

## Specifications and Tolerances (S&T) Committee Interim Agenda

Mr. Steve Giguere, Committee Chair  
Maine

### 300 INTRODUCTION

The S&T Committee will address the following items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The headings and subjects apply to *NIST Handbook 44 Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices, 2011 Edition*. The first three digits of an item's reference key are assigned from the Subject Series List. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. In some cases, background information will be provided for an item. The fact that an item appears on the agenda does not mean it will be presented to National Conference on Weights and Measures (NCWM) for a vote. The committee will review its agenda and may withdraw some items, present some items for information meant for additional study, issue interpretations, or make specific recommendations for change to the publications identified which will be presented for a vote at the Annual Meeting. The committee may also take up routine or miscellaneous items brought to its attention after the preparation of this document. The committee may decide to accept items for discussion that are not listed in this document, providing they meet the criteria for exceptions as presented in Section H of the introductions to *NIST Handbook 44* and *NIST Handbook 130*. The committee has not determined whether the items presented will be Voting or Informational in nature; these determinations will result from their deliberations at the Interim Meeting.

An "Item Under Consideration" is a statement of proposal and not necessarily a recommendation of the committee. Suggested revisions are shown in **bold face print** by ~~striking out~~ information to be deleted and underlining information to be added. Requirements that are proposed to be nonretroactive are printed in *bold faced italics*.

All sessions are open to registered attendees of the conference. If the committee must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed provided that (1) the Chairman or, in his absence, the Chairman-Elect approves; (2) the Executive Director is notified; and (3) an announcement of the closed meeting is posted on or near the door to the meeting session and at the registration desk. If at all possible, the posting will be done at least a day prior to the planned closed session.

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

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**Table B**  
**Glossary of Acronyms and Terms**

<b>Acronym</b>	<b>Term</b>	<b>Acronym</b>	<b>Term</b>
AAR	Association of American Railroad	NIST	National Institute of Standards and Technology
AES	Advanced Encryption Standard	NTEP	National Type Evaluation Program
AREMA	American Railway Engineering and Maintenance-of-Way Association	NTETC	National Type Evaluation Technical Committee
B	Basic Publication	OIML	International Organization of Legal Metrology
CC	Certificate of Conformance	OWM	Office of Weights and Measures
CWMA	Central Weights and Measures Association	P&SP	Packers and Stockyards Program
D	Document	R	Recommendation
DOT	Department of Transportation	RMFD	Retail Motor Fuel Dispenser
FHWA	Federal Highway Administration	S&T	Specifications and Tolerances
GIPSA	Grain Inspection Packers and Stockyard Administration	SC	Technical Subcommittee
GPS	Global Positioning System	SMA	Scale Manufacturers Association
IATR	International Association of Transportation Regulators	SWMA	Southern Weights and Measures Association
IEC	International Electrotechnical Commission	TC	Technical Committee
ISO	International Standardization Organization	USDA	United States Department of Agriculture
LMD	Liquid-Measuring Devices	USNWG	U.S. National Work Group
MDMD	Multiple Dimensions Measuring Device	VTM	Vehicle Tank Meter
MMA	Meter Manufacturers Association	WIM	Weigh-in-Motion
NCWM	National Conference on Weights and Measures	WWMA	Western Weights and Measures Association
NEWMA	Northeastern Weights and Measures Association		

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

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**320 SCALES****320-1 S.1.7. Capacity Indication, Weight Ranges, and Unit Weights****Source:**

Kansas Department of Agriculture (2012)

**Purpose:**

Uniform testing of commercial devices.

**Item Under Consideration:**

Amend *NIST Handbook 44: 2.20 Scales* as follows:

**S.1.7. Capacity Indication, Weight Ranges, and Unit Weights.**

- (a) Gross Capacity. An indicating or recording element shall not display nor record any values when the gross load (not counting the initial dead load that has been canceled by an initial zero-setting mechanism) is in excess of 105 % of scale capacity.
- (b) *Capacity Indication. Electronic computing scales (excluding postal scales and weight classifiers) **shall display and record a gross or net weight of the scale capacity and the applicable tolerance but shall neither display nor record a gross or net weight in excess of scale capacity plus 9d.***

*[Nonretroactive as of January 1, 1993]*

**(Amended 20XX)**

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

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

(Amended 1990, 1992, and 1995)

**Background / Discussion:**

Software used on electronic computing scales does not always allow the scales to indicate a weight value that is above the marked scale capacity, even within nine division allowance. When this happens, the inspector cannot verify the scale error at capacity.

At the 2011 CWMA Interim Meeting, industry asked how the software would know what the applicable tolerance is, and whether or not this item would be retroactive. Regulatory officials commented:

- When testing a scale at capacity and the device is over registering, it may blank out and not allow the inspector to determine the error at capacity
- That this item would promote uniformity
- Provide for ease of testing.

The CWMA recommends the proposed language be changed to “shall display and record a gross or net weight of the scale capacity and the applicable maintenance tolerance”, and that it be an Information Item. This proposal would allow computing scales to be tested uniformly at capacity and be able to determine the error at capacity.

### 320-2 S.6.4. Railway Track Scales and Appendix D – Definitions

**Source:**

Systems Associates, Inc., (2012)

**Purpose:**

This proposal is intended to align *NIST Handbook 44* with updated material in *AAR Scale Handbook*.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Scales Code as follows:

**S.6.4. Railway Track Scales.** – A railway track scale shall be marked with the maximum capacity of each section of the load-receiving element of the scale. Such marking shall be accurately and conspicuously presented on, or adjacent to, the identification or nomenclature plate that is attached to the indicating element of the scale. ~~The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity. The nominal capacity of a two-section scale shall not exceed its rated section capacity.\*~~ **The nominal scale capacity shall not exceed the lesser of:**

- (a) The sum of the Weigh Module Capacities as shown in Table S.6.4, or;
- (b) Rated Sectional Capacity (RSC) multiplied by the quantity of the Number of Sections (Ns) minus the Number of Dead Spaces (Nd) minus 0.5. As a formula this is stated as RSC x (Ns - Nd - 0.5), or;
- (c) 640,000 lb

<b>Table S.6.4.</b>	
<b>Railway Track Scale – Weigh Module Capacity</b>	
<u>Weigh Module Length (ft)</u>	<u>Weigh Module Capacity (ton)</u>
<u>&lt;5</u>	<u>40</u>
<u>5 to &lt; 10</u>	<u>80</u>
<u>10 to &lt; 15</u>	<u>120</u>
<u>15 to &lt; 23</u>	<u>160</u>
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<u>40 to &lt; 56</u>	<u>284</u>

~~[\*Nonretroactive as of January 1, 2002]~~

(Amended 1988, 2001, ~~and 2002,~~ and 20XX)

Add the following to *NIST Handbook 44*: Definitions:

The amendment above would require the definition of Weigh Module to be added to Appendix D - Definitions

**WEIGH MODULE - The single or articulated portion of a weighing element supported by two sections. The length of a module is the distance to which load can be applied. [2.20]**

**Background / Discussion:**

The capacity of a railcar weighing system has historically been based on the capacity of the pivots or load cells supporting the scale section. As pivots were generally the weakest element, this was logical. With the introduction of load cell technology, the capacity of the section could far outreach the capacity of the weighbridge. Weighbridge design, based on the requirements of the *AAR Scale Handbook*, must be capable of supporting 80,000 pound axles on 5 foot centers. With the introduction of combined short span weigh modules over multiple sections, the use of the section capacity to determine scale capacity provides both the opportunity for overloaded structures and/or the requirement to overdesign the section. Determining the nominal scale capacity based on both the section capacity and the structural capacity is the best solution. The 640,000 lb limit assures these scales can be calibrated with 12.5% of capacity using the conventional 80,000 lb test weight equipment.

The changes to the nominal capacity specification were developed by Committee 34 - Scales, of the American Railway Engineering and Maintenance-of-Way Association (AREMA) and approved (by unanimous vote) for inclusion in the *AAR Scale Handbook*. Additional contacts include Mr. Gogolin, Norfolk Southern Corporation as AREMA committee 34 Chairman and Mr. Jimenez, Association of American Railroad Transportation Technology Center as AREMA committee 34 Association of American Railroad (AAR) liaison.

At the 2011 CWMA Interim Meeting, industry stated that it is inappropriate to rate a scales capacity based solely on the sectional capacity of the scale. A regulatory official questioned whether the capacities in table S.6.4 should be listed in pounds. In addition to the proposed definition for weigh module, the CWMA noted it may also be appropriate to include a definition of dead spaces. The CWMA recommends this be a Voting Item. This language would align *NIST Handbook 44* and the *AAR Handbook*, and they believe there is support for this item.

At the 2011 WWMA Annual Meeting, Mr. Straub, Fairbanks Scales, Inc., supported the item as submitted. Mr. Cook, NIST,OWM stated that the definition of weigh module may be confusing and suggested that the submitter include diagrams to NCWM S&T Committee illustrating some typical weigh module installations. The committee recognized that this proposal aligns *NIST Handbook 44* with the updated material in the *AAR Scale Handbook*. However, there remains some confusion around the use of the word “articulated” in the definition which could be clarified with illustrations. The WWMA accepted the committee’s recommendation that this proposal move forward as a Developing Item, until the committee receives diagrams that illustrate weigh module installations from the submitter.

At its 2011 Interim Meeting, NEWMA recommended this as a Voting Item.

At the 2011 SWMA Annual Meeting, Mr. Oppermann, Weights and Measures Consulting, LLC, suggested that the reference to “single or articulated” are unnecessary and could be deleted. It doesn’t matter how the module is put together. The committee also heard from Mr. Feezor, Scales Consulting and Testing, who noted that the term “articulated” refers to how the modules are connected. He offered to submit some drawings of how these are made in the field and he noted that this could apply to more than just railway track scales. Mr. Straub, Fairbanks Scales, Inc., indicated support for the proposal. He stated that he had talked with Mr. Beitzel, Systems Associates, Inc., and suggested that perhaps diagrams from *NCWM Publication 14* might be considered to help illustrate the use of the term “articulated.” The SWMA accepted the committee’s recommendation and unanimously supported the item as a Voting Item with the following change to the definition, which eliminates the phrase “single or articulate”:

**WEIGH MODULE - The ~~single or articulated~~ portion of a weighing element supported by two sections. The length of a module is the distance to which load can be applied. [2.20]**

### 320-3 N.3.1.2. Interim Approval

**Source:**

Systems Associates, Inc., (2012)

**Purpose:**

This proposal is intended to align *NIST Handbook 44* with updated material in *AAR Scale Handbook*.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Scales Code paragraph N.3.1.2. as follows:

**N.3.1.2. Minimum Tests for Interim Approval.** – A test-weight load of not less than 13 500 kg (30 000 lb) and a strain-load test up to at least 25 % of scale capacity may be used to return a scale into service following repairs that could affect the accuracy of the weighing system. A test for an Interim Approval shall include a shift (section) test using a test-weight load of not less than 13 500 kg (30 000 lb). All results shall meet applicable tolerances. The official with statutory authority shall be immediately notified when scales are repaired and placed in service with an interim test. The time period of temporary use is at the discretion of the official with statutory authority.

~~Note: The length of time the scale may be used following an interim test is at the discretion of the official with statutory authority.~~

(Added 1990) (Amended 20XX)

**Background / Discussion:**

The interim approval was added to *NIST Handbook 44* in 1990 and was intended to address the response time for positioning proper test weight equipment (80,000 lb) following a breakdown and subsequent repairs of a railcar weighing system. An interim approval is not appropriate under normal scale maintenance circumstances. In addition, returning a scale to service without requiring a section test could leave a serious accuracy problem, especially when using 30,000 lb weights. As *NIST Handbook 44* requires 80,000 lbs of test weight for testing a railcar scale, any cost impact in limiting the scope of the interim test would be minimal.

The changes to the interim test specification were developed by Committee 34 - Scales, of the AREMA and approved (by unanimous vote) for inclusion in the *AAR Scale Handbook*. Additional contacts include Mr. Gogolin, Norfolk Southern Corporation as AREMA committee 34 Chairman and Mr. Jimenez, Association of American Railroad Transportation Technology Center as AREMA committee 34 AAR liaison.

At the 2011 CWMA Interim Meeting, industry stated that this proposal would strengthen the type of test conducted for an interim approval by requiring that a shift test be conducted during an interim approval. Regulatory officials voiced concerns that a calibration would be a repair that could affect the accuracy of the weighing system. Inserting the words “excluding calibration” between the words repairs and the start of the proposed language would help clarify that an interim approval is not meant to be used in cases where only calibration is being performed.

The CWMA accepted the committee’s recommendation to amend the proposal and move it forward as a Voting Item. The following paragraph includes the new language that was agreed to by the CWMA:

**N.3.1.2. Minimum Tests for Interim Approval.** – A test-weight load of not less than 13 500 kg (30 000 lb) and a strain-load test up to at least 25 % of scale capacity may be used to return a scale into service following repairs, excluding calibration, that could affect the accuracy of the weighing system. A test for an Interim Approval shall include a shift (section) test using a test-weight load of not less than 13 500 kg (30 000 lb). All results shall meet applicable tolerances. The official with statutory authority shall be immediately notified when scales are repaired and placed in service with an interim test. The time period of temporary use is at the discretion of the official with statutory authority.

~~Note: The length of time the scale may be used following an interim test is at the discretion of the official with statutory authority.~~

(Added 1990) (Amended 20XX)

At the 2011 WWMA Annual Meeting, there were no comments on this proposal at the Open Hearings. The committee agreed that the proposal provides additional clarification of the tests to be conducted during an interim approval of railroad track scales and when an interim approval test is required. Therefore, the WWMA accepted the committee's recommendation that this proposal move forward as a Voting Item.

At the 2011 NEWMA Interim Meeting, there was no opposition to this item. NEWMA accepted the committee's recommendation that this item move forward as an Information Item so that input from other regions may be considered.

At the 2011 SWMA Annual Meeting the committee heard comments from Mr. Straub, Fairbanks Scales, Inc., who supported the proposal. The committee also heard comments from Mr. Feezor, Scales Consulting and Testing, who indicated that the definition has already been changed in the *AAR Handbook* and that this proposal would align *NIST Handbook 44* with the *AAR Handbook*. He noted that the Interim Approval was intended to allow a scale to be returned to service until adequate test standards could be brought in by the railroad. There were no comments in opposition. The SWMA accepted the committee's recommendation that this item move forward as a Voting Item.

### **320-4 UR.1.2. Grain Hopper Scales**

**Source:**

Nebraska Department of Agriculture (2012)

**Purpose:**

Amend *NIST Handbook 44* to clarify grain hopper scales to be Class III

**Item Under Consideration:**

**UR.1.2. Grain Hopper Scales Used to Weigh Grain Shall be Class III.** — The minimum number of scale divisions for a Class III hopper scale used for weighing grain shall be 2000

**Background / Discussion:**

*NIST Handbook 44* does not specifically state that grain hopper scales shall be marked as class III. There are only indirect references that give exceptions for grain hopper scales as being class III. There may be inconsistency among jurisdictions as to whether grain hopper scales are required to be class III. This proposal would bring about uniformity among jurisdictions and be in accord with the original intent of the committee. Some states may have a difficulty requiring class III hopper scales for weighing grain if they have already allowed the use of class III L scales for grain. If this concern is raised then perhaps this requirement should remain non-retroactive. If some jurisdictions have allowed Class III L hopper scales to weigh grain, it is an indication that the committee's original intent of the user requirements and tolerances of a hopper scale used to weigh grain does require clarification offered by this proposal.

At the 2011 CWMA Interim Meeting, regulatory officials commented that Table 7a already states that "all weighing not otherwise specified" would define a grain hopper as a Class III scale. So, what problem is this proposal intending to address? The CWMA accepted the committee's recommendation that this item remain a Developing Item.

At the 2011 WWMA Annual Meeting, Mr. Deiman, Alaska Division of Measurement Standards/CVE, suggested that a modification be made to Scales Code Table 7a by adding "Grain Hopper Scales" to the list of typical Class III applications. He was also concerned that a Class III L vehicle scale weighbridge could be modified by removing the deck and adding hoppers, and could potentially be used to weigh grain. In its deliberations, the committee considered Mr. Deiman's example as a modification of type and thus the conversion would not be covered by an NTEP CC. Mr. Cook, NIST, OWM reported that OWM tried to verify the exact problem that initiated the proposal. One possibility is that the use of the word "typical" in the title of Table 7a is not strong enough to ensure that Grain Hopper Scale applications use Class III Hopper Scales. The item is not fully developed because the problem was not sufficiently demonstrated to justify a change to *NIST Handbook 44*. The committee believes that Table 7a

sufficiently addresses the concern and clearly states that Class III L Hopper scales are specifically excluded from weighing grain.

The committee notes that unmarked scales in Table T.1.1. considers Grain Hopper Scales as “all other scales” and that tolerances are based on *NIST Handbook 44* Table 6 for Class III devices which is identical to the wording in Table 7a. for scales marked with as a Class III device. The WWMA accepted the committee’s recommendation this item be Withdrawn and returned to the submitter for further development.

At its 2011 Interim Meeting, NEWMA recommended this as a Developing Item.

At the 2011 SWMA Annual Meeting, the committee did not feel it had enough information to make a decision on this issue. The justification provided in the proposal is not sufficient to clarify the issues that need to be resolved. The committee noted that there are references in *NIST Handbook 44* Scales Code to minimum numbers of divisions for Grain Hoppers. The committee acknowledged that Table 7a includes only “typical” applications and that additional changes might be warranted to clearly define the required parameters for grain hoppers. However, without additional information on the problem that needs to be resolved, the committee is reluctant to offer any suggestions. Consequently, the committee believes additional development is needed on this item before it is ready for consideration. The committee is amenable to supporting this as a Developing Item, provided that the original submitter agrees to further develop the item.

### **320-5 Appendix C – Units of Mass (ton)**

**Source:**

Rice Lake Weighing Systems, Inc. (2012)

**Purpose:**

To establish uniform abbreviations for Short Ton and Long Ton

**Item Under Consideration:**

Amend *NIST Handbook 44*: Appendix C Units of Mass table page C-19

<b>Units of Mass</b>	
1 assay ton <sup>1</sup> (AT)	29.167 grams
1 carat (c)	200 milligrams (exactly) 3.086 grains
1 dram apothecaries (dr ap or ʒ)	60 grains (exactly) 3.888 grams
1 dram avoirdupois (dr avdp)	27 <sup>11</sup> /32 (= 27.344) grains 1.772 grams
1 gamma (γ)	1 microgram (exactly)
1 grain	64.798 91 milligrams (exactly)
1 gram (g)	15.432 grains 0.035 ounce, avoirdupois
1 hundredweight, gross or long <sup>2</sup> (gross cwt)	112 pounds (exactly) 50.802 kilograms
1 hundredweight, gross or short (cwt or net cwt)	100 pounds (exactly) 45.359 kilograms
1 kilogram (kg)	2.205 pounds
1 milligram (mg)	0.015 grain
1 ounce, avoirdupois (oz avdp)	437.5 grains (exactly) 0.911 troy or apothecaries ounce 28.350 grams
1 ounce, troy or apothecaries (oz t or oz ap or ʒ)	480 grains (exactly) 1.097 avoirdupois ounces 31.103 grams
1 pennyweight (dwt)	1.555 grams
1 point	0.01 carat 2 milligrams
1 pound, avoirdupois (lb avdp)	7000 grains (exactly) 1.215 troy or apothecaries pounds 453.592 37 grams (exactly)
1 micropound (μlb) [the Greek letter mu in combination with the letters lb]	0.000 001 pound (exactly)
1 pound, troy or apothecaries (lb t or lb ap)	5760 grains (exactly) 0.823 avoirdupois pound 373.242 grams
1 scruple (s ap or ʒ)	20 grains (exactly) 1.296 grams
1 ton, gross or long ( <b>lt</b> ) <sup>3</sup>	2240 pounds (exactly) 1.12 net tons (exactly) 1.016 metric tons
1 ton, metric (t)	2204.623 pounds 0.984 gross ton 1.102 net tons
1 ton, net or short ( <b>tn</b> )	2000 pounds (exactly) 0.893 gross ton 0.907 metric ton

<sup>1</sup> Used in assaying. The assay ton bears the same relation to the milligram that a ton of 2000 pounds avoirdupois bears to the ounce troy; hence the mass in milligrams of precious metal obtained from one assay ton of ore gives directly the number of troy ounces to the net ton.

<sup>2</sup> The gross or long ton and hundredweight are used commercially in the United States to only a very limited extent, usually in restricted industrial fields. The units are the same as the British “ton” and “hundredweight.”

<sup>3</sup> The gross or long ton and hundredweight are used commercially in the United States to a limited extent only, usually in restricted industrial fields. These units are the same as the British “ton” and “hundredweight.”

**Background / Discussion:**

Other units of mass have an abbreviation for Metric and avoirdupois units, e.g., kg, lb, g, oz. The only abbreviation for tons is for the metric ton which is “t”. If an indicator is set up to display Metric and avoirdupois units, how does the operator or customer know what units he is displaying if “t” is the only abbreviation that is acceptable for ton. Because of the limited space available on today’s indicators, writing out “short ton” or “long ton” is not always an option.

In the *Canadian Lab Manual*, Part 2, Section Appendix-2A in the table for abbreviations and symbols accepted in Canada, metric ton is abbreviated by “t” and ton (short ton) is abbreviated by “tn”. In *NCWM Publication 14*, Appendix C in a table marked Acceptable Abbreviation/Symbols there is an abbreviation for short ton as TN and long tons as LT. In keeping with the Canadian abbreviation, the proposal would use the lower case “tn” and “lt”.

At its 2011 Interim Meeting the CWMA recommended that this be a Voting Item.

At the 2011 WWMA Annual Meeting, Mr. Ripka, Thermo-Fisher Scientific, expressed concern about the impact this proposal’s abbreviation changes would have on the substitution or replacement of existing terms on longstanding industry practices. Mr. Flocken, Mettler-Toledo, Inc., expressed similar concerns. He would support proposal moving forward as an Information Item. Mr. Cook, NIST, OWM reported that *NIST Handbook 44* Appendix C (2011 Edition) uses the lower case (t) for both the U.S. Customary short ton (2000 lbs) on page C-6 and the metric ton (2204.623 lb) on page C-19. Additionally, *NIST Special Publication 811 Guide for the International Systems* doesn’t use any abbreviation for U.S. Customary tons and uses the lower case (t) for the metric ton. The committee believes the proposal lacks specific direction whether to add or replace the existing abbreviations in *NIST Handbook 44* Appendix C. Additionally, there is no proposed solution or suggested abbreviation for indicators with both U.S. Customary and Metric tons used in his example. The WWMA accepted the committee’s recommendation that this proposal remain a Developing Item.

At the 2011 SWMA Annual Meeting, the committee heard from Mr. Lewis, Rice Lake Weighing Systems, Inc.. Mr. Lewis indicated that, based on opposition he has heard to the abbreviation of “long ton,” he suggests removing that abbreviation from the proposal. Thus the proposal would only include an abbreviation for “short ton.” Mr. Flocken, Mettler-Toledo, Inc., noted that the Weighing Sector considered this and agreed to move this forward because of differences between the U.S. and Canadian requirements. Canada doesn’t accept upper case “TN.” Ms. Butcher, NIST, OWM noted during the committee work sessions that *NCWM Publication 14* includes an exception to the abbreviation for “short ton”, with accepted designations of “ton” or “TN.” Mr. Lewis indicated that the Weighing Sector agreed to modify *NCWM Publication 14* to designate short ton as “tn.” There was support for the proposed abbreviation for “short ton” at Open Hearings. Noting the proposed change would align the U.S. requirements with Canadian requirements. There were no indications that the proposed change would impact existing equipments. The committee was informed by Mr. Flocken that the same change is being proposed for *NCWM Publication 14* scales checklists. The SWMA agreed with the committee recommendation to delete the reference to “long ton” as requested by the submitter and move the item forward as a Voting Item after modifying the reference to “ton” on page C-6 of *NIST Handbook 44*, Appendix C to specify the unit “tn” as the abbreviation for “ton” as follows:

<b>Units of Mass</b>	
1 assay ton <sup>4</sup> (AT)	29.167 grams
1 carat (c)	200 milligrams (exactly) 3.086 grains
1 dram apothecaries (dr ap or ʒ)	60 grains (exactly) 3.888 grams
1 dram avoirdupois (dr avdp)	27 <sup>11</sup> /32 (= 27.344) grains 1.772 grams
1 gamma (γ)	1 microgram (exactly)
1 grain	64.798 91 milligrams (exactly)
1 gram (g)	15.432 grains 0.035 ounce, avoirdupois
1 hundredweight, gross or long <sup>5</sup> (gross cwt)	112 pounds (exactly) 50.802 kilograms
1 hundredweight, gross or short (cwt or net cwt)	100 pounds (exactly) 45.359 kilograms
1 kilogram (kg)	2.205 pounds
1 milligram (mg)	0.015 grain
1 ounce, avoirdupois (oz avdp)	437.5 grains (exactly) 0.911 troy or apothecaries ounce 28.350 grams
1 ounce, troy or apothecaries (oz t or oz ap or ʒ)	480 grains (exactly) 1.097 avoirdupois ounces 31.103 grams
1 pennyweight (dwt)	1.555 grams
1 point	0.01 carat 2 milligrams
1 pound, avoirdupois (lb avdp)	7000 grains (exactly) 1.215 troy or apothecaries pounds 453.592 37 grams (exactly)
1 micropound (μlb) [the Greek letter mu in combination with the letters lb]	0.000 001 pound (exactly)
1 pound, troy or apothecaries (lb t or lb ap)	5760 grains (exactly) 0.823 avoirdupois pound 373.242 grams
1 scruple (s ap or ʒ)	20 grains (exactly) 1.296 grams
1 ton, gross or long <sup>6</sup>	2240 pounds (exactly) 1.12 net tons (exactly) 1.016 metric tons
1 ton, metric (t)	2204.623 pounds 0.984 gross ton 1.102 net tons
1 ton, net or short ( <b>tn</b> )	2000 pounds (exactly) 0.893 gross ton 0.907 metric ton

<sup>1</sup> Used in assaying. The assay ton bears the same relation to the milligram that a ton of 2000 pounds avoirdupois bears to the ounce troy; hence the mass in milligrams of precious metal obtained from one assay ton of ore gives directly the number of troy ounces to the net ton.

<sup>2</sup> The gross or long ton and hundredweight are used commercially in the United States to only a very limited extent, usually in restricted industrial fields. The units are the same as the British “ton” and “hundredweight.”

<sup>3</sup> The gross or long ton and hundredweight are used commercially in the United States to a limited extent only, usually in restricted industrial fields. These units are the same as the British “ton” and “hundredweight.”

## 320-6 Appendix D – Definitions (Reference Weight Car)

**Source:**

Systems Associates, Inc. (2012)

**Purpose:**

This proposal is intended to align *NIST Handbook 44* with updated material in *AAR Scale Handbook*.

**Item Under Consideration:**

Replace the existing definition in *NIST Handbook 44*: Appendix D with the following:

**reference weight car. – ~~A railroad car weighed on a scale for temporary use as a mass standard over a short period of time (typically, the time required to test one scale) as part of a test train. A railcar that has been statically weighed for temporary use as a mass standard over a short period of time, typically the time required to test one scale.~~**

**Note:** A test weight car that is representative of the types of cars typically weighed on the scale under test may be used wherever reference weight cars are specified.[2.20]

(Added 1991) (Amended 20XX)

**Background / Discussion:**

The changes would require that reference cars be weighed on a static scale and would remove the statement regarding being part of a train. For instance, Reference Weight Cars may be used in a belt scale test where the concept of a train doesn't exist. The proposed definition change was developed by Committee 34 - Scales, of the AREMA and approved (by unanimous vote) for inclusion in the *AAR Scale Handbook*. Additional contacts include Mr. Gogolin, Norfolk Southern Corporation as AREMA committee 34 Chairman and Mr. Jimenez, Association of American Railroad Transportation Technology Center as AREMA Committee 34 AAR Liaison.

At their 2011 Interim Meetings, the CWMA and NEWMA recommended this item as a Voting Item.

At the 2011 WWMA Annual Meeting, Mr. Straub, Fairbanks Scales, Inc., supported the item as submitted. There was no opposition. The committee recognized that this proposal aligns *NIST Handbook 44* with the updated material in the *AAR Scale Handbook*. The WWMA accepted the committee's recommendation that this proposal move forward as a Voting Item.

At the 2011 SWMA Annual Meeting, the committee heard one comment in support and no comments in opposition. The SWMA agreed with the committee's comments that the modification will further align *NIST Handbook 44* and the *AAR Handbook* and recommended this item move forward as a Voting Item.

## 321 BELT-CONVEYOR SCALE SYSTEMS

### 321-1 S.1.9. Zero Ready Indicator

**Source:**

U.S. National Work Group on Belt-Conveyor Scales (2012)

**Purpose:**

To add a new device specification and user requirement to help ensure that a stable zero-balance condition is established prior to running material across a belt scale. The intent of the proposal is to; 1) provide an indication that the zero condition of the scale is within the specified requirements for accurate measurement, and 2) further

clarify General Code paragraph G-UR.4.1. Maintenance of Equipment regarding a user's responsibility to maintain the scale in proper operation condition.

**Item Under Consideration:**

Add a new paragraph *NIST Handbook 44: S.1.9 Zero Ready Indicator* to Section 2.21., Belt-Conveyor Scale Systems Code to read as follows:

**S.1.9. Zero Ready Indicator. A belt conveyor scale shall be equipped with a Zero Ready indicator. Permanent means shall be provided to produce an audio or visual signal when the zero is within +/- 0.12% of the rated capacity of the scale during an unloaded belt condition. The type of indication (audio or visual) shall be determined by the individual installation.**

**[Nonretroactive as of January 1, 20XX]**

**(Added 20XX)**

Amend paragraph UR.3.2. Maintenance of Section 2.21., Belt-Conveyor Scale Systems Code to include new UR.3.2. (a) as follows:

**UR.3.2. Maintenance.** – Belt-conveyor scales and idlers shall be maintained and serviced in accordance with manufacturer's instructions and the following:

- (a) The zero balance condition of a belt conveyor scale shall be maintained such that, prior to beginning any commercial transaction, with no load on the belt, a zero balance condition within +/- 0.12% of the scales rated capacity can be verified.**

**(Added 20XX)**

- ~~(a)~~**(b)** The scale and area surrounding the scale shall be kept clean of debris or other foreign material that can detrimentally affect the performance of the system.

- ~~(b)~~**(c)** There shall be provisions to ensure that weighed material does not adhere to the belt and return to the scale system area.

(Added 2004)

- ~~(e)~~**(d)** Zero-load tests and simulated load or material tests shall be conducted at periodic intervals between official tests and after a repair or mechanical adjustment to the conveyor system in order to provide reasonable assurance that the device is performing correctly. The minimum interval for periodic zero load tests and simulated load tests shall be established by the official with statutory authority or according to manufacturer recommendations.

\*\*\* No changes recommended for Change in Zero or Change in Factor (Reference) Tables \*\*\*

- ~~(d)~~**(e) Scale Alignment.** – Alignment checks shall be conducted in accordance with the manufacturer's recommendation when conveyor work is performed in the scale area. A material test is required after any realignment.

(Amended 1986 and 2000)

- ~~(e)~~**(f) Simulated Load Equipment.** – Simulated load equipment shall be clean and properly maintained.

~~(f)~~**(g) Zero Load Reference Information.** – When zero load reference information is recorded for a delivery, the information must be based upon zero load tests performed as a minimum both immediately before and immediately after the totalized load.

(Added 2002)

(Amended 2002, 2004, and 2009)

**Background / Discussion:**

It is apparent to owners, manufacturers, and service agents associated with belt conveyor scale systems that a zero shift may occur that is readily observed on systems running at a “no-load” level of operation (particularly those equipped with automatic zero mechanisms). The U.S. National Work Group (USNWG) on belt-conveyor scales has developed a recommendation that would require that an indication be present which indicates a zero condition during these low-flow periods when no material is being totalized by an integrator.

During the 2008 USNWG on Belt-Conveyor Scales meeting, the work group submitted a proposal to NCWM S&T Committee that would add a requirement to *NIST Handbook 44* requiring belt-conveyor scales to include a means to provide the operator with an indication that the system is “ready” to operate. The recommended addition of the paragraph S.1.6.1. as shown below would require an indication that would notify an operator of an out-of-zero condition and also defines the limit of the width of zero for that device.

**S.1.6.1 Zero-load indicator. - The integrator shall display an indication that defines a zero-balance condition when the unloaded condition of the belt over a unit revolution or revolutions is within +/- 0.12% of the rated scale capacity.**

**(Nonretroactive as of January 1, 20XX)**

**(Added 200X)**

This indication would signify that the system had arrived at an acceptable stable zero condition with the belt running during periods when no totalization of material was taking place. The work group also acknowledged the need for an associated User Requirement that would provide guidance for an operator of the system in the event that the system failed to achieve this “ready” state.

At its 2008 Annual Technical Conference, the committee heard support for this item as written in the agenda along with a request to allow additional time for manufacturers to make necessary changes to hardware or software. The committee agreed with the comments and request and recommends the proposal be amended and moved forward as a Voting Item with a 2011 nonretroactive date as shown in the recommendation (effective 18 months after adoption).

During the 2009 NCWM Interim Meeting, the committee received written comments from Alabama Weights and Measures Division stating that an indicator should serve as a means to alert the operator that a zero condition during low-flow periods has occurred. However, if this indicator is activated, the operator and/or service person should make every effort to locate the possible zero change source before making a zero change/adjustment. In many cases, problems of a mechanical or material handling nature occur that does affect the zero balance condition. In these cases, zero changes or adjustments must not be made until repairs, adjustments, or cleaning has been accomplished.

The committee suggested that the Belt-Conveyor Scale work group or Alabama Weights and Measures Division develop a proposal for a separate user requirement similar to Scales Code paragraph UR.4.1. Balance Condition. The proposal should require the user to maintain the zero-balance condition when the belt is unloaded, and to include the inspections recommended in the Alabama comments.

At the 2009 NCWM Annual Meeting, the committee reviewed comments and recommendations from the February 2009 meeting of the Belt-Conveyor Scale work group. The members of the work group initially supported the

recommendation and discussed the need for an associated user requirement to be developed that would require that zero-balance condition be maintained during operation. Further discussion took place where it was stated that +/- 0.12% of rated scale capacity specified in the proposal would occupy too large portion of the value of the tolerance applied to the device. Mr. Chase, consultant, pointed out that this value was twice the allowable tolerance applied during a zero test.

Additional discussion during the February 2009 Belt-Conveyor Scale work group meeting included the possibility of requiring that there be some type of interlock mechanism to prevent the initiation of a transaction until the zero reference has been established and the scale is ready to deliver. The work group generally agreed that if the requirement included a mandatory interlock mechanism, which would prevent totalization at times when the zero reference was subject to a significant shift, then the development of any user requirement would be unnecessary. The question was then raised as to whether or not this would present manufacturers with a significant change in design to overcome; a number of the manufacturers present at the meeting believe this would be a relatively simple change to make in software portion of their devices. Consequently, the work group recommended that this item be Withdrawn and formed a subgroup to further develop the proposal and an associated user requirement if necessary.

The committee agreed that with the work group recommendation that this item needs additional development and a consensus proposal from the work group and to Withdraw this item from the agenda.

This item was included on the 2010 USNWX's meeting agenda for further development. The USNWX was in agreement that there needs to be some form of indication to provide a visual indication for the operator to verify that the scale is in a "zero ready" condition and that a supporting user requirement may need to be developed for the operator/owners. The possibility of including an interlock feature in a totalizer was discussed and the manufacturers present at the meeting stated that they were now reluctant to include an interlock feature in their instrument which has the potential of stopping their customer's production operations.

During the February 2011 meeting of the USNWX, the work group agreed that additional effort should be expended to establish a requirement that will provide indication that an acceptable zero condition exists prior to any totalization operation. There was no consensus regarding specifics related to such a requirement such as: the nature of this proposed indication and its visibility to the operator; the duration of time or length of belt travel needed to establish a zero condition; and the allowable limits that would be applied to any variation from the established zero condition. Further discussion was tabled on this item and the sub-group formed to address this item agreed to further explore these issues and develop a draft proposal. The sub-group consisted of:

- Mr. Ian Burrell
- Mr. Phil Carpentier
- Mr. Paul Chase
- Mr. Todd Dietrich
- Mr. Lars Marmsater
- Mr. Bill Ripka
- Mr. Peter Sirrico

This sub-group worked to develop a draft proposal via e-mail and teleconference. Draft proposals were developed for both a Specification Requirement (S.1.9. Zero Ready Indicator) and the associated User Requirement UR.3.2. (a), which has been submitted as a separate item.

The draft proposal was sent electronically to the entire USNWX on belt-conveyor scales who were asked to review and respond with comments by August 10, 2011. No additional comments were received from the members of the full USNWX.

At the 2011 CWMA and NEWMA Interim Meetings, and the SWMA Annual Meeting, the regional weights and measures associations accepted its respective committees' recommendations that this item move forward as a Voting Item.

At the 2011 WWMA Annual Meeting, Mr. Ripka, Thermo Fisher Scientific, provided the following comments and added that the Belt-Conveyor Scale USNWG has thoroughly discussed the topic of “zero” as it relates to a belt-conveyor scale condition prior to running material loads. Some of these discussions went beyond the “ready” topic and delved into some type of zero alarm. Responses to the alarm comments seem to agree that this is a separate issue and should be addressed at a different time. The USNWG considered the following in its development of this item.

**The name of this feature / requirement.**

The initial proposal I used “Zero Balance” and the group has responded with the terms of “Zero Ready” and “Scale Ready”. In that having a stable zero, within a predefined range does not totally verify that the scale is ready the final proposal uses the term “Zero Ready”.

**Visibility to the operator.**

We do not believe there is a need to clutter the code with specifying the indicator must be visible to the operator. General Code Paragraph G-UR.3.3 indicates “A device or system equipped with a primary indicating element and used in direct sales, except for prescription sales, shall be positioned so that its indications may be accurately read and the weighing or measuring operation may be observed from some reasonable “customer” and “operator” position.”

It is within this code that the rate of flow limit indicator positioning is based, i.e. viewable by the operator. The same should hold true for the “Zero Ready” indicator.

**Period to determine the “Zero” condition.**

All testing criteria currently used for belt conveyor scales base zero on full belt revolutions. The team agrees the same basis should be used for this condition / indication. Section N.3.1.1 identifies: a “Zero-Load test” as “a percentage of the full-scale capacity, or a change in a totalized load over a whole number of complete belt revolutions”. The team neither wants nor needs to redefine this during this exercise. There may be capabilities within belt profiling schemes that would be able to identify this condition in less than a revolution and the revised proposal allows for development of this or other technologies.

**Location of Specification.**

Due to the methodology of indicating retroactive or non-retroactive in the handbook the new requirement should not be included in section S.1.5, which currently has a non-retroactive date of January 1, 1986 –the date the handbook was updated to include provisions to meet NTEP. Changing this to a non-retroactive date of January 1, 20XX could possibly put some old existing systems into a non-compliance condition. Therefore, the recommendation is to add the zero condition statement in a new section, numbered S.1.9 simply to keep the new requirement as a stand-alone item, and to eliminate the need to renumber the other items in this area.

**Allowable limits.**

There were many opinions regarding the amount of zero error allowed prior to the initiation of the “Zero Ready” condition. The initial proposal used 0.06%. The team discussions continually referenced the 0.12% value as allowed during the performance of a materials test. When “testing” a belt-conveyor scale the zero is to be confirmed to be able to hold a zero condition for three consecutive tests within 0.06%. This test proves zero stability of an empty system only (N.3.1.2.). After a materials test load has been delivered, the scale is expected to still be within 0.12%. This is to ensure that the materials load test has not been compromised or influenced by a zero shift (T.1.1.). If the zero requires adjustment during the conduct of a materials test in excess of 0.18% the statutory authority may establish specific intervals for zero testing. This requirement does not restrict the zero range. It can perhaps be argued the allowable zero range during “use” is 0.18%, or even 0.25% - the tolerance of the device itself. While this may be a high value, we need to make changes in the handbook that do not conflict with other requirements already in place. After final discussion, the sub-team of the USNWG agreed that the value to be implemented in this proposal is 0.12%

The WWMA committee agreed with the recommendation and justification provided by the USNWG on belt-conveyor scales. The WWMA accepted the committee’s recommendation that this proposal move forward as a Voting Item.

## 321-2 UR.1. User Requirements

### Source:

U.S. National Work Group on Belt-Conveyor Scales (2012)

### Purpose:

Improve the organization and formatting of the User Requirements section of the *NIST Handbook 44* Belt-Conveyor Scales Code by:

1. Consolidating applicable operational user requirements into paragraph UR.1. User Requirements,
2. Changing the title of paragraph UR.3. from “User Requirements” to “Maintenance,” and
3. Consolidating applicable maintenance requirements into paragraph UR.3.

### Item Under Consideration:

Amend *NIST Handbook 44*: Belt-Conveyor Scales Systems UR. User Requirements section as follows:

**UR.1. Use Requirements.** – ~~A belt-conveyor scale system shall be operated between 20 % and 100 % of its rated capacity.~~

~~(Amended 2004)~~

**UR.1.1. Rate of Operation.** – **A belt-conveyor scale system shall be operated between 20% and 100% of its rated capacity.**

**(Added 20XX)**

**UR.1.2. Rate of Operation.** – **A belt-conveyor scale system shall be operated between 20% and 100% of its rated capacity.**

**(Added 20XX)**

**UR.1.13. Minimum Totalized Load.** – Delivered quantities of less than the minimum test load shall not be considered a valid weighment.

**UR.31.14. Loading.** – The feed of material to the scale shall be controlled to assure that, during normal operation, the material flow is in accordance with manufacturer’s recommendation for rated capacity.

**UR.31.45. Diversion or Loss of Measured Product.** – There shall be no operation(s) or condition(s) of use that result in loss or diversion that adversely affects the quantity of measured product.

(Added 2005)

**UR.1.26. Security Means.** – When a security means has been broken, it shall be reported to the official with statutory authority.

(Amended 1991)

**UR.31.37. Retention of Maintenance, Test, and Analog or Digital Recorder Information.** – Records of calibration and maintenance, including conveyor alignment, analog or digital recorder, zero-load test, and material test data shall be maintained on site for at least the three concurrent years as a history of scale performance. Copies of any report as a result of a test or repair shall be mailed to the official with statutory authority as required. The current date and correction factor(s) for simulated load equipment shall be recorded and maintained in the scale cabinet.

(Added 2002)

\*\*\* No changes recommended for requirements under UR.2. Installation Requirements\*\*\*

**UR.3. Use Requirements Maintenance.**

~~UR.3.1. Loading. The feed of material to the scale shall be controlled to assure that, during normal operation, the material flow is in accordance with manufacturer's recommendation for rated capacity.~~

**UR.3.21. Scale and Conveyor Maintenance.** – Belt-conveyor scales and idlers shall be maintained and serviced in accordance with manufacturer's instructions and the following:

\*\*\*No changes recommended for paragraphs UR.3.21. (a) through (f)\*\*\*

~~UR.3.3. Retention of Maintenance, Test, and Analog or Digital Recorder Information. — Records of calibration and maintenance, including conveyor alignment, analog or digital recorder, zero load test, and material test data shall be maintained on site for at least the three concurrent years as a history of scale performance. Copies of any report as a result of a test or repair shall be mailed to the official with statutory authority as required. The current date and correction factor(s) for simulated load equipment shall be recorded and maintained in the scale cabinet.~~

(Added 2002)

~~UR.3.4. Diversion or Loss of Measured Product. — There shall be no operation(s) or condition(s) of use that result in loss or diversion that adversely affects the quantity of measured product.~~

(Added 2005)

\*\*\*No changes recommended for paragraphs UR.4. Compliance.\*\*\*

**Background / Discussion:**

This item comes from the recommendation of the NIST Technical Advisor to the USNWG on Belt-Conveyor Scales and would:

1. Consolidating applicable operational user requirements into paragraph UR.1. User Requirements,
2. Changing the title of paragraph UR.3. from “User Requirements” to “Maintenance,” and
3. Consolidating applicable maintenance requirements into paragraph UR.3.

During the development of a new User Requirement (UR.3.2. (a)) by the USNWG on belt-conveyor scales, it was recognized that many of the individual paragraphs within the User Requirement Section were not appropriately located in the Belt-Conveyor Scales Code. It was also recognized that two paragraphs, UR.1. and UR.3 were both titled “Use Requirements”. To achieve a better organization and formatting of the User Requirement section, several paragraphs have been renumbered and/or relocated within this section as shown above. A proposed new requirement – UR.3.2. (a) Zero Balance – which has been submitted for consideration separately has also been incorporated into this proposal and has been renumbered as UR.1.2. to maintain continuity within this section.

The draft proposal as shown was circulated to the entire USNWG by e-mail. The members of the work group were asked to respond with their support or comments based on this draft. All responses indicated support for the proposal as drafted.

At the 2011 CWMA and NEWMA Interim Meetings, and the SWMA Annual Meeting, the regional weights and measures associations accepted its respective committees' recommendations that this item move forward as a Voting Item.

At the 2011 WWMA Annual Meeting Mr. Ripka, Thermo Fisher Scientific, restated the reasons and history for this proposal to reorganize the User Requirements. There were no comments to this item. The committee agreed with the justification and background information provided with the submission of this proposal and agreed this reorganization helps consolidate application users requirements. The WWMA accepted the committee's recommendation is to move the item forward as a Voting Item.

### 330 LIQUID MEASURING DEVICES

#### 330-1 S.1.6.4.1. Unit Price

**Source:**

Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capabilities (2012)

**Purpose:**

Update specifications to address current marketing methods for offering discount pricing beyond simple cash/credit pricing.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Liquid Measuring Devices Code as follows:

**S.1.6.4.1. Unit Price.**

- (a) *A computing or money-operated device shall be able to display on each face the unit price at which the device is set to compute or to dispense.*
- (b) *Whenever a grade, brand, blend, or mixture is offered for sale from a device at more than one unit price, then all of the unit prices at which that product is offered for sale, prior to any post-delivery discounts, shall be displayed or shall be capable of being displayed on the dispenser ~~using controls available to the customer~~ through a deliberate action of the purchaser prior to the delivery of the product. It is not necessary that all of the unit prices for all grades, brands, blends, or mixtures be simultaneously displayed prior to the delivery of the product. This subsection shall not apply to fleet sales, other contract sales, or truck refueling sales (e.g., sales from dispensers used to refuel trucks).*

*[Effective and nonretroactive as of January 1, 1991]*

(Amended 1989, and 1997 and 20XX)

**Background / Discussion:**

Current language requires all possible unit prices to be posted or capable of being posted on the dispenser. However, marketing practices used in retail fuel sales have moved passed cash vs. credit, with multiple unit prices potentially offered to customers both pre-delivery and post-delivery, depending on payment method, loyalty programs, services purchased, etc. Newer dispensers, or their point-of-sale software, can allow for a large variety of final unit prices, depending on card type, loyalty programs, etc. There is no reason to supply unit price information to a customer who may not qualify for a certain discounted unit price that is being offered to other customers.

Inserting the phrase, "prior to any post-delivery discounts," would ensure that the unit prices for any pre-delivery discounts, such as for the use of cash or debit card, are posted for every customer to see, but allow for unit price discounts that take place only after the product is dispensed.

Inserting “through a deliberate action of the purchaser” allows for the selection of a unit price through the use of some form of electronic activation, such as a cell phone, or swipe card.

### 330-2 S.1.6.5.4. Selection of Unit Price

**Source:**

Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capabilities (2012)

**Purpose:**

Allows for greater flexibility in the way in which customers can select a unit price to accommodate new technology.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Liquid Measuring Devices Code as follows:

*S.1.6.5.4. Selection of Unit Price.* – Except for dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), when a product or grade is offered for sale at more than one unit price through a computing device, the selection of the unit price shall be made prior to delivery ~~using controls on the device or other customer-activated controls~~ through a deliberate action of the purchaser to select the unit price for the transaction. A system shall not permit a change to the unit price during delivery of product.

[Nonretroactive as of January 1, 1991]

(Added 1989) (Amended 1991, 1992, 1993, ~~and~~ 1996, and 20XX)

**Background / Discussion:**

New technology coming to dispensers will make available the selection of grade or unit price without direct contact with the dispenser. Current language requires purchaser to physically make contact with the device to select a unit price, and does not recognize that unit price selection can be made by attendants, or by use of electronic devices such as swipe cards, or smart phones.

### 330-3 S.1.6.6. Agreement Between Indications

**Source:**

Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capabilities (2012)

**Purpose:**

Provide an exemption from the money values agreement requirement when the dispensing system offers discounts after delivery that result in total price indications that differ from that indicated on an auxiliary element.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Liquid Measuring Devices Code as follows:

**S.1.6.6. Agreement Between Indications.** – When a quantity value indicated or recorded by an auxiliary element is a derived or computed value based on data received from a retail motor fuel dispenser, the value may differ from the quantity value displayed on the dispenser, provided the following conditions are met:

- (a) all total money-values for an individual sale that are indicated or recorded prior to any post-delivery discounts by the system agree; and

- (b) *within each element, the values indicated or recorded meet the formula (quantity x unit price = total sales price) to the closest cent.*

*[Nonretroactive as of January 1, 1988]*

(Added 1985) (Amended 1987, ~~and~~ 1988, and 20XX)

**Background / Discussion:**

Price discounts can be given through either:

1. the dispenser's roll back of the unit price, or
2. recalculation of the transaction at the lower unit price that is performed by auxiliary equipment after, or post, delivery.

Roll back of unit prices prior to fuel delivery requires agreement of total price between the dispenser display and any auxiliary element. However, any post-delivery discounts offered will result in price totals displayed on the dispenser and displayed on an auxiliary element that are not in agreement. The relevant code needs to be changed to recognize this situation.

Inclusion of the proposed phrase "**prior to any post-delivery discounts**" will exempt dispensers from the money values agreement requirement when the dispensing system offers discounts after delivery that result in total price indications that differ from that indicated on an auxiliary element.

**330-4 S.1.6.7. Recorded Representations**

**Source:**

Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capabilities (2012)

**Purpose:**

Ensure that fuel dispensers provide receipts with sufficient information to allow customers to fully understand any post-delivery discounts and allow the use of electronic as well as printed receipts.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Liquid Measuring Devices Code as follows:

***S.1.6.7. Recorded Representations.*** – *Except for fleet sales and other price contract sales, a printed receipt providing the following information shall be available through a built-in or separate recording element for all transactions conducted with point-of-sale systems or devices activated by debit cards, credit cards, and/or cash:*

(a) *the total volume of the delivery;*

(b) *the dispensed unit price;*

(c) *any unit price discounts or discounts to the total price shown on the dispenser applied after delivery;*

(~~e~~) *the total computed price as shown on the dispenser at the end of the delivery; and*

(~~e~~) *the product identity by name, symbol, abbreviation, or code number; and*

(f) *the final price of the sale.*

***For systems equipped with the capability to issue an electronic receipt, the customer may be given the option to receive the receipt electronically (e.g., via cell Phone, computer, etc.)***

*[Nonretroactive as of January 1, 1986]*

(Added 1985) (Amended 1997, and 20XX)

**Background / Discussion:**

Customer confusion can result when dispensers provide post-delivery discounts that are not reflected on the total price shown on dispenser. The confusion can be resolved if the dispenser's printed receipt shows the discounts to the original unit price and any other discounts, and the total final price. Providing this information will allow the customer to "walk back" the transaction using the receipt and ensure they understand how the final price was derived from the price before any discounts were taken.

In addition, there is a need to recognize that electronic receipts, delivered to computers or smart phones, for example, are making their way into the marketplace, and the regulations need to accommodate this feature.

**330-5 UR.3.2. Unit Price and Product Identity**

**Source:**

Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capabilities (2012)

**Purpose:**

Provide realistic requirements for displaying or posting unit prices in consideration of the discount marketing practices being offered to consumers.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Liquid Measuring Devices Code as follows:

**UR.3.2. Unit Price and Product Identity.**

- (a) ~~The following information In the case of a computing type or money-operated type dispenser, the final unit price that includes any pre-delivery discounts and at which the device or system is set to compute shall be conspicuously displayed or posted on the face of a retail dispenser used in direct sale. Between transactions the displayed unit price shall be the highest unit price available. Additionally, any discounted prices may be posted on or adjacent to the dispenser.~~
- ~~(1) except for dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), all of the unit prices at which the product is offered for sale; and~~
- ~~(2) in the case of a computing type or money-operated type, the unit price at which the dispenser is set to compute.~~

~~Provided that the dispenser complies with S.1.6.4.1. Display of Unit Price, it is not necessary that all the unit prices for all grades, brands, blends, or mixtures be simultaneously displayed or posted.~~

~~Note: Dispensers used exclusively for fleet sales, or other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), are exempt from paragraph U.R.3.2.(a).~~

- (b) The following information shall be conspicuously displayed or posted on each side of a retail dispenser used in direct sale:
- (1) the identity of the product in descriptive commercial terms; and
- (2) the identity of the grade, brand, blend, or mixture that a multi-product dispenser is set to deliver.

(Amended 1972, 1983, 1987, 1989, 1992, ~~and~~ 1993, and 20XX)

**Background / Discussion:**

The current requirement in U.R.3.2.requires all unit prices at which the product is offered for sale to be capable of being posted. The growing trend of post-delivery unit pricing in the form of rewards cards, car wash discounts, and others, makes posting all of these unit prices impractical. Unit price discounts may apply only to certain customers using certain types of credit cards. Requiring posting of these unit prices is also unrealistic.

The amendment ensures that pre-delivery discounts such as cash or debit card are displayed on or adjacent to the dispenser. Any post-delivery discounts such as loyalty cards, car wash purchases, discounts based on volume of purchase, etc., would be exempt from any requirement to display on the dispenser each of the unit prices. After product is dispensed, the unit price displayed on the pump will automatically revert to the highest unit price offered by the retailer. This will avoid confusion possibly caused when drivers pull up to a pump and see a unit price to which they are not entitled.

**330-6 UR.3.3. Computing Device****Source:**

Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capabilities (2012)

**Purpose:**

Provide adequate information on the customer receipt to allow the customer to verify all applicable discounts.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Liquid Measuring Devices Code as follows:

**UR.3.3. Computing Device.** – Any computing device used in an application where a product or grade is offered for sale at one or more unit prices shall be used only for sales for which the device computes and displays the sales price for the selected transaction.

(Added 1989) (Amended 1992)

The following exceptions apply:

- (a) Fleet sales and other price contract sales are exempt from this requirement.
- (b) A truck stop dispenser used exclusively for refueling trucks is exempt from this requirement provided that:
  - (1) all purchases of fuel are accompanied by a printed receipt of the transaction containing the applicable price per gallon, the total gallons delivered, and the total price of the sale; and

(Added 1993)

- (2) unless a dispenser complies with S.1.6.4.1. Display of Unit Price, the **unit** price posted on the dispenser and the **unit** price at which the dispenser is set to compute shall be the highest **unit** price for any transaction which may be conducted.

(Added 1993)

- (c) **A dispenser used in an application where a price per unit discount is offered following the delivery is exempt from this requirement, provided the following conditions are satisfied:**

- (1) **The unit price posted on the dispenser and the unit price at which the dispenser is set to compute shall be the highest unit price for any transaction.**

**(2) All purchases of fuel are accompanied by a printed receipt recorded by the system for the transaction containing:**

**(a) the dispensed price per unit, the total quantity delivered, and total price as shown on the dispenser at the end of the delivery,**

**(b) an itemization of the discounts to the unit price, and**

**(c) the final price of the sale.**

**For systems equipped with the capability to issue an electronic receipt, the customer may be given the option to receive the receipt electronically (e.g., via cell phone, computer, etc.)**

**(Added 20XX)**

**Background / Discussion:**

Various methods of pricing fuel are coming to the retail market. In addition to discounts offered for cash or debit cards, new post-delivery discounts to unit prices are becoming more common. These include loyalty cards, discounts based upon the type of credit card used, discounts for car washes purchased, etc. In order for consumers to be confident that they are receiving all the discounts to which they are entitled, it is essential that the dispenser receipt display the original price and total, the discounts that were applied against the unit price, and the final price that the customer is charged.

The additions to this paragraph will allow the customer to “walk-back” their transaction using the receipt provided by the dispenser. The final price that is charged to the customer, the discounts to the unit price, the quantity pumped, and the original price set before the discounts were applied will all be shown. The new language will also allow for electronic receipts to be provided in lieu of paper.

**330-7 UR.3.X. Nozzle Color for Retail Motor Fuel Dispensers**

**Source:**

Missouri Department of Agriculture (2012)

**Purpose:**

Prevent accidental misfueling by establishing uniform fuel dispenser nozzle colors for product recognition.

**Item Under Consideration:**

Add the following paragraph to *NIST Handbook 44*: Liquid Measuring Devices Code:

**UR.3.X. Nozzle Color for Retail Motor Fuel Dispensers.**

**(a) Diesel fuel nozzles shall be green in color and shall be used only for diesel fuel, and**

**(b) E85 fuel nozzles shall be yellow in color and shall be used only for E85.**

**Background / Discussion:**

Missouri Weights and Measures receive numerous complaints each year related to the accidental misfueling of vehicles. Information received from many other states indicates the same problem exists nationwide.

If uniform colors were established for nozzles or nozzle covers, the same colors could be used for fill connections on storage tanks. If color codes were consistent for both fill openings and dispensing nozzles there would likely be far less contamination of fuel in storage tanks and damage to vehicles.

Some diesel auto manufacturers now require a minimum of 23.63 mm (0.930 in) outside diameter for nozzle spout size. This diameter is a common size for all fuels prior to the introduction of unleaded gasoline.

The item was first discussed at the 2011 CWMA Annual Meeting. The proposal establishes uniform fuel nozzle colors for product recognition on retail motor fuel dispensers to prevent accidental misfueling of passenger vehicles. The proposal would require yellow colored nozzle covers for E-85 and mid-level ethanol blends for flex-fuel vehicles and restrict the use of the color yellow from use to identify other products. The proposal would also require green colored nozzle covers for diesel fuel and mid-level blends of diesel fuel and restrict the use of the color green from use to identify other products. In the future consideration could be given to establishing color codes for other products (gasoline, kerosene, etc.)

At the 2011 CWMA Interim Meeting a number of regulatory officials voiced support for this item to promote uniformity. There was discussion about over-regulating and whether the consumer would be aware of and pay attention to this color coding system. Industry suggested that more lead time is needed on this requirement to allow time for consumer education, and time to defray the cost. There was also suggestion that this requirement would adversely affect certain brands. The committee recommended this as a Developing Item.

At the 2011 WWMA Annual Meeting no testimony received during Open Hearings supported the proposal. The committee noted that the proposal doesn't prevent accidental misfueling and the potential number of colors for different grades and types of fuel products could be more confusing to customers. A similar proposal was submitted to NCWM in 2002 and was ultimately Withdrawn in 2003 due to lack of support. The WWMA recommended that this item be Withdrawn since no new justification was provided.

At the 2011 NEWMA Interim Meeting many members noted they have received complaints on this issue and would like to see language that will help the consumer more readily see when diesel is being selected. The committee therefore recommends that this proposal be placed as a Developing Item.

At the 2011 SWMA Annual Meeting the committee recommended that this be a Developing Item. The committee is amenable to considering a proposal to address the issue of misfueling; however, it does not believe the proposal is complete as written. Committee members had concerns that the proposal may not completely address the problems that lead to misfueling. In particular, they believe that size requirements should be considered.

### **331 VEHICLE-TANK METERS**

#### **331-1 T.4. Product Depletion Test**

**Source:**

Northeastern Weights and Measures Association (2009 – Developing Items Part 3.31., Vehicle-Tank Meters - Item 1.)

**Purpose:**

Modify the Vehicle Tank Meter (VTM) code to base the product depletion test tolerances on the meter's maximum flow rate (a required marking on all meters), rather than the meter size (a required marking for meters manufactured beginning in 2009). This will enable more consistent application of the tolerances for older meters, which are not required to be marked with the meter size, and address an unintentional gap which allows an unreasonably large tolerance for smaller meters.

**Item Under Consideration:**

The committee is considering two options for modifications to paragraph T.4. and Table T.4. The committee is asking for feedback on both of these proposals and is particularly interested in data from manufacturers and weights and measures jurisdictions that would illustrate the impact of these proposals on smaller meters.

**Option 1: Modify Paragraph T.4. as follows:**

**T.4. Product Depletion Test.** – The difference between the test result for any normal test and the product depletion test shall not exceed **one-half (0.5 %) percent of the volume delivered in one minute at the maximum flow rate marked on the meter. Tolerances for typical meters are 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 as specified in Table 1. Accuracy Classes and Tolerances for Vehicle-Tank Meters

<b>Table T.4.</b>	
<b>Tolerances for Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters</b>	
<b>Meters Size</b>	<b>Maintenance and Acceptance Tolerances</b>
<b>Up to, but not including, 50 mm (2 in)</b>	<b>1.70 L (104 in<sup>3</sup>)<sup>1</sup></b>
<b>From 50 mm (2 in) up to, but not including, 75 mm (3 in)</b>	<b>2.25 L (137 in<sup>3</sup>)<sup>1</sup></b>
<b>75 mm (3 in) or larger</b>	<b>3.75 L (229 in<sup>3</sup>)<sup>1</sup></b>
<sup>1</sup> Based on a test volume of at least the amount specified in N.3. Test Drafts.	

Replace current Table T.4. with revised Table T.4. as follows:

<b>Table T.4.</b>			
<b>Tolerances for Typical Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters</b>			
<b>Meters Marked with Flow Rates in SI Units</b>		<b>Meters Marked with Flow Rates in Inch-Pound Units</b>	
<b>Marked Maximum Flow Rate<sup>1</sup></b>	<b>Maintenance and Acceptance Tolerances<sup>2</sup></b>	<b>Marked Maximum Flow Rate<sup>1</sup></b>	<b>Maintenance and Acceptance Tolerances<sup>2</sup></b>
<b>114 Lpm</b>	<b>0.57 L</b>	<b>30 gpm</b>	<b>0.15 gal (34.6 in<sup>3</sup>)</b>
<b>227 Lpm</b>	<b>1.14 L</b>	<b>60 gpm</b>	<b>0.30 gal (69.3 in<sup>3</sup>)</b>
<b>380 Lpm</b>	<b>1.90 L</b>	<b>100 gpm</b>	<b>0.5 gal (115 in<sup>3</sup>)</b>
<b>757 Lpm</b>	<b>3.78 L</b>	<b>200 gpm</b>	<b>1.0 gal (231 in<sup>3</sup>)</b>
<sup>1</sup> Refer to T.4. for meters with maximum flow rates not listed.			
<sup>2</sup> Based on a test volume of at least the amount specified in N.3. Test Drafts.			

**Option 2: This option includes larger tolerances for smaller meters. Modify Paragraph T.4. as follows:**

**T.4. Product Depletion Test.** – The difference between the test result for any normal test and the product depletion test shall not exceed **one-half (0.5 %) percent of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated higher than 380 Lpm (100 gpm), or six-tenths (0.6 %) percent of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated 380 Lpm (100 gpm) or lower. Tolerances for typical meters are 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 as specified in Table 1.

<b>Table T.4.</b>	
<b>Tolerances for Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters</b>	
<b>Meters Size</b>	<b>Maintenance and Acceptance Tolerances</b>
<b>Up to, but not including, 50 mm (2 in)</b>	<b>1.70 L (104 in<sup>3</sup>)<sup>1</sup></b>
<b>From 50 mm (2 in) up to, but not including, 75 mm (3 in)</b>	<b>2.25 L (137 in<sup>3</sup>)<sup>1</sup></b>
<b>75 mm (3 in) or larger</b>	<b>3.75 L (229 in<sup>3</sup>)<sup>1</sup></b>
<sup>1</sup> Based on a test volume of at least the amount specified in N.3. Test Drafts.	

Replace current Table T.4. with revised Table T.4. as follows:

<b>Table T.4.</b>			
<b>Tolerances for Typical Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters</b>			
<b>Meters Marked with Flow Rates in SI Units</b>		<b>Meters Marked with Flow Rates in Inch-Pound Units</b>	
<b>Marked Maximum Flow Rate<sup>1</sup></b>	<b>Maintenance and Acceptance Tolerances<sup>2</sup></b>	<b>Marked Maximum Flow Rate<sup>1</sup></b>	<b>Maintenance and Acceptance Tolerances<sup>2</sup></b>
<b>114 Lpm</b>	<b>0.68 L</b>	<b>30 gpm</b>	<b>0.18 gal (41.6 in<sup>3</sup>)</b>
<b>227 Lpm</b>	<b>1.36 L</b>	<b>60 gpm</b>	<b>0.36 gal (83.2 in<sup>3</sup>)</b>
<b>380 Lpm</b>	<b>2.28 L</b>	<b>100 gpm</b>	<b>0.6 gal (139 in<sup>3</sup>)</b>
<b>757 Lpm</b>	<b>3.78 L</b>	<b>200 gpm</b>	<b>1.0 gal (231 in<sup>3</sup>)</b>
<sup>1</sup> Refer to T.4. for meters with maximum flow rates not listed.			
<sup>2</sup> Based on a test volume of at least the amount specified in N.3. Test Drafts.			

#### **Background / Discussion:**

This item was submitted to NEWMA at its 2008 Interim Meeting as an alternative to Item 331-1, "S.5.7. Meter Size," in the 2008 NCWM Annual Report. This alternative would base the tolerances for the product depletion test on a percentage of the maximum flow rate rather than meter size. Justification provided to NEWMA by the submitter is as follows:

NCWM S&T Committee received a proposal in 2008 to add new marking requirements to provide inspectors with a basis on which to assess tolerances since the meter size in inches is not currently marked on meters used in VTM systems. This solution would add a new marking requirement non-retroactively, which will not solve the problem until the entire fleet of meters presently in use are replaced with new meters. This could take a very long time, since VTMs can see many years of service. In addition, the compromise made when this item originally passed did not address the possibility that smaller meters, (e.g., down to ¼ in) could be mounted on a vehicle and thus, subject to these tolerances. Allowing the smallest current tolerance (104 in<sup>3</sup>) on a ¼ in meter delivering 2 gpm would be 22.5% relative error for one minute of flow due to air passing through the meter. Even at 20 gpm for a 1 in meter, the relative error only drops to 2.25%. That seems unconscionable. New York recommends going back to the 0.5% of 1 minute of flow at the maximum rated flow rate for the meter that was part of the original proposal. The max flow rate must be marked on every meter under current *NIST Handbook 44* requirements, thus, the inspector will have the information necessary to correctly apply the tolerance. It is further recommended that the table provide tolerances for the common meter sizes which will handle most cases encountered in the field (i.e., 1¼-, 1½-, 2- and 3-inch meters with maximum flow rates of 30, 60, 100 and 200 gpm, respectively).

There may be concern that users will move to larger meter sizes to take advantage of the larger tolerances. It is not thought that this will happen since these systems cannot deliver much over 100 gpm without damaging storage tanks. In fact, most systems we have seen delivering heating oil are actually delivering at less than 80 gpm. If they move to a 200 gpm, 3-inch meter, rated at 40 to 200 gpm, they will then have to meet acceptance tolerances all the way down to 60 gpm which it is not believed that to be achievable on a consistent basis. We believe the typical 2-inch system will remain the mainstay of the industry.

Graphs of the relationship of typical meter ratings to pipe cross section area show that positive displacement flow rates are clearly a function of pipe size. Any tolerance that does not reflect that relationship is fundamentally flawed in our view. For comparison, we have included a graphic comparison of the proposed tolerances.

The submitter also noted the following:

We recognize that the tolerances proposed will reduce the tolerances for meter sizes 2 inches and under. We could support some compromise to recognize diminishing returns on smaller meters, thus allowing a slightly

larger tolerance (e.g., 0.6%) at or below 100 gpm rated flow rate. At 0.6% for a 2 inch (100 gpm) meter, the tolerance would be 139 in<sup>3</sup>, virtually identical to the existing tolerance.

The submitter provided supporting graphics which can be viewed in the committees 2011 NCWM Interim Agenda and in past years' Developmental Items section.

In its initial review of this item in 2008, NEWMA did not think the proposed change was justified. As a result of discussions at subsequent meetings, NEWMA since determined that this item is ready to be elevated for considerations by NCWM S&T Committee.

At the 2010 NCWM Annual Meeting, the committee heard comments from Mr. Andersen, New York, reiterating NEWMA's request to place this item on the committee's 2011 Interim Agenda. The committee agreed to NEWMA's request and included this item on its 2011 Interim Agenda and submitted it to the 2010 fall regional weights and measures association meetings.

At its 2010 fall Interim Meeting, the CWMA S&T Committee recommended that this item remain a Developing Item as one of the committee members was concerned that the conversion of the metric value may have been incorrectly or inconsistently rounded or truncated in the proposed amendments to Table 4.

At its 2010 Annual Technical Conference, the WWMA recommended that this item move forward as a Voting Item. The WWMA believes the proposed amendments to Table T.4. will reduce the unnecessarily large tolerances for meters under 60 gpm (2-inch meters) and more closely reflects existing tolerances of larger meters. The WWMA also recommends removing paragraph S.5.7. Meter Size since the language was adopted in 2009 to facilitate the application of the correct product depletion test tolerances, which were based on meter size. Since the item under consideration uses meter size to calculate product depletion tolerances, the WWMA believes that paragraph S.5.7. is no longer necessary. During the voting session, Mr. Floren, Los Angeles County Agricultural Commissioner / Weights and Measures, commented he had no issue with the intent of the proposal, but asked that the committee look into the mathematical agreement in the metric conversion listed in Table T.4. It was also suggested that it may be more appropriate to list the "inch-pound" (gpm) before the SI units in Table T.4.

At its 2010 Annual Meeting, the SWMA S&T Committee stated that it does not object to considering modifications to the tolerance to better address the product depletion test. However, the committee believes that additional time is needed for industry and weights and measures officials to study the proposed changes. The committee noted that the product depletion tolerance was amended only five years ago and a new marking requirement was added to correspond to that requirement a few years later in 2009. The committee believes that, before making yet another change, thoughtful consideration needs to be given to ensure that any changes are appropriate. The SWMA agreed with the committee's justification and its recommendation that this item be made an Information Item on NCWM S&T Committee Agenda.

At its 2010 Annual Meeting, NEWMA restated its support for this item and looks forward to input from the other regional weights and measures associations and other interested parties.

At its Open Hearings at the 2011 NCWM Interim Meeting, the committee heard comments from the Meter Manufacturers Association (MMA) expressing concerns about both options presented in the proposal. Mr. Karimov, Liquid Controls, speaking on behalf of the MMA, noted that 2 in meters tested against the tolerances proposed in the first option ("Option 1") would automatically fail. Under the second option ("Option 2"), 2 in meters would meet the requirements, but smaller meters such as 1¼ in meters would fail. The MMA believes that this item requires additional work and recommended that the item be designated as an Information Item.

Ms. Williams, NIST, OWM, offered the following comments for the committee to consider in its technical analysis of this item:

- The graphs in the Interim Agenda under both Option 1 and Option 2 the breakpoints of the tolerance are depicted incorrectly relative to the meter sizes. For example, a tolerance of 104 in<sup>3</sup> is technically extended up to, but not including a 2 in meter rather than just beyond the 1½ in size mark. A different type of graph might be considered to better illustrate the comparison.
- For both Option 1 and 2, the resolution to which the metric values in the tables are reported should be reviewed and reconsidered relative to the typical graduation size of a metric prover. For example, the maximum value of the subdivision on a 200 L prover is 50 mL according to *NIST Handbook 105-3*. The resolution of the equivalent metric values presented is to 0.1 L or 100 mL; this represents two divisions on the prover.
- An alternative to consider for presenting metric versions of the tolerance is to present the metric tolerances in a separate table so that examples are more reflective of meters marked with flow rates in metric units.
- In Option 2, the metric tolerance values for meters with marked maximum flow rates below 100 gpm do not match the proposed changes shown in the corresponding paragraph T.4. The tolerances are calculated at 0.5% rather than 0.6%. (This was also noted by the WWMA and CWMA.)
- Present the proposed changes by striking the existing table and showing the proposed changes as a replacement table. As proposed, it initially appears to some that the tolerance for a 2 in meter, for example, has been reduced from 104 in<sup>3</sup> to 34 in<sup>3</sup>. However, the tolerance for that size meter (which is typically a 100 gpm maximum) is actually 115 in<sup>3</sup>.
- Include examples of the current tolerance and the two options in a tabular format to allow easier comparison and illustrate the impact of the two options. (NIST, OWM provided two examples for the committee to consider along with proposed changes to the tolerance tables in both options to correct the errors noted above.)
- Move the statement “Refer to T.4. for meters with flow rates not listed” to the bottom of the table rather than in the title.

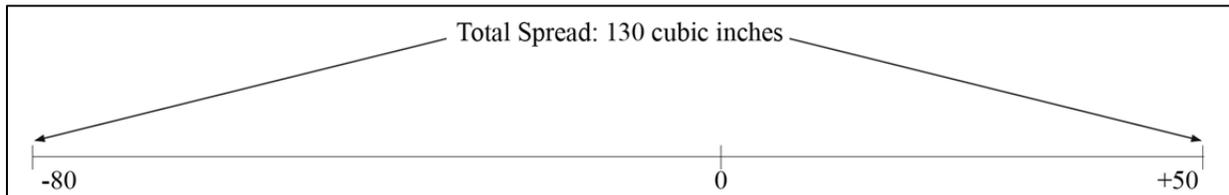
The committee generally agreed with the concept of basing the tolerances on the marked maximum flow rate of the meter rather than on the marked meter size. Additionally, while recognizing that one goal of the proposal was to reduce what the submitter considered to be an unreasonably large tolerance for smaller meters, the committee expressed concern about the magnitude of the impact on these meters. The committee also heard comments from one meter manufacturer indicating that consideration should be given to different technology types since turbine meters, for example, may have different typical flow rate ranges than a positive displacement meter. After reviewing the two options (Option 1 and Option 2) presented by the submitter; considering the comments made during the Open Hearings and in the regions; and reviewing the examples provided by NIST, OWM, the committee agreed that additional work is needed on this item. Consequently, the committee decided to designate the status of the item on its agenda as an Information Item to allow additional time for this information to be collected and reviewed.

The committee would specifically like feedback from meter manufacturers and weights and measures jurisdictions regarding the impact on smaller meters, including results from past tests that could be analyzed against the current and proposed tolerances. In the meantime, the committee modified the two options proposed to correct the errors noted in the discussion above and agreed to include the following examples provided by NIST, OWM to illustrate the impact of the tolerances.

- Example A illustrates a 2-inch meter with max flow of 100 gpm:

<b>Example A</b> <b>Sample Results of a Product Depletion Test</b>	
<b>Meter Size:</b>	2 in
<b>Minimum Flow Rate:</b>	20 gpm
<b>Maximum Flow Rate:</b>	100 gpm
<b>Normal Test Draft Results</b>	+ 50 in <sup>3</sup>
<b>Product Depletion Test Draft Results</b>	- 80 in <sup>3</sup>
<b>Difference (Normal Test – Product Depletion Test Results)</b>	130 in <sup>3</sup>

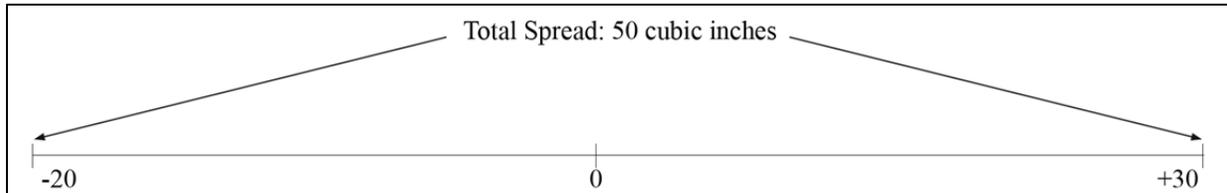
<b>Comparison of Tolerances (Current vs. Proposed)</b> <b>for Example A (2-inch, 100 gpm max)</b>			
	<b>Current Tolerance</b>	<b>Proposal #1</b>	<b>Current Tolerance</b>
Product Depletion Tolerance Calculation		0.5% x Max Marked Flow Rate = 0.005 x 100 = 0.5 gal	0.6% x Max Marked Flow Rate = 0.006 x 100 = 0.6 gal
Product Depletion Tolerance	137 in <sup>3</sup>	115.5 in <sup>3</sup>	138.6 in <sup>3</sup>
Conclusion: Does System “Pass” or “Fail” the Product Depletion Test?	Fail	Fail	Pass



- Example B illustrates a 1-1/4-inch meter with a max flow of 30 gpm.

<b>Example B</b> <b>Sample Results of a Product Depletion Test</b>	
<b>Meter Size:</b>	1¼ in
<b>Minimum Flow Rate:</b>	5 gpm
<b>Maximum Flow Rate:</b>	30 gpm
<b>Normal Test Draft Results</b>	+ 30 in <sup>3</sup>
<b>Product Depletion Test Draft Results</b>	- 20 in <sup>3</sup>
<b>Difference (Normal Test - Product Depletion Test Results)</b>	50 in <sup>3</sup>

<b>Comparison of Tolerances (Current vs. Proposed) for Example B (1-1/4-inch, 30 gpm max)</b>			
	<b>Current Tolerance</b>	<b>Proposal #1 (0.5%)</b>	<b>Proposal #2 (0.6%)</b>
Product Depletion Tolerance Calculation		0.5% x Max Marked Flow Rate = 0.005 x 30 = 0.15 gal	0.6% x Max Marked Flow Rate = 0.006 x 30 = 0.18 gal
Product Depletion Tolerance	104 in <sup>3</sup>	34.6 in <sup>3</sup>	41.6 in <sup>3</sup>
Conclusion: Does System “Pass” or “Fail” the Product Depletion Test?	Pass	Fail	Fail



At the 2011 Annual Meeting, the committee reiterated its need for data to evaluate the impact of any proposed tolerances changes. The committee asks that the following test data be submitted to assist the committee in making this assessment:

- make and model of the meter,
- marked maximum flow rate of the meter,
- actual delivery rate during the product depletion test,
- test draft size, and
- error (in cubic inches or percent) for the product depletion test.

For information on submitting data, contact the NIST Technical Advisor, Ms. Tina Butcher at (301) 975-2196 or [tbutcher@nist.gov](mailto:tbutcher@nist.gov). The committee also plans to distribute a request on NIST, OWMs Director’s list serve for jurisdictions to submit data.

Mr. Karimov, Liquid Controls, speaking on behalf of the MMA, indicated that the MMA continues to be concerned about the impact of any proposed changes on smaller meter sizes, particularly meter sizes that are less than 1.5 inches.

The committee looks forward to receiving additional proposals and requested data by November 1, 2011 so that the information can be considered at the 2012 NCWM Interim Meeting and the item can remain on the committee’s agenda.

At the 2011 CWMA Interim Meeting, the committee heard one comment in support of this item, but the committee recommends that the item be designated as a Developing Item until NCWM S&T Committee receives the data it has requested.

At the 2011 WWMA Annual Meeting, Mr. Cook, NIST, OWM, stated that NCWM S&T Committee has requested data from all weights and measures officials related to this proposal be submitted by November 1, 2011, to Ms. Butcher, NIST, OWM, who is coordinating this data collection. WWMA recommends that the item be designated as a Developing Item.

At the 2011 NEWMA Interim Meeting, it was suggested that there is not a lot of product depletion testing in the field. If the truck only has one tank, it makes the logistics of testing very difficult. Product flow will differ from inspector to inspector and clingage skews test results. Members believe it is much easier to ascertain product flow

information from the ID plate rather than determine actual meter size with piping variations. NEWMA encourages jurisdictions to forward any data to the S&T Committee NIST Technical Advisor.

At the 2011 SWMA Annual Meeting, Ms. Butcher, NIST Technical Advisor, noted that the committee has requested data from routine product depletion tests from weights and measures jurisdictions and manufacturers. Ms. Butcher noted that a request was distributed on the OWM Director's List Serve, with details on the specific data points requested. She asked that any jurisdictions who would be willing to submit data to the committee to contact her. The SWMA committee noted that there does not appear to be a clear preference for either of the two options presented in NCWM S&T Committee report. The committee also heard that a third option may be submitted by several meter manufacturers, but they did not receive a specific proposal. Based upon the fact that work continues to be done on this issue, the committee believes that a more appropriate status is Developmental.

## 336 WATER METERS

### 336-1 S.3. Markings

**Source:**

Neptune Technology Group, Inc. (2012)

**Purpose:**

Add marking requirements for Utility Type Meters under *NIST Handbook 44*: Section 3.36 Water Meters.

**Item Under Consideration:**

Add the following to *NIST Handbook 44* Water Meters Code:

**S.3. Markings**

**S.3.1. Location of Marking Information; Utility Type Meters [See also G-S.1. Identification, G-S.4. Interchange or Reversal of Parts, G-S.7. Lettering and G-UR.2.1.1. Visibility of Identification]**

***The markings may be either on the meter body, primary indicator, or in an accompanying document; except that, if an accompanying document is provided, the serial number shall appear both on the meter body and in the document.***

***[Nonretroactive as of January 1, 2013].***

***The manufacturer's name or trademark, the model designation, and identifying symbols for the model and serial numbers as required by G-S.1. Identification shall also be marked on the meter body, primary indicator or in any accompanying document.***

***[Nonretroactive as of January 1, 2013]***

**Background / Discussion:**

Utility water meters are type approved under the California Type Evaluation Program however they are not yet recognized under NTEP for type evaluation. To include utility water meters in the program, marking requirements under the Water Meter Code of *NIST Handbook 44* have to be added. This proposal is to add marking requirements to the Water Meter Code of *NIST Handbook 44* for water meters. Water meter manufacturers have set precedence since 1982 for the marking requirements of utility water meters. This precedence has been upheld by California state and county inspectors since its inception with no incidence or harm. In many utility-type meter installations, visibility of markings on the meter body can be quite limited, while visibility of markings on the primary indicator can be substantially better.

This proposal is supported by Water Meter Manufacturers: Mr. Noel, Neptune Technology Group, Inc., Mr. De Jarlais, Badger Meter, Inc., Mr. Leckman, Badger Meter, Inc., Mr. Swanson, Sensus Metering, Mr. Koch, Master Meter, Inc., and Mr. Watson, Elster AMCO Water.

This would allow water meters to be recognized and type evaluated under NTEP. Therefore, it opens the opportunity for utility type water meter manufacturers to participate in the NTETC Measuring Sector and play a more active role in providing greater visibility and education to the industry regarding utility water meters and their use.

At the 2011 WWMA Annual Meeting Mr. Noel, Neptune Technology Group, Inc., spoke on behalf of the Water Meter Manufacturers consisting of Badger Meter, Inc., Neptune Technology Group, Inc., Sensus Metering, Master Meter, Inc. and Elster Amco noting their support of the item. The committee received letters of support from the water meter manufacturers group. Mr. Hasmeyer of Alameda County opposed the item based on the proposal allowing identification information located on an accompanying document. Based on comments received, the submitter proposed amendments to the item removing the reference to supplemental documentation as follows:

### **S.3. Markings**

#### **S.3.1. Location of Marking Information; Utility Type Meters [See also G-S.1. Identification, G-S.4. Interchange or Reversal of Parts, G-S.7. Lettering and G-UR.2.1.1. Visibility of Identification]**

**The markings may be either on the meter body or primary indicator. The manufacturer's name or trademark, the model designation, and identifying symbols for the model and serial numbers as required by G-S.1. Identification shall also be marked on the meter body or primary indicator.**

**[Nonretroactive as of January 1, 2013]**

The committee supports this proposal as a Voting Item.

## **354 TAXIMETERS**

### **354-1 S.5. Provision for Security Seals**

**Source:**

Frias Transportation Infrastructure LLC (2012)

**Purpose:**

Allow for a more advanced and secure method of sealing a Taximeter.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Taximeter Code as follows:

**S.5. Provision for Security Seals.** – Adequate provision shall be made to provide security for a taximeter. Security may be provided ~~either~~ by:

- (a) Affixing security seals to the taximeter and to all other components required for service operation of a complete installation on a vehicle, so that no adjustments, alterations, or replacements affecting accuracy or indications of the device or the assembly can be made without mutilating the seal or seals; ~~or~~

- (b) Using a combination of security seals described in paragraph (a) and, in the case of a component that may be removed from a vehicle (e.g., slide mounting the taximeter), providing a physical or electronic link between components affecting accuracy or indications of the device to ensure that its performance is not affected and operation is permitted only with those components having the same unique properties; or
- (c) Using a combination of security seals described in paragraph (a) and, (b) and, in the case of a component that is electronic data affecting accuracy or indications of the taximeter, providing a unique electronic security seal on the electronic data that is encrypted and protected by an audited authentication and authorization mechanism, so that no adjustments, alterations, or replacements affecting the component can be made without the authentication and authorization. (Encryption algorithm for electronic seals must meet NIST AES ADVANCED ENCRYPTION STANDARD.)**

The sealing means shall be such that it is not necessary to disassemble or remove any part of the device or of the vehicle to apply or inspect the seals.

(Amended 1988, ~~and~~ 2000, and 20XX)

**Background / Discussion:**

Per the Taxicab Limousine and Paratransit Association in the United States, there are approximately 6,300 companies operating 171,000 taxicabs. More than 80% of these companies operate less than 50 vehicles while 6% of taxicab operations have more than 100 vehicles in service. Taxicab companies provide work for 350,000 people and transport 1.4 billion passengers annually for purposes that primarily include business, travel, and community transportation. A vast majority of these taxicabs must have a sealed taximeter installed per the regulatory body that oversees it.

The last amendments made to *NIST Handbook 44* Section 5.54. Taximeters paragraph S.5. were made 11 and 23 years ago in 2000 and 1988. Since then many advancements have been made in the security of electronic data to eliminate the need for a physical security seal to a manual programming button used to program the way in which a taximeter can operate. Furthermore, allowing for such a seal may also remove the need for any programming buttons on the actual taximeter itself allowing for a more secure and tamper resistant device.

Use of a physical security seal can also allow for personnel that have access to such seals (like a taximeter shop) to be possibly compromised and allow for the incorrect programming of a taximeter to be accomplished resulting in unfair rates to be imposed on the traveling public. By using an encrypted data packet that is sealed by an audited authentication and authorization mechanism, only certain personnel would be allowed to make such changes to a taximeter providing additionally for a complete audit trail of all changes so that if an inconsistent or flawed parameters were to be programmed to a taximeter one could assess who, when and why such changes were made.

The removal and placement of physical seals along with programming of a taximeter can also be a tremendous burden on taxi drivers, taxi operators, as well as the taxpayer. Every time a rate change or fuel surcharge is approved by the regulatory body, the regulatory body must allow for staff to oversee the removal and replacement of new taximeter seals, the drivers and operators must also face significant downtime while such changes are made to the taximeters. By use of an electronic seal the time it takes to change seals and program a taximeter would change from 5 to 10 minutes per car to seconds per car.

For the purpose of this proposal, the submitter made reference to NIST Advanced Encryption Standard (AES).

AES (FIPS PUB 197) believes that the encryption algorithm for such a security seal on a taximeter should meet this standard.

The submitter also pointed out that Nevada is one of the only states that do not reference *NIST Handbook 44* on Taximeters. To correct this problem for Nevada in the 2011 legislative session alternate language was proposed and

accepted and signed into law in the state of Nevada to allow for the electronic sealing of a taximeter. This bill was signed by the Governor of Nevada on June 16, 2011.

It is difficult to estimate cost savings accurately as every regulatory body that oversees the taxicab industry has different rules on operations as well as differences in who owns or maintains the vehicle or equipment. Allowing for this new way of sealing a taximeter will however, allow for such an option if implemented by a regulatory body or an operator to install new equipment that will benefit all parties dependent on such rulemaking.

The submitter suggested the following benefits to stakeholders:

- Additional level of security for taximeter.
- Audit trail for all changes made to taximeter programming.
- Fast implementation of approved rate changes by regulatory bodies. (In some jurisdictions operators or drivers may have to wait weeks to implement fuel surcharges as changing rates and seals under current standards are time consuming)
- Reduction in costly observational enforcement to industry. (Currently the only way a regulator can determine if an operator has a broken seal or has tampered with a taximeter is through observational enforcement – An electronic seal would allow for real time reporting as to the condition of such a seal, as well as the programming of the taximeter)
- Reduction in overcharging customers by compromised drivers, and operators.
- Allow for new more advanced ways of programming a taximeter and delivery of such programming onto a taximeter.

The submitter offered the following individuals as contacts. Additionally, a letter of support was presented by Mr. Daus, President of the International Association of Transportation Regulators (IATR) and former Commissioner of the NYC Taxi and Limousine Commission.

**Chief Information Officer**

Mr. James Wisniewski  
Frias Transportation Infrastructure  
5010 S Valley View Blvd  
Las Vegas, NV 89118  
Phone: (702) 210-6176

**Chief Technology Officer**

Mr. Mike Pinkus  
Frias Transportation Infrastructure  
5010 S Valley View Blvd  
Las Vegas, NV 89118  
Phone: (702) 210-4896

**President of the IATR**

Mr. Matthew W. Daus  
Windels Marx Lane and Mittendorf, LLP  
156 West 56<sup>th</sup> St  
New York, NY 10019  
Phone: (212) 237-1106

At the 2011 NEWMA Interim Meeting it was noted that there is no prototype yet. The submitter noted that there is an electronic data component that is to be sealed. A regulatory official questioned how the data would get to the official. A cloud based system could be used. No physical seal is needed if this is implemented. An industry member commented that there should still be some type of security seal used. There would be a comfort level for consumers but not for weights and measures officials. What happens if company goes out of business? The committee recommends that this item be presented to the Taximeter Work Group and meanwhile that it be Withdrawn.

At the 2011 SWMA Annual Meeting the committee received a request from Mr. Wisniewski, Frias Transportation Infrastructure, to modify the status of this item to Developing. Mr. Wisniewski noted that NIST, OWM and NCWM are exploring the formation of a Taximeter Work Group to develop proposed changes to the Code to reflect current technologies. He indicated that Frias Transportation plans to work with other manufacturers and regulators in the taximeter community as well as NIST, OWM to further develop this issue through this work group. The committee proposes that this item be given a Developing status on the national committee agenda, with the provision that the submitter will work with the Work Group on Taximeters being formed by NIST, OWM and NCWM and further develop the issue through that venue.

## **354-2 Global Positioning Systems Applications for Taximeters**

**Source:**

Consumer Affairs Unit, City of Seattle (2012)

**Purpose:**

Amend *NIST Handbook 44*: Section 5.54 Taximeters to make it specifically apply to Global Positioning System (GPS) system applications used commercially to compute fares based upon distance and/or time measurements.

**Item Under Consideration:**

To Be Developed

**Background / Discussion:**

GPS system applications designed to compute fares based upon distance and/or time measurements are being introduced into the for-hire industry (e.g., taxicabs, limousines) in major U.S. cities. It is necessary to provide weights and measures inspectors with up-to-date technical standards to protect the consumer from being charged inaccurate fares. The absence of NCWM standards may encourage fraudulent practices by some users just as some taxicab drivers are known to use “zappers” on traditional electronic taximeters, or intentionally using the wrong rate (recent widespread problem in New York City, Los Angeles). The potential for fraud using computer programs and wireless technology was amply demonstrated by the “pulser” unit substitutions in retail motor-fuel dispensers at a very large number of gas stations in Los Angeles a few years ago. Section 5.54 Taximeters must be completely rewritten to reflect the new technology represented by “virtual taximeters.” The test methods (i.e., measured mile, dynamometer) and tolerances are probably satisfactory but the remainder of Section 5.54 must be updated to account for “virtual taximeter” technology.

GPS system applications used commercially to compute fares based upon distance and/or time measurements are: (1) performing the same functions of traditional taximeters, i.e., computing distance and time charges, determining “crossover” speeds; (2) they are “virtual taximeters” replacing traditional (“black box”) taximeters; and (3) these GPS system applications are merely substituting computer programs and wireless technology to replace electronic taximeters – just as electronic taximeters replaced mechanical taximeters some time ago. These “virtual taximeters” are the next generation of measuring devices employed by taxicabs – and now limousines. The “devices” consist of computer software that resides in a “black box” somewhere remote from the taxicab instead of inside the taxicab. However, the challenges for consumer protection remain – i.e., accuracy, security of calibration components, display of measurements at the point of sale where the decision to buy is made. It is time for NCWM to update Chapter 5.54 of *NIST Handbook 44* to reflect new technology being used to replace traditional taximeters.

NCWM, as a standard-setting body, has three goals: (1) consumer protection, (2) uniformity of standards and enforcement, and (3) providing a “level playing field” for producers to fairly compete. This proposal to amend *NIST Handbook 44* is aimed at all of these goals. Producers of traditional taximeters meet NCWM standard in Section 5.54 (e.g., Centrodyne) but their competitors selling GPS system applications used commercially to compute fares based upon distance and/or time measurements (e.g., Uber) do not meet any standards.

According to media coverage and product web sites, easily available by a search of the internet, new technology is being introduced to the taxicab and limousine industry for both dispatching and determining fares. There are several new apps for smart phones that dispatch a taxicab passenger based upon inputs from the taxicab computer dispatch system (e.g., Taxi Magic) but the passenger enters the taximeter fare on the smart phone app in order to pay electronically. The GPS system applications actually determine the fare and based upon distance inputs from GPS such as Google Maps (e.g., Uber). Uber is active in San Francisco, New York and Seattle.

New technology using GPS inputs and computer programming to measure distance and time in order to compute fares is growing very rapidly. If NCWM does not promptly begin to examine the GPS system applications (“virtual taximeters”) as measuring devices then the consumer is not being protected and the taximeter industry will not be afforded a “level playing field.”

At the 2011 NEWMA Interim Meeting the committee believed this item should be discussed and brought to the attention of the National Work Group on Taximeters and recommends Developing status.

At the 2011 SWMA Annual Meeting the committee proposed that this item be given Developing status on the national committee agenda, with the provision that the submitter will work with the Work Group on Taximeters being formed by NIST, OWM and NCWM and further develop the issue through that venue. The committee acknowledges that the use of technologies devices such as GPS need to be reviewed and addressed by *NIST Handbook 44* for applications (such as that described by the submitter) where they will be used to generate commercial measurements.

## 356 GRAIN MOISTURE METERS

### 356-1 UR.3.4. Printed Tickets

**Source:**

Grain and Feed Association of Illinois (2012)

**Purpose:**

Change the mandatory printing of tickets from grain moisture meters to an “on demand at the time of transaction” printing and remove the requirement of printing the calibration version identification.

**Item Under Consideration:**

Amend *NIST Handbook 44*: Grain Moisture Meter Code 5.56.a. as follows:

**UR.3.4. Printed Tickets.**

- (a) Printed tickets shall be free from any previous indication of moisture content or type of grain or seed selected.
- (b) The customer shall be given a printed ticket **on demand at the time of the transaction** showing the date, grain type, grain moisture results, test weight per bushel, ~~and calibration version identification~~. The ticket **information** shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~and~~ 2003, ~~and~~ **20XX**)

**Background / Discussion:**

The user requirement to provide a printed ticket for every single load is unrealistic in the country elevator industry. Traffic patterns at country elevators do not lend themselves to providing a printed ticket to all customers and they really don't want them. As the speed and capacity increases in the industry, outbound scales are being located at a distance from the inbound scale and the scale house where the moisture tester is located to alleviate traffic bottlenecks. By locating the outbound scale away from where the ticket is printed this causes the truck driver to circle back around to pick up the ticket causing logistical problems. In addition, since meters are sealed, inspected and required to have the correct calibration, there is no need for the calibration version identification to be printed on the ticket. Also, most customers are not going to know if it is the correct calibration version identification or not. There have been problems getting the information from the grain moisture tester to the grain accounting system – especially the calibration version identification. Some grain accounting systems have had to “hard code” the calibration version identification which will have to be changed whenever the calibration changes. The change will be at an added cost for the industry.

When a consumer pays at a gas pump, they have the option of a receipt on demand at the time of transaction or not receiving a receipt. There will be a cost savings to moisture meter users as they will save on paper, filing space and

in the situation where the calibration version identification is “hard coded” there will be a cost savings of the expense to have the grain accounting software provider make those changes.

There have been problems getting the information from the grain moisture tester to the grain accounting system – especially the calibration version identification. Some grain accounting systems have had to “hard code” the calibration version identification which will have to be changed whenever the calibration changes. The change will be at an added cost for the industry.

Since moisture testers are capable of printing the ticket, some would argue that they should just go ahead and print them and provide them to the customer. In addition, the requirement does not say when the ticket shall be given to the customer – they could be saved for weeks, months or even years in case the customer had a concern at some point. Printing the calibration version identification insures the correct calibration is being used.

This item was supported by the NTETC Grain analyzer Sector in August 2011.

At the 2011 CWMA Interim Meeting some jurisdictions opposed the item citing that it is a fundamental element of a point of sale transaction that there is either a witness to the transaction or that a receipt is available. Others supported the item and recognized that many customers refuse to take the printed tickets. The committee believes that the calibration version identification is not necessary on the ticket since most jurisdictions are already verifying the calibrations version when the device is inspected. This proposal is not eliminating the opportunity for the seller to obtain a printed ticket. The committee recommends this as a Voting Item.

At the 2011 WWMA Annual Meeting the committee heard no comments on this item. The committee recommended an amended proposal to make the language consistent with other codes such as 3.32 UR.2.6. Ticket Printer: Customer Tickets. The committee recommends the following as a Voting Item.

#### **UR.3.4. Printed Tickets.**

- (a) Printed tickets shall be free from any previous indication of moisture content or type of grain or seed selected.
- (b) The customer shall be given a printed ticket **showing at the time of the transaction or as otherwise specified by the customer. The printed ticket shall include** the date, grain type, grain moisture results, **and** test weight per bushel, ~~**and calibration version identification.**~~ The ticket **information** shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~and~~ 2003, **and 20XX**)

At the 2011 NEWMA Interim Meeting no comments were received on this issue and the committee defers to expertise of Grain Analyzer Sector. The committee recommends this be a Developing Item.

At the 2011 SWMA Annual Meeting, Ms. Butcher, NIST Technical Advisor, noted that the proposed language submitted was slightly different from that discussed by the NTETC Grain Analyzer Sector. She also pointed out that the WWMA proposed alternate language that mirrors similar language for printed tickets in the Vehicle-Tank Meters Code. Ms. Lee, NIST, OWM, prepared a summary of the various versions of the proposal for the committee to consider and this summary was provided to the committee during its agenda review session. The committee agrees with the Grain Analyzer Sector that the customer should be given the option of receiving a printed ticket from a transaction and that the proposed changes would clarify the responsibility of the device user. The committee preferred the option forwarded by the WWMA since it mirrors existing language in other *NIST Handbook 44* codes and is, therefore, more consistent with current requirements and recommends that this be a Voting Item.

## 358 MULTIPLE DIMENSION MEASURING DEVICES

### 358-1 N.1.3.4. Test Objects with Protrusions

**Source:**

Multiple Dimensions Measuring Device (MDMD) Work Group (2012)

**Purpose:**

Update the MDMD code based on the MDMD Work Group's clarification of irregularly shaped objects and protrusions.

**Item Under Consideration:**

Remove paragraph N.1.4.3. in its entirety, as follows:

~~**N.1.4.3. Test Objects with Protrusions.— If the device is marked with a minimum protrusion dimension to be measured, a test object with protrusion shall be used to verify the marked limitation during type evaluation.**~~

~~(Added 2008)~~

**Background / Discussion:**

The MDMD Work Group has determined that a “protrusion” is nothing more than the part or parts of an object that changes the object from a hexahedron shape to an irregularly shaped object. Therefore no special test object is required for type evaluation. If appropriate, the manufacturer is currently required to mark the unit with a “minimum protrusion size” as stated in Note 7 of Table S.4.1.b and the irregularly-shaped object, used during type evaluation, will be configured to verify the manufactures declared limitation.

At the 2011 CWMA Interim Meeting the committee recommended this item as a Voting Item.

At the 2011 WWMA Annual Meeting Mr. Flocken, Mettler-Toledo, Inc., speaking on behalf of the MDMD Work Group, requested removal of paragraph N.1.4.3. in its entirety. The committee agreed with Mr. Flocken's comments that the proposal will harmonize *NIST Handbook 44* with Canadian requirements and other international recommendations for MDMDs regarding irregular shaped objects. The committee's recommendation is to remove paragraph N.1.4.3. in its entirety and that this item move forward as a Voting Item.

At its 2011 Interim Meeting NEWMA agreed with the committee's recommendation that this proposal move forward as an Informational Item.

At the 2011 SWMA Annual Meeting the committee heard from Mr. Flocken, Mettler-Toledo, Inc., speaking as a member of the MDMD Work Group. Mr. Flocken noted that the current MDMD Code includes requirements for hexahedrons (e.g., a six-sided box) and irregularly-shaped, non-hexahedrons (e.g., something other than a six-sided box such as a tailpipe). The code also includes provisions to address objects with “protrusions.” However, the MDMD Work Group believes that objects with protrusions should be addressed the same way as irregularly shaped objects. Thus, the proposed change would simplify the requirements by reducing the types of objects addressed in the code to two categories: hexahedrons and non-hexahedrons. The committee heard no comments on this issue beyond the support offered by Mr. Flocken. Deferring to the expertise of the MDMD Work Group, the SWMA agreed with the committee recommendations to move this item forward as a Voting Item and supports adoption of the item.

## **359 ELECTRONIC LIVESTOCK, MEAT, AND POULTRY EVALUATION SYSTEMS AND/OR DEVICES – TENTATIVE CODE**

### **359-1 Tentative Status of Code 5.59.**

**Source:**

United States Department of Agriculture (USDA), GIPSA, Packers and Stockyards Program (P&SP) (2012)

**Purpose:**

Remove the Tentative Code status of Section 5.59, making it enforceable.

**Item Under Consideration:**

Amend the title of *NIST Handbook 44*: Tentative Code 5.59 as follows:

**Section 5.59. Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices —~~Tentative Code~~**

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

**Background / Discussion:**

Electronic carcass evaluation equipment is a commercial device used in livestock procurement to determine the value of the livestock being purchased. There is no independent, third party verifying the accuracy of these devices. In 2010, 106.9 million hogs weighing 21.8 billion pounds with a total value of \$15.7 billion were commercially slaughtered. Of these, approximately 80% were made on a carcass yield weight basis with an electronic evaluation device. In 2010, 27 million steers and heifers weighing 34.6 billion pounds with a total value of \$33 billion were commercially slaughtered. The use of electronic evaluation devices in the beef industry is just beginning to take hold so there is no data at this point that indicates the number where value is based on the device use. In addition, electronic evaluation devices are used to measure composition or quality constituents in individual cuts of meat for further sale to consumers. Studies have shown that improper use of electronic carcass evaluation equipment can change the value of livestock, meat and poultry. The impact of calibration, machine, and formula errors is unknown. The economic impact of the use of electronic livestock, meat and poultry evaluation equipment is very large. The revenues of livestock and poultry producers in every state are or will be affected by the use of these devices.

State and federal regulatory agencies are charged with protecting livestock, meat and poultry producers as well as the consumer in the marketing of livestock, poultry and meat food products. A permanent code in *NIST Handbook 44* would assist these entities in the enforcement of standards for electronic devices that would ensure compliance, accuracy and consistency across the country.

ASTM International, an organization that develops voluntary international standards, has established the F-10 Committee specifically to address electronic livestock, meat and poultry evaluation devices and systems. It developed several standards referenced in the tentative code. The F-10 Committee remains committed to continuing the development of new standards and the revision of current standards to assist the livestock industry as technology takes a larger role in the determination of value in livestock. Permanent code would support the efforts of this committee to ensure consistency and accuracy across the country.

USDA, GIPSA, P&SP references *NIST Handbook 44* in 9 C.F.R. 201.71(a) in its livestock, poultry and carcass weight scale programs to ensure that all scales are installed, maintained and operated to safeguard accurate weights.

At the 2011 SWMA Annual Meeting the committee heard from Mr. Ainsworth, USDA, who asked the SWMA to consider moving this proposal as a Voting Item. Changing the status of the code from “tentative” to “permanent” will allow them to enforce the provisions of the code. The committee heard no opposition to the proposed change in the status of the code. The committee agrees that, since the code has been in place as a tentative code for several years with no negative feedback, it is appropriate to consider removing the “tentative” status and recommended that this be a Voting Item.

### 360 OTHER ITEMS – DEVELOPING ITEMS

#### 360-1 International Organization of Legal Metrology (OIML) Report

Many issues before the OIML, the Asian-Pacific Legal Metrology Forum, and other international groups are within the purview of the committee. Additional information on OIML activities will appear in the Board of Directors agenda and Interim and Final Reports and on the OIML website at [www.oiml.org](http://www.oiml.org). NIST, OWM staff will provide the latest updates on OIML activities during the Open Hearings at NCWM meetings. For more information on specific OIML related device activities, contact the OWM staff listed in the table below. The OIML projects listed below represent only currently active projects.

##### Mr. John Barton – Liquid Measuring Device Group

Phone: (301) 975-4002 Email: [john.barton@nist.gov](mailto:john.barton@nist.gov)

- R 21 *Taximeters*
- R 50 *Continuous Totalizing Automatic Weighing Instruments (Belt Weighers)*
- R 60 *Metrological Regulations for Load Cells*
- R 106 *Automatic Rail-weighbridges*

##### Mr. Kenneth Butcher – Laws and Metrics Group

Phone: (301) 975-4859 Email: [k.butcher@nist.gov](mailto:k.butcher@nist.gov)

- D 1 *Elements for a Law on Metrology*
- TC 3 *Metrological Control*
- TC 3/SC 2 *Metrological Supervision*
- TC 6 *Prepackaged Products*

##### Mr. Steven Cook – Liquid Measuring Device Group

Phone: (301) 975-4003 Email: [stevenc@nist.gov](mailto:stevenc@nist.gov)

- R 76 *Non-automatic Weighing Instruments*

##### Dr. Charles Ehrlich – International Legal Metrology Group

Phone : (301) 975-4834 Email : [charles.ehrlich@nist.gov](mailto:charles.ehrlich@nist.gov)

- International Committee of Legal Metrology Member for the United States
- V1 *International Vocabulary of Terms in Legal Metrology*
- V2 *International Vocabulary of Basic and General Terms in Metrology*
- B 3 *OIML Certificate System for Measuring Instruments*
- B 6 *OIML Directives for the Technical Work*
- B 10 *Framework for a Mutual Acceptance Arrangement on OIML Type Evaluations*
- TC 3/SC 5 *Expression of Uncertainty in Measurement in Legal Metrology Applications, Guidelines for the Application of ISO/IEC 17025 to the Assessment of Laboratories Performing Type Evaluation Tests*
- TC 3 *Metrological Control*
- ISO/IEC *Guide to the Expression of Uncertainty in Measurement*

**Mr. Richard Harshman** – Legal Metrology Devices Group

Phone: (301) 975-8107 Email: [richard.harshman@nist.gov](mailto:richard.harshman@nist.gov)

- R 51 *Automatic Catchweighing Instruments*
- R 61 *Automatic Gravimetric Filling Instruments*
- R 107 *Discontinuous Totalizing Automatic Weighing Instruments* (totalizing hopper weighers)
- R 134 *Automatic Instruments for Weighing Road Vehicles In-Motion and Measuring Axle Loads*

**Ms. Diane Lee** – Liquid Measuring Device Group

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- R 59 *Moisture Meters for Cereal Grains and Oilseeds*
- R 92 *Wood Moisture Meters – Verification Methods and Equipment*
- R 121 *The Scale of Relative Humidity of Air Certified Against Saturated Salt Solution TC 17/SC 8 Measuring Instruments for Protein Determination in Grains*

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- D 11 *General Requirements for Electronic Measuring Instruments*
- R 35 *Material Measures of Length for General Use*
- R 49 *Water Meters* (Cold Potable Water and Hot Water Meters)
- R 71 *Fixed Storage Tanks*
- R 80 *Road and Rail Tankers* (static measurement)
- R 85 *Automatic Level Gauges for Measuring the Level of Liquid in Fixed Storage Tanks*
- R 95 *Ship's Tanks*
- R 117 *Measuring Systems for Liquids Other Than Water* (all measuring technologies)
- R 118 *Testing Procedures and Test Report Format for Pattern Examination of Fuel Dispensers for Motor Vehicles*
- TC 3/SC 4 *Verification Period of Utility Meters Using Sampling Inspections*
- R 137 *Gas Meters* (all measuring technologies)
- R 140 *Measuring Systems for Gaseous Fuel* (i.e., large pipelines)
- ISO TC 30/SC 7 *Water Meters*

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- D 16 *Principles of Assurance of Metrological Control*
- D 19 *Pattern Evaluation and Pattern Approval*
- D 20 *Initial and Subsequent Verification of Measuring Instruments and Processes*
- D 27 *Initial Verification of Measuring Instruments Using the Manufacturer's Quality Management System*
- D 31 *General Requirements for Software Controlled Measuring Instruments*
- R 34 *Accuracy Classes of Measuring Instruments*
- R 46 *Active Electrical Energy Meters for Direct Connection of Class 2*

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- R 81 *Dynamic Measuring Devices and Systems for Cryogenic Liquids*
- R 139 *Compressed Gaseous Fuels Measuring Systems for Vehicles*

The WWMA and the SWMA support these issues and the related device activities as an Informational Item.

At the 2011 NEWMA Interim Meeting it was noted that Dr. Ehrlich does a great job at annual and interim meetings explaining OIML issues. NEWMA supports the efforts of NIST to harmonize with OIML wherever possible to create a marketplace that reflects the global marketplace of today.

**360-2 D G-S.1. Identification. – (Software)****Source:**

2010 Carryover Item 310-3. This item originated from the National Type Evaluation Technical Committee (NTETC) Software Sector and first appeared on the Committee's 2007 agenda as Developing Item Part 1, Item 1.

**Purpose:**

Amend the identification marking requirements for all electronic devices manufactured after a specified date by requiring that metrological software version or revision information be identified. Additionally, the proposal suggests listing methods, other than "permanently marked," for providing the required information.

**Item Under Consideration:**

Amend *NIST Handbook 44: G S.1. Identification and G S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices* as follows: (Note: This language incorporates the March 2010 recommendation from the NTETC Software Sector and the committee's suggested language to address the Scale Manufacturers Association's (SMA) concerns with the requirements in G-S.1. where it states that "all equipment . . . shall be permanently marked . . ." and G-S.1.1. that allows alternate methods, other than "permanently marked," to identify software-based devices.)

**G S.1. Identification.** – All equipment, except weights, **and** separate parts necessary to the measurement process but not having any metrological effect, ***and software-based devices covered in G-S.1.1. Location of Marking Information\****, shall be clearly and permanently marked for the purposes of identification with the following information:

***[\*Nonretroactive as of January 1, 20XX]***

**(Amended 20XX)**

(c) the name, initials, or trademark of the manufacturer or distributor;

(d) a model identifier that positively identifies the pattern or design of the device;

*(1) The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lowercase.*

*[Nonretroactive as of January 1, 2003]*

(Added 2000) (Amended 2001)

(e) *a non-repetitive serial number, except for equipment with no moving or electronic component parts **and not built for purpose software-based software device;***

*[Nonretroactive as of January 1, 1968]*

(Amended 2003 **and 20XX**)

*(1) The serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.*

*[Nonretroactive as of January 1, 1986]*

- (2) Abbreviations for the word “Serial” shall, as a minimum, begin with the letter “S,” and abbreviations for the word “Number” shall, as a minimum, begin with the letter “N” (e.g., S/N, SN, Ser. No., and S. No.).

[Nonretroactive as of January 1, 2001]

- (f) the current software version or revision identifier for ~~not built for purpose~~ software-based electronic devices;

[Nonretroactive as of January 1, 2004]

(Added 2003) (Amended 20XX)

- (1) The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.

[Nonretroactive as of January 1, 2007]

(Added 2006)

- (2) Abbreviations for the word “Version” shall, as a minimum, begin with the letter “V” and may be followed by the word “Number.” Abbreviations for the word “Revision” shall, as a minimum, begin with the letter “R” and may be followed by the word “Number.” The abbreviation for the word “Number” shall, as a minimum, begin with the letter “N” (e.g., No or No.).

[Nonretroactive as of January 1, 2007]

(Added 2006)

- (g) an NTEP CC number or a corresponding CC Addendum Number for devices that have a CC. The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms “NTEP CC,” “CC,” or “Approval.” These terms may be followed by the word “Number” or an abbreviation of that word. The abbreviation for the word “Number” shall, as a minimum, begin with the letter “N” (e.g., No or No.)

[Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.

(Amended 1985, 1991, 1999, 2000, 2001, 2003, ~~and~~, 2006, and 20XX)

**G-S.1.1. Location of Marking Information for ~~Not Built For Purpose~~ all Software-Based Devices. – For ~~not built for purpose~~, software-based devices, either:**

- (a) The required information in G S.1. Identification. ~~(a), (b), (d), and (e)~~ shall be permanently marked or continuously displayed on the device; or
- (b) The Certificate of Conformance (CC) Number shall be:
- (1) permanently marked on the device;
- (2) continuously displayed; or

- (3) *accessible through ~~an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to, “Help,” “System Identification,” “G S.I. Identification,” or “Weights and Measures Identification.”~~ one or, at most, two levels of access.*

*(i) For menu based systems, “Metrology,” “System Identification,” or “Help.”*

*(ii) For systems using icons, a metrology symbol “(M)”, “(SI),” or a help symbol (“?”, “i,” or an “i” within a magnifying glass).*

*Note: For (b), clear instructions for accessing the information required in G S.I. (a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.*

*[Nonretroactive as of January 1, 2004]*

(Added 2003) (Amended 2006 and 20XX)

#### **Background / Discussion:**

In 2005, the Board of Directors established an NTETC Software Sector. One of the sector’s tasks is to recommend *NIST Handbook 44* specifications and requirements for software incorporated into weighing and measuring devices, which may include tools used for software identification.

During its October 2007 meeting, the sector discussed the value and merits of required markings for software. This included the possible differences in some types of software-based devices and methods of marking requirements. After hearing several proposals, the sector agreed to the following technical requirements applicable to the marking of software:

1. The National Type Evaluation Program (NTEP) Certificate of Conformance (CC) Number must be continuously displayed or hard-marked;
2. The version must be software-generated and shall not be hard-marked;
3. The version is required for embedded (Type P) software;
4. Printing the required identification information can be an option;
5. Command or operator action can be considered as an option in lieu of a continuous display of the required information; and
6. Devices with Type P (embedded) software must display or hard-mark the device make, model, and serial number to comply with G S.I. Identification.

After the 2008 NCWM Annual Meeting, the committee received the Software Sector’s proposal to amend G S.I. Identification and/or G S.I.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices in the Committee’s 2008 Interim Report. The proposal listed “acceptable” and “not acceptable” methods for presenting:

- NTEP CC Number
- Make
- Model
- Serial Number
- Software Version/Revision Number

At the 2009 NCWM Interim Meeting, the SMA commented that it has consistently opposed having different requirements between embedded and downloadable/programmable software-based devices. The SMA added that it continues to support the intent of the proposal and will continue to participate in the Software Sector discussions to develop alternate proposals for the marking of software-based devices. Several weights and measures officials expressed concerns that the proposed language does not specify how the identification information is to be retrieved if it is not continuously displayed, noting this could result in several ways to access the information (e.g., passwords,

display checks, or dropdown menus). The SMA added that the identification location information on the NTEP CC will become outdated anytime a manufacturer changes the way the information can be retrieved. The SMA suggested that a limited number of methods to access the identification information be developed and specified as the only acceptable methods to retrieve identification information. This would make it easier for the inspector to verify the required identification information.

The National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM) noted that in 1992, NCWM adopted S&T Committee agenda Item 320 6, S.6.3. Marking Requirements; Capacity by Division and recommended that Tables S.6.3.a. and S.6.3.b. (Note 3) be interpreted to permit the required capacity and scale division markings to be presented as part of the scale display (e.g., displayed on a video terminal or in a liquid crystal display), rather than be physically marked on the device. NIST, OWM agrees with the interpretation and suggested that this interpretation could be expanded to other marking requirements (e.g., flow rates, capacity, interval, etc.) and codes on a case-by-case basis, and that specific language (based on the above interpretation) might be added to the applicable sections in *NIST Handbook 44*.

Software Sector Co-Chair Pettinato, FMC Technologies Measurement Solutions, Inc., stated that the Software Sector recommended that this item remain Informational to allow NCWM members to further study the proposal in order to develop a consensus on the format for Table G S.1. Identification in its 2009 meeting summary.

At its spring 2009 meeting, the Northeastern Weights and Measures Association (NEWMA) received similar comments from the SMA and the Software Sector and took no position on this item pending its member review of the Software Sector report.

At the 2009 NCWM Annual Meeting, the committee reviewed the recommendations and comments from the Software Sector, SMA, and others, which may be reviewed in greater detail in the 2009 NCWM Annual Report:

The committee agreed to retain this item as an Information Item and that the regional weights and measures associations review the above information and provide the committee with comments and recommendations.

At its fall 2009 meeting, the Central Weights and Measures Association (CWMA) had lengthy discussions about providing the required identification information in a single uniform method. Some of the topics addressed were:

- A single operation or button is needed to view all software version information.
- Use a single function key to access or continuously display software version information.
- Electronic data for both Type U and Type P devices could be hard marked, continuously displayed or accessed by command (operator action).
- The data is useless if it is not easy to access in the field.
- Concern about the cost of requiring a single designated button to access software version information.

The CWMA recommended this remain an Informational Item with changes to the committee recommendations as shown in the 2009 S&T Committee Annual Report and summarized as follows:

1. In proposed paragraph G-S.1.1.(a), add “or accessed by a command (operator action)” and delete subparagraph G S.1.1.(b) (3). to read as follows:

***G S.1.1. Location of Marking Information for Type U (Not-Built-For-Purpose), Software-Based Devices. – For ~~not built for purpose, software-based~~ Type U devices manufactured prior to January 1, 201X, either:***

- (a) *The required information in G S.1. Identification. (a), (b), (d), and (e) shall be permanently marked or continuously displayed on the device or accessed by a command (operator action):*

(b) *The CC Number shall be:*

(1) *permanently marked on the device; or*

(2) *continuously displayed.*

~~(3) *accessible through an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to, “Help,” “System Identification,” “G-S.1. Identification” or “Weights and Measures Identification.”*~~

2. Delete Note 8 in “Table G-S.1. Notes on Identification.”\*

3. Amend “Table G-S.1. Identification . . .” by deleting the three references to “via menu display,” “Print Option (8),” adding “by command (operator action),” and deleting the language at the bottom of the table.\*

\*Table G-S.1. appeared in the 2009 proposal.

During the Open Hearings at the fall 2009 Western Weights and Measures Association (WWMA) Annual Technical Conference, Mr. Straub, speaking on behalf of the SMA, indicated the SMA continues to oppose this item, referring to comments made in conjunction with Item 310-2. He also noted that even if the designations of Type U and Type P were adopted, SMA would continue to oppose the proposed changes to G-S.1., noting that requirements should apply equally to the two different device types described. The WWMA also heard from Mr. Johnson, Gilbarco, Inc., who agreed with the SMA’s assessment. He also indicated that it would be desirable to have the option of using a menu to provide information, citing increasingly limited space in which to provide marking information, and noted it would be virtually impossible for their company to provide a full time display.

Based on the comments received and its position relative to corresponding definitions for the device types developed by the Software Sector, the WWMA recommended that this remain an Information Item until the Software Sector has had an opportunity to review comments from the 2009 NCWM Annual Meeting and any comments made at subsequent regional weights and measures association meetings.

At its fall 2009 meeting, the Southern Weights and Measures Association (SWMA) agreed that the Software Sector should continue to work on the proposal until it arrives at some final language for amending paragraphs G S.1. Identification and G S.1.1. Location of Marking Information for Not-Built-For Purpose, Software-Based Devices. The Software Sector should work with manufacturers in its development of the requirement, and any table or other tools should provide further clarity on the intent of the marking requirements.

During its fall 2009 meeting, NEWMA stated that it supports the committee’s decision to keep this item Informational to have sufficient time to consider the most recent comments from the regional weights and measures associations and other interested parties.

At the 2010 NCWM Interim Meeting, the committee received comments from Mr. Straub, speaking on behalf of the SMA, reiterating the SMA’s spring 2009 position opposing any requirements for software that are different between types of devices and recommending that this item be Withdrawn from the committee’s agenda. Mr. Straub added that SMA comments are based on the proposed “Item Under Consideration” in the Interim Agenda and not the alternate proposal submitted by the software sector after its 2009 spring meeting. Mr. Lewis, Rice Lake Weighing Systems, Inc., stated that metrologically significant software should have the same version number marking requirements in Type P (fixed hardware and software) devices or in Type U software (not built-for-purpose) devices. The Software Sector chair responded that the only difference in the sector’s proposed language is that software identification requires version numbers and not serial numbers. In addition to the comments regarding the “hard marked” terminology presented at the 2009 Annual Meeting, NIST, OWM noted that devices with only Type U software are not required to have serial numbers. However, NIST, OWM asks the sector to clarify its position on marking devices with both Type U and Type P software. Is a device required to have a serial number if it uses both Type P and Type U software?

Mr. Truex, NTEP Administrator, asked the members of NCWM to provide direction to the Software Sector and the committee for what is needed during field verification of software-based devices in order to determine that the software used in weighing and measuring devices represents the devices that were certified during type evaluation. What does a field inspector need to know about the software version in vehicle scales, electronic indicators; electronic cash registers interfaced with weighing and/or measuring devices, controllers with metrological software, etc.

Ms. Quinn, Minnesota Weights and Measures Division, reported that the state has problems because its officials find software versions that appear to be older than the version listed on the CC. Ms. Quinn added that NTEP evaluates software in these devices to verify that the accuracy of the first indication of the final measurement and the security of metrological adjustments.

Mr. Wilke, Grain Inspection Packers and Stockyard Administration (GIPSA), stated that most of the livestock investigations and other regulatory issues most commonly involve software that has not been developed by the original device manufacturer. He noted that any language in *NIST Handbook 44* and *NCWM Publication 14* will help GIPSA.

Mr. Andersen, New York, stated that there is still some confusion about where the scope of NTEP ends and weights and measures' jurisdiction ends. He cited an example on a vehicle scale where a typewriter is used to issue the printed ticket. Weights and measures still has the authority to regulate the way that measurement is used to accurately or inaccurately represent the transaction. Weights and measures authority still exists when the measurement takes place in one jurisdiction and is recorded and subsequently invoiced through a software system in a different jurisdiction.

Ms. Cardin, Wisconsin Weights and Measures, stated that NTEP is required if the software can change the measurement result and NTEP should evaluate software up to the point that the first indication of the final weight is presented.

Mr. Malone, Nebraska, added that every electronic weighing and measuring device evaluated by NTEP has software and that the software is needed to make the device work. The problem is that the field inspector has no way of determining if the software in the device is the same as the software evaluated by NTEP without having to carry a hard copy of the CC with them. Nebraska and other states within the CWMA would like to see a simple and standardized method an inspector could use to obtain the relevant software identification and version information.

Mr. Truex thanked the members who commented and reminded them that the Software Sector is not proposing to reopen the "first final" discussion, but to develop recommendations to help field officials to verify that software in a weighing or measuring device represents the type of software covered by an NTEP CC. The committee concurs with Mr. Truex's comments. The committee agreed to replace the agenda language in the "Item Under Consideration" with the Software Sector's 2009 proposed language in the committee's Interim Report. The committee appreciates the work of the sector and asks that it review the discussions on this item from the reports from regional weights and measures associations, as well as comments in writing from interested parties and from the Open Hearing during the 2010 Interim Meeting.

The committee agreed that the status of this item should remain as an Information Item and asks for additional input from the Software Sector after it has reviewed these and other comments received since its last meeting.

Additional background information on this item can be reviewed in the committee's 2008 and 2009 Final Reports.

In response to comments heard during the 2010 NCWM Interim Meeting, the Software Sector (at its March 2010 meeting) proposed changes to the language shown in NCWM S&T Committee's 2010 Interim Report Item 310.3. These revisions removed the differentiation between types of software (Type P and Type U) while still managing to achieve the sector's objective of simplifying the process of locating required marking information.

The sector recommended amending the 2010 "Item Under Consideration" by removing the proposed words "and manufactured after January 1, 201X" from the first sentence in paragraph G S.1. and added that the remainder of the

proposal remains unchanged. The sector agreed that the reference to the manufacture date is not necessary since the current proposal to amend G-S.1. includes applicable nonretroactive dates for the amended subparagraphs.

The Software Sector also initiated discussion on two new concepts, which may eventually result in additional recommendations to amend G-S.1. It should be noted that these new ideas are in the developmental stage and are included here by request of the sector, since comments from the regions and other interested parties would be appreciated by the sector.

First, the sector sees merit to requiring some “connection” between the software identifier (i.e., version/revision) and the software itself. The proposal was to add a new sub-subparagraph (3) to G-S.1.(d) to read as follows (with the expectation that examples of acceptable means of implementing such a link would be included in *NCWM Publication 14*).

**“The version or revision identifier shall be directly and inseparably linked to the software itself. The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.”**

Second, it seems that at each meeting of the sector, state weights and measures officials reiterate the problems they have in the field locating the basic information required when the CC number is marked via the rather general current *NIST Handbook 44* requirement of accessible through an easily recognizable menu and if necessary a sub-menu (G S.1.1. (b)(3)). States have indicated that this is too vague and field inspectors often cannot find the certificate number on unfamiliar devices.

The sector would like feedback on the proposal to specify a limited number of menu items/icons for accessing the CC number (it is not hard-marked or continuously displayed) in subparagraph (b) as follows:

(c) *The Certificate of Conformance (CC) Number shall be:*

(1) *permanently marked on the device;*

(2) *continuously displayed; or*

(3) *accessible through ~~an easily recognized menu and, if necessary a submenu.~~ **one or, at most, two levels of access. Examples of menu and submenu identification include, but are not limited to, “Help,” System Identification,” “G-S.1. Identification,” or “Weights and Measures Identification.”***

**(i) For menu-based systems, “Metrology”, “System Identification”, or “Help”.**

**(ii) For systems using icons, a metrology symbol (“M” or “SI”), or a help symbol (“?”, “I,” or an “i” within a magnifying glass).**

Note that this is not suggested to be the final list of valid options for locating the point of access for the CC number; the Software Sector would like to have feedback specifically on other acceptable menu text/icon images that identify how to access the CC number on software-based systems. The Software Sector agreed that a reasonable list of acceptable options is not as much of an issue as the fact that the list is finite. The sector realizes this may affect manufacturers so feedback from associate members and representative groups is also appreciated.

At its 2010 Annual Meeting, NEWMA recommended leaving this item Informational to allow review of the Software Sector’s newly proposed language from its March 2010 meeting.

During the 2010 NCWM Annual Meeting, the SMA stated that the proposal from the Software Sector addresses one of the SMA’s concerns dealing with the use of the term “not built for purpose;” however, it still has concerns with the requirement in G-S.1. stating that the software version or revision identifier must be clearly and permanently

marked. The SMA recommends that the Software Sector and the committee review and correct what appears to be conflicting requirements as stated in G-S.1. and G-S.1.1. dealing with the marking requirement.

The committee also received a summary of the 2010 meeting of the NTETC laboratories where some of the NTEP evaluators were concerned that the revised language could be interpreted such that no markings are required on a device. These evaluators expressed concern that an inspector would have to guess which of the eight methods recommended in the Software Sector summary is to be used to find the CC number and questioned whether this would mean that a weighing or measuring device might not be marked with any identifier markings including the manufacturer.

The committee amended the item under consideration based on the recommendations of the Software Sector at its March 2010 meeting. The committee agreed to clarify and document the SMA concerns with the requirements in G-S.1. where it states that “all equipment . . . shall be permanently marked . . .” and G-S.1.1. that allows alternate methods, other than “permanently marked,” to identify software-based devices. Consequently, the committee revised the first paragraph of G-S.1. to read as shown in the “Item Under Consideration” in its 2011 NCWM Interim Agenda.

At its fall 2010 Interim Meeting, the CWMA stated that it believes that this item should be moved to a Voting Item and suggested an editorial change on G.S.1.1.(b)(3) to read “no more than two levels of access” instead of “one or, at most, two levels of access.”

During the fall 2010 WWMA Annual Technical Conference, Mr. Cook, NIST Technical Advisor to the Weighing Sector, provided an update to the WWMA S&T Committee. Mr. Cook also discussed the conflicting language between G S.1. and G S.1.1. identified by the SMA and NCWM S&T Committee’s solution to eliminate the conflict. The Weighing Sector reviewed the list of acceptable abbreviations and icons as requested by the Software Sector and agreed that the abbreviation “SI” should not be included in the list since “SI” is also the abbreviation for the International System of Units.

The Weighing Sector also noted that the icon with the green fill  should not be used since it is used by the European Union as a metrology mark for all devices, not just for metrological software identification.

Mr. Flocken, speaking on behalf of the SMA, restated the SMA’s April 2010 position based on the conflicting language in paragraphs G-S.1. and G-S.1.1. He added that the revised language for G-S.1. in the S&T Agenda should also be reviewed by the Software Sector. Mr. Johnson, Gilbarco Inc., added that their current Retail Motor Fuel Dispenser (RMFD) software cannot display alpha characters for software version identification which is problematic since the latest version of the proposal includes software identification for all software based devices. Mr. Johnson added that a possible solution would be to allow the software version to be reported on the NTEP CC.

The WWMA recommended the following amendment to G-S.1. (d)(1) to address Mr. Johnson’s comments on devices with limited character sets such as RMFD without alpha displays and/or annunciators to read as follows:

*(d) the current software version or revision identifier for ~~not built for purpose~~, software-based devices;*

*[Nonretroactive as of January 1, 2004]*

(Added 2003)

*(1) Except for devices with limited character sets (e.g., primary indications without alpha characters or annunciators\*) ~~The~~ version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.*

*[Nonretroactive as of January 1, 2007] \*[Nonretroactive as of January 1, 20XX]*

(Added 2006) **(Amended 201X)**

- (2) *Abbreviations for the word “Version” shall, as a minimum, begin with the letter “V” and may be followed by the word “Number.” Abbreviations for the word “Revision” shall, as a minimum, begin with the letter “R” and may be followed by the word “Number.” The abbreviation for the word “Number” shall, as a minimum, begin with the letter “N” (e.g. No or No.)*

(Added 2006)

**(OWM Technical Advisor Note: After the WWMA meeting, OWM noted that it believes there is a need to address the exception by adding language to address the method for identifying the version or revision number for devices with limited character sets. For example: Add a new sentence at the end of (2) (see [(2)] above) such as “For devices with limited character sets, the instructions to identify the version or revision identifier shall be listed on the NTEP CC.”)**

[Nonretroactive as of January 1, 2007 \*[Nonretroactive as of January 1, 201X]

The WWMA believes that the above changes to the proposal sufficiently address all issues identified during the Open Hearings and that this should remain an Information Item to allow the Software Sector an opportunity to comment on the revisions proposed by NCWM and WWMA S&T Committees.

At its 2010 Annual Meeting, the SWMA heard from Mr. Johnson, Gilbarco, Inc., restating his concern about how this proposal would apply to simpler devices that may have a limited display capability; while these devices may be able to display a software version number, they aren’t able to display a designation that defines it as a “version number.” Mr. Johnson also noted that the WWMA modified the proposed language to provide an exception for devices with limited character sets and encouraged the committee to review this language. Mr. Straub, Fairbanks Scales, Inc., speaking on behalf of the SMA stated that the SMA, at its 2010 spring meeting, opposed this item. Mr. Straub also pointed out that there appears to be a conflict with regard to the required permanence of the marking, noting that G-S.1. refers to “permanently marked,” whereas G-S.2. makes reference to “continuously displayed” markings.

The SWMA considered whether or not the proposal is ready to be adopted. Based on the variety of comments heard, comments opposing the item, and the alternatives presented, the SWMA did not feel it could make a recommendation at this time. The SWMA believes that the Software Sector should be given the opportunity to review the input and comments made on this issue since the sector’s last meeting. Consequently, the SWMA believes that the item should remain as an Information Item on NCWM S&T Committee agenda.

At its fall 2010 Interim Meeting, NEWMA stated that the WWMA proposed revision to the “Item Under Consideration” and questions raised have merit. NEWMA recommends this remain an Information Item to give the Weighing Sector and NCWM S&T Committee time to evaluate the new language.

At the 2011 Interim Meeting, NCWM S&T Committee heard from the Software Sector Chair on two key points.

1. The software version number would be required for all software based devices (i.e., “built-for-purpose” devices as well as “not-built-for-purpose” devices).
2. Limit the options for non-hard marked certificate numbers so they are easy to find. There have been reports of difficulty in finding information such as the CC number, particularly for not-built-for-purpose devices.

It was also noted that the intent of the proposal is not to require stand-alone software to have a serial number.

The committee agrees that this item is not ready to move forward as a Voting Item. The committee recommends the Software Sector review the following comments and points made during the 2011 Interim meeting and consider how these issues should be addressed.

- Confirm that all software-based devices must have version/revision identification.
- Stand-alone software does not require a serial number.

- Is a definition needed for software-based (electronic) devices?
- Devices with limited character sets may need different requirements since they may not be able to display all characters; they may have limited or no room for full display; and hard markings for identification information may be impractical.
- Guidance is needed for metrological and non-metrological software. Perhaps separate version numbers or specific character locations in the version number that applies to metrological software are needed.
- Combine G-S.1 and G-S.1.1.
- Should G-S.1.(c) be included in G-S.1.1.(b)?

During the 2011 NCWM Annual Meeting Open Hearings, the committee heard from NIST, OWM relative to whether or not the status of this item should be changed to Developing in order to provide the Software Sector additional time to more fully develop the item based on the following points:

1. The current proposal is not developed enough for consideration by the committee. Based on the diversity of comments heard on this issue, NIST, OWM believes the item is not close to a vote and that considerable work still needs to be done to develop the item before it could be considered for vote by NCWM.
2. NIST, OWM interprets the current proposal to require software be marked with a non-repetitive serial number when in fact it is not the intent of the Software Sector to require such marking. Thus, it is believed that the language in current proposal will need modification to resolve this issue.
3. The draft of the March 2011 Software Sector Summary reported that several Software Sector members envision G-S.1. being developed further to the extent that G-S.1.1. may not be needed.

NIST Technical Advisor Mr. Harshman reported that Software Sector Co-Chair Pettinato stated that a key point agreed upon by members of the Software Sector was that the software version/revision identifier should be accessible through the user interface. When asked about the possibility of changing the status of the item to Developing, Mr. Pettinato indicated that he intends to poll members of the Software Sector to determine whether or not they agree that the status should be changed.

Mr. Flocken, representing the SMA, indicated that he believes the Software Sector is intending to propose a change to the current item and looks forward to the further development of this item based on the work of the Software Sector. Mr. Karimov, speaking on behalf of the Meter Manufacturers Association, agreed with the comments made by Mr. Flocken.

The committee discussed the comments offered by NIST, OWM and the SMA. After considering those comments, the committee agreed to change the status of this item to Developing because the item is lacking enough information for full consideration and a full proposal has yet to be developed.

At the 2011 CWMA Interim Meeting there were no comments heard and the committee recommends keeping the item as a Developing Item.

At the 2011 WWMA Annual Meeting Mr. Flocken, representing the SMA, indicated the Software Sector will be proposing a change to the current item and looks forward to their work. Mr. Johnson, Gilbarco, Inc., would like to have this move forward as a Developing Item. Mr. Cook, NIST, OWM, commented that the Software Sector is looking for additional comments for its next meeting in 2012 in order to develop software identification requirements that address the concerns of both weights and measures officials and device manufacturers. The WWMA looks forward to the continued work of the Software Sector and recommends the item as an Information Item.

At the 2011 NEWMA Interim Meeting officials agreed that software is an extremely important feature in devices and will become even more sophisticated as time goes on. The inspector needs to know what version is in the device and be able to access that information as easily as possible. NEWMA accepted the committee's recommendation to keep this item as a Developing Item while the Software Sector continues to develop the issue.

At its 2011 Annual Meeting the SWMA recommended maintaining the item as a Developing Item to allow for additional work by the Software Sector.

**360-3 D Part 2.20. Weigh-In-Motion Vehicle Scales for Law Enforcement – Work Group****Source:**

NIST, OWM, Mr. Richard Harshman, on behalf of the U.S. Federal Highway Administration (FHWA) (2011)

**Purpose:**

Keep the weights and measures community apprised of work to develop standards for Weigh-In-Motion (WIM) scale systems and to encourage their participation in this work.

**Item under Consideration:**

This item is under development. Comments and inquiries may be directed to Mr. Rick Harshman, NIST, OWM at (301) 975-8107 or [richard.harshman@nist.gov](mailto:richard.harshman@nist.gov).

The FHWA is forming a USNWG to develop proposed standards that would apply to WIM scale systems used to screen or sort commercial vehicles for possible violations of legal roadway weight limits with the ultimate goal of bringing the proposed standards before the weights and measures community for possible inclusion in *NIST Handbook 44*. FHWA has been collaborating with NIST, OWM and the commercial vehicle enforcement community to identify industry experts, device users, regulatory officials, and others interested in participating in the work group. The work group plans to develop proposed specifications, tolerance, and other technical requirements applicable to WIM scale systems used in official use for the enforcement of law or for the collection of statistical information by government agencies.

**Background / Discussion:**

The nation's highways, freight transportation system, and enforcement resources are being strained by the volume of freight being moved and the corresponding number of commercial vehicles operating on its roads. Traditional, manual-based vehicle inspection activities simply cannot keep pace with anticipated truck volume increases. Current U.S. Department of Transportation (DOT) forecasts project freight volumes to double by 2035 and commercial vehicles to travel an additional 100 billion miles per year by 2020. WIM technology has been targeted by FHWA and Federal Motor Carrier Safety Administration to a technology capable of supporting more effective and efficient truck weight enforcement programs.

Several DOT efforts are underway and planned for the future to maintain adequate levels of enforcement that ensure equity in the trucking industry market and protection of highway infrastructure. Judicial support for enforcement decisions to apply more intense enforcement actions on specific trucks depends on support from the U.S. legal metrology community. Standards are needed in *NIST Handbook 44* to address the design, installation, accuracy, and use of WIM systems used in a screening/sorting application. The implementation of a uniform set of standards will greatly improve the overall efficiency of the nation's commercial vehicle enforcement process.

Once adopted by the truck weight enforcement community, these requirements will enhance the accuracy of the nation's WIM scale systems, serve as a sound basis for judicial support of next-generation truck weight enforcement programs and result in fewer legally loaded vehicles being delayed at static weigh station locations, thus reducing traffic congestion and non-productive fuel consumption and improving the movement of freight on our nation's roadways.

At the 2010 CWMA Interim Meeting, a comment was heard during Open Hearings that WIM scales could be used for enforcement issues and evaluating or assessing fines to overweight trucks. Currently most of these scales are used for audit purposes only. The committee believes that the efforts to establish requirements for WIM scales has merit, and when fully developed, will assist in expediting commerce by not having to reweigh clearly legal highway vehicles while protecting roadways from vehicles that exceed legal highway load limits.

At the 2010 WWMA Annual Technical Conference, Mr. Langford, Cardinal Scales Manufacturing Co., stated that he is a member of the work group and supports adding language defining performance parameters of WIM devices for use in law enforcement. Mr. Langford added that the work group will be considering other existing standards to help develop the language in *NIST Handbook 44* (e.g., OIML Recommendation (R) 134 *Automatic Instruments for Weighing Road Vehicles in Motion and Measuring Axle Loads*). Mr. Floren, Los Angeles County Agricultural

Commissioner / Weights and Measures, added that even though these devices are non-commercial they are covered under the scope of *NIST Handbook 44* General Code Application paragraph G-A.1.(c) Commercial and Law Enforcement Equipment.

At the 2010 SWMA Annual Meeting comments were heard from Mr. Langford, Cardinal Manufacturing Co., supporting the direction of this work group. Mr. Langford noted that these WIM scales are not currently used to levy fines, but rather to screen for overweight trucks. He noted that the work group is just getting started and that Cardinal Manufacturing Co. is looking forward to participating in this work. Mr. Gray, Florida Department of Agriculture and Consumer Services, questioned whether putting requirements for highway WIM devices in *NIST Handbook 44* would obligate jurisdictions to conduct tests of these devices. While he doesn't oppose the inclusion of requirements in general, he questioned the availability of resources to accommodate the additional workload given the extreme budget restrictions many jurisdictions are facing. Ms. Butcher, NIST, OWM, noted that DOT reported that highway weight enforcement officials are concerned that the use of the scales in screening will be challenged without reference to a recognized standard. Since many of these agencies currently reference *NIST Handbook 44*, they felt that recognition of these devices in *NIST Handbook 44* as law enforcement equipment would lend credibility and consistency to the design, use, accuracy, and application of this equipment.

The SWMA committee stated its support for the efforts of the work group. However, given some of the concerns and questions raised at the Open Hearings about resources for testing, the committee did not want to take a position on this issue until it has more information about the direction of the work group.

At the 2010 NEWMA Interim Meeting comments were heard supporting the formation of the work group but questioned what role existed for NCWM S&T Committee at this time.

At the 2011 NCWM Interim Meeting Open Hearings, Ms. Williams, NIST, OWM, provided the following update on the progress of WIM standards development:

**Purpose of the Project:**

The FHWA's Office of Freight Management and Operations recognized a need to encourage uniformity in the design, testing, installation, and performance of WIM technology and subsequently encourage acceptance by prosecution agencies (administrative or judicial) regarding the validity of WIM technology's role in supporting Commercial Motor Vehicle weight enforcement.

In response to this need and recognizing the credibility of having a standard included in *NIST Handbook 44* because it lends integrity and is more recognizable in legal actions, the FHWA seeks to integrate WIM technology into the handbook. The FHWA recently contracted the services of the Texas Transportation Institute—The Texas A&M University System and Battelle (a private company) to begin this process. Additionally, a small oversight committee was formed by the FHWA, made up of three representatives from the FHWA, a NIST Technical Advisor, and a representative of a U.S. manufacturer of WIM equipment to validate that each contract deliverable is completed according to contract.

The intended application of the proposed new code is for screening purposes only (i.e., for screening/sorting commercial vehicles for possible violations of FHWA vehicle weight requirements). It is anticipated that as WIM technology continues to advance, this code may have a much broader application sometime in the future.

As a first step in this effort, the contracted team was tasked to develop an initial, detailed Project Work Plan intended to guide activities and establish lines of communication from project inception to project completion. This deliverable has been completed and was recently submitted to the Project Oversight Committee for consideration.

The next step will be to establish a work group from the WIM technology stakeholder community. This process is already underway and the WG will be comprised of representatives from state departments of transportation, state law enforcement agencies, weights and measures officials, WIM technology manufacturers and vendors, academic researchers, and others. The initial meeting of the work group is planned, although not yet scheduled, for the middle of February 2011. It is anticipated that a final draft code will be ready for consideration by NCWM in 2012.

Mr. Gray, Florida Department of Agriculture and Consumer Services, commented that although he didn't have any issues regarding developing standards for WIM systems, he did not believe that inclusion of a new WIM code into *NIST Handbook 44* was appropriate because the application of the proposed code was for screening purposes only.

Mr. Langford, Cardinal Manufacturing Co., supported the development of the standard and stated that the "Application" section of the General Code not only applies to commercial equipment, but also equipment used in law-enforcement and for the collection of statistical information by government agencies. He also stated that it was too early to make a determination on how much work would be involved in the testing of WIM systems because the work group had yet to be formed.

At the 2011 NCWM Annual Meeting Mr. Harshman, NIST, OWM provided an update on the progress of the WIM Work Group.

At the 2011 WWMA Annual Meeting Mr. Cook, NIST, OWM, provided the following update on the activities of the WIM Vehicle Scales work group: Mr. Harshman, NIST, OWM, is the NIST Technical Advisor to the work group and participated in the discussions and offered technical positions on the various items during its first meeting in July 2011. Mr. Harshman presented an overview of the process to develop the technical content of a new WIM code, explained how *NIST Handbook 44* was organized, and how requirements developed by the work group would fit into the various sections of a new *NIST Handbook 44* code. He also provided an overview of the standards development process and discussed the benefits of the work group using a "straw man," which he has already created to develop the new draft code. Mr. Langford, Cardinal Scale Manufacturing Co., gave a presentation on the *NIST Handbook 44* amendment process which detailed the various steps the work group would need to complete to add a new device code to *NIST Handbook 44*.

Several concerns/questions were raised by participants during a scheduled open discussion of the work group. The following are some of the more important concerns/questions discussed:

1. The application section of the code is critical. The types of WIM systems in which the code does and does not apply will significantly impact all other sections of the code.
2. What tolerance should be specified in the draft code? An important related question is: What degree of accuracy will the judicial system (courts) accept as being sufficiently accurate enough to screen commercial vehicles for possible overweight violations? The degree of accuracy required will have a large impact on the kinds of systems that get included or excluded in the application section of the code.
3. There needs to be a separation of requirements, i.e., those that apply to virtual weigh stations and those that apply to WIM systems installed at weigh stations having a static scale.
4. To adopt a draft code at the national level, two things must happen: 1) A legitimate test procedure is needed to enable states to test these systems, and 2) federal funding is needed to help cover the cost of testing.
5. Will *NCWM Publication 14* type evaluation criteria be needed since these systems are not commercial and are unlike other devices typically covered by *NIST Handbook 44*?

Mr. Flocken, Mettler-Toledo, Inc., has accepted the position as the WIM work group Chair, and encouraged submission of comments to the work group. These questions/concerns and others are to be discussed during the next meeting of the work group. The next meeting date has not yet been decided.

At the 2011 NEWMA Interim Meeting it was suggested that resources may be too limited to enforce and conduct inspections on these devices once the code is developed. The committee recognized, however, that the traffic at truck stops can be backed up and this technology will help to ease that problem. They would also be easier to set up than axle-load weighers. While the committee heard some support for WIM scales, there are also questions. Would these be located at permanent or temporary locations? Will fines be issued off of these scales? How often will scales need to be tested? The committee recommends continuing to collect data and comments on this new technology.

At the 2011 SWMA Annual Meeting the committee heard from Mr. Flocken, Mettler-Toledo, Inc., who advised that he has been appointed chair of the USNWG. Mr. Flocken reported that the work group held its first meeting in July. He also noted that Mr. Harshman, NIST, OWM, prepared a draft code for the work group to consider as a starting point. Mr. Flocken has created a checklist that he proposes to distribute to the work group along with the draft code;

he plans to ask work group members to complete the checklist as they review the code, identifying sections which they believe need additional work. He hopes that this review process can be completed by about mid-December, after which time the work group will meet to review the input from members. Mr. Flocken noted that if the timing is appropriate, it may be possible to hold a work group meeting in conjunction with NCWM Interim Meeting. Mr. Flocken will submit his proposed next steps to DOT's Work Group Oversight Committee for approval. He also asked that the community be patient while this work group gets underway and he will look forward to bringing specific proposals to the committee as work progresses further. The committee recognizes that this work is still in the developmental stages and agrees that additional time is needed before any proposals can be considered by the committee.

### **360-4 Part 3.30. Price Posting and Computing Capability and Requirements for a Retail Motor-Fuel Dispenser (RMFD)**

**Source:**

NIST, OWM and the Regional Associations (2008)

**Purpose:**

To review and update criteria in the Liquid-Measuring Devices (LMD) Code related to price posting and computing capability of RMFDs to reflect current market practices.

**Item under Consideration:**

This item is under development. Comments or inquiries may be directed to NIST Technical Advisor, Ms. Juana Williams, at (301) 975-3989 or [juana.williams@nist.gov](mailto:juana.williams@nist.gov).

In 2008 and 2009, the committee considered a proposal to make modifications to *NIST Handbook 44* Section 3.30. LMD Code to address price posting and computing capability for RMFDs. Full details of the recommendation are found in Agenda Item 330-3 in the committee's 2008 and 2009 Final Reports. The committee believes that changes are needed to the LMD Code; however, based on comments received it does not believe the proposal adequately addressed the community's concerns. In 2010, the committee received approval to form a Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability to review and recommend necessary changes to the LMD Code by January 2012.

**Key Points:**

- Current LMD Code requirements relative to unit price posting and selection and total price computation were developed to address marketing practices in place in the early 1990s; primarily cash/credit forms of payment.
- Marketing practices have changed since the 1990s, and the LMD Code does not adequately address these changes with regard to the display, posting, and selection of unit price information or total price information at various points in a transaction.
- There appears to be general agreement in the weights and measures community that changes are needed to the LMD Code in *NIST Handbook 44* to better reflect current market practices.
- Comments indicate the proposal considered in 2008-2009 by the committee did not adequately address concerns, particularly on the parts of weights and measures officials.
- Weights and measures officials are concerned that customers be given adequate information at all points of the transaction, not just at the end.
- Regional weights and measures associations and industry comments indicated support for a work group to further develop this issue.
- The 2010 S&T Committee established a task group to further develop this issue and present an alternative recommendation for its consideration in 2012.

**Background / Discussion:**

In the early 1990s, various sections of the LMD Code in *NIST Handbook 44* (including paragraphs S.1.6.4. Display of Unit Price and Product Identity, S.1.6.5.4. Selection of Unit Price, UR.3.2. Unit Price and Product Identity, and

UR.3.3. Computing Device) were modified to address multi-tier pricing applications, such as cash or credit in instances where the same product is offered at different unit prices based on the method of payment or other conditions of the sale. Since that time, marketing practices have evolved to include the addition of new practices, such as frequent shopper discounts and club member discounts. Numerous questions have been posed to NIST, OWM and weights and measures officials regarding the requirements for posting unit prices, calculation of total price, customer-operated controls, and other related topics, such as the definitions for associated terminology.

It is clear from these questions that changes are needed to *NIST Handbook 44* to ensure the requirements adequately address current marketplace conditions and practices. OWM has raised this issue with the committee, and has also discussed a variety of pricing practices with individual state and local weights and measures jurisdictions.

The OWM reviewed the existing requirements and their application to current market practices and collected information on a number of scenarios, including the following:

1. Frequent shopper discounts
2. Club member discounts
3. Discount for prepaying cash (to prevent “drive-offs”)
4. Prepay at the cashier for credit sales
5. Discounts for purchasing store products
6. Discounts for purchasing a service (e.g., carwash)
7. Targeted group discounts (e.g., Tuesday – ladies 5 cents off per gallon)
8. Full service
9. Self service
10. Progressive discounts based on volume of motor-fuel purchased
11. Coupons for discounts on immediate or future purchases
12. Rebates (e.g., use of oil company credit card)
13. Day of the week discounts

Note: The conditions under some of these scenarios may not typically fall under the authority of weights and measures jurisdictions.

The OWM expressed an interest in receiving input from the weights and measures community about various practices and pricing structures in use, and indicated it welcomed opportunities to discuss this item at regional weights and measures associations to ensure the item is adequately addressed.

The regional weights and measures associations agreed that changes are needed and encouraged OWM to continue development of the issue. During the 2007 NCWM Interim Meeting, the committee agreed to add to its agenda a Developing Item to begin to address these issues. At the 2008 NCWM Interim Meeting, Ohio Weights and Measures submitted a proposal to modify various sections of the LMD Code to the committee. With a specific proposal to consider, the 2008 committee elevated the item from Developing to Information status for further review and input.

In 2008, the CWMA noted that although the proposal was a good start it did not address what was happening in the marketplace. The CWMA also recommended establishment of a small work group to further develop the issue and encouraged consideration of points such as the following:

1. discounts calculated at the pump and others at the counter;
2. level of consumer responsibility;
3. can the dispensers do tier pricing;
4. competitors complaining about non-uniformity of enforcement;
5. discounts should be done electronically; and
6. all is okay as long as the receipt explains the transaction.

NIST, OWM agreed to form a small work group to further study this issue and held an initial meeting of interested parties in July 2008. A reduction of staff at NIST, OWM prevented subsequent work on this issue. The committee

continued to hear requests from the regional associations and industry regarding the importance that this work be continued and urging that NIST, OWM allocate resources to the project. Mr. Eichberger, National Association of Convenience Stores, offered to coordinate assistance from some of the association's interested members at the point where work would resume. See the committee's 2008 and 2009 Final Reports for additional details on this effort.

At its fall 2009 meeting, the CWMA urged that resources be committed to this items further development. CWMA members commented that price posting continues to be a problem, noting that the current language in *NIST Handbook 44* does not reflect current market practices and the language needs to be either fixed or removed from the handbook. The CWMA also requested that NCWM sponsor a work group to address this issue.

At its fall 2009 meeting, NEWMA agreed that this is a priority item and encouraged the formation of a work group as soon as possible. NEWMA further noted comments heard during its meeting:

- As long as terms and conditions are made clear prior to sale, the transaction should be allowed.
- Businesses should purchase the correct equipment (according to *NIST Handbook 44*) for their marketing strategy.
- This item needs to move forward as a priority.
- We need to find some remedy for businesses that have older equipment.
- It is very difficult to take a hard line (follow *NIST Handbook 44* exactly) on this item.
- We must enforce equally and provide a level playing field.
- *NIST Handbook 44* is antiquated and should be revised.

At its fall 2009 meeting, the SWMA recommended that NIST, OWM resume working on this proposal as soon as resources are available. The SWMA also encouraged NIST, OWM to include Mr. Eichberger, National Association of Convenience Stores, and other sectors that are interested in the work and any stakeholders impacted by proposals to modify the LMD code relative to price posting and computing for RMFDs.

The committee heard comments from all four regional weights and measures associations, industry, and individual NCWM members that, while changes are needed to the LMD Code, the proposal on NCWM S&T Committee's 2008 and 2009 agendas did not meet the needs of the marketplace (see the committee's 2008 and 2009 Final Reports for details of specific concerns). A key concern raised by weights and measures officials was the importance for consumers to have full information about the purchase price of the product before they dispense the fuel and to be able to follow all aspects of the transaction.

Prior to the 2010 January NCWM Interim Meeting, NIST, OWM reallocated additional resources to work on this issue and announced that Ms. Williams, NIST, OWM, would lead the effort to renew the work group. Working in collaboration with the committee, Ms. Williams held an informal meeting during the 2010 Interim Meeting to allow interested parties to further discuss the issue, share thoughts about next steps, and indicate interest in participating in the work group. That meeting was well attended with 29 NCWM members participating and a number of useful comments were made. Prior to the Open Hearings, Ms. Williams gave the committee an overview of the informal meeting and an update on the plan to renew the work group.

At its 2010 Open Hearings, the committee received positive comments regarding NIST, OWM's reallocation of resources to this project and agreed that reviewing and revising current requirements is important. The committee continued to strongly support the intent of the proposal and recognized that significant additional development is needed. The committee believes that this can best be done through an S&T task group, and decided to give this item Developing status until the task group develops a proposal for consideration by the conference. After collaborating with NCWM Chairman, Mr. Jennings, the Committee Chair indicated that the task group should be chaired by an NCWM voting member under the technical direction of NIST, OWM and report to NCWM S&T Committee. The committee asked that Ms. Williams collaborate with the S&T Committee Chair regarding possible candidates for the task group's chair position based on those who have indicated an interest in serving on the task group. The committee asked that the task group provide frequent updates on its progress to the committee and to the regional weights and measures associations. The committee also asked that the task group communicate a work plan and time line after its first official meeting.

Prior to the July 2010 NCWM Annual Meeting, Chair Mr. Humphreys, Los Angeles County Agricultural Commissioner / Weights and Measures, and Co-Chair Ms. Elson-Houston, Ohio Department of Agriculture, were appointed to lead the task group. On July 11, 2010, the Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability held its first formal meeting. The task group expressed its thanks to its sponsor NCWM S&T Committee and also to NCWM members for their contributions made up to this session.

The task group was tasked with reviewing the current *NIST Handbook 44* Section 3.30 LMD Code to determine if the code requirements address rapidly changing practices for marketing retail motor-fuels to the general public. The task group was also tasked with developing proposals for modifying those codes that need changing and preparing them for a review by the committee.

Since July 2010, the task group has made progress in the following areas to achieve its goals:

1. September 2010 – Established a Work Plan (to include a project timeline) approved by the S&T Committee;
2. September 2010 – Developed a Motor-Fuel Marketing Method Information Form approved by the S&T Committee;
3. September 2010 – Recruited and confirmed 13 new task group members who are stakeholders affected by these marketing practices who represent the following organizations/agencies/associations/sectors:
  - Convenience Store Associations;
  - CWMA;
  - Discount Programming/Point of Sale Systems;
  - NEWMA;
  - NTEP;
  - Petroleum Marketers Associations;
  - RMFD Manufacturers;
  - SWMA;
  - Weights and Measures Consultants;
  - WWMA.
4. October 21, 2010 – Web/Teleconference Meeting;
5. December 14, 2010 – Web/Teleconference Meeting;
6. January 23, 2011 – In-Person Meeting; and
7. Upcoming Web/Teleconference Meetings are planned for February 23, 2011, and March 22, 2011.

NCWM has provided the task group with two resources: a web page and a list serve e-mail system. The web page is available as a central point for posting task group documents, photos, etc., so these working documents and information can be viewed or downloaded. The website allows the task group to work more efficiently through draft documents. NCWM Listserv allows the task group to communicate ideas and proposals, etc. by e-mail.

The task group began its work by requesting additional information to ensure that it does not reinvent code sections that already work to address marketing practices. The task group was interested in any recent legislation or policies enacted to address these marketing scenarios and will continue to accept this information. The task group plans to examine various examples of marketing practices to establish some general categories for classifying these marketing practices and later analyzing if a practice is adequately addressed by any codes it might develop. The task group developed a Motor-Fuel Marketing Method Information Form for stakeholders to provide information on newly emerging marketing practices they encounter which are either: (1) not addressed in the code; (2) result in non-uniform interpretation of the application of code sections; or (3) are difficult to enforce because of conflicting codes that apply to the equipment's design and use.

The primary focus of the task group's work has been six existing *NIST Handbook 44* LMD Code requirements that apply to RMFDs and address the equipment's:

- computing capability/suitability;
- receipts;
- unit price displays;
- unit price selection and control; and
- exemptions from these requirements.

The task group outlined several principles that might be considered as the basis for any marketing practice used in motor fuel sales through a RMFD. These principles would:

- ensure transparency of the transaction;
- allow for customer selection of the unit price;
- result in the unit price being correctly applied; and
- provide detailed transaction information available on the receipt.

These principles would allow sufficient flexibility for the consumer and avoid unintentional errors that the weights and measures community has observed in the absence of requirements for past marketing schemes.

Since multiple agency requirements apply to service station transactions at RMFDs for street signage, credit card regulations, etc., at some point the task group may need to determine if there are other laws and regulations that should be examined for conflicts or redundancy. The task group has discussed and will continue to monitor the Dodd-Frank Wall Street Reform and Consumer Protection Act and its effects on discounts offered for motor-fuel purchases based on payment made with various types and levels of credit/debit cards. The Dodd-Frank Act is an extensive piece of legislation intended to offer consumer protections and improve practices and services in the U.S. financial system. The task group plans to work with its membership and available resources to ensure that any requirements it develops are in harmony with this act.

The task group has provided summaries of its October 2010 and December 2010 Web/Teleconference Meetings to the January 2011 S&T Committee to update the committee on its work. Task Group Chair Mr. Humphreys also provided an update on the task group's work at the Open Hearings of the January 2011 NCWM Interim and Annual Meetings.

In November, 2011, the Task Group Chair submitted new proposals to the committee for consideration at the 2012 NCWM Interim Meeting.

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Mr. Steve Giguere, Maine | Committee Chair  
Mr. Kenneth Ramsburg, Maryland | Member  
Mr. Paul Moyer, Nebraska | Member  
Mr. Brett Gurney, Utah | Member  
Mr. Mahesh Albuquerque, Colorado | Member  
Mr. Ted Kingsbury, Measurement Canada | Canadian Technical Advisor  
Ms. Tina Butcher, NIST, OWM | NIST Technical Advisor  
Mr. Rick Harshman, NIST, OWM | NIST Technical Advisor

#### **Specifications and Tolerances Committee**