Bunker Oil, 6 Oil, Crude Oil, Asphalt, Vegetable Oil, etc.	<u>0.3 to 2500</u>	<u>0.68 to 1.1</u>	<u>None</u>
Edible Oil Products	<u>Aviation</u> <u>Fuels</u>	AVgas, Jet A, Jet A-1, Jet B, JP4, JP5, JP7, JP8, etc.	<u>0.4 to 3.6</u>	<u>0.68 to 0.85</u>	<u>None</u>
	<u>Vegetable</u> <u>Oils</u>	Cooking Oils, Sunflower Oil, Soy Oil, Peanut Oil, Olive Oil, etc.	<u>20 to 300</u>	<u>0.8 to 1.0</u>	<u>None</u>
<u>Solvents</u>	<u>Solvents</u> <u>General</u>	<u>Acetates, Acetone, Esters,</u> <u>Ethylacetate, Hexane, MEK,</u> <u>Naphtha, Toluene, Xylene, etc.</u>	<u>0.3 to 7</u>	<u>0.6 to 1.6</u>	<u>None</u>
	Solvents Chlorinated	<u>Carbon Tetra-Chloride, Methylene-</u> <u>Chloride, Perchloro-Ethylene,</u> <u>Trichloro-Ethylene, etc.</u>	<u>0.3 to 7</u>	<u>0.6 to 1.6</u>	<u>None</u>
<u>Alcohol &</u> <u>Glycols</u>	<u>Alcohols,</u> <u>Glycols, &</u> <u>Water</u> <u>Mixes</u> <u>Thereof</u>	Ethanol, Methanol, Butanol, Isopropyl, Isobutyl, Ethylene glycol, Propylene glycol, etc.	<u>0.3 to 7</u>	<u>0.6 to 1.6</u>	<u>None</u>

C. Product Families for Positive Displacement Meters

Product Family	Product Subgroup	Typical Products ¹	Viscosity (Centipoise)	Specific Gravity ²	% Abrasive Solids
Liquefied Compressed	Fuels and Refrigerants	LPG,Propane, Butane, Ethane, Freon 11, Freon 12, Freon 22, etc.	<u>0.1 to 0.5</u>	<u>0.3 to 0.65</u>	None
<u>Gases</u>	<u>NH</u> 3	Anhydrous Ammonia	<u>0.1</u>	0.56 to 0.68	None
<u>Water</u>	Water	<u>Tap Water, Deionized,</u> Demineralized, Potable	<u>1.0</u>	<u>1.0</u>	None
	Clear Liquid				
<u>Agricultural</u> <u>Liquids</u>	<u>Fertilizers</u>	<u>Nitrogen Solution; 28 %, 30 % or</u> 32 %; 20 % Aqua-Ammonia; Urea; <u>Ammonia Nitrate; N-P-K solutions;</u> <u>10-34-0; 4-10-10; 9-18-9; etc.</u>	<u>10 to 400</u>	<u>1.0 to 1.45</u>	None
	<u>Crop</u> Chemicals	Herbicides: Round-up, Touchdown, Banvel, Treflan, Paraquat, Prowl, etc	<u>4 to 400</u>	<u>0.7 to 1.2</u>	<u>None</u>
		<u>Fungicides, Insecticides, Adjuvants,</u> <u>Fumigants</u>	<u>0.7 to 100</u>	<u>0.7 to 1.2</u>	<u>None</u>
	<u>Flowables</u> <u>Crop</u> Chemicals	Dual, Bicep, Marksman, Broadstrike, Doubleplay, Topnotch, Gaurdsman, <u>Harness, etc.</u>	<u>20 to 900</u>	<u>1 t o1.2</u>	<u>Nil to 3 %</u>
	Chemicals	Fungicides			
		<u>Micronutrients</u>			
	Suspensions				
	<u>Fertilizers</u>	<u>3-10-30; 4-4-27, etc.</u>	<u>20 to 900</u>	<u>1.0 to 1.6</u>	<u>Nil to 4 %</u>
	<u>Liquid</u> <u>Feeds</u>	Liquid Molasses; Molasses plus Phos Acid and/or Urea; etc.	<u>10 to 50 000</u>	<u>1.2 to 1.5</u>	<u>Nil to 4 %</u>
Chemicals	Chemicals	Sulfuric Acid, Hydrochloric Acid, Phosphoric Acid, etc	1.0 to 296	1.1 to 1.85	None

¹NOTE: The Typical Products listed in this table are not limiting or all-inclusive; there may be other products and product trade names, which fall into a product family and product subgroup.

²<u>The specific gravity of a liquid is the ratio of its density to that of water at standard conditions, usually 4 °C (or 20 °C) and 1 atm. The density of water at standard conditions is approximately 1000 kg/m3 (or 998 kg/m3)</u>

³ Diesel fuel blends (biodiesel) with up to 20 % vegetable or animal fat/oil.

⁴ Gasoline includes oxygenated fuel blends with up to 15 % oxygenate.

Source for some of the viscosity value information is in the Industry Canada - Measurement Canada "Liquid Products Group, Bulletin V-16-E (repv. 1), August 3, 1999."

9. NTEP Tolerances for Meters with Different Flow Rates when Using Different Size Provers

Source: Maryland NTEP Laboratory

Background: During a recent evaluation of a high gallonage RMFD with marked flow rates of 60 gpm maximum and 12 gpm minimum, the Maryland NTEP laboratory found that the actual flow rate on the lowest setting of the automatic nozzle was 6 gpm. Several questions need to be addressed regarding this situation.

LMD Code paragraph N.4.2.2 (b) states "Devices marked with a flow-rate capacity of 100 L (25 gal) or more per minute, shall have a "special" test performed at the slowest of the following rates: (1) the minimum discharge rate marked on the device, or (2) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting." Is it appropriate to operate the device below the marked minimum flow rate?

If a 10-gallon test measure is used, what is the appropriate tolerance applicable? LMD Code paragraph Table T.2. stipulates that the special test tolerance is 0.5 % or 11.55 cubic inches on a 10-gallon test draft; however, there is a footnote that states that the applicable acceptance tolerance when using a 10-gallon test draft is 5.5 cubic inches. Which tolerance should be applied during an NTEP evaluation? If a prover with a capacity greater than 10 gallons is used, does it provide a tolerance advantage over tests conducted with a 10-gal test measure?

General Code paragraph G-T.1. (e) states that acceptance tolerances apply to all equipment undergoing type evaluation. Does that mean that special test tolerances are not applicable during NTEP testing?

Recommendation: The Sector needs to determine what tolerances are appropriate for NTEP evaluations. The Sector may also want to recommend changes to Handbook 44 General Code G-T.1. and LMD Code paragraph N.4.2.2. and Table T2 as follows:

G-T.1. Acceptance Tolerances. - Acceptance tolerances shall apply to:

- (a) equipment to be put into commercial use for the first time;
- (b) equipment that has been placed in commercial service within the preceding 30 days and is being officially tested for the first time;
- (c) equipment that has been returned to commercial service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service;
- (d) equipment that is being officially tested for the first time within 30 days after major reconditioning or overhaul; and
- (e) equipment undergoing type evaluation (special test tolerances are not applicable).

N.4.2.2. Retail Motor-Fuel Devices.

- (a) Devices with a flow-rate capacity less than 100 L (25 gal) per minute shall have a "special" test performed at the slower of the following rates:
 - (1) 19 L (5 gal) per minute, or
 - (2) the minimum discharge rate marked on the device, or
 - (3) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting <u>provided it is not less than the marked minimum flow rate</u>.
- (b) Devices marked with a flow-rate capacity 100 L (25 gal) or more per minute shall have a "special" test performed at the slowest of the following rates:
 - (1) the minimum discharge rate marked on the device, or
 - (2) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting <u>provided it is not less than the marked minimum flow rate</u>.

Table T.2. Accuracy Classes for Liquid Measuring Devices Covered in NIST Handbook 44 Section 3.30				
Accuracy Class	Application	Acceptance Tolerance	Maintenance Tolerance	Special Test Tolerance
0.3	Petroleum products delivered from large-capacity motor-fuel devices (<u>with marked maximum</u> flow rates over 115 L/min (30 gpm))**, heated products at or greater than 50 °C, asphalt at or below temperatures 50 °C, all other liquids not shown where the typical delivery is over 200 L (50 gal).	0.2 %	0.3 %	0.5 %
0.3A	Asphalt at temperatures greater than 50 °C	0.3 %	0.3 %	0.5 %
0.5*	Petroleum products delivered from small-capacity (at designed maximum flow rates of 4 L/min (1 gpm) through 115 L/min (30 gpm))** motor-fuel devices, agri-chemical liquids, and all other applications not shown where the typical delivery is # 200 L (50 gal).	0.3 %	0.5 %	0.5 %
1.1	Petroleum products and other normal liquids from devices with flow rates** less than 1 gpm and devices designed to deliver less than one gallon.	0.75 %	1.0 %	1.25 %
*For 5-gallon and 10-gallon test drafts, the tolerances specified for Accuracy Class 0.5 in the table above do not apply. For these test drafts, the maintenance tolerances on normal and special tests for 5-gallon and 10- gallon test drafts are 6 cubic inches and 11 cubic inches, respectively. Acceptance tolerances on normal and special tests are 3 cubic inches and 5.5 cubic inches. ** Flow rate refers to designed or marked maximum flow rate.				

(Added 2002)

Decision: The Sector modified the recommendation as shown below and agreed to forward it to the NCWM and Southern Weights and Measures Association S&T Committees for consideration.

Recommendation: Modify Handbook 44 Section 1.10 paragraph G-T.1. Acceptance Tolerances (e) and Section 3.30. paragraph N.4.2.2. Retail Motor-Fuel Devices as follows:

G-T.1. Acceptance Tolerances. - Acceptance tolerances shall apply to:

- (a) equipment to be put into commercial use for the first time;
- (b) equipment that has been placed in commercial service within the preceding 30 days and is being officially tested for the first time;
- (c) equipment that has been returned to commercial service following official rejection for failure to conform to performance requirements and is being officially tested for the first time within 30 days after corrective service;
- (d) equipment that is being officially tested for the first time within 30 days after major reconditioning or overhaul; and
- (e) equipment undergoing type evaluation (special test tolerances are not applicable).

N.4.2.2. Retail Motor-Fuel Devices.

- (a) Devices with a flow-rate capacity less than 100 115 L (25 30 gal) per minute shall have a "special" test performed at the slower of the following rates:
 - (1) 19 L (5 gal) per minute, or
 - (2) the minimum discharge rate marked on the device, or
 - (3) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting provided it is not less than the marked minimum flow rate.
- (b) Devices marked with a flow-rate capacity 100 115 L (25 30 gal) or more per minute shall have a "special" test performed at the slowest of the following rates:
 - (1) the minimum discharge rate marked on the device, or
 - (2) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting provided it is not less than the marked minimum flow rate.

10. Testing Required to Upgrade a RMFD from Audit Trail Category 2 to Category 3

Source: NTEP Director

Background/Discussion: Effective January 1, 2005, all devices with remote configuration capability must comply with the sealing requirements of Category 3. Several manufacturers have asked what level of testing is required to upgrade their Certificate of Conformance for a Category 2 device to cover a modification of their device to meet Category 3 requirements.

The Sector was asked to discuss the subject and provide input to the NTEP Committee regarding the amount of laboratory and/or field evaluation required to upgrade an existing certificate for a Category 2 device to cover an upgrade to Category 3.

Decision: The Sector agreed CC holders for liquid measuring devices with remote configuration capability that meet Category 2 sealing requirements must submit their device(s) for evaluation to verify the device meets Category 3 sealing requirements and have the CC upgraded. The Sector agreed to forward the following amended NCWM Publication Audit Trail Category Tables to the NTEP Committee for consideration.

Category 1 Devices (Devices with No Remote Configuration Capability):	
The device is sealed with a physical seal or it has an audit trail with two event counters (one for calibration, the second for configuration).	Yes 🗌 No 🗌 N/A 🗌
A physical seal must be applied without exposing electronics.	Yes 🗌 No 🗌 N/A 🗌
Event counters are non-resettable and have a capacity of at least 000 to 999.	Yes 🗌 No 🗌 N/A 🗌
Event counters increment appropriately.	Yes 🗌 No 🗌 N/A 🗌
The audit trail information must be capable of being retained in memory for at least 30 days while the device is without <u>power or must be retained in nonvolatile memory.</u>	Yes 🗌 No 🗌 N/A 🗌
Accessing the audit trail information for review shall be separate from the calibration mode.	Yes 🗌 No 🗌 N/A 🗌
Accessing the audit trail information must not affect the normal operation of the device.	Yes 🗌 No 🗌 N/A 🗌

Accessing the audit trail information shall not require removal of any Yes No N/A physical security seal. (e.g., a key to open a locked panel may be required).

Category 2 Devices (Devices with Remote Configuration Capability but Controlled by Hardware):

	•
Category 2 applies only to devices manufactured prior to January 1, 2005. Devices with remote configuration capability manufactured after that date must meet the sealing requirements outlined in Category 3. Devices without remote configuration capability manufactured after that date will be required to meet the minimum criteria outlined in Category 1.	Yes No N/A
The physical hardware enabling access for remote communication must be on-site.	Yes No N/A
The physical hardware must be sealable with a security seal or	Yes No N/A
The device must be equipped with at least two event counters: one for calibration, the second for configuration parameters - calibration parameters event counter - calibration parameters event counter - configuration parameters event counter - configuration parameters event counter	¥es - No - N/A -
Adequate provision must be made to apply a physical seal without exposing electronics.	Yes No N/A
Event counters are nonresettable and have a capacity of at least 000 to 999.	Yes No N/A
Event counters increment appropriately.	Yes 🗌 No 🗌 N/A 🗌
Event counters may be located either: - at the individual measuring device or - at the system controller	Yes 🗌 No 🗌 N/A 🗌
If the counters are located at the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.	Yes 🗌 No 🗌 N/A 🗌
An adequate number (see table below) of event counters must be available to monitor the calibration and configuration parameters of each individual device.	Yes No N/A
The device must either: - clearly indicate when it is in the remote configuration mode or - the device shall not operate while in the remote configuration mode.	Yes No N/A
If capable of printing in the calibration mode, it must print a message that it i s in the calibration mode.	Yes No N/A
The audit trail information must be capable of being retained in memory for at least 30 days while the device is without power <u>or must be retained in</u> <u>nonvolatile memory.</u>	¥es 🗌 No 🗌 N/A 🗌
The audit trail information must be readily accessible and easily read.	Yes No N/A
Event counters located at the system controller must be provided with a means to generate a hard copy of the audit trail information.	Yes No N/A

Category 3 Devices (Devices with Unlimited Remote Configuration Capability):

Category 3 devices have virtually unlimited access to sealable parameters or access is controlled though a password.

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 For devices manufactured after January 1, 2001, the device must either: clearly indicate when it is in the remote configuration mode, or the device shall not operate while in the remote configuration mode 	Yes 🗌 No 🗌 N/A 🗌
The device is equipped with an event logger	Yes 🗌 No 🗌 N/A 🗌
The event logger automatically retains the identification of the parameter changed, the date and time of the change, and the new value of the parameter.	Yes 🗌 No 🗌 N/A 🗌
Event counters are nonresettable and have a capacity of at least 000 to 999.	Yes 🗌 No 🗌 N/A 🗌
The system is designed to attach a printer, which can print the contents of the audit trail.	Yes 🗌 No 🗌 N/A 🗌
The audit trail information must be capable of being retained in memory for at least 30 days while the device is without power <u>or must be retained in nonvolatile memory.</u>	Yes 🗌 No 🗌 N/A 🗌
The event logger must have a capacity to retain records equal to ten times the number of sealable parameters in the device, but not more than 1000 records are required.	Yes 🗌 No 🗌 N/A 🗌
The event logger drops the oldest event when the memory capacity is full and a new entry is saved.	Yes 🗌 No 🗌 N/A 🗌
Describe the method used to seal the device or access the audit trail information	0 n.

[NOTE: All devices with remote communication that are manufactured after January 1, 2005, must meet the requirements outlined for Category 3.]

Minimum Number of Counters Required			
	Minimum Counters Required for Devices Equipped with Event Counters	Minimum Event Counter(s) at System Controller	
Only one type of parameter accessible (calibration or configuration)	One (1) event counter	One (1) event counter for each separately controlled device, or one (1) event counter, if changes are made simultaneously.	
Both calibration and configuration parameters accessible	Two (2) event counters	Two (2) event counters for eachseparately controlled device, ortwo (2) or more event countersif changes are made to allcontrolled devicessimultaneously.	

11. Specific Gravity Range to be Covered on a Certificate of Conformance Based on Products Tested

Source: Invensys/Foxboro

Background: NCWM Publication 14 Section D. Product Family for Mass Flow Meters allows a Certificate of Conformance to cover only a range of specific gravities based on the products with the highest and lowest specific gravities tested. The specific gravity covered by a certificate can only be expanded by testing with additional products having a higher and/or lower specific gravity. The submitter believes the current limit on specific gravity range listed on

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a certificate is too restrictive and would like to have the range of specific gravities covered on a certificate within ± 25 % (or at least a minimum of 10 %) from the highest and lowest specific gravities for products evaluated.

Recommendation: The Sector will consider the proposal, and if there is sufficient support, a work group should be formed to collect data to support expanding the range of densities covered on a certificate based on the densities of products tested. If the data collected provides evidence that the range can be expanded, the work group should provide a specific proposal for expanding the range by an appropriate percentage for the Sector to consider at its next meeting.

Decision: The Sector agreed to combine agenda Item 11 with agenda Item 13 for discussion.

12. Computer Jump on RMFD

Source: Maryland NTEP Laboratory

Background: As price for motor fuel nears or exceeds \$2.00 per gallon, the number of complaints regarding computer jump has also increased. WMD has received numerous calls from jurisdictions related to this problem. It appears that the actual amount of jump or meter creep occurring because of internal pressure related to changes in temperature has not changed. However, at the higher unit prices this relatively small meter creep creates a delivery indication of several cents.

Recommendation: The Sector and the manufacturers of RMFDs may want to take a proactive role and develop a proposal for Handbook 44 to require that the measurement of product begins only after the system has reached normal delivery pressure. The Sector will review the following recommendation, and if it agrees, the recommendation will be forwarded to the NCWM S&T Committee for consideration.

S.1.6. Operating Requirements, Retail Devices (Except Slow Flow Meters).

S.1.6.1. Indication of Delivery. - The device shall automatically show on its face the initial zero condition and the quantity delivered (up to the nominal capacity).

However, the first 0.03 L (or 0.009 gal) of a delivery and its associated total sales price need not be indicated.

S.1.6.1.1. - The indication of delivered quantity and total price on a digital device shall be inhibited until the entire fuel delivery system reaches normal operating pressure. (Amended 1982 and 200X)

Decision: The Sector amended the recommendation as shown below and agreed to forward it to the NCWM and Southern Weights and Measures Association S&T Committees for consideration.

Amend Handbook 44 Sec. 3.30. paragraph S.1.6.1. Indication of Delivery and add new paragraph S.1.6.1.1. Inhibiting Measurement and Indication of Delivery as follows:

S.1.6. Operating Requirements, Retail Devices (Except Slow Flow Meters).

S.1.6.1. Indication of Delivery. - The device shall automatically show on its face the initial zero condition and the quantity delivered (up to the nominal capacity).

However, the first 0.03 L (or 0.009 gal) of a delivery and its associated total sales price need not be indicated.

<u>S.1.6.1.1. – After the suppression of up to 0.03 L (or 0.009 gal) the measurement of delivered quantity</u> and indication of total price on a digital device shall be inhibited until the fueling position reaches normal delivery pressure.

(Amended 1982 and 200X)

13. Section D Product Family for Mass Flow Meters – Specific Gravity Range 0.1 Above and 0.1 Below Products Tested

Source: Endress & Hauser Flowtec AG

Background: Once tested with two liquids within a product group, a mass flow meter should be covered for liquids with specific gravities of 0.1 above and 0.1 below the range of specific gravities for the liquid(s) tested.

Recommendation: Add additional language to Section D, Page LMD 4 of Publication 14, 2004 edition as follows:

D. Product Families for Mass Flow Meters

When submitting a direct mass flow meter for evaluation, the manufacturer must specify the product or product group for which the meter is being submitted. To cover a product group, NTEP tests must be conducted with two liquids within the product group. Upon test completion, a range of specific gravities between the specific gravities of the two liquids attained within the product group will be covered on the Certificate of Conformance (CC). The mass flow meter will be covered for approved liquids with density 0.1 above the highest specific gravity tested and 0.1 below the lowest specific gravity tested. The specific gravity range within the product group can be expanded by conducting an NTEP test with a liquid of higher or lower specific gravity than is covered on the existing CC.

The above does not apply to the following product groups: compressed gases, compressed liquids, and cryogenic liquids. In the case of these product groups, only one liquid within each group is required to undergo an NTEP evaluation, and, upon completion, the entire product group will be covered on the existing CC.

Multi-product applications (i.e., applications in which the meter will be used without a change to zero or calibration to dispense different products which vary in specific gravity by more than 0.1) must include a multi-product test. The multi-product initial test will be performed on the meter without a change to zero or calibration using multiple products having a difference in specific gravity of at least 0.2. For devices which will be used to dispense multiple products having a specific gravity range greater than 0.2, the multi-product testing must be performed over the anticipated range before multi-product applications will be included on the CC. For the multi-product testing, throughput testing will be performed on one or a combination of the products; testing for the subsequent test will be conducted on both products without a change to zero or calibration. Multi-product testing requirements do not apply to meters used to dispense a product such as propane in which the density varies in normal operation.

Decision: The Sector agreed to forward the following amended first paragraph Section D of NCWM Publication 14 for Liquid Measuring Devices to the NTEP Committee for consideration.

D. Product Families for Mass Flow Meters

When submitting a direct mass flow meter for evaluation, the manufacturer must specify the product or product group for which the meter is being submitted. To cover a product group, NTEP tests must be conducted with two liquids within the product group. Upon test completion, a range of specific gravities between the specific gravities of the two liquids attained within the product group will be covered on the Certificate of Conformance (CC). When two liquids of different densities are tested the Certificate of Conformance (CC) for the mass flow meter will cover approved liquids with a specific gravity range from 0.1 above the highest specific gravity tested to 0.1 below the lowest specific gravity tested. The specific gravity range within the product group can be expanded by conducting an NTEP test with a liquid of higher or lower specific gravity than is covered on the existing CC.

The above does not apply to the following product groups: compressed gases, compressed liquids, and cryogenic liquids. In the case of these product groups, only one liquid within each group is required to undergo an NTEP evaluation, and, upon completion, the entire product group will be covered on the existing CC.

Multi-product applications (i.e., applications in which the meter will be used without a change to zero or calibration to dispense different products which vary in specific gravity by more than 0.1) must include a multi-product test. The multi-product initial test will be performed on the meter without a change to zero or calibration using multiple products having a difference in specific gravity of at least 0.2. For devices which will be used to dispense multiple products having a specific gravity range greater than 0.2, the multi-product testing must be performed over the anticipated range before multi-product applications will be included on the CC. For the multi-product testing, throughput testing will be performed on one or a combination of the products; testing for the subsequent test will be conducted on both products without a change to zero or calibration. Multi-product testing requirements do not apply to meters used to dispense a product such as propane in which the density varies in normal operation.

14. Section D Product Family for Mass Flow Meters – Multi-product Applications

Source: Endress & Hauser Flowtec AG

Background: A mass flow meter submitted and approved for multi-product testing where product densities differ by greater than 0.2 has demonstrated ability to perform with major density changes. Therefore, the mass flow meter should be able to be used for products with differing densities throughout the range of the meter approval.

Recommendation: Add additional language to Section D, Page LMD 4 of Publication 14, 2004 edition as follows:

D. Product Families for Mass Flow Meters

When submitting a direct mass flow meter for evaluation, the manufacturer must specify the product or product group for which the meter is being submitted. To cover a product group, NTEP tests must be conducted with two liquids within the product group. Upon test completion, a range of specific gravities between the specific gravities of the two liquids attained within the product group will be covered on the Certificate of Conformance (CC). The specific gravity range within the product group can be expanded by conducting an NTEP test with a liquid of higher or lower specific gravity than is covered on the existing CC.

The above does not apply to the following product groups: compressed gases, compressed liquids, and cryogenic liquids. In the case of these product groups, only one liquid within each group is required to undergo an NTEP evaluation and, upon completion, the entire product group will be covered on the existing CC.

Multi-product applications (i.e., applications in which the meter will be used without a change to zero or calibration to dispense different products which vary in specific gravity by more than 0.1) must include a multi-product test. The multi-product initial test will be performed on the meter without a change to zero or calibration using multiple products having a difference in specific gravity of at least 0.2. For devices which will be used to dispense multiple products having a specific gravity range greater than 0.2, the multi-product testing must be performed over the anticipated range before multi-product applications will be included on the CC. For the multi-product testing, throughput testing will be performed on one or a combination of the products; testing for the subsequent test will be conducted on both products without a change to zero or calibration. The mass flow meter will be approved for multiproduct applications where the specific gravity of a single product, or multiple products, varies by the amount tested throughout the entire approved specific gravity range of the meter. Example: Where a meter has been tested and a certificate issued for multi-product applications with one liquid having a specific gravity of 0.7 and another liquid having a specific gravity of 1.0 and the meter is subsequently tested to expand the range with a liquid having a specific gravity of 1.6 the allowed variation of densities will be from 0.7 through 1.6. Multi-product testing requirements do not apply to meters used to dispense a product such as propane in which the density varies in normal operation.

Decision: The Sector agreed to forward the following amended last paragraph of Section D in NCWM Publication 14 for Liquid Measuring Devices to the NTEP Committee for consideration.

D. Product Families for Mass Flow Meters

When submitting a direct mass flow meter for evaluation, the manufacturer must specify the product or product group for which the meter is being submitted. To cover a product group, NTEP tests must be conducted with two liquids within the product group. Upon test completion, a range of specific gravities between the specific gravities of the two liquids attained within the product group will be covered on the Certificate of Conformance (CC). The specific gravity range within the product group can be expanded by conducting an NTEP test with a liquid of higher or lower specific gravity than is covered on the existing CC.

The above does not apply to the following product groups: compressed gases, compressed liquids, and cryogenic liquids. In the case of these product groups, only one liquid within each group is required to undergo an NTEP evaluation and, upon completion, the entire product group will be covered on the existing CC.

Multi-product applications (i.e., applications in which the meter will be used without a change to zero or calibration to dispense different products which vary in specific gravity by more than 0.1) must include a multi-product test. The multi-product initial test will be performed on the meter without a change to zero or calibration using multiple products having a difference in specific gravity of at least 0.2. For devices which will be used to dispense multiple products having a specific gravity range greater than 0.2, the multi-product testing must be performed over the anticipated range before multi-product applications will be included on the CC. For the multi-product testing, throughput testing will be performed on one or a combination of the products; testing for the subsequent test will be conducted on both products without a change to zero or calibration. The CC for a mass flow meter will cover multiproduct applications where the specific gravity of a single product, or multiple products, varies by the amount tested throughout the entire approved specific gravity range of the meter. Example: Where a meter has been tested and a certificate issued for multi-product with one liquid having a specific gravity of 0.7 and another liquid having a specific gravity of 1.0 and the meter is subsequently tested to expand the range with a liquid having a specific gravity of 1.6 the allowed variation of densities covered by the CC will be from 0.7 through 1.6. Multi-product testing requirements do not apply to meters used to dispense a product such as propane in which the density varies in normal operation.

15. Next Meeting

The Sector discussed the time and location for its next meeting.

Decision: The Sector agreed to recommend to the NCWM NTEP Committee that the 2005 Measuring Sector Meeting be held immediately prior to the 2005 meeting of the Southern Weights and Measures Association beginning at 8:00 am on Friday and continuing through 5:00 pm on Saturday. The ending time on Saturday will be dependent on the length of the agenda.

Additional Items

16. ECRs Approved for Dispensers from Multiple Manufacturers

Source/Background: The NTEP Laboratories want to know how many dispensers and features should be evaluated in the laboratory and/or field when evaluating an ECR for use with multiple dispensers,

Decision: The Sector agreed that, as a minimum, two dispensers from different manufacturers, each of which includes all of the features listed on the ECR CC, must be evaluated with the ECR in order to have the statement "equivalent and compatible equipment" appear on the CC. The Sector further agreed to forward to the NTEP Committee for consideration the following amendment to NCWM Publication 14 Section A of the Electronic Cash Register Interfaced with Retail Motor-Fuel Dispensers.
A. Introduction

This checklist is intended for use when conducting general evaluations of new electronic cash registers that are to interface with retail motor-fuel dispensers. It is assumed that the dispenser was previously evaluated, if not, the LMD checklist must be applied to the dispenser sale system. The ECR must interface with a dispenser to perform this evaluation. Specific criteria that apply to service station control consoles are in the checklist for retail motor-fuel dispensers and must be applied if the cash register also serves as the service station controller. As a minimum, two dispensers from different manufacturers, each of which includes all of the features to be listed on the ECR CC, must be evaluated with the ECR in order to have the statement "equivalent and compatible equipment" appear on the CC.

This checklist is designed in a logical sequence for the user to determine and record the conformance of the device with the elements of NIST Handbook 44. The user should make copies of the checklist to serve as worksheets and preserve the original for reference. In most cases, the results of evaluation for each element can be recorded by checking the appropriate response to the following:

17. Zero Set-back Interlocks on Vehicle-tank Meters

Source/Background: The S&T Committee has requested input from the Sector on Carryover Item 331-3, a Handbook 44 requirement for Zero Set-back Interlocks on Vehicle-tank Meters.

Decision: The Sector agreed to forward the following new paragraph S.2.4. for Handbook 44 Section 3.31. Vehicle-Tank Meters to the SWMA and NCWM S&T Committees for consideration.

S.2.4. Zero-Set-Back Interlock, Vehicle-Tank Meters. – Except for aircraft fueling, an electronic device shall be so constructed that after an individual or multiple deliveries at one location have been completed, an automatic interlock system shall engage to prevent a subsequent delivery until the indicating and, if equipped, recording elements have been returned to their zero position. For individual deliveries, if there is no product flow for 3 minutes the transaction must be completed before additional product flow is allowed. The 3 minute timeout may be a sealable feature on an indicator designed for commercial and non-commercial applications. [Nonretroactive as of January 1, 200X]

18. Wireless Communication Systems

Source/Background: The Maryland NTEP Laboratory has a fuel dealer that wants to install a wireless communication system for transferring billing information from the vehicle-tank meter to a central billing office. Does the communication equipment installed for this purpose require an NTEP CC?

Decision: The Sector agreed that the scenario as described, where wireless communication is used to transfer billing information, is not an NTEP issue at this time. The scenario is similar in some respects systems that use telephone communication to transfer billing information to a central billing office. NTEP currently evaluates systems to the point of the first final indication of quantity delivered.

19. Display of Unit Price on Vehicle-Tank Meters

Source/Background: Maryland NTEP Laboratory and FMC requested clarification of the intent of Handbook 44 Section 3.31., paragraph S.1.4.1. The paragraph states that a device of the computing type shall provide a means to display the unit price at which the device is set to compute on the outside of the device.

- Can the unit price be on the display screen?
- If it is on the display screen, is it required to be displayed full time?
- Does a posted sign plaque meet the requirement?

Decision: The Sector agreed to forward the following amended paragraph S.1.4.1. to the SWMA and NCWM S&T Committees for consideration.

S.1.4.1. Display of Unit Price. - In a device of the computing type, means shall be provided for displaying on the outside of the device, in a manner clear to the operator and an observer, the unit price at which the device is set to compute. The unit price is not required to be displayed continuously.

20. Evaluations Using Simulated Input Devices

Source/Background: FMC Measurement Solutions requested the Sector provide guidelines for evaluating electronic indicating devices when submitted separate from the measuring element. Will NTEP allow electronic indicators to be evaluated using simulated inputs, i.e., meter pulse, temperature, pressure density etc?

Decision: The Sector agreed to forward to the NTEP Committee for consideration the following new Section U for addition to the Technical Policy for Liquid-Measuring Devices in Publication 14.

U. Testing Electronic Indicators for Stationary Installations Using Simulated Inputs.

When evaluating electronic indicators for stationary installations, submitted separate from a measuring element, indicators may be evaluated using simulated inputs (i.e., meter pulse, temperature, pressure, density, etc.).

21. Modifications to Pre-NTEP Certificates:

Source/Background: FMC Measurement Solutions requested the Sector provide guidelines for allowing feature modifications to pre-NTEP certificates without the need for permanence testing for established metering technologies, i.e., PD meters, if the modification can be shown that the measurement basis has not been changed (no metrological significance).

Example of feature modification: Changing a PD meter with a conventional shaft output to a direct electronic output. Cyclic volume remains unchanged as the modification is (1) the replacement of the top cover to remove the gear train and packing glands and (2) the addition of a target gear and electronic sensor(s). The measurement chamber (cyclic volume) remains unchanged.

Decision: The Sector agreed that changing from a conventional shaft output to an electronic output with the removal of a gear train, the external shaft, and packing gland, along with the addition of a target gear and electronic sensor(s), is a modification of type that requires, as a minimum, an initial evaluation of the modified device. Permanence testing may be required at the discretion NTEP based on the results of the initial evaluation.

Attendance List

Name	Company/Agency	Address	Telephone #	E-Mail Address
Belue, Mike	Belue Associates	1319 Knight Dr Murfreesboro TN 37128	615 867 1010	bassoc@aol.com
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Buxton, Joe	Daniel Measurement Control	19267 Hwy 301 N Statesboro, GA 30461	912 489 0253	Joe.buxton@emersonprocess.com
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Cooper, Rodney	Actaris Neptune	1310 Emerald Rd Greenwood SC 29646	864 942 2226	rcooper@greenwood.actaris.com
Forkert, Maurice	Tuthill Transfer Systems	8825 Aviation Dr Ft Wayne IN 46809	260 747 7529	mforkert@Tuthill.com
Gallo, Mike	Clean Fuel Technologies	140 Market Street Georgetown, TX 78626	512 942-8304	Mike.gallo@cftdispensers.com
Glowacki, Paul	Murray Equipment, Inc.	2515 Charleston Place Fort Wayne, IN 46808	260 484 0382	pglowacki@murrayequipment.com
Hoffman, David	Toptech Systems	280 Hunt Park Cove Longwood FL 32750	407 332 1774	dhoffman@toptech.com
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Kalevoda, Raymond	FMC Measurement Solutions	1602 Wagner Avenue Erie, PA 16510	814 898 5264	Ray.kalivoda@fmcti.com
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Lachance, Christian	Measurement Canada	Stds Bldg #4 Tunney's Pasture Ottawa Ontario K1AOC9	613 952 3528	Lachance.Christian@ic.gc.ca
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Appendix D

National Type Evaluation Technical Committee Weighing Sector Meeting – Annual Meeting

August 29-31 2004, Ottawa Canada Draft Summary of Decisions

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Carry-Over Items

1. Recommended Changes to Publication 14 Based on Actions at the 2004 NCWM Annual Meeting

The NTEP technical advisor provided the Sector with specific recommendations for incorporating into Publication 14 test procedures and checklist language based upon actions of the previous Annual Meeting of the NCWM. The Sector was asked to briefly discuss each item and provide general input on the technical aspects of the issues.

(a). Manual Gross Weight Entries

Background: See the Report of the 89th National Conference on Weights and Measures, Specifications and Tolerances Committee Agenda Item 320-1for additional background information. During its 2004 Annual Meeting, the NCWM agreed to amend NIST Handbook 44 2.20. Scales Code paragraph S.1.12. Manual Gross Weights to allow the manual entry of net weights for prepackage applications and for pre-weighed items from other legal-for-trade scales.

Discussion: The Weighing Sector considered a proposal from the NIST technical advisor to amend NCWM Publication 14 Weighing Devices Technical Policy, Checklists, Test Procedures Digital Electronic Scales Section 17 Manual Weight Entries.

During the discussion, confusion arose regarding identifying preset tare weights (i.e., keyboard tare entry or tare stored in memory) as manual weight entries, and this confusion may be attributed to the adopted amended title of the amended paragraph S.1.12 "Manual Weights." One commenter was concerned that two manual weights may have to be entered for weigh-in/weigh-out transactions when there is a loss of communication between separate weighing locations and that the manual tare weight entries should be identified. Another commenter suggested additional language for paragraph S.1.12 that would state that preset tares do not have to be identified. The NIST technical advisor reported the intent of the proposed amendment to S.1.12 did not apply to preset tare weights and that amending the title of paragraph S.1.12. to Manual Gross or Net Weight Entries (did what--solved the problem?).

Additionally, the Sector made some editorial suggestions to the proposed amendment to Publication 14 Section 17.

Recommendation: The Sector recommends that amendments proposed in Appendix A agenda Item 1(a) be incorporated into Publication 14 Section 17. Manual Weights.

Additionally, the Weighing Sector suggested that the S&T technical advisors make the following editorial changes to paragraph S.1.12. of NIST Handbook 44, indicated in <u>underlined</u> text, to clarify that the amended paragraphs do not apply to manually entered tare weights, and that manual net weight entries are non-retroactive as of January 1, 2005:

S.1.12. Manual <u>Gross or Net</u> Weight Entries. - A device when being used for direct sale shall accept an entry of a manual gross or net weight value only when the scale gross or net² weight indication is at zero. Recorded manual weight entries, except those on labels generated for packages of standard weights, shall identify the weight value as a manual weight entry by one of the following terms: "Manual Weight," "Manual Wt," or "MAN WT." The use of a symbol to identify multiple manual weight entries on a single document is permitted, provided that the symbol is defined on the same page on which the manual weight entries appear and the definition of the symbol is automatically printed by the recording element as part of the document.

[Nonretroactive as of January 1, 1993]

[Nonretroactive as of January 1, 2005²]

(Added 1992) (Amended 2004²)

$\frac{2}{2}$ The term "net" was added in 2004 to include net weights entered from items pre-weighed on a legal-for-trade scale.

(b). Section Capacity Prefix

Background: See the Report of the 89th National Conference on Weights and Measures, Specifications and Tolerances Committee Agenda Item 320-3 for additional background information. During its 2004 Annual Meeting, the NCWM

agreed to amend NIST Handbook 44 2.20. Scales Code paragraph S.6.4.3. Section Capacity Prefix and Table S.6.3.a. Marking Requirements. During its 2004 Annual Meeting, the NCWM agreed to additional language for the 2005 Edition of NIST Handbook 44 regarding the use of abbreviations for the marking of section capacity.

Discussion/Recommendation: The Weighing Sector considered a proposal from the NIST technical advisor to amend NCWM Publication 14 Weighing Devices Technical Policy, Checklists, Test Procedures Digital Electronic Scales Section 5. Marking – Livestock, Vehicle, and Railway Track Scales paragraph 5.1. and agreed to recommend that amendments proposed in Appendix A, agenda Item 1(b) be incorporated into Publication 14 Section 5.

(c). Field Standard Weight Cart

Background: See the Report of the 89th National Conference on Weights and Measures, Specifications and Tolerances Committee Agenda Item 320-4 for additional background information to amend NIST Handbook 44 2.20. Scales Code paragraph Item 320-4 N.3.2. Field Standard Weight Carts. During its 2004 Annual Meeting, the NCWM agreed to add language in the 2005 Edition of NIST Handbook 44 recognizing field standard weight carts for use as a certified test load.

Discussion/Recommendation: The Weighing Sector recommends no further action on this item.

(d). Discrimination Test

Background: See the Report of the 89th National Conference on Weights and Measures, Specifications and Tolerances Committee Agenda Item 320-5 for additional background information. During its 2004 Annual Meeting, the NCWM agreed to amend NIST Handbook 44 2.20. Scales Code paragraph N.1.5 Discrimination Test to add language to the 2005 Edition of NIST Handbook 44 to clarify discrimination test procedures for testing scales with an operational automatic zero-setting mechanism.

Discussion: NCWM Publication 14 already includes procedures to conduct discrimination tests near zero and near capacity. The Sector considered a proposal by the NIST technical advisor to amend Publication 14, Digital Electronic Scales Sections 63 "Performance and Permanence Test for Floor Scales" and 69 "Performance and Permanence Test for Dynamic Monorail Scales." The Sector discussed that Publication 14 Section 43 "Zone of Uncertainty" should also include test procedures for determining compliance with discrimination test requirements that are similar to requirements and tests recommended by Measurement Canada and OIML R76 for Non-automatic Weighing instruments.

Recommendation: The Weighing Sector recommends that NCWM Publication 14 Sections 43 Zone of Uncertainty, 63 Performance and Permanence Test for Floor Scales, and 69 Performance and Permanence Test for Dynamic Monorail Scales'' be amended to clarify discrimination test requirements and procedures as shown in Appendix A, agenda Item 1 (d).

(e). Automatic Weighing Systems

Background: See the Report of the 89th National Conference on Weights and Measures, Specifications and Tolerances Committee Agenda Item 324-1 for additional background information. During its 2004 Annual Meeting, the NCWM agreed to change the status of Handbook 44, Section 2.24. Automatic Weighing Systems (AWS) from a tentative code to a permanent code. One of the changes to the tentative code was to remove the type evaluation test procedures and incorporate them into NCWM Publication 14.

Discussion/Recommendation: The Weighing Sector reviewed the proposed language, as shown in Appendix A agenda Item 1(e), which was developed by Andrea Buie of the Maryland NTEP laboratory, and recommended that such language be added to Publication 14 Automatic Weighing Systems checklist. The Sector also recommended that a meeting should be planned to develop additional changes to Publication 14 that were identified during the 2002 meeting of the AWS NCWM Work Group. The Sector further believes that much of the work can be accomplished electronically among the participants following the next meeting.

2. Identification: Built-for-Purpose Software-based Devices

Background: See the Report of the 89th National Conference on Weights and Measures, Specifications and Tolerances Committee Agenda Item 320-1for additional background information and the proposed language considered by the S&T Committee.

At the 2004 NCWM Interim Meeting, the S&T Committee requested that prior to the NCWM Annual Meeting in July 2004 the technical advisor to the NTETC Weighing Sector distribute to its members the proposal for the S&T Committee's Agenda Item 310-1 along with a ballot requesting support for the proposal. Although there were 15 responses to the ballot and the majority of the members of the Weighing Sector voted affirmatively, there was no clear consensus.

At the 2004 NCWM Annual Meeting, the Scale Manufacturers Association (SMA) stated that Item 310-1 should not go forward for a vote because the ballot of the NTETC Weighing Sector failed to provide clear support for the item. A manufacturer stated that the term "microprocessor" was not appropriate because their devices contain numerous microprocessors. Another manufacturer stated that the requirement for marking the current software version number would place an unrealistic burden on their company. The Committee agreed that sufficient opposition and questions were raised during the open hearing to demonstrate that the item is not sufficiently developed to be a voting item at this meeting. The Committee agreed to make Item 310-1 an information item to be returned to the NTETC Weighing and Measuring Sectors for further development.

Discussion: The Weighing Sector reviewed the background information from the NCWM S&T Committee, previous Sector recommendations, and information regarding international activities. The Sector also reviewed an updated proposal for S&T agenda Item 310-1 from NIST WMD. The updated proposal included new and amended definitions and attempted to address concerns raised during the NCWM S&T Committee and open hearing deliberations on this item. The definition for "not-built-for-purpose" devices was amended to clarify their use as auxiliary or peripheral equipment for weighing and measuring devices and systems.

Some of the private Sector members repeated their comments that current electronic weighing and measuring equipment technology easily permits the display of required identification information and that there was no technical justification for treating these devices differently than not-built-for-purpose devices.

Additionally, the proposed definitions would reclassify most measuring devices according to the physical property being measured (e.g., liquid, length, vapor, cryogenic, etc.). Since the proposed new definition for measuring devices applies to all types of Handbook 44 devices, there was some concern that laws and regulations would need changing because many states' statutes are written using the "weighing and measuring" device terminology.

Recommendation: The Sector recommended the following updated proposal submitted by NIST WMD with suggestions from the Weighing Sector be forwarded to the NTETC Measuring Sector for its review and comments.

Add new Terms and definitions as follows:

measuring device (general) – A device (instrument) intended to be used to make measurements, alone or in conjunction with supplementary devices. (VIM)

measuring system (general) - An instrument or group of instruments that serves to make measurements, alone or in conjunction with supplementary devices. (VIM)

electronic devices – A device operating by the principles of electronics, which may consist of one or more subassemblies and performs a specific function(s). (ASTM)

not-built-for-purpose device -- Any electronic peripheral or auxiliary device or element which was not originally manufactured with the intent that it be used as, or part of, a weighing or measuring device or system.

metrological software version (revision) – A designation that specifically defines the metrological software version used in a measuring instrument, system, or peripheral/auxiliary device with field programmable or downloadable metrological software).

weighing device (instrument) -- A measuring instrument that serves to determine the mass of a body by using the action of gravity on said body. The instrument may also be used to determine other quantities, magnitudes, parameters or characteristics related to the determined mass. According to its method of operation, a weighing instrument is classified as an automatic or non-automatic instrument. (OIML R76)

Amend the definition for built-for-purpose device as follows:

built-for-purpose device – Any main, <u>peripheral</u>, <u>or auxiliary</u> device or element which was manufactured with the intent that it be used as, or part of, a weighing or measuring device or system.

Amend General Code paragraph G-A.1. Commercial and Law Enforcement Equipment as follows:

G-A.1. Commercial and Law Enforcement Equipment. - These specifications, tolerances, and other technical requirements apply as follows:

- (a) To commercial weighing and measuring devices or systems equipment; that is, to weights, and measures, and weighing and measuring devices or systems commercially used or employed in establishing the size, quantity, extent, area, or measurement of quantities, things, produce, or articles for distributed or consumed, purchased, offered, or submitted for sale, hire, or award, or in computing any basic charge or payment for services rendered on the basis of <u>quantity determination</u> weight or measure.
- (b) To any accessory attached to or used in connection with a commercial weighing or measuring device when such accessory is so designed that its operation affects the accuracy of the device.
- (c) To-weighing and measuring <u>devices or systems</u> equipment in official use for the enforcement of law or for the collection of statistical information by government agencies.

(These requirements should be used as a guide by the weights and measures official when, upon request, courtesy examinations of noncommercial equipment are made.)

Amend General Code paragraph G-S.1. Identification as follows:

G-S.1. Identification. - All equipment, except weights and separate parts necessary to the measurement process, but not having any metrological effect, shall be clearly marked <u>in accordance with Table G-S.1</u>. for the purposes of identification, with the following information:

- (a) the name, initials, or trademark of the manufacturer or distributor;
- (b) a model designation that positively identifies the pattern, or design, or metrological version or revision of the device in accordance with Table G-S.1;
- (c) the model designation shall be prefaced by the term "Model," "Type," or "Pattern." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod."

[Nonretroactive January 1, 2003] (Added 2000) (Amended 2001)

[Note: Prefix lettering may be initial capitals, all capitals or all lower case.]

 (d) except for equipment with no moving or electronic component parts and not-built-for-purpose, softwarebased <u>electronic</u> devices, a nonrepetitive serial number;
[Nonretroactive as of January 1, 1968]

(c) for not-built-for purpose, software-<u>microprocessor-</u>based devices the current software version designation <u>or revision number;</u>

(Added 2003)

(<u>e</u>f) the serial number shall be prefaced by words, an abbreviation, or a symbol that clearly identifies the number as the required serial number; and [Nonretroactive as of January 1, 1986]

(fg) the serial number shall be prefaced by the words "Serial Number" or an abbreviation of that term. Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No, and S No.).

[Nonretroactive as of January 1, 2001]

(gh) Ffor devices that have an NTEP Certificate of Conformance (CC), the CC Number or a corresponding CC addendum number-shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). [Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device. (Amended 1985, 1991, 1999, 2000, 2001 and 2003)

Delete General Code paragraph G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Softwarebased Devices and renumber G-S.1.2. Remanufactured Devices and Remanufactured Main Elements as follows:

G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-based Devices. - For not-built-for-purpose, software-based devices, the following shall apply:

- (a) the manufacturer or distributor and the model designation shall be continuously displayed or marked on the device (see note below), or
- (b) the Certificate of Conformance (CC) Number shall be continuously displayed or marked on the device (see note below), or
- (c) all required information in G-S.1. Identification. (a), (b), (c), (c), and (h) shall be continuously displayed. Alternatively, a clearly identified "view only" System Identification, G-S.1. Identification, or Weights and Measures Identification shall be accessible through the "Help" menu. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated.

Note: Clear instructions for accessing the remaining required G-S.1. information shall be listed on the CC. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated. [Nonretroactive as of January 1, 2004] (Added 2003)

G-S.1.12. Remanufactured Devices and Remanufactured Main Elements. - All remanufactured devices and remanufactured main elements shall be clearly and permanently marked for the purposes of identification with the following information:

(a) The name, initials, or trademark of the last remanufacturer or distributor;

(b) The remanufacturer's or distributor's model designation if different than the original model designation. [Nonretroactive as of January 1, 2002] (Added 2001)

Note: Definitions for "manufactured device," "repaired device," and "repaired element" are also included (along with definitions for "remanufactured device" and "remanufactured element") in Appendix D, Definitions.

Add new Table G-S.1. Identification as follows:

Table G-S.1. Identification					
	<u>Built-for-Purpose</u> Instruments, Elements, or Systems	<u>Not-Built-for-Purpose</u> <u>Devices or Elements</u>			
<u>Name, initials, or trademark of the manufacture or distributor</u>	M	<u>D</u> ²			
Model designation	$\underline{\mathbf{M}}^{\underline{1}}$	<u>D</u> ²			
Specific model designation ³	<u>M¹ or D</u>				
<u>Serial number</u>	<u>M</u>	Not required			
Metrological version or revision designation ³	<u>M or D NA</u>	D			
Certificate of Conformance (CC) number	<u>M or D</u>	$\underline{\mathbf{D}}^2$			

<u>M:</u> Physically and permanently marked

<u>D:</u> Either: (1) displayed by accessing a clearly identified view only System Identification, G-S.1. Identification, or Weights and Measures Identification accessible through the "Help" menu. Required information includes that information necessary to identify the software in the device is the same type that was evaluated, or (2) continuously displayed. Note: For revision or software version number, clear instructions for accessing this information shall be listed on the CC in lieu of the "Help" menu. Required information includes that information necessary to identify the software in the device is the same or subsequent type that was evaluated.

(Nonretroactive as of January 2004)

Note 1: <u>As a minimum, the model designation (positively identifying the pattern, design, type, series, generic, or</u> trademark designation) must be marked on the device. If the model designation changes with differing parameters such as size, features, options, intended application, not Handbook 44 compliant, construction, etc., the specific model designation shall be physically marked or continuously displayed or be capable of being displayed. (Nonnetrogeting as of Lanuary 200X)

(Nonretroactive as of January 200X)

Note 2: <u>As a minimum, either the manufacturer or distributor and the model designation, or the CC Number shall be</u> <u>continuously displayed.</u> <u>Clear instructions for accessing the remaining required G-S.1.information shall be</u> <u>listed on the CC, which may be available as an unaltered copy of the CC or printed by the device or</u> <u>through another on-site device.</u> (Nonretroactive as of January 200X)

Note 3: Metrological version or revision designation for devices with downloadable or field programmable software.

3. Ad Hoc Procedures for Class I and II Scales used in Prescription Filling Applications

Source: 2003 NTETC Weighing Sector Agenda Item 14 b.

Background: See the 2003 S&T Committee Annual Report Item 320-2 for additional background information. During its 2003 Annual Meeting, the NCWM agreed to modify paragraph S.1.2.3. of NIST Handbook 44. The approved language was incorporated in the 2004 Edition of NIST Handbook 44.

At its 2003 meeting, the Weighing Sector reviewed the language adopted by the 88th NCWM at its annual meeting and discussed a draft checklist developed by Brian Christopher (McKesson) that was distributed to the Sector. The Sector discussed the need to verify that minimum piece weight and piece count limits required by the new language in Handbook 44 are effective. Additionally, NTEP tests should be conducted with counts and loads that are less than the minimums in new paragraph S.1.2.3. that verify the scale is prevented from displaying a total piece count (e.g., 29 e and/or 9 pieces for samples to determine piece weights). There was a discussion that the scale cannot be recalibrated while evaluating the counting feature. The manufacturers explained that it is possible to have inaccurate weight measurements and still have correct count indications. Additionally, the recommended checklist should include verification of new marking requirements.

At the request of the Sector, the Publication 14 evaluation checklist submitted by Brian Christopher was further developed with the assistance of the participating laboratories, the NTEP director, and the NIST technical advisor and was used on an *ad hoc* basis until the procedure could be fully evaluated and accepted by the Sector.

The NTEP participating laboratories have used the *ad hoc* procedures on several evaluations this past year. Neither the applicants nor the laboratories identified any procedural issues.

Discussion: The Weighing Sector discussed the *ad hoc* procedures and noted that they did not include a reference to Handbook 44 specification paragraph S.2.5.3. Class I and II Prescription Scales with a Counting Feature and recommended an amendment to the procedures to correct the omission.

During the review of paragraph S.2.5.3., there was a discussion regarding motion detection requirements for recording elements that can print the number of pills when there is no display of weight in the counting mode. Currently, there is no language in the Scales Code that requires an effective means to permit the recording of count values when the count indication is stable. The Sector discussed the possibility of adding a motion detection requirement for the printing or recording of count. There was also a discussion questioning which "quantity" was required to have a stable indication. The Sector believes that the paragraph could be editorially amended to provide clarification that the term "quantity" is intended to be the sample quantity.

The Sector also discussed the *ad hoc* procedure abbreviations for minimum sample size (MSS), minimum piece weight (MPW), and minimum sample size in weight (MSSW) and agreed to recommend the abbreviations be listed in Publication 14 Section 75 List of Acceptable Abbreviations/Symbols.

Recommendation: The Weighing Sector recommends the *ad hoc* procedures, as amended by the Sector, be added to Publication 14 as shown in Appendix A agenda Item 3.

The Sector also recommends that paragraph S.2.5.3. be editorially amended to clarify that the quantity placed on the load-receiving element is for sample piece weight determination as follows:

S.2.5.3. Class I and Class II Prescription Scales with a Counting Feature. - A Class I or Class II prescription scale shall indicate to the operator when the piece weight computation is complete by a stable display of the <u>sample</u> quantity placed on the load-receiving element.

Additionally, the Sector recommends amending paragraph S.2.5.1. Digital Indication Elements to clarify that the recording of indicated count values must be stable.

S.2.5.3. Class I and Class II Prescription Scales with a Counting Feature. - A Class I or Class II prescription scale shall indicate to the operator when the piece weight computation is complete by a stable display of the

<u>sample</u> quantity placed on the load-receiving element. <u>Prescription scales with a counting feature and</u> recording element shall be equipped with effective means to permit the recording of count values only when the indication is stable within plus or minus 1 piece.

4. S.1.1.c. Zero Indication (Marking Requirements)

Source: 2003 Weighing Sector Agenda Item 19 - Screen Savers on Electronic Cash Registers and Point-of-Sale Systems.

Background: See the Report of the 89th National Conference on Weights and Measures, NTEP Committee Report 2003 NTETC Weighing Sector Meeting Summary agenda Item 19, and the S&T Committee Report agenda Item 320-8 for additional background information.

Discussion/Recommendation: The Sector reviewed the background information and accepted the 2004 S&T Committee interpretation of the intent of the 78th NCWM. However, the majority members of the Sector stated that no additional wording was needed since changes had already been added to Publication 14 that clarified that additional marking is required for weighing devices that use indications other than a digital zero to indicate the scale is operational and at a zero-balance condition.

During the discussion, some of the Sector members stated that is not appropriate for the Sector to further develop the proposal when the S&T Committee interpretation answered the Sector's questions. Additionally, the Sector stated that commenting on S&T Committee agenda items that have no impact on type evaluation and Publication 14 have a low priority and are typically discussed at the end of the Sector meeting if time permits.

The Sector recommends that no changes be made to the existing language in Handbook 44 Scales Code paragraph S.1.1. (c) Zero Indication. Additionally, the Sector did not have time at the end of its meeting to further discuss this item.

New Items

5. Bench/Counter Scale Shift Test and Definitions

Source: NIST WMD

Background: During the 2002 meeting of the Weighing Sector, the NTEP director reported some confusion in the classification of bench/counter scales and other platforms and the location of test load while performing a shift test. Bench/counter and other platforms have different shift test positions depending if a scale is located on a counter or on the floor. The problem is compounded when a family of scales covers both bench/counter and other platform applications. **Bench and counter scale** shift tests are conducted with a one-half capacity test load centered successively at four points equidistant between the center and the front, left, back and the right edges of the load-receiving element (N.1.3.1.). **Other platform scale** shift tests are conducted with a one-half capacity test load centered, as nearly as possible, successively at the center of each quadrant.

The Weighing Sector proposal to amend Handbook 44 was intended to align the U.S. and Measurement Canada's shift test procedures that are based on the number of load supports in the scale. During the 2003 NCWM Annual Meeting, the Specifications and Tolerance Committee (S&T) agreed with comments from industry and weights and measures officials that paragraphs N.1.3.1. and N.1.3.8. already adequately address shift test procedures and any change would create confusion. The Committee agreed that the proposal to modify the definition of counter scale, as written, does not provide weights and measures officials with a means to determine the shift test procedure that is appropriate for a scale design (single or four load supports). The Committee recognized the difficulty or reluctance of field officials to dismantle a scale to determine its design. Consequently, the Committee changed this item's status to an information item and recommended the Weighing Sector consider the practice of including scale design information on all NTEP Certificates of Conformance to assist officials in performing shift tests.

The NIST technical advisor revised the 2002 Sector proposal to remove the reference to the number of load supports, align Handbook 44 shift test procedures for scales with OIML R76, and delete the definition for bench and counter

scales. The NTEP participating laboratories have been requested to conduct a series of tests on instruments currently under NTEP evaluation comparing shift test results between the current Handbook 44 procedures and the shift test procedures in the following proposal. Note: The proposal does not permit corner testing for scales less than or equal to 150 kg. This limit was selected since corner testing is allowed if there are not enough test weights to perform the shift test or if the scale has four load supports, and Table 4 Minimum Test Weights requires that scales with a capacity of 150 kg or less have test weights up to 100 % of the scale capacity.

Proposal: Delete the definition of Bench and Counter Scale:

bench scale. See "counter scale."[2.20]

counter scale. One that, by reason of its size, arrangement of parts, and moderate nominal capacity, is adapted for use on a counter or bench. Sometimes called "bench scale."[2.20]

Delete Scales Code paragraph N.1.3.1. Bench and Counter Scales:

N.1.3.1. Bench or Counter Scales. A shift test shall be conducted with a half capacity test load centered successively at four points equidistant between the center and the front, left, back, and right edges of the load receiving element.

Renumber remaining N.1.3.X paragraphs and amend paragraph N.1.3.8 as follows:

N.1.3.<u>78</u>. All Other Scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel-Load Weighers, and Portable Axle-Load Weighers. - A shift test shall be conducted using the following prescribed test loads and test patterns. For livestock scales, the shift test load shall not exceed one-half the rated section capacity or one-half the rated concentrated load capacity, whichever is applicable. A shift test shall be conducted using either:

- (a) A one-quarter nominal capacity test load centered as nearly as possible, successively over each main load support as shown in the diagram below; or (Added 2003)
- (b) A one-half nominal capacity test load centered as nearly as possible, successively at the center of each quarter of the load-receiving element as shown in the diagram below.
- (a) For scales greater than 150 kg (300 lb) a shift test load may be conducted by either using one-third nominal capacity test load centered as nearly as possible at the center of each quarter of the load receiving element as shown in Figure 1 below, or by using a one-quarter nominal capacity test load centered as nearly as possible, successively over each corner of the weighing/load receiving element as shown in Figure 2 below.
- (b) For scales with a nominal capacity of 150 kg (300 lb) or less, a shift test load shall be conducted using a one-third nominal capacity test. The load shall be applied centrally in the segment if a single weight is used, or applied uniformly over the segment, if several small weights are used.
- (c) For livestock scales, the shift test load shall not exceed one-half the rated section or concentrated load capacity using the prescribed test pattern as shown in Figure 1, or one-quarter the section or concentrated load capacity as shown in Figure 2 below.



(Amended 1987, and 2003, and 200X)

Discussion/Recommendation: The NIST technical advisor reported that no data had been received by the time of the Sector meeting. The Weighing Sector continues to support aligning the shift test requirements in Handbook 44 with the equivalent requirements in OIML R76 Non-automatic Weighing Instrument to the fullest extent possible.

The Sector agreed with the proposal and commented that the exact test load of one-third capacity is not required or necessary. They also agreed that the test load of one-third capacity in the recommended test positions is roughly equivalent to one-half capacity in the current test load position for bench and counter scales. Since the test positions for other platform scales are not changed in this proposal and are tested at one-third instead of onehalf capacity, the Sector believes that data should be collected to verify that the proposed test load would not pass scales that would have failed under the current test load requirements.

The Sector agreed to forward the above proposal as an information or developmental item to the regional weights and measures associations and the NCWM S&T Committee. The Sector further requests data demonstrating the performance differences or similarities between the current and proposed test procedures from the NTEP labs and other jurisdictions.

6. Automatic Zero-Setting Mechanism (Zero-Tracking)

Source: NIST WMD

Background: During the 2002 meeting of the Weighing Sector discussion on shift test positions, the NTEP director reported some confusion in the classification of bench/counter scales and other platforms and the range of the automatic zero-setting mechanism (AZSM). Bench/counter and other platforms have different zero-tracking requirements depending if a scale is located on a counter or on the floor. The problem is compounded when a family of scales covers both bench/counter and other platform applications. **Bench and counter scale** limit for AZSM is 0.6 e (S.2.1.3.a). **Other platform scales** limit AZSM to 1.0 e (S.2.1.3.c).

The NIST technical advisor and the participating NTEP laboratories recommended the following proposal to amend Handbook 44, Scales Code paragraph S.2.1.3. Scales Equipped with an Automatic Zero-Setting Mechanism to remedy the problem and partially align AZSM requirements with Measurement Canada and OIML R76 recommendations. The following proposal retains AZSM requirements for Class III L weighing instruments.

S.2.1.3. Scales Equipped with an Automatic Zero-Setting Mechanism (Zero Tracking). - Under normal operating conditions the maximum load that can be "rezeroed," when either placed on or removed from the platform all at once, shall be:

S.2.1.3.1. - For scales manufactured before January 1, 200X, the maximum load that can be "rezeroed," when either placed on or removed from the platform all at once under normal operating conditions, shall be:

- (a) for bench, counter, and livestock scales: 0.6 scale division;
- (b) for vehicle, axle-load, and railway track scales: 3.0 scale divisions; and

(c) for all other scales: 1.0 scale division. [Nonretroactive and enforceable as of January 1, 1981]

S.2.1.3.2. - For scales manufactured after January 1, 200X, the maximum load that can be "rezeroed," when either placed on or removed from the platform all at once under normal operating conditions, shall be:

(a) for vehicle, axle-load, and railway track scales: 3.0 scale divisions; and

(b) for all other scales: 0.5 scale division. [Nonretroactive and enforceable as of January 1, 200X]

S.2.1.3.<u>3</u>+. Automatic Zero-Setting Mechanism (Zero Tracking) on Class III L Devices - Class III L devices equipped with automatic zero-setting mechanisms shall be designed with a sealable means to allow the automatic zero setting to be disabled during the inspection and test of the device. [Nonretroactive as of January 1, 2001] (Added 1999) (Renumbered 200X)

Discussion/Recommendation: The Sector agrees with the concept of the proposal and the alignment of Handbook 44 with OIML R76. The public Sector members discussed the implication the proposal may have on field officials in determining the date of manufacture of other platform scales (i.e., floor scales) when verifying compliance with AZSM (zero-tracking) requirements. Since other platform scales currently have a zero tracking requirement of 1 e, some of the public members were concerned about the ability of field officials to determine the date of manufacture of these scales to verify if it complied with 1 e or 0.5 e.

The private Sector members were concerned with the effective date of the proposed requirements and suggested a delay of several years in the effective date. This would allow manufacturers to avoid costly changes to their products that are nearing the end of their production cycle. This may also allow time for field officials to become trained in the requirements before the requirement becomes effective.

The Sector recommended this item be forwarded to the regional weights and measures association and the NCWM S&T Committee as a developmental item in order to gather information on the impact on field evaluations.

7. Prescription Scale with an Operational Counting Feature

Source: Mettler Toledo

Background: Handbook 44, paragraph S.6.6. Counting Feature, Minimum Individual Piece Weight and Minimum Sample Piece Count states:

S.6.6. Counting Feature, Minimum Individual Piece Weight and Minimum Sample Piece Count – A Class I or Class II prescription scale with an operational counting feature shall be marked with the minimum individual piece weight and minimum number of pieces used in the sample to establish an individual piece weight.

This marking is unnecessary if proper operation is confirmed during the NTEP evaluation using the defined minimum values since paragraph S.1.2.3. states:

S.1.2.3. A Class I or Class II prescription scale with an operational counting feature shall not calculate a piece weight or total count unless the sample used to determine the individual piece weight meets the conditions:

minimum individual piece weight is greater than or equal to 3 e; and minimum sample piece count is greater than or equal to 10 pieces. (Added 2003)

During the NTEP evaluation, a series of tests are conducted to determine these values as a minimum operation requirement. These tests could also be conducted in the field to confirm continued compliance with this requirement.

For example:

A test weight equal to 30 e or more is placed on the platter; a sample size of less then 10 is entered or selected. If the device displays a total count, the instrument fails the test.

A test weight of less than 30 e is placed on the platter; a sample size of 10 or more is entered or selected. If the device displays a total count, the instrument fails the test.

A test weight of less than 30 e is placed on the platter; a sample size of less than 10 is entered or selected. If the device displays a total count, the instrument fails the test.

A test weight equal to 30 e is placed on the platter; a sample size of 10 is entered or selected. If the device displays the proper count, the instrument passes and the marking requirements are waived. If the evaluation shows that the minimum sample weight must be greater than 30 e or the sample size must be greater than 10 for the instrument to perform an accurate count, the marking requirements are mandatory.

It is certainly within a scale's ability to compare the operator entered or selected, the sample size to ensure that the number is 10 or greater, and then to divide the weight on the platter to ensure that the sample weight is equal to or greater than 30 increments. The above test examples would confirm compliance to this requirement and remove the need to have this information marked on the scale.

The submitter of this item recommended amending Handbook 44, Scales Code, S.6.6. to remove the marking requirements for the minimum individual piece weight and minimum number of pieces providing the instrument conforms to both individual minimum values as stated in paragraph S.1.2.3. as follows:

S.6.6. Counting Feature, Minimum Individual Piece Weight and Minimum Sample Piece Count – A Class I or Class II prescription scale with an operational counting feature shall be marked with the minimum individual piece weight and minimum number of pieces used in the sample to establish an individual piece weight <u>if the minimum</u> individual piece weight or the minimum number of pieces used to establish an individual piece weight is different from that specified in S.1.2.3. a and b.

NOTE: The NIST technical advisor suggests the Sector consider the potential confusion created or implications involved if an applicant submits a scale with minimums smaller than specified in S.1.2.3. a and b.

Discussion/Recommendation: Mettler Toledo withdrew this item from the Weighing Sector agenda since the proposal did not relate to problems encountered with Publication 14 type evaluation procedures. Additionally, there was no additional time at the end of the meeting to further discuss this item.

8. "#" Symbol

Source: Rice Lake Weighing Systems (RLWS)

Background: NCWM Publication 14 Section 75 List of Acceptable Abbreviations/Symbols lists "#" as an acceptable (but discouraged) symbol for recorded representations for electronic cash registers (ECR) and point-of-sale systems. RLWS reasons that if the symbol is suitable for recorded representations for ECRs, there is no justification for its prohibition for other recorded representations or markings. It should either be Acceptable or <u>Not</u> Acceptable.

According to the 61st NCWM Annual Report, the "#" was originally allowed in 1976 because of space limitations on recording elements. The "#" only took up one column where "lb" took two columns. The "#" was also allowed since it was reported that it is used in the dictionary.

The NIST technical advisor also noted the symbol is known by many names such as the octothorp, dry pound, avoirdupois pound, number, hash, sharp, crunch, hex, grid, crosshatch, square, pig-pen, ticktacktoe, scratch mark, thud, thump, and splat. In cartography, it is the symbol for a village (eight fields around a central square). The U.S.

usage is derived from an old-fashioned commercial practice of using a "#" suffix to tag pound weights on bills of lading. Outside the U.S., the symbol is usually pronounced "hash" (the British symbol for pound is "£").

The submitter recommends the "#" symbol be removed from Publication 14 as an acceptable symbol and be reclassified as no longer acceptable based upon the changes in printer technology over the past 30 years and multiple definitions of the "#" mark. Additionally, Handbook 44 Scales Code footnote for paragraph S.1.8.4. Recorded Representations, Point-of-Sale Systems should be amended to eliminate the use of the "#" symbol as follows:

¹ Weight values shall be identified by kilogram, kg, grams, g, ounces, oz, pound, <u>or lb, or the sign "#."</u>. For devices interfaced with scales indicating in metric units, the unit price may be expressed in price per 100 grams. (Amended 200X)

Discussion/Recommendation: The Weighing Sector agreed that the "#" symbol should be removed from Publication 14 as an acceptable symbol and be reclassified as no longer acceptable based upon the changes in printer technology over the past 30 years and multiple definitions of the "#" mark. Additionally, Handbook 44 Scales Code footnote for paragraph S.1.8.4. Recorded Representations, Point-of-Sale Systems should be amended to eliminate the use of the "#" symbol as follows:

¹ Weight values shall be identified by kilogram, kg, grams, g, ounces, oz, pound, <u>or lb, or the sign "#."</u>. For devices interfaced with scales indicating in metric units, the unit price may be expressed in price per 100 grams.

(Amended 200X)

9. Elimination of Temperature Testing for Separable Weighing/load-receiving Elements

Source: Rice Lake Weighing Systems (RLWS)

Background: RLWS eported temperature testing (influence factor) failures of separable weighing/load-receiving elements that incorporate load cells that have an NTEP Certificate of Conformance (CC). RLWS builds the instrument to be submitted for tests using load cells from their inventory, installs them into a weighing/load-receiving element, and performs the room temperature testing before submitting the instrument to the NTEP laboratory for evaluation. The instrument passes all applicable tests performed at room temperature but fails the temperature test. RLWS reported that the load cells are from a well-known and respected load cell manufacturer. When RLWS contacted the load cell manufacturer, they responded by stating, "You should have told us these load cells were for NTEP testing." RLWS stated that the load cell manufacturer will send them four "GOLDEN" load cells that have been separately temperature tested to enable the weighing/load receiving element to pass temperature testing. RLWS further stated that it takes between 4 to 6 weeks or longer to receive load cells if they are requested for a weighing/load-receiving element to be submitted for NTEP evaluation.

An NTEP laboratory reported to RLWS that load cell manufacturers told other weighing/load-receiving element NTEP applicants the same thing after their weighing/load-receiving element failed the NTEP temperature testing.

RLWS does not believe that separable weighing/load-receiving elements using load cells that have an NTEP CC should be subject to additional temperature testing for the following reasons:

- Weighing/load receiving elements over 2000 lb are not subject temperature testing by NTEP;
- The NCWM Conformity Assessment program will help assure that production load cells comply with temperature and other influence factor requirements; and
- The costs associated with the temperature test for the weighing/load-receiving element can become excessive when the load cells already comply with temperature tests, especially if there is a failure. RLWS has provided a breakdown of NTEP costs associated with the temperature test using the Ohio NTEP laboratory rate schedule.

RLWS acknowledged that Measurement Canada does not approve load cells and that temperature testing may still be required for an evaluation approval under the Mutual Recognition Agreement.

The NIST technical advisor has contacted two load cell manufacturers and inquired what they did to provide a scale applicant with "golden" load cells. They reported that they retest and select the load cells that are well within the error requirements. They also acknowledged that load cells are NTEP evaluated in ideal loading conditions. There are no load cell tests that simulate off-center loading caused by deflection of the load-receiving element and changes to the mechanical interface at different temperatures between the load cell mount and the load-receiving element.

RLWS recommended amending Publication 14 by removing the temperature testing of separable bench and other platform weighing/load receiving elements and establishing a new tolerance for these devices while tested at room temperature.

Time	Cost	Description		
1 hour	\$110	Set-up of weighing/load-receiving element		
2 hours	\$220	Full test (increasing/decreasing, shift, corner)		
1 hour	\$110	Increasing/decreasing at temperature10° (FAIL)		
Chamber	\$200	Billed for a half cycle of the temperature chamber		
1 hour	\$110	Ship weighing/load-receiving element back to manufacturer		
*		Ship weighing/load-receiving element back to manufacturer		
*		Order "GOLDEN" load cells to pass temperature tests		
*		Remove original load cells, install new load cells, and re-test at room temp		
*		Ship weighing/load receiving element back to lab		
1 hour	\$110	Setup of weighing/load receiving element		
2 hours	\$220	Full test (increasing/decreasing, shift, corner)		
1 hour \$110		Increasing/decreasing at temperature.		
Total	\$1190	Costs to the point where the failure occurred		
* Additional time to complete an evaluation and applicant costs				

Divisions	Acceptance Tolerances Complete Weighing Device	Acceptance Tolerances Weighing/load-receiving Element with Temp Testing	Acceptance Tolerances Weighing/load-receiving Element only room Temp Testing
0 to 500	0.5 e	0.35 e	0.30 e (proposed)
501 to 2000	1.0 e	0.70 e	0.60 e (proposed)
2001 to 4000	1.5 e	1.05 e	0.70 e (proposed)
4001 to 10 000	2.0 e	1.40 e	0.80 e (proposed)

This recommended new tolerance applies to weighing/load-receiving elements that meet the following criteria:

- 1. Weighing elements must have NTEP-approved load cells with an n_{max} of 5000 and must be approved for temperatures -10 °C to +40 °C (14 °F to 104 °F).
- 2. Weighing elements Certificate of Conformance (CC) will specify the load cell used during the evaluation and state that a similar NTEP-approved load cell could be used.

NOTE: The replacement load cell must have an n_{max} of 5000 and be approved for temperatures -10 °C to +40 °C (14 °F to 104 °F).

The Weighing Sector should consider that the proposed change to amend Publication 14 tolerances for weighing/load-receiving elements tested at room temperature would likely require supporting language in NIST Handbook 44.

Additionally, the proposal, as submitted, will continue to require temperature testing if the load cell does not have an NTEP CC or if the load cells have a temperature range other than -10 °C to 40° C.

The technical advisor seeks input from manufacturers that are holders of OIML R76 test reports conducted by other international laboratories and information on the international policies regarding the testing of these devices that use OIML R60 load cells.

Discussion: During the discussion of this item, the NIST technical advisor reported that load cell manufacturers do not make special cells for weighing/load-receiving elements that are submitted for type evaluation. The load cell manufacturers reported that they select load cells with errors that are well within the maximum permissible errors if they know a weighing/load-receiving element is to be submitted for type evaluation.

Some of the NTEP participating laboratories reported that they continue to see problems with weighing/load-receiving elements during the influence factor tests that do not comply with tolerances. The NTEP applicants have stated that the materials used in the construction of weighing/load-receiving elements and components in load cell junction boxes that are affected by influence factors were the reason the device failed influence factor testing.

A manufacturer commented that weighing/load-receiving elements above 2000 lb are also required to comply with influence factor requirements and suggested that NTEP perform testing above the 2000 lb limit. Another manufacturer stated that international laboratories testing for compliance with OIML R76 for Non-automatic Weighing Instruments do not evaluate weighing/load-receiving elements above 1000 kg (2000 lb). Additionally, the manufacturer reported that R76 used a different apportion of errors for evaluation of elements (modules) that reduced the problems encountered by NTEP.

The NTEP director expressed concern with the current apportionment of errors for separable elements and load cells. The load cells used in weighing/load-receiving elements have an "M" (multiple load cell application) designation, which means that a 1.0 factor is applied to the applicable tolerance. This may present a problem with weighing/load-receiving elements since they are evaluated to a tighter tolerance (0.7 time the applicable tolerance) than the load cells.

Recommendation: Based upon the discussion and comments, the submitter withdrew its proposal.

10. Time Dependence Tolerances

Source: NIST WMD and NTEP Laboratories

Background: John Elengo, in his comparison of Handbook 44, OIML R76 – Non-automatic Weighing Instruments, and OIML R60 – Load Cells, provided the following background information on the development and evolution of Handbook 44 Scales Code T.N.4.5. Time Dependence.

Prior to the establishment of Handbook 44 paragraph T.N.4.5., there was no such U.S. requirement for "creep" and, at the time of its consideration, the OIML requirement was based on a 4-hour period. This was considered excessive, especially since the error is primarily that of the load cells used in a scale. Generally, the greatest amount of load cell creep occurs during a short period (minutes) immediately following a step change in load. Thereafter, the output becomes more and more constant. Hence, Handbook 44 adopted a 1-hour requirement rather than a 4-hour requirement. Some years later and during the course of revising OIML R60, it became evident that most international evaluation laboratories were not conducting the 4-hour test but a shorter one, and the creep proved to stabilize sufficiently during this shorter test. The assumption was made that it would meet the 4-hour requirement. This assumption was verified by sample tests. Based on this experience and that gained in the international comparison of load cell evaluations, the international work group for R60 concluded that a 30-minute test is sufficient provided that, in addition to measuring the difference over a 30-minute period, the difference occurring in the last 10 minutes of this period be measured also. A more restrictive allowance than the total allowance for the 30-minute period is applied to the 10-minute period difference in order to assure the creep is becoming more and more constant and not increasing. OIML R76 adopted the R60 30-minute requirement. In so doing, the requirement now applies to the instrument as a whole and not only to the load cell. If main components other than the load cell are a source of creep, they can be accounted for using the principle of apportionment of errors (including the

assignment of fractions pi to those various separate main components of an instrument that can be evaluated separately). [refer to R76-1, 3.5.4]

This item was further discussed at the 2004 meeting of the NTEP participating laboratories where they agreed to forward a proposal to align Handbook 44 with R76 and R60. However, there was some discussion about the accuracy class marking for load cells (A, B, C, and D). Steve Patoray indicated that OIML recommended load cells be marked with letter accuracy class designations so that load cells would not be confused with scales. This is consistent with the NTEP policy that a load cell by itself does not constitute a weighing/load-receiving element. The labs felt that there would be confusion by field inspectors if scales could have load cells marked with either an alpha or numeric accuracy class.

The NIST technical advisor recommended amending paragraph T.N.4.5. and adding new paragraphs T.N.4.5.1. and T.4.5.2. to include performance and zero return requirements that are aligned with OIML R76 and R60 as follows:

T.N.4.5. Time Dependence (Creep) for Non-automatic Weighing Instruments (Scales) during Type Evaluation. - At constant test conditions, the indication 20 seconds after the application of a load and the indication after 1 hour shall not differ by more than:

(a) one half of the absolute value of the applicable tolerance for the applied load for class III L devices; and

(b) the absolute value of the applicable tolerance for the applied load for all other devices. (Amended 1989)

T.N.4.5.1. A non-automatic weighing instrument of Class II, III, and IIII shall meet the following requirements at constant test conditions:

- (a) When any load is kept on an instrument, the difference between the indication obtained immediately after placing a load and the indication observed during the following 30 minutes shall not exceed 0.5 e.
- (b) However, the difference between the indication obtained at 15 minutes and that at 30 minutes shall not exceed 0.2 e. If these conditions are not met, the difference between the indication obtained immediately after placing a load on the instrument and the indication observed during the following four hours shall not exceed the absolute value of the maximum permissible error at the load applied.
- (c) <u>The deviation on returning to zero as soon as the indication has stabilized, after the removal of any load</u> which has remained on the instrument for one half hour, shall not exceed 0.5 e.

For a multi-interval instrument, the deviation shall not exceed 0.5 e₁ (first weighing segment).

On a multiple range instrument, the deviation on returning to zero from Max_i (load in the applicable weighing range) shall not exceed 0.5 e_i (interval of the weighing segment). Furthermore, after returning to zero from any load greater than Max_1 (capacity of the first weighing range) and immediately after switching to the lowest weighing range, the indication near zero shall not vary by more than e_1 (interval of the first weighing range) during the following 5 minutes.

T.N. 4.5.2. A weighing instrument of Class III L shall meet the following requirements:

- (a) When any load is kept on an instrument, the difference between the indication obtained immediately after placing a load and the indication observed during the following 30 minutes shall not exceed 1.5 e.
- (b) However, the difference between the indication obtained at 15 minutes and that at 30 minutes shall not exceed 0.6 e. If these conditions are not met, the difference between the indication obtained immediately after placing a load on the instrument and the indication observed during the following four hours shall not exceed the absolute value of the maximum permissible error at the load applied.

The deviation on returning to zero as soon as the indication has stabilized, after the removal of any load which has remained on the instrument for one-half hour, shall not exceed one-half of the absolute value of the applicable tolerance for the applied load for Class III L devices.

Add new paragraphs T.N.4.6. through T.N.4.6.3. and Table T.N.4.6.2. to include tolerances for load performance and zero repeatability that are aligned with OIML R60.

T.N.4.6. Time Dependence (Creep) for Load Cells during Type Evaluation. – A load cell (force transducer) marked with an accuracy class, shall meet the following requirements at constant test conditions:

T.N. 4.6.1. - With a constant maximum load for the measuring range, D_{max} , between 90 % and 100 % of maximum capacity, E_{max} , applied to the load cell, the difference between the initial reading and any reading obtained during the next 30 minutes shall not exceed the absolute value of the maximum permissible error (mpe) for the applied load (see N.4.6.2.). The difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes shall not exceed 0.15 times the absolute value of the mpe (see N.4.6.2.).

T.N.4.6.2. - The mpe for creep shall be determined from Table 5 using the following apportionment factors (pLC):

pLC = 0.7 for load cells marked with S (single load cell applications), and pLC = 1.0 for load cells marked with M (multiple load cell applications)

Table T.N.4.6.2. Maximum Permissible Errors (mpe) on Type Evaluation						
Tolerance	Load (m)					
<u>(mpe)</u>	<u>Class I</u>	Class II	Class III	<u>Class IIII</u>		
plc x 0.5v	$\underline{0 \le 50\ 000v}$	$0 \le m \le 5000v$	$\underline{0 \le m \le 500v}$	$0 \le m \le 50$		
plc x 1.0v	$50\ 001v \le m \le 200\ 000v$	$\underline{5001v} \le m \le 20\ 000v$	$\underline{501v \le m \le 2000v}$	$51v \le m \le 200v$		
plc x 1.5v	<u>200 001v < m</u>	$20\ 001v \le m \le 100\ 000v$	$\underline{2001v \le m \le 10\ 000v}$	$\underline{201v} \le m \le 1000v$		
Load m, Class III L						
plc x 0.5v	$\underline{pLC \ x \ 0.5v} \qquad \underline{0 \le m \le 500v}$					
<u>pLC x 1.0v</u> $501 \le m \le 1000v^*$						
* Add 0.7 to the tolerance for each 500 v of load or fraction thereof up to a maximum load of 10 000 v for load cells						
marked with S.						
* Add 1.0 to the tolerance for each 500 v of load or fraction thereof up to a maximum load of 10 000 v for load cells						
marked with M.						

The NIST technical advisor acknowledges that this proposal and the proposal in the following agenda item address the alignment issue in small steps. Another possible alternative for aligning Handbook 44 and Publication 14 with OIML R60 is to consider incorporating OIML R60 chapters 1 through 7 by reference into Handbook 44 and OIML R60 Annexes A through E into Publication 14. Handbook 44 and Publication 14 could further include paragraphs that state which requirements are not adopted, are different than, or are in addition to OIML R60.

Discussion/Recommendation: The Weighing Sector discussed the impact and implications of amending the marking requirements for load cells to align with the marking requirements in OIML R60 (see applicable extracts of OIML R60 marking requirements and selection guidelines in Appendix A). One of the Sector members noted that the proposal for time dependence testing did not include Class I scales (*Note: OIML R76 does not require Class I scales comply with time dependence (creep) requirements*). However, the current language in Handbook 44 paragraph TN.4.5. includes Class I scales.

The Sector withdrew this item from the Weighing Sector agenda since the proposal did not relate to problems encountered with Publication 14 type evaluation procedures. Additionally, there was no time at the end of the meeting to further discuss this item.

11. Publication 14 Force Transducer (Load Cell) Family and Selection Criteria

Source: NTEP Committee Technical Advisor

Background: The OIML Mutual Acceptance Agreement (MAA) was adopted at a recent International Committee on Legal Metrology (CIML) meeting in Kyoto, Japan, in November 2003. The agreement will likely allow NTEP to accept (and eventually exchange) reports and test data for load cells that have been evaluated to OIML R60 – Load Cells requirements. The data then can be evaluated to NCWM Publication 14 requirements in order to issue an NTEP Certificate of Conformance. Although the MAA does not require the U.S. and NTEP requirements to be fully harmonized and aligned with the requirements in R60, it does require that NTEP identify the differences **between the** requirements so that an OIML applicant is aware of additional testing and policies applicable to its load cells such as markings, Class III L tolerances, and family and selection guidelines.

Additionally, the original NTEP Publication 14 load cell family and selection guidelines were originally developed prior the adoption of similar guidelines in the 2000 revision of OIML R60. John Elengo and the U.S. National Work Group developed and submitted the guidelines that are currently in R60.

The NIST technical advisor recommended that the selection guidelines and definition of a load cell family in OIML R60 be incorporated in NCWM Publication 14 to the fullest extent possible. Additionally, it was suggested that the Sector consider making a recommendation to adopting the R60 marking requirements into Handbook 44. The primary difference between R60 and Handbook 44 are markings for humidity and accuracy classes. The R60 class markings for load cells are A, B, C, and D. Handbook 44 class markings for load cells are the same for scales and load cells (I, II, III, III L and IIII). It has been reported that the purpose of different class markings for R60 load cells was to ensure that a load cell and indicating element would not be considered a non-automatic weighing instrument. This is consistent with the NTEP policy stating that a load cell incorporated with a tank, hopper, hook or platform does not convey that the load cell (and indicating element) CC covers the complete weighing system.

Discussion: The NTEP director summarized the current NTEP load cell selection process as follows:

- One load cell would be selected if the family is small (e.g., 10:1).
- The capacity selected would be close to the middle of the family and within 4:1 of the highest and lowest capacity load cell in the family.

Using this process, NTEP typically selects a capacity that is not the most difficult to manufacture but is likely to be the most popular. The R60 selection process typically selects load cells of a lower capacity, which are more difficult to build and manufacture. The NTEP system is significantly different from international requirements.

Several of the load cell manufacturers present agreed that the lowest capacity load cell is the most difficult to manufacturer. One of the manufacturers further stated that he believes the OIML R60 selection process is more stringent. However, the OIML R60 family definition is broader than NTEP, and they have not seen an increase or decrease in the number of cells submitted for evaluation.

Recommendation: The Weighing Sector agreed to assign a work group (Stephen Patoray (NTEP), Steven Cook (NIST), the NIST Force Group, Joseph Antkowiak (Flintec), Frank Rusk (Coti), and the California NTEP laboratory) to:

- 1. Develop the definition of a family, determine load cell selection criteria, and develop an example of a load cell selection for 2005 NCWM Interim Meeting.
- 2. Review and adapt OIML R60 language for incorporation into Publication 14 for the next meeting of the Weighing Sector.

The NIST technical advisor will forward an electronic copy of OIML R60 to assist the work group members.

12. Compatibility of Indicators Interfaced with Weighing and Measuring Elements

Source: NTETC Measuring Sector and NCWM S&T Committee

Background: See the Report for the 89th National Conference on Weights and Measures, Specifications and Tolerances Committee Agenda Item 310-2 for additional background information.

During its 2003 meeting, the NTETC Measuring Sector agreed to forward a proposal to the NCWM S&T Committee through the SWMA to add a new paragraph G-N.3. Compatibility of Indicators and Weighing or Measuring Elements to Handbook 44. The proposal intended to clarify what requirements must be met to interface an indicating element and a weighing or measuring element, each of which has its own NTEP CC listing compatible communication specifications, but not previously evaluated together on a single NTEP CC.

At the 2004 NCWM Interim Meeting, the S&T Committee heard several comments indicating that this item is not sufficiently developed to move forward. The S&T Committee decided to *withdraw* Item 310-2 from the S&T Committee agenda until it is further developed and resubmitted by the NTETC Weighing and Measuring Sectors.

Discussion: The Weighing Sector reviewed the background information. The NIST technical advisor reported that an *ad hoc* meeting may be scheduled on Saturday, October 23, 2004, with the Measuring Sector members attending the Southern Weights and Measures Association meeting in Gulfport, Mississippi, to discuss this item.

The Weighing Sector agreed with the NTEP director that the policies used by the NTETC Measuring Sector are very restrictive. Members of the Measuring Sector want to have policies for measuring elements that are as flexible as existing Weighing Sector policies. Weighing device policies permit separate main elements (e.g., indicators, load cells, and weighing elements) with separate NTEP Certificates of Conformance to be combined—a practice referred to as "mixing and matching"—to create weighing systems which are recognized by NTEP.

The representatives from Canada reported that their liquid-measuring device type evaluation laboratory performs additional evaluations on the pulse output from the measuring element and the pulse input capability of the indicating element. NTEP essentially evaluates the performance of the combination of elements.

Some of the Weighing Sector members believed that the proposal belongs in the Liquid-Measuring Devices Code. They also were concerned that the terms "previously evaluated" and "Handbook 44 compliant ticket" are not clear and need further development. Another concern expressed by the Weighing Sector was that the proposed language in G-N.3. (a) could be interpreted to mean that all combinations of communication means between elements would have to be evaluated without adequate Handbook 44 standards and Publication 14 tests.

Other Weighing Sector members believed `there are no significant compatibility issues with weighing devices. Separable indicating and weighing/load receiving elements will either work correctly (if properly installed and configured) or not be operable. The NTEP director discussed the fact that NTEP does have an issue with the compatibility of separable indicating and weighing/load receiving elements, especially with vehicle scales with several load cells. OIML R76 evaluates the minimum voltage per scale verification division, which has not been adopted in Handbook 44 and Publication 14. The combination of separable indicating and weighing/load-receiving elements would not be a suitable combination if the signal from the weighing/load-receiving element were too small for the indicating element. The resultant combination will appear to perform correctly, however, it may no longer comply with influence factors and have a zone of uncertainty that would be too large to display a stable weight.

The Weighing Sector also stated that they do not fully understand liquid-measuring device technology compatibility issues (i.e., pulse counting compatibility, partially compatible digital communications, and applicable NTEP liquid-measuring device testing) to give additional input on the proposal.

Recommendation: The Sector believes that the proposal is not appropriate for weighing devices since the language could require all combinations of devices and communications be evaluated. The Weighing Sector agrees with the Measuring Sector that this is not the intent of the proposed language.

The Sector supports the joint meeting of the NTETC Weighing and Measuring Sector members who are attending the 2004 SWMA Technical Conference. If the Sectors agree on the issues and proposal, then the proposal can be placed in the General Code; otherwise, any proposals should remain in the specific codes. If there is no clear consensus of that meeting, the Measuring Sector could request a separate work group to develop a proposal to address the compatibility of multiple elements issue.

13. Handbook 44 Computing Scales Interfaced with an Electronic Cash Register

Source: NTEP Participating Laboratories

Background: Field inspectors have reported to one of the NTEP laboratories that they are finding computing scales interfaced with electronic cash registers (ECR) where an ECR will accept weighing results from the computing scale, use the ECR's price look-up (PLU) to retrieve tare and unit price information, and calculate the total price. The inspectors have reported that a different unit price, tare, and total price may already be entered and displayed on the computing scale. What the customer sees on the display of the computing scale (the net weight, unit price, and total price) may not be what the customer is actually charged and printed on the ECR receipt. The NTEP laboratories have reported that at least three companies have requested this method of operation for NTEP certification.

In one example, the scale manufacturer is marketing the computing scale as a point-of-sale scale for use with an ECR. The computing scale has push button tare, percent tare, PLUs, gross/net display, and memory recall. The company wants to amend its CC to allow the scale's use in general applications and for use with an ECR. The company notes that this is one of the most important selling features for its product line. It gives the operator the ability to quote the price of an item without having to "ring it up" on the ECR.

The operation is addressed in Sections 11.15. to 11.21. of the 2004 Publication 14 Electronic Cash Registers Interfaced with Scales (ECRS) checklist. If the ECR were setup to meet the requirements of those sections there wouldn't be a problem. The company does not want to burden the end user with using a compatible ECR designed to work with a computing scale. The company stated that the computing scale, interfaced with an ECR, is already approved by a weights and measures jurisdiction.

The NTEP laboratories believe NIST Handbook 44 needs clarification in this area and are proposing the following paragraph be added to the Scales Code to address those areas already noted in NCWM Publication 14:

S.1.8.5. Computing Scale Interfaced to a Cash Register. - A computing scale may interface with a cash register provided:

- (a) The cash register only records (serves as a printer) the information received from the scale.
- (b) The computing scale has tare capability.
- (c) The computing scale is not equipped with PLU capability.
- (d) The electronic cash register does not have any input to the computing scale in the process of determining the total price of a weighed item.

Discussion: The Sector reviewed the background information and proposed language for NIST Handbook 44. The Maryland participating laboratory added that in the example they encountered, a unit price that would be displayed on the scale would be different than the unit price associated with product look-up code in the electronic cash register. Tares can also be overridden. The device was subsequently submitted for NTEP evaluation and the identified problems were corrected. The participating laboratories believe there is no problem with the test performed in Publication 14; however, they stated that the field inspector does not have the information contained in Publication 14 and has not been trained to look for the problems identified in the background information.

Several Sector members stated that the Maryland field officials properly identified a problem with the agreement of indications, noted that the ECR and computing scale Certificates of Conformance did not list this combination of interfaces, and took appropriate corrective actions.

Recommendation: The Sector agreed not to recommend the proposed changes to NIST Handbook 44 since there are currently appropriate means in Handbook 44 (G-S.5. Indicating and Recording Elements and G-S.2. Facilitation of Fraud), and the examination procedure outlines address these issues during field evaluation.

14. Publication 14 Requirements for Computing Scales Interfaced with an Electronic Cash Register

Source: NTEP Participating Laboratories

Background: In addition to the background information in the above agenda item for computing scales interfaced with an electronic cash register (ECR), many computing scale manufacturers are not aware of the computing scale and ECR interface requirements in the ECRS checklist (electronic cash register interfaced with scales) in NCWM Publication 14. Also, there are no guidelines in the Digital Electronic Scales (DES) checklist to direct them to the appropriate language in the ECRS checklist.

The participating laboratories recommend that NCWM Publication 14 DES and ECRS be amended to:

- 1. Put a check box in the Publication 14 DES checklist that will state that the computing scale interfaced to an ECR meets the applicable requirements in the ECRS checklist, and
- 2. Add to the ECRS checklist: "If the scale has multiple sales accumulation capability, only weighed items are accumulated and the cash register only records the total accumulated price."

Discussion: The Sector discussed the proposal to amend Publication 14. The Sector agreed the addition to the DES checklist was appropriate. However, the Sector was concerned about the ability of a computing scale to have an operational accumulation capability while it was interfaced with an ECR because the receipt on an ECR itemizes purchases made by the customer, however the items that are accumulated on the computing scale would not be itemized in the ECR receipt.

Recommendation: The Sector recommends that Publication 14 DES checklist be amended as proposed by the NTEP laboratories and that the proposal to amend the ECRS checklist be amended to require the computing scale accumulation capability be disabled if it can be interfaced with an ECR ("<u>If the scale has multiple sales accumulation capability</u>, <u>only weighed items are accumulated and the cash register only records the total accumulated price, or the scale accumulation capability is disabled</u>".). The NIST technical advisor further recommended an editorial change to the ECRS checklist by renumbering paragraphs 11.15. through 11.21. to 11.15.1. through 11.5.7. to clarify the requirements are for computing scales interfaced with an ECR. The proposed recommendation to amend Publication 14 is in Appendix A, agenda Item 14.

15. Publication 14 - Computing Scale Section

Source: NTEP Participating Laboratories

Background: The Weighing Sector discussed a Maryland NTEP laboratory proposal to clarify display identification, label formatting, and the use of other features (pre-pack, POS application, etc.) The NTEP laboratories agreed the computing scale section of the DES checklist lacks clarity in these areas.

The Maryland NTEP laboratory drafted amendments to NCWM Publication 14 DES Section 27 that clarifies checklist requirements for price computing scales.

Discussion: The Sector agreed with the proposal from the Maryland NTEP laboratory and reviewed the examples of correct and incorrect labels for compliance with applicable sections of NIST Handbook 130 Uniform Packaging and Labeling Regulation, including the use of "unit price" on the printed labels. The Sector suggested that the proposal be amended to correct the examples of correct labels that do no have a kg, lb, or count associated with the unit prices and add an additional example where the term "unit price" is correctly used on a label.

Recommendation: The Sector recommends the proposal to amend Publication 14, Section 27, as modified by the Sector, be incorporated into Publication 14, as shown in Appendix A agenda Item 15.

NTEP - D22

16. Publication 14 - New Items in Computing Scale Section

Source: Maryland Participating Laboratory

Background: This item is related to the computing scale proposal in agenda Item 15 and was included in the original discussion at the NTEP laboratory meeting. The Maryland NTEP laboratory believed the computing scale section of the DES checklist lacked clarity in the areas of multiple uses of displays, position of displays, and the use of other features (e.g., pre-pack)

Generally, manufacturers use the "unit price" or a separate display for indicating non-metrological information (e.g., PLU codes). If non-metrological numerical values are placed in the "weight" display or in the "total price" display, they could be misleading and interpreted as valid weight.

The Maryland NTEP laboratory recommended the following additional language for NCWM Publication 14, Section 27-Price Computing Scales:

- 27.X. Dedicated displays (used only for the display of the specific information) are provided for the total price and the quantity information. (Values that could be interpreted as a weight shall not be displayed in the weight display window.)
- 27.X. The placement of displays shall be mathematically logical (net weight x unit price = total price) when reading from left to right (or top to bottom).



Yes No N/A

27.X. When a computing scale is setup in a mode for indirect sales to the customer, information that would not be available in the direct sales mode is not displayed on the customer side.

The following areas of R76-Non-automatic Weighing Instruments were used in developing the additional requirements.

OIML R76 states:

4.4.4. Multiple use of indicating devices

Indications other than primary indications may be displayed in the indicating device, provided that,

- the appropriate unit of measurement, or symbol thereof, or a special sign identifies quantities other than weight values,
- weight values that are not weighing results shall be clearly identified, or they may be displayed only temporarily on manual command and shall not be printed.

No restrictions apply if the weighing mode is made inoperative by a special command.

4.15.4. Special applications of a price-computing instrument

Only if all transactions performed by the instrument or by connected peripherals are printed on a ticket or label intended for the customer, a price-computing instrument may perform additional functions that facilitate trade and management. These functions shall not lead to confusion about the results of weighing and price computing.

Other operations or indications not covered by the following provisions may be performed, provided that no indication that could possibly be misunderstood as a primary indication is presented to the customer.

Discussion: The Maryland NTEP laboratory reported on a computing scale (see picture below) that used the "Total Price" display to indicate the product code prior to a load placed on the scale and a calculation of total price. If the product code was indicated in the "Total Price" display while a load was already on the scale, a customer may believe that the product code number is the total price to pay.



Many of the sector members did not believe the example provided by the Maryland laboratory was a problem since the product code did not use a decimal point similar to a representation of money.

Recommendation: The Sector believed the example provided by the Maryland NTEP laboratory did not demonstrate a problem. It also believed the proposed language could cause additional confusion. The submitter agreed to develop language to further its case and submit such to the Sector for discussion and ballot approval. If no consensus can be reached on the ballot, the item will be carried over to the next meeting of the Weighing Sector.

17. Handbook 44 - Location of Marking for "Capacity x d" on Scales

Source: NTEP Participating Laboratories

Background: NIST Handbook 44, Scales Code, Table S.6.3.b., Note 3 states:

The nominal capacity and the value of the scale division shall be shown together (e.g., $50\ 000\ x\ 5\ kg$, $100\ 000\ x$ 10 lb, $15\ x\ 0.005\ kg$, or $30\ x\ 0.01$ lb) adjacent to the weight display when the nominal capacity and the value of the scale division are not readily apparent. Each scale division value or weight unit shall be marked on multiple range or multiple-interval scales.

There have been discussions with the NTEP labs on their interpretation of the location requirement for marking "capacity x d." Specifically, what is meant by the term "adjacent"? This item has been addressed several times in the past and the Weighing Sector and NCWM Executive Committee have been unable to develop a solution. The June 1990 NTETC Weighing Sector Report stated:

"The Committee was unable to be more definitive and maintained its opinion that the NTEP Laboratory's judgment remains the best solution. In cases of extreme disagreement, the appeal process (to the Board of Governors) is the avenue to resolve."

Attempts to interpret this requirement continue to cause conflict between NTEP labs and manufacturers. The NTEP labs maintain that the marking shall be next to the weight display on the face of a scale, but devices are being submitted with the marking located elsewhere on the face of the scale. (See the following examples.)

Example 1 - Correct



Example 2 - Incorrect



NOTE: By amending Handbook 44 as proposed, both examples would be acceptable.

The NTEP laboratories agree with the following premises:

- Example 2 is incorrect according to Handbook 44 because the marking does not appear *adjacent* to the weight display (*Tech Advisor comment: Additionally, the markings are not placed as close as practical to the weight indication as required in G-S.5.2.4. Values*).
- The operator is familiar with the device and does not rely heavily on the location of the marking for capacity x division.
- The customer rarely understands the marking or its significance.
- The marking in both examples is conspicuous enough for the inspector and service technician who rely most heavily on the information.
- Both examples in the attachment would be acceptable if the requirement could be amended to allow for the marking to simply be placed conspicuously on the face of the indicating portion of the scale. (*Tech advisor comment: The current Scales Code requirements are not in conflict with the General Code paragraph G-S.5.2.4. Values, however, the proposal submitted by the NTEP laboratories does create a conflict since the markings may not be placed as close as practical to the indications.*)

NCWM Publication 14 DES Section 2.13. states:

2.13. The nominal capacity by minimum scale division shall be clearly and conspicuously marked adjacent to the weight display. (Acceptable location depends on conspicuousness.)

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This statement implies, and the NTEP laboratories concur, that "conspicuousness" should be the primary concern, not "adjacent." But until "adjacent" is removed from the requirement, NTEP is tied to that portion of the requirement as well.

The NIST technical advisor also included language in OIML R76 for Non-automatic Weighing Instruments paragraph 7.1.4 Presentation of descriptive markings. The NIST technical advisor believes the recommendations in R76 satisfy the intent of the participating laboratories' recommendations and does not require a third definition of "face" in NIST Handbook 44, Appendix D, as follows:

7.1.4. Presentation of descriptive markings

The descriptive markings shall be indelible and of a size, shape and clarity allowing easy reading. They shall be grouped together in a clearly visible place either on a descriptive plate fixed to an instrument or on a part of the instrument itself.

The markings:

Max ...

Min ...

e ...

and d if d does not equal e

shall also be shown near the display of the result if they are not already located there (*Tech advisor note: The markings may need to be repeated near the result if they are on a plate or location that is not near the weight display, or if the markings are on separable elements*). It shall be possible to seal the plate bearing the descriptive markings unless its removal will result in its destruction. If the data plate is sealed, it shall be possible to apply a control mark to it.

The participating laboratories asked the Nebraska NTEP laboratory to develop a proposal to amend Scales Code Table S.6.3.b., Note 3 and add a new definition of "face" based upon discussions of this item during the 2004 meeting of the NTEP laboratories.

Discussion/Recommendation: The Weighing Sector reviewed the background information and the proposed amendments to Handbook 44 from the NTEP laboratories and the NIST technical advisor. The Sector agreed to forward to the regional and NCWM S&T Committees the following amended recommendation:

The nominal capacity and value of the scale division shall be shown together (e.g., $50\ 000\ x\ 5\ kg$, $100\ 000\ x$ $10\ lb$, $15\ x\ 0.005\ k$, or $30\ x\ 0.01\ lb$) adjacent to the weight display in a clear and conspicuous manner and be readily apparent when viewing the reading face of the scale indicator unless when the nominal capacity and the value of the scale division are not immediately it is <u>already</u> apparent <u>by the design of the device</u>. Each scale division value or weight unit shall be marked on multiple range or multi-interval scales. [Nonretroactive as of January 1, 1983] (Amended January 1, 200X)

18. CLC Type Evaluation Tests on Railway Track/Vehicle Scales – Technical Policy

Source: Brechbuhler Scales Inc.

Background: During the 1998 NTETC Weighing Sector meeting, the Sector agreed the GIPSA (Grain Inspection Packers and Stockyards Administration) test car may be used to satisfy testing requirements for CLC and section capacity. However, there was no recommendation regarding the addition of vehicle weighing applications for existing Certificates of Conformance (CC) that were certified for only railway track applications. Brechbuhler Scales believes that vehicle weighing applications (e = 20 lb) can be added on a railway track scale NTEP CC without additional testing, and that the CLC rating can be established based upon previous section tests using the GIPSA test car (or other railroad test cars and additional test weights used for the evaluation). Brechbuhler Scales states that there is no benefit for performing additional CLC tests to include the vehicle weighing application to an existing railway track scale CC.

It should be noted that existing NTEP technical policy A. Models to be submitted for Evaluation, paragraph 8(a) Weighing Systems, Scales or Weighing/Load-receiving Elements Greater than 30 000 lb Capacity states that the scale division **e** will be limited to the value of **e** that was originally evaluated and listed on the CC.

Brechbuhler Scales requested that vehicle weighing applications (e = 20 lb) be added to existing railway track scale CCs (e = 50 lb) that have been designed to Cooper E-80 standards and tested using the GISPA test car (or other railroad test cars and additional test weights).

Discussion: The Sector reviewed the background information and discussed amending the appropriate NTEP Technical Policy. Brechbuhler Scales also provided additional history of the item. The railroad track scale in question was originally submitted as a combination vehicle/railroad track scale. However, the user changed the application such that vehicles could not drive onto the scale, therefore, the device was evaluated and a Certificate of Conformance was issued for railroad track applications only. On a later installation, a CLC test was performed. Brechbuhler Scales questions the value of the additional evaluation.

Some of the Sector members support additional testing to verify that a railroad track scale can accurately weigh at lower capacities used by highway vehicles. They report frequent problems when the scale is calibrated for railroad use and is inaccurate for vehicle weighing. Additionally, the traffic patterns are different between highway vehicles and railroad cars. Highway vehicles frequently travel along the side of the scale where railroad cars travel on the rails, which are typically located on the main girders of the weighbridge. These Sector members believed that a scale designed for railroad cars might not have been designed to adequately support highway vehicles along the sides of the scale.

The manufacturers stated that the calibration problems encountered during verifications are the result of improper use and maintenance of railway track scales.

Other Sector members believe that CLC testing can be eliminated on combination vehicle/railroad track scales because of the amount of weights placed on the scale. Dave Quinn reported that he is working on a white paper that will help clarify the CLC issue.

Recommendation: The Weighing Sector did not reach a consensus on this item. Brechbuhler Scales stated that they would develop and submit a proposal for testing for railroad track scales that will include procedures to include highway vehicle applications.

This item will be carried over to the 2005 meeting of the Weighing Sector.

19. Display of a Negative Balance Condition and Required Markings

Source: NTEP Participating Laboratories

Background: One of the NTEP laboratories has reported that it has seen not-built-for-purpose primary weight displays in which blanking the weight display is used to indicate a behind zero condition. The problem occurs when all of the required G-S.1. Identification markings also blank. The scale is in an error condition, is still functioning in a normal operational mode as it was designed to operate (display an error code within specific parameters), and is not in a screen saver or sleep mode. Blanking the required markings is not necessary and would give the false impression that the weight display feature is not enabled. Primary indications must be clear and definite. G.S.1. information must be permanently marked.

The laboratories recommended adding the following statement to the end of Publication 14, Digital Electronic Scales, Section 18.2 –Blanking the Display:

When blanking a primary weight display with live on screen G-S.1. and/or S.6.3. markings, the required markings must not blank.

The laboratories also recommended:

- adding language to Section 5- Identification in the ECRS checklist Section 18. Zero Indication;
- similar wording be added to Section 5 of the ECRS checklist;

• group existing paragraphs 5.6. thru 5.9. under a new Section 5.7. to clarify that paragraphs above the phrase "For not-built-for-purpose, software-based devices, the following shall apply:" may be applicable to all ECRs (including not-built-for-purpose, software-based devices).

Discussion/Recommendation: The Weighing Sector reviewed and discussed the proposed changes to Publication 14. A question was asked if the use of "pop-up" displays or menus that temporarily blocked the required information was a problem. The Sector agreed there should be no issues with the "pop-up" feature since this is a temporary condition during normal operation; a transaction cannot be conducted while the temporary feature is operational, and the customer is able to review the entire transaction (zero-load, weight, and price calculations if applicable).

The Sector agreed to recommend that the proposed language, as shown in Appendix A - Agenda Item 19, be added to NCWM Publication 14.

20. Dropping the 4th Step in Class III and IIII Tolerances

Source: NIST Technical Advisor

Background: During the August 2003 meeting of the U.S. National Work Group (USNWG) for R76 Non-Automatic Weighing Instruments, the group discussed the difference in the tolerance for Class III and IIII weighing instruments. The USNWG confirmed that the original intent of the step tolerances was to provide a relationship between scale accuracy and resolution. They further recommended that Handbook 44 Class III and Class IIII tolerances be aligned with OIML R76. The manufacturers present during the meeting reported that they essentially build identically performing instruments and load cells for both national and international markets. Additional background information is presented in Appendix A.

Since the August 2004 meeting Nigel Mills and Gary Lameris of the Hobart Corporation provided the following additional "production data" comparing the different Class III tolerances:





The charts indicate that the above production scales would comply with Handbook 44 linearity tolerances up to 10 000 e and OIML R76 tolerances up to approximately 7000 e. Hobart Corporation also reported` that many scales and load cells would have difficulty complying with the temperature effect on zero with an n_{max} greater than 5000 e in both Handbook 44 and OIML R76.

The Sector was requested to review the background information and discuss submitting the following proposal to amend Scales Code Table 6 Maintenance Tolerances as follows:

Table 6. Maintenance Tolerances (All values in this table are in <u>verification</u> scale divisions <u>e</u>)						
Tolerance in <u>verification</u> scale divisions <u>e</u>						
	1 2 3 5			5		
Class		Test Load				
Ι	0 - 50 000	50 001 -	200 000	200 001 +		
Π	0 - 5 000	5 001 -	20 000	20 001 +		
III	0 - 500	501 -	2 000	2 001 <u>+</u> -	4 000	4 001 +
IIII	0 - 50	51 -	200	201 <u>+</u> -	400	401 +
III L	0 - 500	501 -	1 000	(Add 1d for each ac	lditional 500 d	l or fraction thereof)

The NIST technical advisor requested that the Sector discuss Accuracy Class III L and offer a technical justification to retain the Handbook 44 Class III L tolerance and propose a similar tolerance be incorporated in OIML R76 or recommend that Class III L be removed from Handbook 44, and if so, should it e non-retroactive? The Class III L tolerance structure in Handbook 44 deviates from the intent step tolerances since there is little relation of the value of the scale division (e.g., e = 20 lb resolution) to the accuracy required (i.e., ± 8 e at 80 000 lb maintenance tolerance). The tolerance values, zero-tracking limit and motion detection requirements in Handbook 44 are roughly equivalent to an R76 instrument when e = 50 lb.

Discussion/Recommendation: The Weighing Sector withdrew this item from its agenda since the proposal did not relate to problems encountered with Publication 14 type evaluation procedures. The Sector recommended that the proposal submitted by NIST and the U.S. National Work Group be made an information/developmental item if it were submitted to the regional weights and measures associations and the NCWM S&T Committee.

Members of the Weighing Sector offered the following comments:

The elimination of the fourth step in Class III weighing devices may encourage the increased usage of multiple range scales. This by itself is desirable, however, NTEP should consider manufacturers' concerns with existing Publication 14 interpretations of Handbook 44 that require the range or interval in use be adequately identified. A problem arises when the change in minimum interval does not change the number of significant digits in the display (frequently used to adequately define which range is in use).

Additionally, the proposal may have an impact on Class III separable weighing/load-receiving elements and load cells and the maximum permissible errors allowed during type evaluation since the apportionment of errors in Handbook 44 is different than OIML R76 and R60.

There was no time available at the end of the meeting to discuss Class III L scales and load cells.

21. Cash Acceptors or Card-activated Systems

Source: NTEP Participating Laboratories

Background: During the 2001 Weighing Sector Meeting, the cash/coin acceptor capability for self-service ECR-POS systems was discussed.

The Sector concluded that the participating labs would use the draft procedure on a one-year trial basis and report back to the NIST technical advisor with their comments. Additionally, the NIST technical advisor would attempt to contact the affected manufacturers of self-service checkout systems interfaced with scales for their comments on the proposed checklist addition.

The NTEP laboratories reported no problems with the draft procedures and agreed to forward them to the Weighing Sector for review and comment. The Sector should also consider if the draft procedures are needed or suitable for Digital Electronic Scales checklist. The NIST technical advisor was requested to send the draft procedures to CC holders of self-checkout POS systems. Unfortunately, this has not been done yet.

Discussion/Recommendation: The Sector agreed to recommend the procedures, as shown in Appendix A, agenda Item 21, be added to Publication 14 ECRS.

22. Tare on a Multiple Range Scales

Source: NTEP Participating Laboratories:

Background: NCWM Publication 14, Section 33 is not clear on what is expected of tare on a multiple range scale when switching from a lower weighing range to a higher weighing range. Section 33 states: "On a multiple range instrument, a tare value may only be transferred from one weighing range to another one with a larger verification scale interval but shall then be rounded in the upward direction to the latter verification interval." It is not clear if this means the tare must always be rounded to a higher value, or if tare can be rounded to the resolution of the higher range.

During the 2004 NTEP Laboratory meeting in Ottawa Canada, there was discussion about the rounding of tare to zero when the tare value was less than 0.5 e. The Ohio NTEP laboratory believes that rounding of tare should follow normal rounding rules, except that the scale can never round tare to zero and maintain the scale in Net mode, indicating that zero Tare is entered. Don Onwiler, Nebraska, stated that Nebraska's policy is to consider tare less than 0.5 e to be a product without tare material. Canada allows tare to round to the nearest division, including zero. The labs (except NE) agreed to submit the Ohio proposal as amended by the NTEP labs to the Sector with changes noted during the discussion. The tare value can round down to the nearest scale division except when the nearest scale division is zero. Then tare has to round up.

The NTEP laboratories submitted the following amendments to NCWM Publication 14 as indicated in the highlighted text.

33. Multiple Range Scales

A multiple range scale is an instrument having two or more weighing ranges with different maximum capacities and different scale intervals for the same load receptor, each range extending from zero to its maximum capacity. The weighing ranges may be either manually or automatically selected. Each weighing range is considered to be an individual scale and evaluated accordingly.

The capacity and verification scale division must be conspicuously marked near the weight display. The range in use must be clearly indicated. If a scale has a decimal point and a different number of decimal places in each weighing range, the position of the decimal point and the number of digits following is an adequate definition of the weighing range in use. If the weighing ranges do not utilize a decimal point and differing numbers of decimal places (e.g., scale divisions are 20 lb, 50 lb, and 100 lb), another method such as an external range indicator must be provided to indicate the weighing range in use.

Whenever gross and tare weights fall in different weighing ranges so that the scale divisions for the gross and tare weights differ, the net weight must agree mathematically with the gross and tare weights that are indicated or recorded (i.e., net = gross - tare).

On a multiple range instrument, a tare value may only be transferred from one weighing range to another with a larger verification scale interval. When transferring a tare value from a lower range to a higher range, the tare value should be rounded appropriately to the latter verification interval with care taken to prevent a zero tare value. but shall then be rounded in the upward direction to the latter verification interval.

Examples: (Assuming an interval value for range 1 is 2 lbs and an interval value for range 2 is 5 lbs.)

- Tare value entered in range 1 is 8 lbs when switching to range 2, the tare value would become 10 lbs.
- Tare value entered in range 1 is 6 lbs when switching to range 2, the tare value would become 5 lbs.
- Tare value entered in range 1 is 2 lbs when switching to range 2, the tare value would become 5 lbs or the tare value may be cleared and the scale returned to the gross mode. (Strikeout was suggested at the spring meeting of the NTEP labs)
- In examples 1 and 2 above, the tare value is rounded appropriately to realize the smallest error introduced by rounding. In example 3, appropriate rounding could create a zero tare condition. In this example, the tare value would be rounded up or cleared. (Strikeout was suggested at the spring meeting of the NTEP labs)

33.1.	The range in use sl	hall be conspicuously indicated.	Yes 🗌 No 🗌 N/A
33.2.	Ranges may be cha		
	33.2.1. Manually	33.2.1. Manually	
	33.2.1.1.	from a smaller to greater range at any load.	Yes 🗌 No 🗌 N/A
	33.2.1.2.	from a greater to a smaller weighing range when there is no load on the load receptor and the indication is zero or at a negative net value; the tare operation shall either be canceled or revert to the original value and zero shall be set, both automatically.	Yes 🗌 No 🗌 N/A
	33.2.2. Automatically		
	33.2.2.1.	from a smaller to the following greater weighing range when the load exceeds the maximum gross weight of the range being operative.	Yes 🗌 No 🗌 N/A
	33.2.2.2.	only from a greater to the smallest weighing range when there is no load on the load receptor and the indication is zero or at a negative net value; the tare operation shall either be canceled or revert to the original value and zero shall be set, both automatically.	Yes 🗌 No 🗌 N/A

following 5 minutes.

33.3.	Devices with a tare capability must indicate and record values that satisfy the equation:	Yes 🗌 No 🗌 N/A
	net = gross - tare. and When automatically changing to a higher range from a lower	
	range, the round the tare value shall be rounded up to the appropriate verification	
	interval for the higher range. Care shall be taken to prevent a zero tare value. larger	
	division size when entering the targer division. Example, 2 g changes to 5 g not 0 g.	
33.4.	Keyboard tare entries must be consistent with the displayed scale division.	Yes 🗌 No 🗌 N/A
33.5.	For manual multiple range scales, the maximum weight value indicated in each range must not exceed:	
	33.5.1. 105 % of the rated capacity for the weighing range, or	Yes 🗌 No 🗌 N/A
	33.5.2. maximum capacity plus 9 d.	Yes 🗌 No 🗌 N/A
33.6.	For all weighing ranges, e must equal d.	Yes 🗌 No 🗌 N/A
33.7.	On a multiple range instrument, the deviation on returning to zero from Max shall not exceed 0.5 e. Furthermore, for automatic range changing devices, after returning to zero from any load greater than Max and immediately after switching to the lowest	Yes 🗌 No 🗌 N/A

Discussion: Several Weighing Sector members stated that forcing a user to round tare up forces them to give away product. Other Sector members responded that they tell the users that items are to be sold on the basis of net weight, customers are not expected to pay for the package material (tare), and that costs associated with tare are part of the cost associated with doing business. Therefore, the unit price of the commodity should be adjusted accordingly. Another Sector member reported that actual quantities of products and tare often fall more or less randomly between indicated amounts and rounding to the nearer value and should balance out over a number of transactions.

weighing range, the indication near zero shall not vary by more than e during the

It was also reported that Publication 14 allows for tare to be rounded to the nearest scale division for single range scales (DES 2004 paragraph 47.2.2.), but forces tare to be rounded to the next higher division for multiple range scales (DES 2004 paragraph 32.3.). Members of the Sector questioned why the rounding of tare is treated differently between the two types of scales and whether or not Handbook 44 supports the Publication 14 requirements in paragraph 32.3.

Some of the manufacturers stated that they recommend to their customers with pre-packaging scales that they round tare up to the next higher division to reduce the possibility of packages being rejected by weights and measures officials.

Recommendation: The Sector did not reach consensus on this item. This issue will be carried over to the next meetings of the NTEP laboratories and NTETC Weighing Sector.

23. Performance and Permanence Tests for Railway Track Scales Used to Weigh Statically

Source: NTEP Participating Laboratories

Background: The 2004 edition of NCWM Publication 14 states the following:

- 68. Performance and Permanence Tests for Railway Track Scales Used to Weigh Statically
- 68.7. Permanence Test

The permanence test shall be conducted from 20 to 30 days after successful completion of the initial performance test. It is recommended that the performance tests described above be repeated. However, if the original test car is not available, the test may be conducted to the extent possible with at least two railroad test weight cars. The results of this test must be within acceptance tolerance¹³. If the device does not meet these tolerance limits, the entire test must be repeated.

(footnote 13) If the subsequent performance test cannot be completed within 30 days because of the unavailability of test cars, maintenance tolerance will be applied.

The NTEP laboratories agreed the wording for this and all permanence testing should be changed to say a "minimum of 20 days" (not stating a maximum). Additionally, Footnote 13 should be removed and acceptance tolerances should be applied for all type evaluation testing, except where absolute values are to be used.

Discussion: The Weighing Sector reviewed the summary of the June 1992 meeting of the NTETC Weighing Sector that addressed the permanence test for railway track scales. The Sector recognized the language in Publication 14, Section 68, footnote 13 is not supported by Handbook 44 paragraph G-T.1. Acceptance Tolerances. However, manufacturers are concerned with eliminating the footnote since it is difficult to perform the subsequent permanence test within the 20-to 30-day time period. They are also concerned that the use (abuse) of these scales makes it difficult for them to maintain acceptance tolerances for periods significantly beyond the 30 days. Additionally, it is costly for the NTEP applicant if the scale fails the permanence test and they have to discontinue the evaluation until a GISPA type test car can return to the site or if they have to pay the railroads to deliver two railroad test cars to the test site.

Recommendation: The Sector agreed to recommend the requirement that the subsequent permanence test be "conducted 20 to 30 days after the successful completion of the initial permanence test" be changed to "after a minimum of 20 days...."

However, there was no consensus or recommendation for the minimum number of weighments between tests or the deletion of footnote 13.

The NIST technical advisor and Ed Luthy (Brechbuhler Scales) volunteered to submit this issue to the railroads during the October 2004 meeting of AREMA Committee 34-Scales (American Railway Engineering and Maintenance of Way Association).

This item will be carried over for the 2005 meeting of the NTETC Weighing Sector.

24. Next Sector Meeting

Discussion/Recommendation: The normal rotation of laboratories for the next Weighing Sector meeting is at the Ohio NTEP participating laboratory. However, the Sector recommends that the meeting be held in conjunction with the Western Weights and Measures Association regional meeting which will be held in Phoenix, AZ, in September 2005.
Appendix A - Recommendations for Amendments to Publication 14

Agenda Item 1 (a)

17. Manual Weights

Code References: G-S.2. and S.1.12

The following requirements apply to scales being used for din	rect sales to the customer, unattended scales, or customer-
operated scales and scales used in weighmaster applications.	These requirements do not apply to scales and weighing
systems used to generate labels for standard net content packa	ges.

- 17.1. Manual entries of gross or net weights are permitted when being used for direct sales Yes No N/A for use in the following applications only:
 - \Box (1)POS systems interfaced with a scale when giving credit for a weighed item;
 - (2) when generating labels for standard weight packages;
 - (3) postal and package shipping scales when generating manifests for pick-up at a later time; and-
 - (4) on livestock scales and vehicle scales to correct erroneous tickets; and
 - □ (5) when an item is pre-weighed on a legal-for-trade scale and marked with the correct net weight.
- 17.2. The scale <u>shall</u> must be at gross-load or net zero and the scale indication <u>shall</u> must Yes No N/A be at zero in the gross weight display mode before manual weight entries are permitted (except for scales being used not-for-direct sales to the customer) and;
- 17.3. Recorded weight values shall be identified as MAN WT, MANUAL WT, MAN Yes No N/A WEIGHT, or similar statement. Recorded manual gross or net weight values must be adequately defined so it is clear that the gross weight values are manual gross or net weight entries. Recorded weight values must be identified as MAN WT, MANUAL WT, MAN WEIGHT, or similar statement.

The use of a symbol to identify multiple manual weight entries is permitted, provided the symbol is defined on the same page on which the manual weight entries appear and the definition of the symbol is automatically printed by the recording element as part of the document.

17.4.	Scales that can be used for both direct and indirect scales to the customer by the use	Yes 🗌 No 🗌 N/A 🗌
	of an external button or switch to issue prepack random weights or standard pack	
	labels, the manual weight capability shall only be operable in the prepack and unit	
	price) or similar modes of operation that retain tare (and unit price) information for	
	labeling multiple packages.	

- 17.5. Manual tare entries shall not interact with a feature that compares one weight value to Yes \square No \square N/A \square another to identify the larger weight as the gross weight.
- 17.6 Manual tickets may be entered from scales that are not interfaced (physically Yes □ No □ N/A □ connected) to the system provided it is clearly stated on the ticket.
 NOTE: The use of a "hot key" or other means to selectively interrupt communication with the scale is not permitted.

<u>17.7.</u>	In the normal weighing mode, when scale to computer communications exists, manual gross and net weights cannot be entered for a new (not voided) ticket. Manual gross and tare weights can be entered for new tickets if scale communication is lost. Scales reading errors such as motion, below zero, over capacity, or wrong display units are not considered a loss of communication with the scale. A conspicuous message must be printed on the ticket that this is a manually generated weigh-ticket.	Yes 🗌 No 🗍 N/A 🗌
Agend	a Item 1 (b)	
<u>2.21.</u>	The section capacity of a railway track and livestock scale-indicating element shall be marked on or adjacent to the identification badge on the indicating element. The section capacity shall be prefaced by the words "Section Capacity" or an abbreviation of that term. Abbreviations shall be "Sec Cap" or "Sec C." All capital letters and periods may be used.	Yes No N/A
<u>5.1.</u>	The section capacity of a railway track and livestock scale shall be marked on or adjacent to the identification badge on the indicating element. The section capacity shall be prefaced by the words "Section Capacity" or an abbreviation of that term. Abbreviations shall be "Sec Cap" or "Sec C." All capital letters and periods may be used.	<u>Yes No N/A </u>
5.4.	Combination vehicle/railway track and combination vehicle/livestock scales shall be marked with (1) the nominal capacity and CLC for vehicle weighing, and (2) the nominal capacity and section capacity for railway and livestock weighing. The e_{min} for both vehicle weighing, and railway, and livestock weighing shall also be marked.	Yes 🗌 No 🗌 N/A 🗌
	NOTE: Combination scales (vehicle/railway track and vehicle/livestock) shall be	

NOTE: Combination scales (vehicle/railway track and vehicl<u>e/livestock</u>) shall be marked with all required information.

75. List of Acceptable Abbreviations/Symbols

Weighing and Indicating Elements:	Accuracy Class	I, II, III, III L, IIII Or <u>or</u> Symbols enclosed in an ellipse such as: D	l, ll, lll, lll L, llll, 1, 2, 3, 3 L, 4
	maximum number of scale divisions	n _{max}	
	Section Capacity	Sec C or Sec Cap	

Agenda Item 1 (d)

43. Discrimination and Zone of Uncertainty

Code Reference: <u>T.N.7.1 and</u> T.N.7.2.

The zone of uncertainty <u>for digital indications</u> must be ≤ 0.3 d. This test shall be conducted under controlled conditions in which environmental factors are reduced to the extent that they will not affect the results obtained.

- 43.1. Zone of Uncertainty Test <u>for digital indications</u>: Record the width of the zone of uncertainty as a decimal fraction of a scale division.
 - 43.1.1. Near Zero.

AVOIRDUPOIS_____d METRIC _____d OTHER UNITS (Identify units_____) _____d

43.1.2. Near Capacity.

AVOIRDUPOIS_____d METRIC _____d OTHER UNITS (Identify units_____) _____d

- <u>43.2.</u> <u>Discrimination Test.</u> The following tests shall be performed within 10 e of zero and at the maximum test load.</u>
 - 43.2.1. Digital Indications Decreasing-load Test

Gently place the error weights in 1/10 e increments until the indication (I) increases by 1 displayed division (I + 1). Gently remove a test load equivalent to 1.4 e. This shall cause a decrease in the indicated or recorded value of 2 e.

<u>43.2.1.1.</u> At or near zero (zero plus 10 e)

43.2.1.2. At maximum test load.

43.2.2 Digital Indications –Increasing-load Test

Place error weights on the load receptor at least 10 times 1/10 e. Gently remove the error weights in 1/10 e increments until the indication (I) decreases by 1 displayed division (I-1). Gently add a test load equivalent to 1.4 e. This shall cause an increase in the indicated or recorded value of 2 e.

43.2.2.1. At or near zero (zero plus 10 e)

43.2.2.2. At maximum test load.

43.2.3. Automatic Analog Indications

A test load equivalent to 1.4 e placed gently on or removed from the load receptor while the instrument is at equilibrium shall cause the change in equilibrium in the indication of at least 1.0 e.

<u>43.2.3.1.</u> <u>At or near zero</u>

43.2.3.2. At maximum test load.

Yes	No 🗌	N/A
Yes	No 🗌	N/A

Yes	No] N/A 🗌
Yes	No] N/A 🗌

Yes	No 🗌	N/A
Yes	No	N/A

63.4. Subsequent Type Evaluation (Field) Permanence Test (Applicable for instruments above 2000 lb capacity, or instruments, because of their size, that can not be accommodated by the laboratory.)

A minimum of two increasing-load, two decreasing-load, and two shift (or a combination of shift and corner) tests, are to be conducted after a minimum of 20 days after the initial tests. The scales are to be tested to capacity using certified



Yes No N/A

tests weights. If the test results are at or near acceptance tolerance limits, at least one more set of tests should be conducted immediately to verify the test results and determine device repeatability. If scale repeatability is not good (e.g., > 0.5d), conduct additional tests.

Repeat width-of-zero, zone of uncertainty, sensitivity, and discrimination tests near zero (outside the range of the <u>AZSM</u>) and at or near capacity on the subsequent tests.

69.1.1. Discrimination test at zero-load or near zero outside the range of the AZSM, and at scale capacity or the maximum test load, whichever is less.

69.4.1. Discrimination test at zero-load or near zero outside the range of the AZSM, and at scale capacity or the maximum test load, whichever is less.

Agenda Item 1 (e)

50. Performance and Permanence Tests for Counter (Bench) Scales (Including Computing Scales)

50.1. Increasing Load Test

Because of the ease of testing computing scales, it is recommended that the increasing load test for computing scales (approximately 30 lb capacity) consist of loads of 0.05, 0.45, and 0.95 lb, at 1 lb intervals thereafter to one-half capacity, and at 2 lb intervals from one-half capacity to capacity. Larger capacity scales should be tested at 1 lb intervals to 5 lb and in convenient steps to capacity, with a minimum of eight additional test loads. These are minimum tests.

50.2. Decreasing Load Test

The minimum decreasing load test is at a test load of one-half capacity after the scale has been loaded to capacity.

50.3. Shift Test

Test with test loads equal to one half capacity as specified in N.1.3.1. and at test positions as illustrated below:

Bench or Counter Scales



Other Small Platform Scales



50.1. Performance Test (Weigh-Labelers)

Note:

- If the device is designed for use in static (non-automatic) weighing, it shall be tested statically using mass standards.

- If the device is designed for only automatic (dynamic or static) weighing, it shall only be tested in the automatic mode of operation.

50.1.1. Non-automatic (Static) Tests.

50.1.1.1 **Increasing-Load Test.** - The increasing-load test shall be conducted with the test loads approximately centered on the load-receiving element of the scale.

50.1.1.2. **Decreasing-Load Test.** - The decreasing-load test shall be conducted with the test loads approximately centered on the load-receiving element of the scale.

50.1.1.3. Shift Test. - To determine the effect of off-center loading, a test load equal to one-half ($\frac{1}{2}$) maximum capacity shall be placed in the center of each of the four points equidistant between the center and front, left, back, and right edges of the load receiver.



50.1.1.2. **Discrimination Test.** - A discrimination test shall be conducted with the weighing device in equilibrium at zero load and at maximum test load, and under controlled conditions in which environmental factors are reduced to the extent that they will not affect the results obtained. This test is conducted from just below the lower edge of the zone of uncertainty for increasing-load tests, or from just above the upper edge of the zone of uncertainty for decreasing-load tests.

50.1.1.5. **Zero-Load Balance Change.** - A zero-load balance change test shall be conducted on all automaticweighing systems after the removal of any test load. The zero-load balance should not change by more than the minimum tolerance applicable. (Also see G-UR.4.2.)

50.1.1.6. **Influence Factor Testing. -** Influence factor testing shall be conducted.

50.1.2. Automatic (dynamic or static) Tests. - The device shall be tested at the highest speed for each weight range using standardized test pucks or packages. Test runs shall be conducted using four test loads as described in Table N.3.2. Each test load shall be run a minimum of 10 consecutive times.

Table N.3.2. Test Loads
At or near minimum capacity
At or near maximum capacity
At two (2) critical points between minimum and maximum capacity
Test may be conducted at other loads if the device is intended for use at other specific capacities

50.1.2.1 Shift Test. - To determine the effect of eccentric loading, for devices without a means to align packages, a test load equal to one-third (1/3) maximum capacity shall be passed over the load receiver or transport belt (1) halfway between the center and front edge, and (2) halfway between the center and back edge.



50.2. Performance Test (Automatic Checkweighers)

50.2.1. Non-automatic (static) Tests. - If the scale is designed to operate statically during normal user operation, it shall be tested statically using the applicable weigh-labeler requirements.

50.2.2. Automatic (dynamic or static) Tests. - The device shall be tested at the highest speed in each weight range using standardized test pucks or packages. Test runs shall be conducted using four test loads. The number of consecutive test weighments shall be as described in Table N.4.2.

Table N.4.2. Number of Sample Weights per Test for Automatic Checkweighers			
<u>Weighing Range</u> <u>m = mass of test load</u>	Number of sample weights per test		
<u>20 divisions < m < 10 kg</u> <u>20 divisions < m < 22 lb</u>	<u>60</u>		
$\frac{10 \text{ kg } < m < 25 \text{ kg}}{22 \text{ lb } < m < 55 \text{ lb}}$	<u>32</u>		
$\frac{25 \text{ kg} < m < 100 \text{ kg}}{55 \text{ lb} < m < 220 \text{ lb}}$	<u>20</u>		
<u>100 kg (220 lb) < m</u>	<u>10</u>		

50.32. Out-of-Level Tests for Weigh-labelers and Checkweighers (If Applicable)

If the scale is not equipped with a level-indicating means, it must be tested in an out-of-level condition to determine compliance with paragraph S.4. Leveling-Indicating Means.

- 50.32.1. Place one side of the scale three degrees (or 5 %) out-of-level with respect to the width axis of the scale. The scale should then be zeroed. Conduct a shift test¹ and increasing and decreasing load tests.
- 50.<u>32</u>.2. Place the opposite side or the scale out-of-level, zero the scale, and repeat tests.
- 50.<u>3</u>2.3. Place the front of the scale three degrees (or 5 %) out-of-level with respect to the length axis of the scale. Zero the scale and conduct the shift, increasing and decreasing load tests.
- 50.<u>32</u>.4. Place back of scale out-of-level, zero the scale, and repeat tests. All test results must be within acceptance tolerances. If the scale fails any of these tests, a level-indicating means is needed.

¹ The shift test is usually conducted first since this test frequently reveals accuracy problems.

Agenda Item 3

<u>PROPOSED CHANGES TO PUB 14 TO INCLUDE COUNTING FEATURE</u> <u>Page DES 17</u> <u>UNDERLINED TEXT IS PROPOSED TO BE ADDED</u>

Marking Nominal Capacity, Value of the Scale Division, Special Applications Code References: S.6., S.6.6. Table S.6.3.a., and Table S.6.3.b.

This requirement applies to digital indicating elements and to both the operator and customer's indications on complete scales. The lettering must be permanent as described in section 1, but the attachment of any badge or decal is slightly less stringent than for the G-S.1. Information. In terms of attachment, any badge or decal must be "durable", that is, it must be difficult to remove (at all temperatures). Remote weight displays (except "scoreboard" displays), the customer's weight display provided for scales interfaced with electronic cash registers (ECRs), and weight displays that are built into ECRs must be marked with the scale capacity and scale division. The capacity by division statement may be part of the scale display or marked adjacent to the display. Large remote customer's ("scoreboard") displays have not been required to meet the marking requirements because the markings probably cannot be read from a customer's position. In those cases, the operator's weight display must be properly marked.

The marked nominal capacity on all vehicle, axle-load, and livestock scales shall not exceed the concentrated load capacity times the quantity of the number of sections in the scale minus 0.5. As a formula, this is stated as:

Nominal Capacity = Concentrated Load Capacity x (N - 0.5) where N = the number of sections in the scale.

Devices designed for special applications are to be so marked to prevent them from being used in an unsuitable application. Examples of special application scales are prepackaging scales, digital postal scales with simultaneous pound and ounce weight unit indications, weight classifying scales, and Class III scales with a small number of scale divisions and a verification scale division. When a scale is installed with an operational counting feature, the scale shall be marked on both the operator and customer side with the statement, "The counting feature is not legal for trade." Exception: When a prescription scale complies with paragraphs S.1.2.3., S.2.5.3., and S.6.6., it shall be marked, "Counting Feature for Prescription Filling Only."

The system must be clearly and permanently marked on an exterior surface, visible after installation, as follows:

1.1	The name, initials, or trademark of the manufacturer or distributor. A remote display	Yes 🗌 No 🗌 N/A 🗌
	is required to have the manufacturer's name or trademark and model designation.	
	(Code Reference G-S.1.)	

- 1.2 A model designation that positively identifies the pattern or design of the device. The Model designation shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.) The abbreviation for the word "Model" shall be "Mod" or "Mod." (Effective January 1, 2003) (Code Reference G-S.1.)
- 1.3 Except for equipment with no moving or electronic component parts, a non-repetitive Yes No N/A serial number. (Code Reference G-S.1.)

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 1.18. If a scale has an operational counting feature, it must be marked on both the operator and customer side with the statement, "The counting feature is not legal for trade."
 Yes No N/A

 Note: Not applicable to prescription scales meeting paragraph 1.19 below.

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Yes No N/A

1.19.	If a Class I or Class II	prescription	scale complies	s with	paragraphs S.	1.2.3., S.2.5.3.,
	and S.6.6., it shall be:		-			

- 1.19.1 <u>marked, "Counting Feature for Prescription Filling Only" (see test</u> Yes No N/A procedure in Section 58);
- 1.19.2 marked with the minimum piece weight and minimum number of pieces Yes No N/A used to establish an individual piece count.
- 1. $\frac{1}{100}$ All markings must be clear and easily readable.
- 1.201 The lettering for all markings must be permanent. Record the grade for the Yes No N/A permanence of markings:
- 1.242 If the markings for other than device identification required by G-S.1. are placed on badge or decal, then the badge or decal must be durable (difficult to remove at all temperatures).

Proposed New Section to be inserted after Grain Test Scales, Section 38, Page DES 57

<u>38. Counting Feature on Class I or II Scales Used in Prescription Filling Applications</u> Code References: S.1.2.3, S.2.5.3, N.1.10, T.N.3.10, and Table T.N.3.10

<u>38.1</u>	The scale's accuracy class is Class I or Class II Note accuracy class:	Yes No N/A
<u>38.2</u>	The counting mode is clearly marked on the display or by an annunciator	Yes No N/A
<u>38.3</u>	The scale display differentiates between count indications and weight indications.	Yes No N/A
	<u>38.3.1</u> If symbol "ct" is used to identify count, it is not used to identify carat in the weighing mode.	Yes No N/A
<u>38.4</u>	Values must be identified with the word or symbol for pieces (pcs) or count (ct)	Yes No N/A
<u>38.5</u>	Count values must be displayed as a whole integer, without a decimal point.	Yes No N/A
<u>38.6</u>	The scale is capable of displaying zero count.	Yes No N/A
Record	the marked minimum piece weight (MPW): the marked minimum sample size in pieces (MSS):	
Calcula	te and record the minimum sample size in weight (MSSW) =MPW x MSS=	_
<u>38.7</u>	The counting feature shall not calculate a piece weight or total count unless the following conditions are met:	
	<u>38.7.1</u> Individual piece weight is equal to or greater than 3 e.	Yes 🗌 No 🗌 N/A 🗌
	<u>38.7.2</u> Sample size is equal to or greater than the marked minimum sample size in pieces.	Yes 🗌 No 🗌 N/A 🗌
<u>38.8</u>	The marked minimum sample size must be equal to or greater than 10 pieces.	Yes 🗌 No 🗌 N/A 🗌
<u>38.9</u>	<u>Place a load of less than MSSW on the scale, and enter the MSS. The device shall reject the entry.</u>	Yes 🗌 No 🗌 N/A 🗌

38.10 Place a load equal to the MSSW on the scale and enter a sample count less than Yes No N/A the MSS. The device shall reject the entry.

In addition to Table 6 Maintenance Tolerances (for weight), the indicated piece count value computed by a Class I or Class II prescription scale counting feature shall comply with the tolerances in Table T.N.3.10. Maintenance and acceptance tolerances are the same.

<u>Table T.N.3.10</u> <u>Maintenance and Acceptance Tolerances</u> <u>In Excess and in Deficiency for Count</u>			
Indication of Count	<u>Tolerance</u> (piece count)		
0 - 100	<u>0</u>		
<u>101 to 200</u>	<u>1</u>		
201 or more	0.5 %		

Notes on testing:

<u>Conduct at least two increasing and decreasing load tests with at least four different test loads, including the maximum at each tolerance level. Do not recalibrate the scale during this test. Document any non-conformance results.</u>

Example:

Scale Capacity = $620g \ge 0.01 g$ (marked with a minimum piece weight of 0.03 g and a minimum piece count of 10) Piece weight = 0.03 g = 3 eMinimum sample size = 10 pieces = 30 e = 0.30 g100 pcs = 300 e = 3 g200 pcs = 600 e = 6 g

To achieve the highest possible count, divide the capacity (620 g) by the minimum weight of the piece count (0.03 g). Truncate the quotient (20666.666 counts) to the nearest whole integer (20666 counts).

To perform the test at near maximum, pick a whole number near this amount, such as 20500. Calculate the amount of weight that should cause the scale to indicate a count of 20500 by multiplying the desired count (20500) by the weight of the minimum piece weight (0.03 g), The result is 615 g. Place 615 g on the scale and it should indicate 20500 counts.

<u>38.11</u>	Calcula 10 100 individ toleran (If nec	ate the loads required to cause the scale to indicate, respectively, a count of , 200, and maximum count capacity (based on scale capacity and minimum ual piece weight). The device indicates each of these loads within the ce specified in table T.N.3.10.	Yes 🗌 No 🗌 N/A 🗌
<u>38.7</u>	<u>The co</u>	unting feature shall not calculate a piece weight unless the following ons are met:	
	<u>38.7.1</u>	The individual piece weight is equal to or greater than 3 e.	Yes 🗌 No 🗌 N/A 🗌
	<u>38.7.2</u>	The sample size is at least 10 pieces or the marked minimum sample size in pieces, whichever is greater.	Yes 🗌 No 🗌 N/A 🗌
	<u>38.7.3</u>	The sample count indication is stable.	Yes 🗌 No 🗌 N/A 🗌

Device Application	Term	Acceptable	<u>Not</u> Acceptable
	Head (sale by)	HB or H	
	Weight (sale by)	WT or W	
Livestock & Animal Scales:	Other symbols recognized by the Packers & Stockyards Administration		
	Minimum Piece Weight	MPW	
Prescription Filling Count Feature for Class I & II	Minimum Sample Size	MSS	
Scales:	Minimum Sample Size in Weight	MSSW	
Belt Conveyor Scales:	U.S. short ton (note: different from "General" application)	Т	

75. List of Acceptable Abbreviations/Symbols

Agenda Item 14

Add a check box in the Publication 14 DES checklist that states the computing scale interfaced to an ECR meets the applicable requirements in the ECRS checklist as follows:

27.4	If the computing scale is interfaced with a electronic cash register (ECR), the ECRS	Yes No N/A
	checklist must also be completed. The operation of the computing scale with the	
	ECR meets the ECRS checklist.	

and

Amend ECRS Sections 11.15 through 11.21 as follows:

<u>11.15.</u>	A computing scale may interface with a cash register, and the cash register need only
	record the total price, that is, serve merely as a printer, provided:

11.15.	<u>11.15.1.</u>	The computing scale displays the net weight, unit price, and total price on both the operator and customer sides of the scale.	Yes 🗌 No 🗌 N/A 🗌
11.16.	<u>11.15.2.</u>	The computing scale has a tare capability.	Yes 🗌 No 🗌 N/A 🗌
11.17.	<u>11.15.3.</u>	The scale is positioned so the customer can accurately read the indications and observe the weighing operation.	Yes 🗌 No 🗌 N/A 🗌
11.18.	<u>11.15.4.</u>	The scale must be equipped with motion detection that complies with Handbook 44 requirement S.2.4.1.	Yes 🗌 No 🗌 N/A 🗌
11.19.	<u>11.15.5.</u>	The scale is not equipped with a price-look-up capability. The unit price must be manually entered into the computing scale to give the customer adequate time (equivalent to a transaction in the delicatessen department) to assimilate the display information.	Yes 🗌 No 🗌 N/A 🗌
11.20.	<u>11.15.6.</u>	The electronic cash register must not have any input to the computing scale in the process of determining the total price of a weighed item.	Yes 🗌 No 🗌 N/A 🗌
11.21.	<u>11.15.7.</u>	If the ECR is equipped with a computing scale, it shall meet the criteria given above.	Yes 🗌 No 🗌 N/A 🗌
	<u>11.15.8.</u>	If the scale has multiple sales accumulation capability, the scale accumulation capability is disabled.	Y <u>es No N/A</u>

11.15.9. If the ECR is equipped with a computing scale, it shall meet the criteria Yes No N/A

Agenda Item 15

27. Computing Scales - General Without Multiple Sales Accumulation Capability

Code Reference: S.1.8.3, G-S.2, G-S.5.1, G-S.6, S.1.9.2

27.1 The net weight, unit price, and total price are clearly displayed and identified on both Yes \square No \square N/A \square the operator and customer sides of the scale. Yes No N/A 27.1.1 The unit price is clearly defined. The symbols "\$/" with a unit symbol (i.e., lb, kg, g) may be used, provided: Yes No N/A 27.1.1.1 -the scale is capable of only displaying net weight in that weight unit, or Yes No N/A 27.1.1.2 -the scale has an internal units selection switch that can be sealed in the unit used for both the unit price and the net weight display, or -the scale has an external unit conversion key, and the unit of Yes No N/A 27.1.1.3 mass marked in the unit price display and the unit of mass

Examples of scale display

С	orrect				Correct		
	WEIGHT	\$/Ib	TOTAL PRICE \$]	WEIGHT	UNIT PRICE	TOTAL PRICEs
	1.00 lb	2.00	2.00		1.00 lb Capacity 30 x 0.01 lb 15 x 0.005 kg	2.00	2.00
L	15 X 0.005 Kg						

marked in the weight display are the same.

Incorrect

WEIGHT	\$/Ib	TOTAL PRICEs
1.00 kg	2.00	2.00
Capacity 30 x 0.01 lb 15 x 0.005 kg		

<u>27.2</u> The computing scale has tare capability.

27.3 Computing Scales with Printers

In the case of printers that issue labels for packages, requirements of the Fair Packaging and Labeling Act and the Uniform Packaging and Labeling Regulation apply.

Yes No N/A

Preprinted labels stating the unit of measure (i.e., lb, kg) acceptable for scales capable of displaying one weight unit or which have an internal lb/kg conversion switch.

27.3.1	The unit p	rice is clearly defined.	Yes No N/A
	<u>The symbol</u> provided:	ols "\$/" with a unit symbol (i.e., lb, kg, g) may be used,	
	<u>27.3.1.1</u>	<u>-the scale is only capable of printing the net weight in that</u> weight unit, or	Yes No N/A
	<u>27.3.1.2</u>	<u>-the scale has an internal units selection switch that can be</u> sealed in the unit used for both the unit price and the net weight, or	Yes No N/A

	<u>27.3.1.3</u> -the scale has an external unit conversion key, and the unit of mass printed in the unit price and the unit of mass printed with the weight are the same.	Yes No N/A
<u>27.3.2</u>	The symbol "\$" or the word "dollars" is printed with the total price and must be printed by the device or pre-printed on the label.	Yes No N/A
<u>27.3.3</u>	The quantity block must be headed with the words "Net Weight/Count". (The term "Net Weight" is optional.) If the printer does not print the specific weight unit, the pre-printed label must include this information; for example, pound, lb, or kg.	Yes 🗌 No 🗍 N/A 🗌
<u>27.3.4</u>	For items sold by count, the count is printed in the quantity block. NOTE: If there are no individual blocks for the printed information, and the printer prints a qualifying term such as "pieces" or a symbol such as "pcs" in a horizontal manner reading from left to right, and if there is little doubt as to the meaning of the label, then it is considered appropriate.	Yes 🗌 No 🗍 N/A 🗌
<u>27.3.5</u>	The count must be printed as an integer without a decimal point and must be modified with the word or symbol for pieces (pcs) or count (ct) either in the heading or next to the number.	Yes No N/A
27.3.6	Printing of non-weighed items by count shall either (27.1 in 2004 edition)	
	27.3.6.1 operate only under no load condition or (27.1.1 in 2004 edition)	Yes 🗌 No 🗌 N/A 🗌
	27.3.6.2 cause the display to blank. (27.1.2 in 2004 edition)	Yes 🗌 No 🗌 N/A 🗌

Incorrect Label				
Net Weight	Unit Price	Total Price		
1.00 kg	\$2.00	\$2.00		
(unit price	e not identified	with unit)		
Incorrect Label				
Net Weight	Unit Price	Total Price		
1.00 lb	\$2.00	\$2.00		
(unit price	e not identified	with unit)		
]	Incorrect Labe	1		
Net Weight	Price/lb	Total Price		
1.00 kg	\$2.00	\$2.00		
(different unit	s of net weight a	and unit price)		
Correct Label				
Net Weight/CT	Unit Price	Total Price		
10	\$2.00	\$20.00		

Correct Label					
Net Weight	Price	Total Price			
1.00 kg	\$2.00/kg	\$2.00			

Correct Label					
Net Weight	Unit Price	Total Price			
1.00 lb	\$2.00/lb	\$2.00			

Correct Label					
Net Weight	Price/kg	Total Price			
1.00 kg	\$2.00	\$2.00			

	Correct Labe	
Net Weight	\$/lb	Total Price
1.00 lb	\$2.00	\$2.00

Yes No N/A

27.4 If the computing scale is interfaced with a electronic cash register (ECR), the ECRS checklist must also be completed. The operation of the scale with the ECR meets the ECRS checklist. (from previous agenda item)

Agenda Item 19

The Sector recommends that following amendments to Publication 14 DES Section 18 indicated in <u>underlined</u> text be included in Publication 14.

18. Zero Indication - General

Code Reference: G.S.5.1., <u>G.S.1, S.6.3</u>

Any of the following methods may be used to indicate a negative balance condition.

18.1. Display of negative values.

A display of negative weight values is required in the net display mode when the gross weight is less than the tare value. This assumes that the gross weight is zero or positive. If the gross weight is negative (behind zero-balance condition), and if blanking the display is used to indicate a behind-zero-balance condition, the gross and net display may blank.

18.2. Blanking the display

This method cannot be used to indicate a negative balance condition if the device also: (1) blanks the display to indicate over-capacity and (2) the load condition of the weighing/load receiving element is not evident to the operator, (e.g., a hopper scale where the operator cannot see the load condition, empty or full, of the hopper).

If blanking is used, it is recommended that the indicator also have an annunciator to indicate "power on" so the operator does not think that power has been lost when the display is blank.

18.2.1 When blanking a primary weight display with live on screen G-S.1 and/or Yes No N/A S.6.3 markings, the required markings must **not** blank.

18.3. Display of a symbol which cannot be interpreted as a quantity value, (e.g., -, ---, Yes No N/A EEEE, E S-1) is acceptable; however, the display of complements are not acceptable, and flashing zeros or a minus sign preceding a zero or zeros cannot be used.

The Sector recommends that following amendments to Publication 14 ECRS Section 5 indicated in <u>underlined</u> text be included in Publication 14. Language to be removed is indicated in strikeout text.

5. Identification

Code Reference: G.S.5.1., <u>G.S.1, S.6.3</u>

..... No changes in this area No changes in this area

..... No changes in this area

Yes [No 🗌	N/A
-------	------	-----



- 5.1. The cash register shall be clearly and permanently marked for the purposes of identification with the following information:
 - 5.1.1. The name, initials, or trademark of the manufacturer or distributor.
 - A model designation that positively identifies the pattern or design of the 5.1.2. device. The Model designation shall be prefaced by the word "Model", "Type", or "Pattern". These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.) The abbreviation for the word "Model" shall be "Mod" or "Mod.". (Effective January 1, 2003).
 - 5.1.3. Except for equipment with no moving or electronic component parts and not-built-for-purpose, software-based devices, a nonrepetitive serial number.
 - For not-built-for-purpose, software-based devices, the current software 5.1.4. version designation.
 - 5.1.5. The serial number shall be prefaced by the words "Serial Number" or an abbreviation of that term. Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No, and S No.).

Location of the information:

Code Reference G-S.1. (g). Effective January 1, 2003

The NTEP Certificate of Conformance (CC) Number or a corresponding CC 5.1.6. addendum number for devices that have a CC. The number shall be prefaced by the terms "NTEP CC", "CC", or "Approval." These terms may be followed by the word "Number" or an abbreviation for the word "Number." The abbreviation shall, as a minimum, begin with the letter "N" (e.g., No or No.).

> The device must have an area, either on the identification plate or on the device itself, suitable for the application of the Certificate of Conformance Number. If the area for the CC Number is not part of an identification plate, note its intended location and how it will be applied.

Location of CC Number if not located with the identification

5.2.	The	other	components	of	the	system	are	marked	consistent	with	the	above	Yes 🗌	No 🗌	N/A	
	desci	ription.														

5.3. Identifying information shall be:

> Located so that it is readily observable without the necessity of Yes 🗌 No 🗌 N/A 🗌 5.3.1. disassembling a part requiring the use of any means separate from the device. If the required information is located on the back of a device, the same information must also appear on the side, front, or top. The bottom of a device is not an acceptable surface. If required markings are behind a door or panel, the manufacturer is encouraged to put a label on the outside of the device that explains where the identification information is located

- 5.3.2. Marked on a surface that is an integral part of the chassis.
- If the required marking is on a plate or badge, the plate must be permanent. (See 5.4. criteria above for Permanence of Attachment of Badge.)

Yes No N/A Yes No N/A Yes No N/A Yes No N/A

Yes No N/A

Yes No N/A

Yes 🗌	No 🗌	N/A	
-------	------	-----	--

Yes 🗌	No 🗌	N/A
Yes 🗌	No 🗌	N/A

5.5.	The lett	ering for all markings must be permanent.	Yes 🗌 No 🗌 N/A 🗌
	Record	the grade for the markings:	
Code Softwa	Referenc 1re-Base	e: G-S.1.1. Location of Marking Information for Not Built-for-Purpose, d Devices. Effective January 1, 2004	
<u>5.6</u>	<u>When b</u> marking	blanking a primary weight display, with live on screen G-S.1 and/or S.6.3 gs, the required markings must not blank.	Yes No N/A
<u>5.6.7</u>	For not	-built-for-purpose, software-based devices, the following shall apply:	
	<u>5.7.1</u>	The manufacturer or distributor and the model designation shall be continuously displayed or marked on the device; or	Yes 🗌 No 🗌 N/A 🗌
5.7.	<u>5.7.2</u>	The Certificate of Conformance (CC) Number shall be continuously displayed or marked on the device, or	Yes 🗌 No 🗌 N/A 🗌
5.8.	<u>5.7.3</u>	All required information in G-S.1. Identification. (a), (b), (c), (e), and (h) shall be continuously displayed. Alternatively, a clearly identified "view only" System Identification, G-S.1. Identification, or Weights and Measures identification shall be accessible through the "Help" menu. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated.	Yes 🗌 No 🗌 N/A 🗌
5.9.	<u>5.7.4</u>	Clear instructions for accessing the remaining required G-S.1. information shall be listed on the CC. Required information includes that information necessary to identify the software in the device is the same type that was	Yes 🗌 No 🗌 N/A 🗌

Agenda Item 21

X. Cash Acceptors or Card-activated Systems

Code Reference: G-S.2., G-S.5.1., G-S.6

evaluated.

Accidental or intentional fraud causes great concern when customers use cash acceptors or card-activated systems.

Because systems may be installed with separate power lines to the controller, card reader, and scale, tests should be run with power failures to different parts of the system to evaluate the potential for accidental or intentional errors. The appropriate device response depends upon when the power loss occurs during the transaction.

Tests using various denominations of bills accepted by the cash acceptor should be performed.

Certificates of Conformance will cover the use of the cash acceptor option at both attended and unattended systems. Cash acceptors, which are used at unattended locations, must meet the marking requirements of paragraph G-UR.3.4. Responsibility, Money-Operated Devices shall be clearly and conspicuously displayed on the device or immediately adjacent to the device information detailing the return of monies paid when the product cannot be obtained.

Note: For bills that have not yet been drawn into the cash acceptor to the point that the bill is no longer visible, it is assumed that the information on the bill denomination can be obtained from visual examination.

Various methods may be used to recall specific portions of the transaction depending on how the basic system operates. For example, systems that can print a record of the amount fed into the machine as each bill is fed into the device maintain an ongoing record of bills recognized by the system. Other systems may not print a receipt until the end of the transaction, so the information is recalled on a journal printer accessible to the customer or can be recalled on the cash acceptor display

<u>1.1</u>	Systems with Battery Back-up or Uninterruptible Power Supply or Equivalent - Some Yes No No	/A
	systems are equipped with a battery back-up or an uninterruptible power supply (or	
	equivalent) which allows a transaction to continue in the event of a power loss. For	
	such systems, the transaction in progress at the time of a power interruption must	
	continue as if no power interruption had occurred (or comply with the requirements	
	for systems not equipped with a battery back-up). That is, all bills (including bills	
	being fed into the device at the time of the power loss) must be correctly accounted	
	for, and the total sale amount must be mathematically correct. Check these systems	
	by interrupting power at several points in the transaction to ensure that all information	
	(total price, mathematical agreement, and total dollar amount inserted by the	
	customer) is accounted for correctly.	
	-	

1.2. All Other Systems - To check the operation of systems not equipped with a battery Yes No N/A back-up, uninterruptible power supply, or equivalent, interrupt power as described below. As noted earlier, if separate power lines supply different components in the system, interrupt power to different parts of the system.

When one or more bills have been accepted and registered by the device, at least one of the following criteria must be met to ensure that this information can be recalled in the event of a power interruption:

- 1.2.1. The printer on the device must print the denomination of the bill as the device recognizes the bill. (The printed receipt must be available to the customer.)
- 1.2.2. A journal or other printer accessible to the customer must print the Yes No N/A denomination of each bill as the device recognizes each bill.
- 1.2.3. The total display must be capable of being recalled for at least 15 minutes. Yes No N/A
- 1.2.4. Means are provided to enable the customer to retrieve the money inserted Yes No N/A to into the device (e.g., a button which can be used during a power interruption to eject the money inserted by the customer).
- 1.2.5. Other means is used to provide a visual or printed record of the total amount Yes No N/A of money accepted by the device.
- 1.3. There is a brief period of time during which a bill has been accepted by the cash <u>Yes</u> <u>No</u> <u>N/A</u> <u>acceptor but has not yet been recognized by the device.</u> The following criteria must be met to ensure completion of that this information can be recalled in the event of a power failure.
 - 1.3.1. Means is provided to enable the attendant or customer to retrieve the bill (for example, a button which can be used during a power interruption to eject the bill or if the cash acceptor box can be removed by the attendant and the bill retrieved).

Note: There may be a space of time in which a bill can be caught partially in and out of the cash acceptor during a power interruption. In such a case, if the denomination of the bill is visible to the customer and attendant, this is sufficient to provide information about the bill being fed into the device at the time of the power interruption. The cash acceptor must comply with the other applicable items noted above.

1.4. Power should be interrupted at different points in the transaction to determine that all transaction information can be recalled in the event of a power interruption including combinations of the following:

<u>1.4.1.</u>	after one bill has been inserted.	Yes No N/A
<u>1.4.2.</u>	after several bills have been inserted.	Yes No N/A
<u>1.4.3.</u>	while a bill is being inserted.	Yes No N/A
<u>1.4.4.</u>	after a bill has been inserted but not yet recognized.	Yes 🗌 No 🗌 N/A 🗌
<u>1.4.5.</u>	after a bill(s) has been inserted and recognized.	Yes No N/A

- 1.5. Total Money Display A running display showing the amount of money fed into the Yes No N/A machine must be provided.
- 1.6. Printed Receipt A printed receipt must be available to the customer from the device Yes No N/A at the completion of the transaction.

Because the customer must be provided with a receipt, the system must not accept cash if sufficient paper is not available to complete the transaction.

The cash acceptor must not initiate a cash transaction if either of the following conditions are true:

•	no paper is in the receipt printer of the cash acceptor;	Yes 🗌 No 🗌 N/A 🗌
_		

- insufficient paper is available to complete a transaction.
 Yes No N/A
- $\frac{1.7.}{\text{cash acceptor.}} \quad \frac{\text{Instructions must be marked on the device to inform the customer how to operate the Yes <math>No$ N/A
- 1.8.
 Means must be provided for the customer to cancel the transaction at any point.
 Yes
 No
 N/A

 1.8.1.
 The customer has inserted cash. If the customer cancels the transaction by pressing the cancel key (or equivalent key(s)), the device must either:
 Yes
 No
 N/A
 - 1.8.1.1. be equipped with means for the customer to retrieve the cash Yes No N/A inserted from the device, AND

automatically issue a printed receipt indicating the amount tendered and the amount returned, OR

 1.8.1.2.
 display instructions (such as "sale terminated, see attendant," "sale
 Yes
 No
 N/A

 terminated, get receipt" or similar wording) for the customer to see
 the attendant, AND

automatically issue a printed receipt showing the amount of cash inserted by the customer, a statement indicating that the sale was terminated, and instructions for the customer to see the attendant.

Note: It is acceptable for different messages to be used. This depends upon whether the transaction is terminated by use of the cancel key (e.g., "sale terminated, get receipt" or "sale terminated, see cashier", "change due, see cashier").

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Appendix B – NTETC Weighing Sector Attendance List