

Specifications and Tolerances Committee 2012 Annual Final Report

Tim Chesser, Chairman
Arkansas Weights and Measures
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Louisville, Kentucky

INTRODUCTION

The Specifications and Tolerances (S&T) Committee (hereinafter referred to as “Committee”) submits its Report to the Southern Weights and Measures Association (SWMA). The Report consists of the SWMA Agenda (NCWM Carryover and NEW items) and this Addendum. Page numbers in the tables below refer to pages in this Addendum. Suggested revisions to the handbook are shown in **bold face print** by ~~striking out~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in **bold-faced italics**.

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320 SCALES

320-1 V S.6.4. Railway Track Scales and Appendix D – Definitions

Source:

Systems Associates, Inc., (2012)

Purpose:

Align *NIST Handbook 44* with updated material in *AAR Scale Handbook*.

Item Under Consideration:

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

The nominal capacity marking shall satisfy the following.

(a) For scales manufactured from January 1, 2002 through December 31, 20XX:

- (1) The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity.
- (2) The nominal capacity of a two section scale shall not exceed its rated section capacity.

(b) For scales manufactured on or after January 1, 20XX, the nominal scale capacity shall not exceed the lesser of:

- (1) The sum of the Weigh Module Capacities as shown in Table S.6.4, or;

- (2) **Rated Sectional Capacity (RSC) multiplied by the quantity of the Number of Sections (Ns) minus the Number of Dead Spaces (Nd) minus 0.5. As a formula this is stated as RSC x (Ns - Nd - 0.5); or**
- (3) **640,000 lb.**

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

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

Table S.6.4.M.	
Railway Track Scale – Weigh Module Capacity	
<u>Weigh Module Length (m)</u>	<u>Weigh Module Capacity (kg)</u>
<u>< 1.5</u>	<u>36 300</u>
<u>1.5 to < 3.0</u>	<u>72 600</u>
<u>3.0 to < 4.5</u>	<u>108 900</u>
<u>4.5 to < 7.0</u>	<u>145 100</u>
<u>7.0 to < 9.0</u>	<u>168 700</u>
<u>9.0 to < 10.5</u>	<u>192 300</u>
<u>10.5 to < 12.0</u>	<u>234 100</u>
<u>12.0 to < 17.0</u>	<u>257 600</u>
<u>Note: The capacity of a particular module is based on its length and determined from corresponding capacity values specified in Table S.6.4.M.</u>	

(Table Added 20XX)

Table S.6.4.	
Railway Track Scale – Weigh Module Capacity	
<u>Weigh Module Length (ft)</u>	<u>Weigh Module Capacity (lb)</u>
<u><5</u>	<u>80 000</u>
<u>5 to < 10</u>	<u>160 000</u>
<u>10 to < 15</u>	<u>240 000</u>
<u>15 to < 23</u>	<u>320 000</u>
<u>23 to < 29</u>	<u>372 000</u>
<u>29 to < 35</u>	<u>424 000</u>
<u>35 to < 40</u>	<u>516 000</u>
<u>40 to < 56</u>	<u>568 000</u>
<u>Note: The capacity of a particular module is based on its length and determined from corresponding capacity values specified in Table S.6.4.</u>	

(Table Added 20XX)

2) Add the following definition for the term “Weigh Module” to *NIST Handbook 44*, Appendix D:

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

Background / Discussion:

The Item under Consideration was amended by the committee at the 2012 Annual Meeting. The original proposal was as follows:

1) Amend *NIST Handbook 44*, Scales Code paragraph S.6.4. Railway Track Scales as follows:

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

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

<u>Table S.6.4.</u>	
<u>Railway Track Scale – Weigh Module Capacity</u>	
<u>Weigh Module Length (ft)</u>	<u>Weigh Module Capacity (ton)</u>
<u><5</u>	<u>40</u>
<u>5 to < 10</u>	<u>80</u>
<u>10 to < 15</u>	<u>120</u>
<u>15 to < 23</u>	<u>160</u>
<u>23 to < 29</u>	<u>186</u>
<u>29 to < 35</u>	<u>212</u>
<u>35 to < 40</u>	<u>258</u>
<u>40 to < 56</u>	<u>284</u>

Note: The capacity of a particular module is based on its length and determined from corresponding capacity values specified in Table S.6.4.

~~{*Nonretroactive as of January 1, 2002}~~

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

2) Add the following definition for the term “Weigh Module” to *NIST Handbook 44*, Appendix D:

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

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. The submitter stated that determining the nominal scale capacity based on both the section capacity and the structural capacity is the best solution. Additionally, a 640,000 lb limit assures these scales can be calibrated with 12.5 % of capacity using the conventional 80,000 lb test weight equipment.

The changes to the nominal capacity specification were developed by Committee 34 - Scales, of the American Railway Engineering and Maintenance-of-Way Association (AREMA) and approved, by unanimous vote, for inclusion in the *AAR Scale Handbook*.

At the 2011 CWMA Interim Meeting, members of the weighing industry reported that it is inappropriate to rate a scale's capacity based solely on the sectional capacity of the scale. One regulatory official questioned whether the capacities in table S.6.4 should be listed in pounds. In addition to the proposed definition for weigh module, the CWMA noted it may also be appropriate to include a definition of dead spaces. CWMA believed there would be support for the item to align *NIST Handbook 44* and the *AAR Handbook*. CWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 Western Weights and Measures Association (WWMA) Annual Meeting, Mr. Straub, Fairbanks Scales, Inc., supported the item as submitted. Mr. Cook, NIST, OWM stated that the definition of weigh module may be confusing and suggested that the submitter include diagrams to NCWM S&T Committee illustrating some typical weigh module installations. The WWMA S&T Committee recognized that this proposal aligns *NIST Handbook 44* with the updated material in the *AAR Scale Handbook*, and added that there remains some confusion around the use of the word "articulated" in the definition which could be clarified with illustrations. WWMA forwarded the item to NCWM, recommending it as a Developing Item until such time that the committee receives diagrams that illustrate weigh module installations from the submitter.

At its 2011 Northeastern Weights and Measures Association (NEWMA) Interim Meeting, NEWMA forwarded the item to NCWM, recommending it as an Informational Item.

At the 2011 Southern Weights and Measures Association (SWMA) Annual Meeting, Mr. Oppermann, Weights and Measures Consulting, LLC, suggested that the reference to "single or articulated" are unnecessary and could be deleted. It doesn't matter how the module is put together. The SWMA S&T Committee also heard from Mr. Feezor, Scales Consulting and Testing, who noted that the term "articulated" refers to how the modules are connected. He offered to submit some drawings of how these are made in the field and he noted that this could apply to more than just railway track scales. Mr. Straub, Fairbanks Scales, Inc., indicated support for the proposal. He stated that he had talked with the original submitter, Mr. Beitzel, Systems Associates, Inc., and suggested that perhaps diagrams from *NCWM Publication 14* might be considered to help illustrate the use of the term "articulated." SWMA forwarded the item to NCWM, recommending it as a Voting Item with unanimous support for the following change to the definition, eliminating the phrase "single or articulate":

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

At the 2012 NCWM Interim Meeting, Mr. Cotsoradis, Flint Hills Resources questioned whether anyone had considered the impact that the item would have on existing scales considering that the new language proposed is retroactive.

Mr. Lewis, Rice Lake Weighing Systems, Inc., indicated that the proposal, if adopted, would affect two existing National Type Evaluation Program (NTEP) Certificate of Conformance (CCs) issued to Rice Lake Weighing Systems, Inc. Mr. Lewis questioned whether those CC's would need to be updated if the proposal was adopted and who would be responsible for the costs associated with those updates should they be required.

Mr. Flocken, speaking on behalf of the SMA, supported the item. However, he suggested that the word "articulated" be removed from the language in the definition originally proposed because it could be misunderstood and its removal would not have any impact on the requirement.

NIST, OWM stated that the SMA recommendation to delete the word "articulated" from the definition originally proposed would not change its meaning and agreed that it may facilitate a better understanding of the definition. Regarding use of the term "weighing element" in the proposed definition, NIST, OWM indicated that the term "load-receiving element" seemed more appropriate given the definition of the two terms in *NIST Handbook 44* (i.e., load-receiving element and weighing element).

Similar to the question raised by Mr. Cotsoradis, NIST, OWM questioned whether adequate consideration had been given to the impact the proposal might have on existing equipment, especially equipment manufactured between the dates January 1, 2002 (the effective date of enforcement of the nonretroactive portion of the current paragraph proposed for deletion) and the date the proposed changes to the paragraph would take effect. Of particular concern is whether or not existing equipment would be able to comply with the changes being proposed. To that end, NIST, OWM provided the committee a brief analysis of existing NTEP CC's for modular railway track scales. The analysis showed that the nominal capacity listed on the CC for some single module scales was greater than the lesser of the three values derived from the three bullets specified in the proposal. There were even more instances where the lesser value in the proposal exceeded the nominal capacity listed on the CC for module installations with and without dead spaces. NIST, OWM's analysis did not include all of the various configurations listed on the CC's. A related concern noted by NIST, OWM was whether anyone had considered the impact of the proposal relative to combination vehicle/railway track scales.

Should the committee decide to proceed with the proposal, NIST, OWM suggested that the committee consider adding a fourth bullet to the list of proposed nominal capacity considerations that includes the nominal capacity listed on the CC and that a note be added to proposed Table S.6.4. to make clear that module capacities are to be based on the length of the module and corresponding capacities specified in Table S.4. NIST, OWM offered the following proposed additions to the committee in relation to these recommendations:

1. Add the following note to proposed Table S.6.4.:

Note: The capacity of a particular module is based on its length and determined from corresponding capacity values specified in Table S.6.4.

2. Add a fourth bullet to the list of nominal capacity considerations that includes the nominal capacity listed on the CC.
 - (a) The sum of weigh module capacities in the proposed table
 - (b) The results of a calculation using the rated section capacity, number of sections and number of dead spaces,
 - (c) 300 000 kg (640 000 lb), or

(d) The nominal capacity listed on the CC.

NIST, OWM also noted that the current version of the proposed language uses “ton” units in the proposed table and “lb” units in the proposed changes to paragraph S.6.4. It was suggested that the committee consider making the units consistent by either including both units for every value [e.g., 640,000 lb (320 ton)] or only a single unit. Note that the railroad industry has traditionally rated section capacity in tons and nominal capacity in lb units. Additionally, NIST, OWM noted that it will likely include equivalent International System of Units (SI) values in *NIST Handbook 44* if this item is adopted.

Mr. Oppermann, Weights and Measures Consulting, LLC., suggested amending the first sentence in the definition of weigh module (originally proposed) to read as follows:

The portion of a load-receiving element supported by two sections of the weighing element.

Mr. Beitzel, Systems Associates, Inc., stated that he supported removal of the words “single or articulated” from the proposed definition of weigh module, but would be opposed to adding a fourth bullet “d” to reference the nominal capacity listed on the CC. Adding a reference to the nominal capacity on the CC would create a circular argument in that, if added, some might interpret that to mean that the nominal capacity of a scale cannot be increased beyond the value specified on the original CC, even if load cell capacity and the structural integrity of the weighbridge make possible an increase to the capacity. Subparagraph (d) would continue to limit the nominal capacity for the system. With respect to NIST, OWM's suggestion to the committee to change the units of measure in proposed table S.6.4.

from tons to pounds, there would be no problem as Nominal Capacity is generally represented in pounds on railway track scales.

Prior to the 2012 Interim meeting, the committee received a letter of support of this item as proposed from the Association of American Railroads (AAR).

The committee considered the comments received during the Open Hearings and agreed with concerns for how the proposed new language would affect current equipment that is already in service.

In consideration of the analysis presented by NIST, OWM, the committee agreed with their suggestion to add a fourth bullet to the list of proposed nominal capacity considerations that includes the nominal capacity listed on the CC. The committee also agreed to add a note beneath proposed Table S.6.4. to make clear that the module capacities are to be based on the length of the module and corresponding capacities specified in the proposed table. A final change agreed to by the committee was to amend the definition originally proposed. All of the changes agreed to by the committee are included in the Item Under Consideration. The 2012 S&T Committee designated this item as an Informational Item to allow time for additional information relative to these concerns and further analysis and comments on the amended proposal.

At the 2012 NCWM Annual Meeting open hearings, Mr. Darrel Flocken, Mettler Toledo, speaking on behalf of SMA supported the proposal as written.

Ms. Juana Williams, speaking on behalf of NIST OWM noted that bullet (d) of the proposal was added by the committee during the 2012 NCWM Interim Meeting after it was made known there existed at least one CC (and possibly more) for railway track scales with nominal capacities greater than the lessor of the values corresponding to bullets (a), (b), and (c), which created potential conflicts between the requirement as originally proposed and the information on some existing CCs.

During further analysis of this item, OWM recognized that information on CCs is sometimes amended. If the capacity specified on a CC issued for a railroad scale were changed, it could have an impact on the application of the proposed requirement; perhaps causing a device that once was compliant to be in violation. For this reason, OWM questioned whether bullet (d) in the Item Under Consideration should be included as one of the factors to be used in determining whether or not a device complies. If the committee agreed with this concern, it might, as an alternative to adding bullet (d), consider dividing the Item Under Consideration into two parts and assigning different enforcement dates to those parts. For example, new equipment could be required to comply with the proposed new portion of the paragraph while equipment already in service could continue to have to comply with the existing paragraph.

If the committee decided to divide this paragraph into two parts, it would be necessary to include the two struck out sentences in the Item Under Consideration with the existing (old) portion of the paragraph. OWM offered an example to show how the concerns described in the analysis of this item might be addressed in the language and proposed modifying the requirements to be retroactive in nature.

OWM also pointed out that the current version of the proposed language uses “ton” units in the proposed table and “lb” units in the proposed changes to paragraph S.6.4. The committee may wish to consider making the units consistent by either using both units for every value [e.g., 640,000 lb (320 ton)] or only use a single unit. Note that the railroad industry has traditionally rated section capacity in tons and nominal capacity in “lb” units. Additionally, OWM will likely include equivalent SI values in Handbook 44 if this item is adopted.

Mr. Steve Beitzel, SAI, commented as the original submitter that he supported the changes proposed by including the proposed change to a retroactive status and the proposed change of the values in the table from tons to pounds. He also suggested that the definition for “Weigh Module” be further modified to delete the phrase “of the weighing element” at the end of the first sentence. Mr. Beitzel also agreed with OWM’s suggestion to delete subparagraph S.6.4. (d).

Mr. Rafael Jimenez, AAR, stated that AAR supports the changes outlined by Steve, including those offered by OWM.

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 320-1: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
During its open hearings, the Committee heard from Darrell Flocken, speaking on behalf of SMA. Mr. Flocken noted that SMA supported the original version. The SMA has not met since the more recent changes to the proposal. However, SMA supported this in concept and he believes the SMA will support this as written. SMA will meet in November to review the most recent proposal.	
Committee recommendation:	
Forward the item, as proposed in the Committee’s agenda, to the National S&T Committee with a recommendation that the item be designated as a voting item.	
Reasons for the committee recommendation:	
The Committee heard support for the general proposal from SMA and, hearing no opposition to the proposal, the Committee agreed to recommend the item for a vote.	
Final updated or revised proposal from the region:	
The SWMA supports the proposal as reflected in NCWM Publication 16 with revisions made to S.6.4. Railway Track Scales by the NCWM S&T Committee during the 2012 NCWM Annual Meeting and reflected in the addendum sheets for that meeting.	
Recommendation to NCWM for item status: <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

320-2 ——— ~~This item was not submitted to this region.~~ **[NEW]**

320-3 V Appendix C – Units of Mass (ton)

Source:

Rice Lake Weighing Systems, Inc. (2012)

Purpose:

Establish uniform abbreviations for Short Ton.

Item Under Consideration:

Amend the Units of Mass Table on page C-19 of *NIST Handbook 44* Appendix C to recognize the abbreviation “tn” for (net or short) ton as follows:

Units of Mass	
1 assay ton ¹⁷ (AT)	29.167 grams
1 carat (c)	200 milligrams (exactly) 3.086 grains
1 dram apothecaries (dr ap or ʒ)	60 grains (exactly) 3.888 grams
1 dram avoirdupois (dr avdp)	27 ¹¹ /32 (= 27.344) grains 1.772 grams
1 gamma (γ)	1 microgram (exactly)
1 grain	64.798 91 milligrams (exactly)
1 gram (g)	15.432 grains 0.035 ounce, avoirdupois
1 hundredweight, gross or long ¹⁸ (gross cwt)	112 pounds (exactly) 50.802 kilograms
1 hundredweight, gross or short (cwt or net cwt)	100 pounds (exactly) 45.359 kilograms
1 kilogram (kg)	2.205 pounds
1 milligram (mg)	0.015 grain
1 ounce, avoirdupois (oz avdp)	437.5 grains (exactly) 0.911 troy or apothecaries ounce 28.350 grams
1 ounce, troy or apothecaries (oz t or oz ap or 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 ϥ)	20 grains (exactly) 1.296 grams
1 ton, gross or long ¹⁹	2240 pounds (exactly) 1.12 net tons (exactly) 1.016 metric tons
1 ton, metric (t)	2204.623 pounds 0.984 gross ton 1.102 net tons
1 ton, net or short (tn)	2000 pounds (exactly) 0.893 gross ton 0.907 metric ton

¹⁷ Used in assaying. The assay ton bears the same relation to the milligram that a ton of 2000 pounds avoirdupois bears to the ounce troy; hence the mass in milligrams of precious metal obtained from one assay ton of ore gives directly the number of troy ounces to the net ton.

¹⁸ The gross or long ton and hundredweight are used commercially in the United States to only a very limited extent, usually in restricted industrial fields. The units are the same as the British “ton” and “hundredweight.”

¹⁹ The gross or long ton and hundredweight are used commercially in the United States to a limited extent only, usually in restricted industrial fields. These units are the same as the British “ton” and “hundredweight.”

Background / Discussion:

The submitter of this item has discovered a difference between U.S. and Canadian abbreviation requirements that may impact manufacturers that sell products in both countries and NTEP type evaluations under the US/Canada mutual recognition program. Most units of mass have an abbreviation for SI and U.S. customary units (e.g., kg, lb, g, oz, etc.). However, the same abbreviation, the lower case “t,” is used to represent both the metric ton and the short ton (2000 lb). If an indicator is set up to display both SI and U.S. customary units, the operator or customer cannot know what units are displayed if “t” is the only abbreviation that is acceptable for metric ton. Because of the limited space available on today’s indicators, the words “short ton” or “long ton” are not always an option.

In the *Canadian Lab Manual*, Part 2, Section Appendix-2A in the table for abbreviations and symbols accepted in Canada, metric ton is abbreviated by “t” and ton (short ton) is abbreviated by “tn”. In *NCWM Publication 14*, Appendix C in a table marked Acceptable Abbreviation/Symbols there is an abbreviation for short ton as TN and long tons as LT. In keeping with the Canadian abbreviation, the committee considered a request that *NIST Handbook 44* be amended to use the lower case “tn” and “lt” as the abbreviations for short and long ton respectively.

At the 2011 CWMA Interim Meeting, CWMA forwarded the item to NCWM, recommending it as a Voting Item.

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

At its 2011 SWMA Annual Meeting, the S&T Committee heard from Mr. Lewis, Rice Lake Weighing Systems, Inc. Mr. Lewis indicated that, based on opposition he had heard on his proposal to include an abbreviation for “long ton”, he suggests removing that abbreviation from the proposal. Thus, the proposal would only include an abbreviation for “short ton.” Mr. Flocken, Mettler-Toledo, LLC, noted that the Weighing Sector considered this and agreed to move this forward because of differences between the 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 the abbreviation for short ton as “tn”. There was support for the proposed abbreviation during the Open Hearings. Noting the proposed change would align the U.S. requirements with Canadian requirements, there were no indications that the proposed change would impact existing equipment. Mr. Flocken indicated that the same change is being proposed for *NCWM Publication 14* scales checklists. The SWMA agreed with its committee recommendation to delete the reference to “long ton” in the original submission as requested by the submitter. SWMA forwarded the item to NCWM, recommending it as a Voting Item after modifying the reference to “ton” on page C-6 of *NIST Handbook 44*, Appendix C to specify the unit “tn” as the abbreviation for “ton”.

At the 2012 NCWM Interim Meeting, the original submitter, Mr. Lewis, Rice Lake Weighing Systems, Inc., requested that the proposal in the Interim Agenda be modified to remove the reference to long ton and its associated proposed abbreviation “lt”. Mr. Lewis indicated that the intent of the proposal is to align U.S. and Canadian requirements and noted that the abbreviation “tn” is an acceptable Canadian abbreviation for short ton.

Mr. Flocken, speaking on behalf of the SMA, suggested making the item Informational to allow for more discussion. He stated that SMA supports the abbreviation “tn” for short ton but not the long ton abbreviation “lt”.

NIST, OWM stated that they agreed with the points raised during the 2011 WWMA Annual Meeting for continued development of the item.

Mr. Ripka, Thermo Fisher Scientific, indicated that several different references for ton (short) have been used with belt-conveyor scale systems over the years. For example, both lower case “t” and upper case “T” have been used to abbreviate short ton. He stated that although he was not opposed to the item, more work is needed to ensure that references are consistent throughout all of *NIST Handbook 44*.

The committee considered the comments received during the Open Hearings and agreed with the recommendation to amend the Units of Mass table on page C-19 of *NIST Handbook 44 Appendix C* as shown in Item Under Consideration. The committee agreed that additional work is needed on this item. The committee asked the NIST Technical Advisors to undertake a review of the references in *NIST Handbook 44*, the Canadian requirements, and *NCWM Publication 14*, and identify any additional changes that might be needed to ensure consistency. Additionally, the committee is seeking input from the community on the impact that this item might have on existing scales in the marketplace. The 2012 S&T Committee designated this item as an Informational Item.

Technical Advisors Note: After the 2012 NCWM Interim meeting had concluded, NIST, OWM, in reviewing summary comments from the 2011 SWMA fall meeting, discovered an additional reference on page C-6 of Appendix C, NIST Handbook 44, that SWMA had identified as needing to be changed in order to be consistent with the change proposed in the Item Under Consideration. NIST, OWM suggests that the following change be made for future consideration of this item:

Amend the abbreviation “t” representing the “net” or “short” ton on page C-6 of *NIST Handbook 44 Appendix C* to “tn” as follows:

Avoirdupois Units of Mass⁶

[The “grain” is the same in avoirdupois, troy, and apothecaries units of mass.]

1 μlb	= 0.000 001 pound (lb)
27 ¹¹ / ₃₂ grains (gr)	= 1 dram (dr)
16 drams	= 1 ounce (oz)
	= 437½ grains
16 ounces	= 1 pound (lb)
	= 256 drams
	= 7000 grains
100 pounds	= 1 hundredweight (cwt) ⁷
20 hundredweights	= 1 ton (tn)
	= 2000 pounds ⁷

In “gross” or “long” measure, the following values are recognized:

112 pounds (lb)	= 1 gross or long hundredweight (cwt) ⁷
20 gross or long hundredweights	= 1 gross or long ton
	= 2240 pounds

⁶ When necessary to distinguish the **avoirdupois** dram from the **apothecaries** dram, or to distinguish the **avoirdupois** dram or ounce from the **fluid** dram or ounce, or to distinguish the avoirdupois ounce or pound from the **troy** or **apothecaries** ounce or pound, the word “avoirdupois” or the abbreviation “avdp” should be used in combination with the name or abbreviation of the **avoirdupois** unit.

⁷ When the terms “hundredweight” and “ton” are used unmodified, they are commonly understood to mean the 100 pound hundredweight and the 2000-pound ton, respectively; these units may be designated “net” or “short” when necessary to distinguish them from the corresponding units in **gross** or **long** measure.

At its 2012 Annual Meeting, NEWMA supported the item as amended at the 2012 Interim Meeting. NEWMA questioned whether the wrong “Units of Mass” table was included in the NCWM S&T Committee’s Interim Report.

At its 2012 Annual Meeting, CWMA recommended that the item remain Informational. The CWMA also recommended changing the abbreviation “t,” which refers to a “short ton,” to “tn” to avoid conflict with the recommended proposal. At that meeting Darrell Flocken supported “tn” as an acceptable abbreviation for “short ton,” but does not support “lt” as the abbreviation for “long ton;” he also suggested that the abbreviation “lt” was erroneously left in the proposal.

At the 2012 NCWM Annual Meeting, the committee acknowledged that the reference to “lt” is no longer under consideration. Mr. Darrell Flocken, Mettler Toledo, speaking on behalf of SMA, reiterated the comments he made at the CWMA meeting and supported changing the item to “Informational.”

Juana Williams, NIST OWM, noted that the 2011 Publication 14 Belt-Conveyor Scale Systems type evaluation criteria provides a table on page BCS-4 that indicates the U.S. short ton may be identified as “ton” or upper case “T;” the metric ton as lower case “t;” and the U.S. long ton as upper case “LT.” The following abbreviations appear in the 2011 version of Pub 14 BCS systems type evaluation criteria:

Unit	Abbreviation
pounds	lb or LB
U.S. short ton	ton or T
U.S. long ton	LT
Metric ton	t
kilograms	kg

The abbreviation “T” for U.S. short ton in Pub 14 conflicts with the acceptable abbreviation for the U.S. short ton specified in Appendix C of Handbook 44, which is “t.” A search of the word “ton” in Appendix C of NIST Handbook 44 revealed that nowhere is upper case “T” used, although lower case “t” appears as an acceptable abbreviation for both the U.S. short (or net) ton (page C-6) and the metric ton (page C-19). OWM expressed concern that officials applying paragraph G-S.5.6.1. might be inclined to reject an upper case “T” as an acceptable abbreviation for the U.S. short (or net) ton even though Pub 14 indicates that the upper case “T” is acceptable. Officials might also find it confusing if lower case “tn” were made an acceptable abbreviation for the U.S. short or net ton, given that the table on page BCS-4 of Pub 14 specifies lower case “t” as the acceptable abbreviation for the metric ton.

OWM noted that even if everyone were to agree on different acceptable abbreviations for the U.S. short or net ton, the U.S. long ton, and the metric ton, it would be unlikely that this would completely resolve all the confusion relating to the value of the ton in commercial transactions. The spelled-out version of the word “ton” is often used instead of its abbreviation to identify values displayed or recorded by a commercial device. Thus, unless the word “ton” is further qualified using an appropriate clarifying preface such as metric, short, net, or long, it’s unclear as to which ton is being referenced when the word “ton” by itself is used to identify the unit of measure.

OWM suggested that the committee consider changing the abbreviation “t” (which refers to 1 ton (short), beneath the heading “Avoirdupois Units of Mass” on page C-6 of the 2012 version of NIST Handbook 44) to “tn” to avoid conflict with the recommended proposal. OWM also noted that the abbreviation “lt” was erroneously left in the table.

The committee agreed that the “lt” abbreviation for “1 ton, gross or long” in the table on page S&T 20 of 2012 Publication 16 was erroneously left in the table from the original proposal and should be removed.

The committee reiterated its request for input from the community on the impact that this item might have on

existing scales in the marketplace and asks for input regarding what additional changes might be needed to the proposal prior to moving it forward.

The committee recommended deleting the reference to “Long Ton” in the “Purpose” so that it reads as follows:

“Purpose: Establish uniform abbreviations for Short Ton.”

The Committee also recommended deleting the reference to “It” in the “Units of Mass” table in the “Item Under Consideration” so that the reference for “1 ton, gross” reads as follows:

1 ton, gross or long¹⁹

The Committee is recommending no other changes to the “Item Under Consideration.”

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 320-3: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
During its open hearings, the Committee heard from Darrell Flocken, speaking on behalf of SMA. Mr. Flocken noted that SMA supports the proposal as written.	
Committee recommendation:	
Forward the item, as proposed in the Committee’s agenda, to the National S&T Committee with a recommendation that the item be designated as a voting item.	
Reasons for the committee recommendation:	
The Committee heard support for the proposal from SMA and, hearing no opposition to the proposal, the Committee agreed to recommend the item for a vote.	
Final updated or revised proposal from the region:	
The SWMA supports the proposal	
Recommendation to NCWM for item status: <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

~~320-4~~ — ~~This item was not submitted to this region~~ **[NEW]**

321 BELT-CONVEYOR SCALE SYSTEMS

321-1 V UR.2.2. Conveyor Installation [NEW]

Source:

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

Purpose:

Remove restrictions on minimum and maximum belt lengths.

Item Under Consideration:

Amend NIST HB44 Section 2.21. Belt Conveyor Scale Systems Code as follows:

UR.2.2. Conveyor Installation.

- (a) **Installation - General.** – A belt-conveyor scale shall be so installed that neither its performance nor operation will be adversely affected by any characteristic of the installation, including but not limited to, the foundation, supports, covers, or any other equipment.

(Amended 2002)

- (g) **Tripper and Movable Pulleys.** – There shall be no tripper or movable head pulleys in the conveyor.

~~(h) **Conveyor Length.** – The conveyor shall be no longer than 300 m (1000 ft) nor shorter than 12 m (40 ft) from head to tail pulley.~~

~~[Nonretroactive as of January 1, 1986]~~

- (i) **Conveyor Orientation.** – The conveyor may be horizontal or inclined, but, if inclined, the angle shall be such that slippage of material along the belt does not occur.

- (j) **Conveyor Stringers.** – Conveyor stringers at the scale and for not less than 6 m (20 ft) before and beyond the scale shall be continuous or securely joined and of sufficient size and so supported as to eliminate relative deflection between the scale and adjacent idlers when under load. The conveyor stringers should be so designed that the deflection between any two adjacent idlers within the weigh area does not exceed 0.6 mm (0.025 in) under load.

Background / Discussion:

Belt-conveyor scale manufacturers in the USNWG BCS have reported a demand from their customers for shorter conveyor systems which would also meet current NIST HB44 requirements. The minimum conveyor length requirement and those requirements that set minimum spacing between components on a belt-conveyor system currently existing in HB44 will not permit them however. The USNWG during their February 2012 meeting concluded that the limit of 40 feet for a conveyor is unrealistic due to the spacing required between components and that this requirement is too prescriptive. In addition, the WG agreed that limiting the conveyor length to 1000 feet would be, to some extent self-regulating, in that calibration and testing that incorporates the use of whole/full revolutions of the belt would be excessively time consuming. The WG also agreed that the performance of the weighing device should be evaluated without regard to conveyor length and that if the design of the device supported acceptable performance using conveyors outside the limits of this requirement, the requirement should be stricken. As an initial step towards removing language in the HB44 Belt-Conveyor Systems Code that is prohibitive of shorter belt conveyor systems (weigh-belts) the WG recommends that paragraph UR.2.2.(h) be deleted. The WG will continue to develop further proposals to amend additional requirements within the BCS Code so they will be applicable to shorter belt-conveyor scale systems.

The elimination of UR.2.2.(h) will further align U.S. standards (NIST HB44) with the international requirement - OIML R50-Continuous totalizing automatic weighing instruments (belt weighers) in that OIML R50 does not contain minimum or maximum requirements for conveyor length.

Item 321-1: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee received no comments on this item.	
Committee recommendation:	
Forward the item, as proposed in the Committee’s agenda, to the National S&T Committee with a recommendation that the item be designated as a voting item.	
Reasons for the committee recommendation:	
While the Committee heard no specific comments on this item, the Committee acknowledges that the proposal is supported by the USNWG. Recognizing the expertise of the USNWG members, the Committee believes it is appropriate to support the proposal as recommended by the Work Group.	
Final updated or revised proposal from the region:	
Recommendation to NCWM for item status: <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

321-2 V Appendix D – Definitions: Belt Revolution, Belt Load, Integrator, Loading Point, and Master Weight Totalizer [NEW]

Source:
U.S. National Work Group on Belt-Conveyor Scales (USNWG BCS)

Purpose:
Provide clarity of meaning for the use of terms in the Belt-Conveyor Scales Code to avoid confusion or misuse.

Item Under Consideration:
Amend NIST HB44 Appendix D – Definitions as follows:

belt revolution. - The amount of conveyor belt movement or travel that is equivalent to the total length of the conveyor belt. Also referred to as "belt circuit "[2.21]

belt load. - The weight of the material carried by the conveyor belt, expressed in terms of weight units per unit of length - i.e., pounds per foot, kilograms per meter. Also called Belt Loading.[2.21]

integrator. - A device used with a belt-conveyor scale which combines conveyor belt load (e.g., lb/ft) and belt travel (e.g., feet) to produce a total weight of material passing over the belt-conveyor scale. An integrator may be a separate, detached mechanism or may be a component within a totalizing device. (Also see “master weight totalizer”)[2.21]

loading point. - A location on a conveyor where the material is received by the belt. The location of a hopper, chute, or the discharge of a pre-feed device used to supply material to a conveyor.[2.21]

master weight totalizer. - A primary indicating element used with a belt-conveyor scale which incorporates the function of an integrator to indicate the totalized weight of material that was passed over the scale. ~~The master weight totalizer is a primary indicating element of the belt conveyor scale.~~ (Also see “integrator”)[2.21]

Background / Discussion:

Certain terms and phrases are used in NIST HB44 and in discussions related to belt-conveyor scales systems that have specific meanings within that context. The terms “belt revolution”, “belt load”, “integrator”, and “loading point” are used routinely in these discussions and, at this time are not defined in HB44. The term “master weight totalizer” is currently defined in Appendix D and is frequently used interchangeably with the term “integrator.” The amendment to this definition is intended to distinguish between these two terms while recognizing the interrelated functions of (1) the integration of belt travel and belt loading and (2) the totalization and display of weight passing over the weighing device. This proposal recommends that these four terms and definitions should be added, and the one existing definition for “master weight totalizer” be amended in HB44 Appendix D to promote consistency in their use.

Item 321-2: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee received no comments on this item.	
Committee recommendation:	
Forward the item, as proposed in the Committee’s agenda, to the National S&T Committee with a recommendation that the item be designated as a voting item.	
Reasons for the committee recommendation:	
While the Committee heard no specific comments on this item, the Committee acknowledges that the proposal is supported by the USNWG. Recognizing the expertise of the USNWG members, the Committee believes it is appropriate to support the proposal as recommended by the Work Group.	
Final updated or revised proposal from the region:	
Recommendation to NCWM for item status: <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

330 LIQUID MEASURING DEVICES

~~330-1~~ ~~This item was not submitted to this region~~ [NEW]

331 VEHICLE-TANK METERS

331-1 VI T.4. Product Depletion Test

Source:

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

Purpose:

Enable more consistent application of the tolerances between older and newer meters and address an unintentional gap that allows an unreasonably large tolerance for smaller meters.

Item Under Consideration:

Amend *NIST Handbook 44* Vehicle Tank Meter Code paragraph T.4. and the accompanying Table T.4 as follows: Note that this option was identified as “Option 2” in the committee’s 2011 Final Report and 2012 Interim Agenda.

T.4. Product Depletion Test. – The difference between the test result for any normal test and the product depletion test shall not exceed ~~tolerance shown in Table T.4.~~ **0.5 % percent of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated higher than 380 Lpm (100 gpm) or 0.6 % percent of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated 380 Lpm (100 gpm) or lower.** Test drafts shall be of the same size and run at approximately the same flow rate.

[Note: The result of the product depletion test may fall outside of the applicable test tolerance as specified in Table 1.]

Delete current Table T.4.

Table T.4.	
Tolerances for Vehicle Tank Meters on Product Depletion Tests, Except Milk Meters	
Meters Size	Maintenance and Acceptance Tolerances
Up to, but not including, 50 mm (2 in)	1.70 L (104 in³)¹
From 50 mm (2 in) up to, but not including, 75 mm (3 in)	2.25 L (137 in³)¹
75 mm (3 in) or larger	3.75 L (229 in³)¹
Based on a test volume of at least the amount specified in N.3. Test Drafts.	

Background / Discussion:

This item was submitted to NEWMA at its 2008 Interim Meeting to propose an alternative to existing product depletion test tolerances which are based on the size of the meter. The alternatives presented by the original submitter propose basing tolerances on a percentage of maximum flow rate rather than meter size. The submitter noted that, while a nonretroactive marking requirement added in 2008 eliminates difficulties in determining meter size for newer metering systems, inspectors are still faced with difficulties consistently determining meter size for

older systems, and those systems will likely remain in service for many years. Additionally, the submitter noted that the original proposal to base tolerances on meter size did not consider the possibility of smaller meters (e.g., down to ¼ inch diameter) being mounted on vehicles. Applying current tolerances to these smaller meters based on meter size would result in a 22.5 % relative error for one minute of flow during a product depletion test. Even a slightly larger, 1-inch meter would have a relative error of 2.25 %. These tolerances seem inappropriately large. While the submitter noted that 2-inch and 3-inch meters are expected to comprise the largest number of vehicle-mounted meters, the current tolerances based on meter size provide an inappropriately large tolerance for smaller meters.

The committee has agreed with the concept of basing the product depletion test tolerances on the marked maximum flow rate of the meter rather than on the marked meter size and has considered several proposals for modifying the tolerances since this item was introduced in 2008. Details of these proposals and associated discussion can be found in the committee's 2009-2011 final reports. While recognizing that one goal of the original proposal was to reduce what the submitter considered an unreasonably large tolerance for smaller meters, the committee expressed concern about the impact the proposal would have on these meters based on comments from Meter Manufacturers Association (MMA), including comments during the 2011 NCWM Annual Meeting.

From 2009 to 2011, the committee repeatedly requested data to support or oppose the proposals under consideration with little success. At the 2011 NCWM Annual Meeting, the committee reiterated its need for data to evaluate the impact of any proposed tolerances changes. Following the meeting, NIST Technical Advisor, Ms. Butcher distributed a request on the NIST, OWM Director's list serve on behalf of the committee asking weights and measures jurisdictions to submit data.

At their fall 2011 Meetings, CWMA, SWMA, and WWMA encouraged the collection of data. Since work continues on this issue, all three associations recommended that the item be a Developing Item until data has been submitted and analyzed. SWMA also noted that there does not appear to be a clear preference for either of the two options presented in NCWM S&T Committee's 2011 Final Report; the SWMA heard that a third proposal may be under development by the MMA.

At the 2011 NEWMA Interim Meeting, it was suggested that there is not a lot of product depletion testing in the field. If the truck only has one tank, it makes the logistics of testing very difficult. NEWMA also noted that variations in product flow rate and clinging of product will also skew test results. Members believe it is much easier to ascertain product flow information from the ID plate rather than determine actual meter size with piping variations. NEWMA encouraged jurisdictions to forward any data to the S&T Committee NIST Technical Advisor.

At the 2012 NCWM Interim Meeting, the committee reiterated its position that tolerances for the product depletion test of a vehicle tank meter should be based on the marked maximum flow rate of the meter rather than meter size. The committee considered the three options for modifying *NIST Handbook 44*, including two options presented in its 2011 Interim Agenda and a third option submitted by the MMA prior to the meeting. A summary of the three options is outlined in the following table. A second table illustrating examples of tolerances for common meter sizes and maximum flow rates is also included.

Summary of Product Depletion Tolerance Options Considered		
	Marked Maximum Flow Rate or Meter Size	Tolerance (% of Marked Max Flow Rate)
Current	Up to but not including 2"	104 in ³
	2" up to but not including 3"	137 in ³
	3" and larger	229 in ³
Option 1:	All Maximum Flow Rates	0.5 %
Option 2:	Marked Max ≤ 100 gpm	0.6 %
	Marked Max > 100 gpm	0.5 %
Option 3:	Marked Max ≤ 60 gpm	0.8 %
	Marked Max > 60 gpm up to and including 100 gpm	0.6 %
	Marked Max > 100 gpm	0.5 %

Examples of Product Depletion Tolerance Options for Different Meter Sizes/Flow Rates					
Size	Marked Maximum Flow Rate (gpm)	Current Tolerance	Option 1 (0.5 % max)	Option 2 (0.6 % max) (0.5 % max)	Option 3 (0.8 % max) (0.6 % max) (0.5 % max)
1-1/2"	60 gpm	104 in ³	69 in ³	83 in ³	111 in ³
2"	100 gpm	137 in ³	115 in ³	139 in ³	139 in ³
2"	150 gpm	137 in ³	173 in ³	173 in ³	173 in ³
3"	150 gpm	229 in ³	173 in ³	173 in ³	173 in ³
3"	200 gpm	229 in ³	231 in ³	231 in ³	231 in ³
3"	300 gpm	229 in ³	346 in ³	346 in ³	346 in ³
3"	350 gpm	229 in ³	404 in ³	404 in ³	404 in ³

At the 2012 NCWM Interim Meeting Open Hearings, members of the MMA supported Option 3. Mr. Andersen, who originally proposed the item in 2008, pointed out that the tolerances in option 1 were the same as those that apply prior to modifying the tolerance to be based on meter size.

Ms. Butcher, NIST Technical Advisor, reported that the committee received product depletion test data from nine state and county weights and measures jurisdictions. She brought a copy of the raw data for examination by the committee during its work sessions and also distributed a summary to the committee as shown in the following two tables. She explained how the data was analyzed and noted that assumptions were made about meter size in some instances where meter size and/or maximum flow rate were not both provided. The first table summarizes for each jurisdiction the number of meters on which the product depletion test was conducted along with a comparison of the number that failed the current and proposed tolerances; the data includes both total meters for each option along with a breakdown of meters in three different flow rate categories. The second table provides a summary showing these totals for all jurisdictions combined.

Summary of Product Depletion Test Data Submitted by State and County Weights and Measures Jurisdictions As Of 1/20/12						
	Total Meters	Failed Current Tolerance	Failed Option 1	Failed Option 2	Failed MMA	Marked Max
Jurisdiction #1	67	0	2	1	1	---
	1	0	1	1	1	60 gpm
	53	0	1	0	0	100 gpm
	12	0	0	0	0	>100 gpm
	1	0	0	0	0	??
Jurisdiction #2	9	0	0	0	0	No Data
Jurisdiction #3	288	21	33	22	20	---
	28	1	5	3	1	60 gpm
	228	17	25	16	16	100 gpm
	32	3	3	3	3	>100 gpm
Jurisdiction #4	196	7	18	9	6	---
	14	0	3	3	0	60 gpm
	153	5	14	5	5	100 gpm
	29	2	1	1	1	>100 gpm
Jurisdiction #5	134	7	12	7	7	---
	10	2	3	2	2	60 gpm
	72	4	8	4	4	100 gpm
	52	1	1	1	1	>100 gpm
Jurisdiction #6	200	20	29	20	20	---
	0	0	0	0	0	60 gpm
	178	16	25	16	16	100 gpm
	22	4	4	4	4	>100 gpm
Jurisdiction #7	196	13	14	13	13	---
	0	0	0	0	0	60 gpm
	150	11	12	11	11	100 gpm
	46	2	2	2	2	>100 gpm
Jurisdiction #8	761	0	7	1	0	---
	103	0	1	1	0	60 gpm
	629	0	6	0	0	100 gpm
	29	0	0	0	0	>100 gpm
Jurisdiction #9	71	26	26	20	20	No Data

	Total Meters	Failed Current Tolerance	Failed Option 1	Failed Option 2	Failed Option 3	Marked Maximum Flow Rate
Summary of All Jurisdictions	156	3	13	10	4	60 gpm
	1463	53	91	52	52	100 gpm
	222	12	11	11	11	>100 gpm
	81	26	26	20	20	No Info
Totals	1922	94	141	93	87	

The committee expressed sincere appreciation to those jurisdictions that submitted data. The committee discussed the data and the summaries. The committee recognized that the data was not obtained under controlled conditions or as part of a structured survey or study; however, the data was extremely valuable in assessing the relative impact of the three options proposed. The committee agreed that option 2 represents a reasonable compromise between the original proposal and the MMA's proposal (designated Option 3 in the tables above). The committee acknowledged that this item has included multiple proposals up to this point and it is important to designate a single option for consideration by NCWM so this item can move forward. Consequently, the committee presented Option 2 for consideration. Because this item has included multiple proposals up to this point, the 2012 S&T Committee designated this item as an Informational Item and requested comments on the proposal as shown in the Item Under Consideration prior to moving the item forward as a Voting Item.

At its 2012 Annual Meeting, NEWMA expressed its support for moving this item ahead as a "Voting" item in the next NCWM cycle. At its 2012 Annual Meeting, CWMA supported the item as "Informational."

At the 2012 NCWM Annual Meeting, Mr. Dmitri Karimov, Liquid Controls, speaking on behalf of the Meter Manufacturers Association, commented that, while MMA was aware that the committee did not support MMA's proposed "Option 3," the MMA supported "Option 2" recommended by the committee.

The Committee requested additional input from regional associations and industry regarding whether or not the proposed changes are ready for adoption in the next NCWM cycle.

Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 331-1: Regional Report to NCWM

Summary of comments considered by the regional committee (in writing or during the open hearings):

Mike Keilty, Endress and Hauser, speaking on behalf of the NTETC Measuring Sector, reported that the Measuring Sector thoroughly discussed this issue during its meeting on October 5-6, 2012. He also noted that the MMA agreed that this item should move forward as a voting item with the tolerances from Option 2.

Committee recommendation:

Forward the item, proposing Option 2 as shown in the Committee’s agenda, to the National S&T Committee with a recommendation that the item be designated as a voting item.

Reasons for the committee recommendation:

The Committee discussed the potential impact of Option 2 vs. Option 3 on smaller meter sizes. However, the Committee recognized that, at the 2012 NCWM Annual Meeting, the MMA agreed to support Option 2. The Committee also recognized the support of the item from experts within the metering community in the Measuring Sector and within MMA. Consequently, the Committee the supports the tolerances proposed in Option 2.

Final updated or revised proposal from the region:

Amend *NIST Handbook 44* Vehicle Tank Meter Code paragraph T.4. and the accompanying Table T.4 as follows:

Note that this option was identified as “Option 2” in the committee’s 2011 Final Report and 2012 Interim Agenda.

T.4. Product Depletion Test. – The difference between the test result for any normal test and the product depletion test shall not exceed ~~tolerance shown in Table T.4.~~ **0.5 % percent of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated higher than 380 Lpm (100 gpm) or 0.6 % percent of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated 380 Lpm (100 gpm) or lower.** Test drafts shall be of the same size and run at approximately the same flow rate.

[Note: The result of the product depletion test may fall outside of the applicable test tolerance as specified in Table 1.]

Delete current Table T.4.

Table T.4.	
Tolerances for Vehicle Tank Meters on Product Depletion Tests, Except Milk Meters	
Meters Size	Maintenance and Acceptance Tolerances
Up to, but not including, 50 mm (2 in)	1.70 L (104 in³)¹
From 50 mm (2 in) up to, but not including, 75 mm (3 in)	2.25 L (137 in³)¹
75 mm (3 in) or larger	3.75 L (229 in³)¹
Based on a test volume of at least the amount specified in N.3. Test Drafts.	

Recommendation to NCWM for item status:

- Voting Item on the NCWM Agenda
- Information Item on the NCWM Agenda
- Withdraw the Item from the NCWM Agenda
- Developing Item on the NCWM Agenda
- Unable to consider at this time
- Other: *(Please Describe)*

Regional Position:

- Supports
- Opposes
- Split
- Neutral

Additional Comments:

Adopted unanimously by voice vote.

336 WATER METERS

~~336-1~~ ~~This item was not submitted to this region~~ [NEW]

337 MASS FLOW METERS

337-1 **D Appendix D – Definitions: Diesel Liter and Diesel Gallon Equivalents (DLE, DGE)**
[NEW]

Source:

Clean Vehicle Education Foundation

Purpose:

Enable consumers to make cost and fuel economy comparisons between diesel fuel and natural gas.

Item Under Consideration:

Amend *NIST Handbook 44* Appendix D – Definitions as follows:

Add the following definitions:

Diesel Liter Equivalent (DLE). - means 0.756 kg of natural gas.

Diesel Gallon Equivalent (DGE). - means 2.863 kg (6.312 lb) of natural gas.

Background / Discussion:

The gasoline gallon equivalent (GGE) unit was defined by NIST/NCWM in 1994 (See Appendix A) to allow users of natural gas vehicles to readily compare costs and fuel economy of light-duty natural gas vehicles with equivalent gasoline powered vehicles. For the medium and heavy duty natural gas vehicles in widespread use today, there is a need to officially define a unit (already in widespread use) allowing a comparison of cost and fuel economy with diesel powered vehicles. Also natural gas is sold as a vehicle fuel as either Compressed Natural Gas (CNG) or Liquefied Natural Gas (LNG) and each method of sale is measured in mass. Therefore the generic term natural gas is proposed to be used in Handbooks 44 and 130 without the existing term "compressed".

The mathematics justifying the specific quantity (mass) of natural gas in a DLE and DGE is included in Appendix A.

The official definition of a DLE and a DGE will likely provide justification for California, Wisconsin and any other state to permit retail sales of LNG for heavy-duty vehicles in these convenient units.

Additional Contacts: Clean Energy, Seal Beach, CA, NGVAmerica, Washington, DC, Clean Vehicle Education Foundation, Acworth, GA

Item 337-1: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
Mike Keilty, Endress and Hauser, noted some confusion about the values designated in the proposal. He also made additional comments regarding the display of these values; these comments are captured in Item 337-2.	
Committee recommendation:	
<p>The Committee does not believe that the proposal has been adequately developed with regard to the application of the proposed definitions, including aspects such as vetting of these values within the industry with relative to actual gas supplies; explanation of how this will be applied consistently; and provisions for ensuring clear and understandable value comparisons by consumers (particularly given variations in gas supplies); and how this will apply to dispensers that may be used to fuel vehicles conventionally fueled by gasoline or diesel.</p> <p>The Committee supports including this item on the agenda as a Developing Item, provided that the original submitter will further develop this item and address the questions that have been raised.</p>	
Reasons for the committee recommendation:	
<p>The Committee heard questions about the values of the units and questions whether they adequately represent the natural gas supplies as a whole. The Committee also questioned whether or not these units have benefit to the consumer.</p> <p>The Committee questioned whether it might be more appropriate for the community to consider establishing mass as the method of sale for natural gas and providing educational information through mechanisms such as pump toppers that would enable the consumer to compare the fuel costs with gasoline- or diesel-powered vehicles. This approach would eliminate concerns about designating equivalent values that may not accurately represent the product being sold through a specific dispenser.</p> <p>The Committee believes that the item is not adequately developed to move forward for NCWM action. However, the Committee supports including this item on the agenda as a Developing Item, provided that the original submitter will further develop it and address the questions that have been raised.</p>	
Final updated or revised proposal from the region:	
The SWMA believes that this item requires further development and believes the community should consider establishing mass as the method of sale for natural gas. The SWMA agreed to propose the item be made a Developing item on the NCWM S&T Committee’s agenda with the provision that the submitter further develops the issue.	
Recommendation to NCWM for item status: <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input checked="" type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

337-2 D S.1.2. Compressed Natural Gas Dispensers, s.1.3.1.1. Compressed Natural Gas Used as an Engine Fuel, S.5.2. Marking of Gasoline Volume Equivalent Conversion Factor [NEW]

Source:

Clean Vehicle Education Foundation

Purpose:

Enable consumers to make cost and fuel economy comparisons between diesel fuel and natural gas.

Item Under Consideration:

Amend *NIST Handbook 44* Mass Flow Meter Code as follows:

S.1.2. ~~Compressed-Natural Gas Dispensers.~~ – Except for fleet sales and other price contract sales, a ~~compressed~~ natural gas dispenser used to refuel vehicles shall be of the computing type and shall indicate the quantity, the unit price, and the total price of each delivery. The dispenser shall display the mass measured for each transaction either continuously on an external or internal display accessible during the inspection and test of the dispenser, or display the quantity in mass units by using controls on the device.
(Added 1994)

S.1.3.1.1. ~~Compressed-Natural Gas Used as an Engine Fuel.~~ – When ~~compressed~~ natural gas is dispensed as an engine fuel, the delivered quantity shall be indicated in: ~~“gasoline liter equivalent (GLE) units” or “gasoline gallon equivalent (GGE) units” (see definitions).~~

(a) "gasoline liter equivalent (GLE) units" or gasoline gallon equivalent (GGE) units",

(b) "diesel liter equivalent (DLE) units" or "diesel gallon equivalent (DGE) units" (see definitions).

(Added 1994)

S.5.2. Marking of Diesel and Gasoline Volume Equivalent Conversion Factor. – A device dispensing ~~compressed~~ natural gas shall have: ~~either the statement “1 Gasoline Liter Equivalent (GLE) is Equal to 0.678 kg of Natural Gas” or “1 Gasoline Gallon Equivalent (GGE) is Equal to 5.660 lb of Natural Gas” permanently and conspicuously marked on the face of the dispenser according to the method of sale used.~~

(a) either the statement "1 Gasoline Liter Equivalent (GLE) is Equal to 0.678 kg of Natural Gas" or "1 Gasoline Gallon Equivalent (GGE) is Equal to 5.660 lb of Natural Gas",

(b) either the statement "1 Diesel Liter Equivalent (DLE) is Equal to 0.756 kg of Natural Gas" or "1 Diesel Gallon Equivalent (DGE) is Equal to 6.312 lb of Natural Gas"

permanently and conspicuously marked on the face of the dispenser according to the method of sale used.

(Added 1994)

Background / Discussion:

The gasoline gallon equivalent (GGE) unit was defined by NIST/NCWM in 1994 (see Appendix A) to allow users of natural gas vehicles to readily compare costs and fuel economy of light-duty natural gas vehicles with equivalent gasoline powered vehicles. For the medium and heavy duty natural gas vehicles in widespread use today, there is a need to officially define a unit (already in widespread use) allowing a comparison of cost and fuel economy with diesel powered vehicles. Also natural gas is sold as a vehicle fuel as either Compressed Natural Gas (CNG) or Liquefied Natural Gas (LNG) and each method of sale in measure in mass. Therefore the generic term natural gas is proposed to be used in Handbook s 44 and 130 with out the existing term "compressed".

The mathematics justifying the specific quantity (mass) of natural gas in a DLE and DGE is included in Appendix A.

The official definition of a DLE and a DGE will likely provide justification for California, Wisconsin and any other state to permit retail sales of LNG for heavy-duty vehicles in these convenient units.

Additional Contacts: Clean Energy, Seal Beach, CA, NGVAmerica, Washington, DC, Clean Vehicle Education Foundation, Acworth, GA

Item 337-2: Regional Report to NCWM
Summary of comments considered by the regional committee (in writing or during the open hearings):
Mike Keilty, Endress and Hauser, noted that there appears to be confusion about what the dispenser will display, particularly for dispensers that will serve vehicle types that run on gasoline as well as vehicle types that could run on diesel. He asked whether the units will display in both GGL/GGE and DLE/DGE and how will the dispenser display this information. He suggested that this item be designated as a “Developing” item to allow additional time to address these concerns.
Committee recommendation:
The Committee does not believe that the proposal has been adequately developed with regard to the application of the proposed code changes, including aspects such as vetting of the referenced values within the industry with relative to actual gas supplies; explanation of how these requirements will be applied consistently; and provisions for ensuring clear and understandable value comparisons by consumers (particularly given variations in gas supplies); and how this will apply to dispensers that may be used to fuel vehicles conventionally fueled by gasoline or diesel. The Committee supports including this item on the agenda as a Developing Item, provided that the original submitter will further develop this item and address the questions that have been raised.
Reasons for the committee recommendation:
The Committee heard questions about how this information would be displayed on dispensers, particularly those serving vehicle types that could run on gasoline as well as vehicle types that could run on diesel. Would a dual display showing both the gasoline and diesel unit equivalents be required to be displayed? If so, would the dispenser have to calculate in both units? What might the displays look like and would these be readily understood by the consumer? Based on the comments received and discussions during its work session, the Committee believes that the proposed language has not been sufficiently discussed. As noted in Item 337-1, the Committee questioned whether it might be more appropriate for the community to consider establishing mass as the method of sale for natural gas and providing educational information through mechanisms such as pump toppers that would enable the consumer to compare the fuel costs with gasoline or diesel powered vehicles. This approach would eliminate concerns about designating equivalent values that may not accurately represent the product being sold through a specific dispenser. The Committee believes that the item is not adequately developed to move forward for NCWM action.
Final updated or revised proposal from the region:
The SWMA believes that this item requires further development and believes the community should consider establishing mass as the method of sale for natural gas. The SWMA agreed to propose the item be made a Developing item on the NCWM S&T Committee’s agenda with the provision that the submitter further develops the issue.

<p>Recommendation to NCWM for item status:</p> <p><input type="checkbox"/> Voting Item on the NCWM Agenda</p> <p><input type="checkbox"/> Information Item on the NCWM Agenda</p> <p><input type="checkbox"/> Withdraw the Item from the NCWM Agenda</p> <p><input checked="" type="checkbox"/> Developing Item on the NCWM Agenda</p> <p><input type="checkbox"/> Unable to consider at this time</p> <p><input type="checkbox"/> Other: <i>(Please Describe)</i></p>	<p>Regional Position:</p> <p><input checked="" type="checkbox"/> Supports</p> <p><input type="checkbox"/> Opposes</p> <p><input type="checkbox"/> Split</p> <p><input type="checkbox"/> Neutral</p>
<p>Additional Comments: Adopted unanimously by voice vote.</p>	

356 GRAIN MOISTURE METERS

356-1 V UR.3.4. Printed Tickets

Source:

Grain and Feed Association of Illinois (2012)

Purpose:

Change the mandatory printing of tickets from grain moisture meters to an “on demand at the time of transaction” printing and remove the requirement of printing the calibration version identification. Note that the committee did not agree with proposed removal of the requirement to print the calibration version identification; this position is reflected in the version of the proposal currently under consideration by the committee.

Item Under Consideration:

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

UR.3.4. Printed Tickets.

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

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

Background / Discussion:

According to the submitter, the user requirement to provide a printed ticket for every single load is unrealistic in the country elevator industry. Traffic patterns at country elevators do not lend themselves to providing a printed ticket to all customers and customers really don’t want them. As the speed and capacity increases in the industry, outbound scales are being located at a distance from the inbound scale and the scale house where the moisture tester is located to alleviate traffic bottlenecks. When the outbound scale is located away from where the ticket is printed, the truck driver must circle back around to pick up the ticket, thus, causing logistical problems. In addition, since meters are sealed, inspected and required to have the correct calibration, there is no need for the calibration version identification to be printed on the ticket. Also, most customers are not going to know if it is the correct calibration version identification or not. There have been problems getting the information from the grain moisture meter to the grain accounting system – especially the calibration version identification. Some grain accounting systems have to

be “hard coded” for calibration version identification which must be changed whenever the calibration changes. The change will be at an added cost for the industry.

When a consumer pays at a gas pump, they have the option of a receipt on demand at the time of transaction or not receiving a receipt. There would be a cost savings to moisture meter users as they would save on paper and filing space, and in the situation where the calibration version identification is “hard coded,” there will be a cost savings of the expense to have the grain accounting software provider make those changes.

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

The submitter proposed amendments to paragraph UR.3.4. Printed Tickets as follows:

UR.3.4. Printed Tickets.

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

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

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

At the 2011 WWMA Annual Meeting the committee heard no comments on this item. The WWMA amended the proposal to make the language consistent with other codes such as 3.32. . LPG and Anhydrous Ammonia Liquid-Measuring Devices Code paragraph UR.2.6. Ticket Printer: Customer Tickets. WWMA forwarded the modified version below to NCWM, recommending it as a Voting Item.

UR.3.4. Printed Tickets.

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

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

At the 2011 NEWMA Interim Meeting there were no comments. Deferring to the expertise of the Grain Analyzer Sector, NEWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2011 SWMA Annual Meeting, Ms. Butcher, NIST Technical Advisor, noted that the proposed language submitted was slightly different from that discussed by the NTETC Grain Analyzer Sector and provided a summary corresponding to this item prepared by Ms. Lee, Grain Analyzer Sector Technical Advisor. Ms. Butcher also

pointed out that WWMA proposed alternate language that is consistent with printed tickets requirements in other Codes. SWMA agreed that the customer should be given the option of receiving a printed ticket from a transaction and that the proposed changes would clarify the responsibility of the device user. SWMA preferred the option forwarded by WWMA since it mirrors existing language in other *NIST Handbook 44* codes. SWMA forwarded the item to NCWM, recommending it as a Voting Item as revised by WWMA.

At the 2012 NCWM Interim Meeting, the committee received comments in support of the alternative language submitted by the WWMA. NIST, OWM reported that the proposed language submitted to the regional weights and measures associations was different from that agreed to by the Grain Analyzer Sector at its August 2011 meeting. The Grain Analyzer Sector had specifically opposed deleting the phrase “calibration version identification.” NIST, OWM also noted that not all grain moisture meters are Category 3 devices; consequently, calibration version identification information is a critical component on the printed receipt to reconstruct the basis for a sale and help officials to resolve complaints.

The committee agreed that the version proposed by WWMA and SWMA was preferable since it mirrors similar language in other *NIST Handbook 44* Codes. The committee also agreed that, given the Grain Analyzer Sector’s opposition to deleting the reference to “calibration version identification,” this phrase should be retained in the paragraph. The committee presented an amended version of the proposal. The committee recognized that the regional associations were not aware of the sector’s position on the proposed deletion of the reference to the calibration version and that the submitter has not had an opportunity to review the significant changes from the original version. The 2012 S&T Committee designated this item as an Informational Item to allow additional opportunity for input.

At their 2012 Annual Meetings, NEWMA and CWMA supported this item as a voting item.

At the 2012 NCWM Annual Meeting, the Committee heard no additional comments during its open hearings. The Committee reiterates its request for input on the modifications to the proposal, particularly from the original submitter and any regional weights and measures association that has not had an opportunity to review the modifications. The Committee is recommending no changes to the “Item Under Consideration.”

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 356-1: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee heard no comments on this item during its open hearings.	
Committee recommendation:	
Forward the item, as proposed in the Committee’s agenda, to the National S&T Committee with a recommendation that the item be designated as a voting item.	
Reasons for the committee recommendation:	
The Committee recognized that the NCWM S&T Committee designated this as an information item to allow additional time for the weights and measures community, including the original submitter to review the changes made to the proposal during the 2012 NCWM Interim Meeting. The Committee believes that adequate time has elapsed to allow the original submitter and others interested in the proposal to comment. The Committee noted that the NTETC Grain Sectors have also reviewed the proposal, as modified, and have expressed no opposition. Hearing no opposition during its open hearings, the Committee believes the item is ready to recommend for a vote.	
Final updated or revised proposal from the region:	
Recommendation to NCWM for item status: <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

360 OTHER ITEMS – DEVELOPING ITEMS

360-1 W Appendix A – 3.4. Alternative Standard [NEW]

Source:
Total Meter Services

Purpose:
Define a method of accepting alternative standards for the testing apparatus.

Item Under Consideration:
Add the following to Handbook 44, Appendix C:

3.4 Alternate Standard– When alternate testing apparatus is available it is considered an acceptable test standard when:

- a. **The alternate standard combined error and uncertainty is equal to or less than an existing testing apparatus error and uncertainty, and**

b. The alternate apparatus meets the Adequacy, Tolerances for Standards, and Accuracy in paragraphs 3.1, 3.2, and 3.3.

Background / Discussion:

There is no mechanism in Handbook 44 for dealing with Alternate Standards. If an alternate standard when used in the field is as good as or better than an existing standard as defined by the error and uncertainty, it should be acceptable. The standard must of course meet the Adequacy, Tolerance for Standards, and Accuracy defined in the existing Appendix A Section 3 of Handbook 44.

A NIST National Working Group on Alternative Test Methods For Commercial Measuring Devices is working on an understanding of current and alternate test methods. The USNWG has defined error and uncertainty analysis of test methods used in the field as key to understanding both current and alternate methods. The USNWG is in the process of defining Error and Uncertainty for a particular current method and alternate proposed method. This example may assist the conference in understanding the need for the proposal. Uncertainty and error are used in HBK 44 Appendix A Paragraph 3.2 Tolerance of Standards, as a minimum criteria for acceptance of the capability of standards relative to the tolerance. Any alternate standard therefore must meet or exceed that criteria. The proposal addresses that need and notes the uncertainty and error must be “equal to or less than” an existing standard to assist W&M officials in accepting the new standard. If the Combined Uncertainty and Error at the field level number for the current standard is say “3”, then the Alternate Standard number must be 3 or smaller. The NIST Office of Weights and Measures is the logical body to be responsible for leading the effort to derive the combined Error and Uncertainty numbers for testing apparatus.

Item 360-1: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
<p>During its open hearings, the Committee heard comments from the submitter of the item, Dave Rajala, Total Meter Services, asking the Committee to consider designating this item as a Developing item. He noted that NIST has established a USNWG to address various test methods. He recommended that this language be further developed to provide criteria in NIST Handbook 44 for alternative standards. He noted that the USNWG is working on these issues, but wants to ensure that the item retains visibility at the national level.</p> <p>The Committee also heard from Henry Oppermann, representing Seraphin Test Measure, opposing the item. Mr. Oppermann noted that NIST has already established a USNWG and two subgroups to work on this and other related issues. He commented that there is no action needed by the NCWM at this time. He suggested waiting until the USNWG has had an opportunity to work on the development of criteria to address various test methods and come forward with recommendations that have been vetted and supported by the entire USNWG. Mr. Oppermann also noted that eight codes in NIST Handbook 44 already recognize alternate standards, thus, the proposed language is not necessary at this time.</p>	
Committee recommendation:	
After considering the proposal, the Committee proposed withdrawing this item.	
Reasons for the committee recommendation:	
<p>The Committee heard from Mr. Rajala and others that the USNWG will be addressing questions such as those raised in the proposal, and Mr. Rajala indicated that he intended the development of the proposal to be done through the USNWG . Since the USNWG is already working on issues related to the recognition of various types of test methods, the Committee believes that it is premature to consider specific changes to NIST Handbook 44 such as those outlined in the proposal. While the Committee is certainly willing to consider proposals outside of the USNWG, the Committee believes that, wherever possible, the development of these issues should be done within the USNWG to ensure consistency and broad support. The Committee appreciates Mr. Rajala’s interest in moving these issues forward, but since he indicated that his intention was that the development of this proposal would be done within the USNWG, the Committee feels that maintaining a separate item on the agenda is unnecessary.</p>	
Final updated or revised proposal from the region:	
The SWMA agreed to withdraw this item from its agenda.	
Recommendation to NCWM for item status: <input checked="" type="checkbox"/> Withdraw (not forwarded to NCWM) <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

~~360-2~~ ~~This item was not submitted to this region~~ **NEW**

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

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

Mr. John Barton – Liquid Measuring Device Group
Phone: (301) 975-4002 Email: john.barton@nist.gov

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

Mr. Kenneth Butcher – Laws and Metrics Group
Phone: (301) 975-4859 Email: k.butcher@nist.gov

- TC 6 *Prepackaged Products*

Mr. Steven Cook – Liquid Measuring Device Group
Phone: (301) 975-4003 Email: 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

- 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

- R 51 *Automatic Catchweighing Instruments*
- R 61 *Automatic Gravimetric Filling Instruments*
- R 76 *Non-automatic Weighing Instruments*
- R 107 *Discontinuous Totalizing Automatic Weighing Instruments (totalizing hopper weighers)*
- R 134 *Automatic Instruments for Weighing Road Vehicles In-Motion and Measuring Axle Loads*

Ms. Diane Lee – Liquid Measuring Device Group
Phone: (301) 975-4405 Email: diane.lee@nist.gov

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

Mr. Ralph Richter – International Legal Metrology Group
Phone: (301) 975-3997 Email: ralph.richter@nist.gov

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

Dr. Ambler Thompson – International Legal Metrology Group

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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*

Ms. Juana Williams – Legal Metrology Devices Group

Phone: (301) 975-3989 Email: juana.williams@nist.gov

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

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.

Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 360-3: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee heard no comments on this item during its open hearings.	
Committee recommendation:	
The Committee proposes maintaining this item as a “Developing” item on the NCWM S&T Committee’s agenda .	
Reasons for the committee recommendation:	
This item is included as an information item only. No action is required.	
Final updated or revised proposal from the region:	
There is no specific proposal associated with this item and the SWMA had no comments on this item.	
Recommendation to NCWM for item status: <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input checked="" type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote as part of the Committee’s report.	

360-4 D G-S.1. Identification. – (Software)

Source:

2010 Carryover Item 310-3. This item originated from the NTETC Software Sector and first appeared on NCWM S&T Committee’s 2007 agenda as Developing Item Part 1, Item 1.

Purpose:

Provide marking requirements that enable field verification of the appropriate version or revision for metrological software, including methods other than “permanently marked,” for providing the required information.

Item Under Consideration:

Amend *NIST Handbook 44*: G S.1. Identification and G S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices as follows:

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

[*Nonretroactive as of January 1, 20XX]

(Amended 20XX)

- (a) the name, initials, or trademark of the manufacturer or distributor;
- (b) a model identifier that positively identifies the pattern or design of the device;

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

[Nonretroactive as of January 1, 2003]

(Added 2000) (Amended 2001)

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

[Nonretroactive as of January 1, 1968]

(Amended 2003 and 20XX)

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

[Nonretroactive as of January 1, 1986]

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

[Nonretroactive as of January 1, 2001]

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

[Nonretroactive as of January 1, 2004]

(Added 2003) (Amended 20XX)

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

[Nonretroactive as of January 1, 2007]

(Added 2006)

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

[Nonretroactive as of January 1, 2007]

(Added 2006)

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

[Nonretroactive as of January 1, 2003]

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

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

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

- (a) *The required information in G S.1. Identification. ~~(a), (b), (d), and (e)~~ shall be permanently marked or continuously displayed on the device; or*
- (b) *The Certificate of Conformance (CC) Number shall be:*
 - (1) *permanently marked on the device;*
 - (2) *continuously displayed; or*
 - (3) *accessible through ~~an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to, “Help,” “System Identification,” “G S.1. Identification,” or “Weights and Measures Identification.”~~ one or, at most, two levels of access.*
 - (i) *For menu based systems, “Metrology,” “System Identification,” or “Help.”*
 - (ii) *For systems using icons, a metrology symbol “(M),” “(SI),” or a help symbol (“?”, “i,” or an “i” within a magnifying glass).*

Note: *For (b), clear instructions for accessing the information required in G S.1. (a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.*

[Nonretroactive as of January 1, 2004]

(Added 2003) (Amended 2006 ~~and 20XX~~)

Background / Discussion:

Among other tasks, the NTETC Software Sector was charged by the NCWM Board of Directors to recommend *NIST Handbook 44* specifications and requirements for software incorporated into weighing and measuring devices, which may include tools used for software identification. During its October 2007 meeting, the sector discussed the value and merits of required markings for software, including possible differences in some types of software-based devices and methods of marking requirements. After hearing several proposals, the sector agreed to the following technical requirements applicable to the marking of software:

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

In 2008, the sector developed and submitted a proposal to the NCWM S&T Committee to modify G-S.1. and associated paragraphs to reflect these technical requirements. Between 2008 and 2011, this item appeared on the S&T Committee's main agenda and the committee and the sector received numerous comments and suggestions relative to the proposal. The sector developed and presented several alternatives based on feedback from weights and measures officials and manufacturers. Among the key points and concerns raised during discussions over this period were how to address the following:

- (a) **Limited Character Sets and Space.** – How to address devices that have limited character sets or restricted space for marking.
- (b) **Built-for-Purpose vs. Not-Built-for-Purpose.** - Whether or not these should be treated differently.
- (c) **Ease of Access.** – Ease of accessing marking information in the field.
 - Complexity of locating the marking information
 - Use of menus for accessing the marking information electronically
 - Limits on the number of levels required to access information electronically
 - Possibility of single, uniform method of access
- (d) **Hard Marking vs. Electronic.** – Whether or not some information should be required to be hard marked on the device.
- (e) **Continuous Display.** – Whether or not required markings must be continuously displayed.
- (f) **Abbreviations and Icons.** – Establishment of unique abbreviations, identifiers, and icons and how to codify those.
- (g) **Certificate of Conformance Information.** – How to facilitate correlation of software version information to a CC, including the use of possible icons.

Further details on the alternatives considered can be found in the committee's Final Reports from 2008 to 2011.

At the 2011 NCWM Interim Meeting, the S&T Committee concurred with the Software Sector Chair that this item is not ready to move forward as a Voting Item. The committee recommended the sector review a number of specific comments and points (see the committee's 2011 Final Report for details.)

At the 2011 NCWM Annual Meeting, the committee heard support for the continued work of the sector. The 2011 S&T Committee designated this item as a Developing Item to provide the Software Sector additional time to more fully develop the item. The committee looked forward to considering the sector's future recommendations.

At the fall 2011 regional meetings, the regional weights and measures associations noted the importance of this work. All regional associations recommended that the item remain as a Developing Item to allow the sector to further develop the issue.

Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 360-4: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee heard no comments on this item during its open hearings.	
Committee recommendation:	
The Committee recommends maintaining this as a Developing Item on the NCWM S&T Committee's Interim Agenda to allow the Sector time to continue development of this issue	
Reasons for the committee recommendation:	
The Committee heard no comments in opposition to the item. The Sector continues to actively work on the item when it meets, thus, the Committee is willing to support maintaining the item on the agenda	
Final updated or revised proposal from the region:	
There is no specific proposal associated with this item and the SWMA had no comments on this item.	
Recommendation to NCWM for item status: <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input checked="" type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote as part of the Committee's report.	

360-5 D Part 3.30. Price Posting and Computing Capability and Requirements for a Retail Motor-Fuel Dispenser (RMFD)

Source:
 NIST, OWM and the Regional Associations (2008)

Purpose:
 Review and update criteria in the LMD Code related to price posting and computing capability of RMFDs to reflect current market practices.

Item under Consideration:
 NCWM Task Group on Retail Motor Fuel Dispenser Price Posting and Computer Capability developed specific proposals for modifying the LMD Code to address price posting and computing requirements for RMFDs. These proposals can be found under Item 330-1 of the committee's agenda. This item, 360-4, is being retained as a Developing Item pending any additional assignments that may be given by the committee to the Task Group relative to the implementation of new code requirements that may be adopted. Comments or inquiries may be directed to NIST Technical Advisor, Ms. Juana Williams, at (301) 975-3989 or juana.williams@nist.gov.

Background / Discussion:
 In the early 1990s, various sections of the LMD Code in *NIST Handbook 44* were modified to address multi-tier pricing applications in instances where the same product is offered at different unit prices based on the method of payment (such as cash or credit) or other conditions of the sale. Since that time, marketing practices have evolved to include the addition of new practices, such as frequent shopper discounts and club member discounts. Numerous questions have been posed to NIST, OWM and weights and measures officials regarding the requirements for posting unit prices, calculation of total price, customer-operated controls, and other related topics, such as the definitions for associated terminology. It is clear from these questions that changes are needed to *NIST Handbook*

44 to ensure the requirements adequately address current marketplace conditions and practices. The committee agreed that changes are needed to the LMD Code relative to these issues and, in 2010, established a task group to further develop this issue and present an alternative recommendation for its consideration.

Additional details on this item can be found in the committee’s 2008-2011 Final Reports.

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 360-5: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee heard no comments on this item during its open hearings.	
Committee recommendation:	
The Committee recommends maintaining this as a Developing Item to allow the Task Group time to continue work on this issue.	
Reasons for the committee recommendation:	
The Committee heard from the NCWM S&T Chairman that the S&T Committee has asked the NCWM Task Group on RMFD Price Posting and Computer Capability to continue its work to develop guidelines and examples, including sample receipt layouts, to illustrate how the changes to the LMD code adopted in July 2012 are intended to be implemented. The Committee looks forward to the Task Group’s development of these guidelines.	
Final updated or revised proposal from the region:	
There is no specific proposal associated with this item and the SWMA had no comments on this item. The SWMA supports the continued work of the Task Group to develop guidelines and examples.	
Recommendation to NCWM for item status: <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input checked="" type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote as part of the Committee’s report.	

360-6 D Part 2.20. Weigh-In-Motion Vehicle Scales for Law Enforcement – Work Group

Source:

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

Purpose:

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

Item under Consideration:

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

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

Background / Discussion:

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

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

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

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

At the 2010 WWMA Annual Technical Conference, Mr. Langford, Cardinal Scales Manufacturing Co., stated that he is a member of the work group and supports adding language defining performance parameters of WIM devices for use in law enforcement. Mr. Langford added that the work group will consider other existing standards to help develop the language in *NIST Handbook 44* (e.g., OIML Recommendation (R) 134 *Automatic Instruments for Weighing Road Vehicles in Motion and Measuring Axle Loads*). Mr. Floren, Los Angeles County Agricultural Commissioner / Weights and Measures, added that even though these devices are non-commercial they are covered under the scope of *NIST Handbook 44* General Code Application paragraph G-A.1.(c) Commercial and Law Enforcement Equipment.

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

these devices in *NIST Handbook 44* as law enforcement equipment would lend credibility and consistency to the design, use, accuracy, and application of this equipment.

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

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

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

Purpose of the Project:

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

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

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

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

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

Mr. Gray, 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. He explained how *NIST Handbook 44* was organized, and how requirements developed by the work group would fit into the various sections of a new *NIST Handbook 44* code. He also provided an overview of the standards development process and discussed the benefits of the work group using a “straw man,” which he has already created to develop the new draft code. Mr. Langford, 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, LLC, accepted the position as the WIM work group chair, and encouraged stakeholders to submit 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 NEWMA S&T Committee recognized, however, that the traffic at truck stops can be backed up and this technology would help to ease that problem. They would also be easier to set up than axle-load weighers. While the committee heard some support for WIM scales, there are also questions. Would 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 recommended continuing to collect data and comments on this new technology.

At the 2011 SWMA Annual Meeting, Mr. Flocken, Mettler-Toledo, LLC, reported that he has been appointed chair of the USNWG and that the work group held its first meeting in July. He also noted that Mr. Harshman, NIST, OWM, prepared a draft code for the work group to consider as a starting point. Mr. Flocken has created a checklist that he proposes to distribute to the work group along with the draft code; he plans to ask work group members to complete the checklist as they review the code, identifying sections which they believe need additional work. He hopes that this review process can be completed by mid-December, after which time the work group will meet to review the input from members. Mr. Flocken noted that if the timing is appropriate, it may be possible to hold a work group meeting in conjunction with the NCWM Interim Meeting. Mr. Flocken will submit his proposed next steps to the FHWA’s Project Oversight Committee for approval. He also asked that the community be patient while this work group gets underway and he will look forward to bringing specific proposals to the committee as work progresses further. The committee recognizes that this work is still in the developmental stages and agrees that additional time is needed before any proposals can be considered by the committee.

At the 2012 Interim Meeting, Mr. Flocken, Mettler-Toledo, LLC, new chair of the Weigh-In-Motion Work Group provided an update on the standards development for WIM scale systems. Mr. Flocken reported that the work group held its first face to face meeting in July 2011 to launch the project, get participants involved, and discuss some of the more important tasks at hand. Mr. Harshman, NIST Technical Advisor to the work group had prepared a draft

code for participants of the work group to consider as a starting point. That draft code, as well as a checklist that Mr. Flocken created, had been distributed to participants of the work group. Participants were asked to complete the checklist as they reviewed the draft code, identifying sections which they believed needed additional work. Based upon the comments indicated on completed checklists that have been returned thus far, it was evident that participants of the work group have very diverse ideas concerning the standards that should go into a new draft code. For that reason, Mr. Flocken and Mr. Harshman met earlier during the week to talk about how best to proceed. They decided to arrange a teleconference meeting with members of the FHWA's Project Oversight Committee to seek guidance on the scope of the project. Mr. Flocken planned to schedule that conference within a few weeks following conclusion of the 2012 Interim Meeting. There is a mix of support and opposition to this project and Mr. Flocken requested that the community be patient. He looked forward to bringing specific proposals to the committee as work progresses further.

At its 2012 Annual Meeting, NEWMA recommended that the status of this item remain as "Developing." NEWMA maintained a neutral position on this item and is awaiting further proposals from the WG. At its 2012 Annual Meeting, the CWMA did not take a position on this item. At both the NEWMA and CWMA meetings, Mr. Darrell Flocken, Mettler Toledo, speaking as Chairman of the WIM Work Group, provided an update on the progress of the WG, noting that work has been delayed pending the resolution of funding issues within the FHWA.

At the 2012 NCWM Annual meeting, Mr. Flocken noted that the WG had not been able to meet due to funding issues, but those issues have been resolved and the WG will now be able to move ahead with its work.

Mr. Steve Langford, Cardinal Scale, spoke as a member of the WG Oversight Committee. He apologized for the delays in being able to progress with this work, citing factors outside of the WG's control, but echoed Mr. Flocken's assurances that the work is once again progressing.

The Committee expressed appreciation for updates on this issue and looks forward to further progress by the WG.

Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.newm.net/content/2012pub-16 to review these documents.

Item 360-6: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
During its open hearings, the Committee heard from Darrell Flocken, Mettler-Toledo, speaking as chairman of the US Federal Highway Administration’s Weigh-in-Motion Work Group, updated the SWMA on the progress of the Work Group. Mr. Flocken reported that the Work Group has worked primarily via e-mail for the past year. The WG is finalizing arrangements for an in-person meeting sometime in mid-November. After that meeting, he anticipates that the WG will have a document on which people can begin reviewing and commenting. Mr. Flocken also noted that the draft code, at this point, is intended to be used to identify and designate vehicles for weighing on a static scale. He indicated he sees no reason this focus would change.	
Committee recommendation:	
The Committee recommends maintaining this as a Developing Item on the NCWM S&T Committee’s Interim Agenda to allow the Work Group time to continue work on this issue	
Reasons for the committee recommendation:	
The Committee heard no comments in opposition to this item and understands that the US FHWA Work Group continues to work on this item. The Committee appreciates the efforts of this WG and looks forward to a future proposal from the WG.	
Final updated or revised proposal from the region:	
There is no specific proposal associated with this item and the SWMA had no comments on this item. The SWMA supports the continued work of the WIM Work Group and looks forward to future recommendations from the group.	
Recommendation to NCWM for item status:	Regional Position:
<input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input checked="" type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	<input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote as part of the Committee’s report.	

360-7 D S.5. Provision for Security Seals

This item originally appeared as 354-1 in the committee’s 2012 Interim Agenda.

Source:

Frias Transportation Infrastructure LLC (2012)

Purpose:

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

Item Under Consideration:

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

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

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

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

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

Background / Discussion:

The submitter of this proposal noted that, per the Taxicab Limousine and Paratransit Association in the United States, there are approximately 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 are required by a regulatory authority to have a sealed taximeter.

The last amendments made to *NIST Handbook 44* Section 5.54. Taximeters paragraph S.5. were made in 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 on a manual programming button used to program the way in which a taximeter can operate. Furthermore, the new technology without physical seals may remove the need for any programming buttons on the actual taximeter itself creating a more secure and tamper resistant device.

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

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

For the purpose of this proposal, the submitter made reference to NIST Advanced Encryption Standard (AES). AES (FIPS PUB 197) believes that the encryption algorithm for such a security seal on a taximeter should meet this standard.

The submitter also pointed out that Nevada is one of the only states that do not reference *NIST Handbook 44* on Taximeters. To correct this problem, alternate language was introduced in the 2011 legislative session to allow for the electronic sealing of a taximeter. This bill was signed into law by the Governor of Nevada on June 16, 2011.

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

The submitter suggested the following benefits to stakeholders:

- Additional level of security for taximeter.
- Audit trail for all changes made to taximeter programming.
- Fast implementation of approved rate changes by regulatory bodies. (In some jurisdictions operators or drivers may have to wait weeks to implement fuel surcharges because the process for changing rates and seals under current standards is time consuming)
- Reduction in costly observational enforcement to industry. (Currently the only way a regulator can determine if an operator has a broken seal or has tampered with a taximeter is through observational enforcement – An electronic seal would allow for real time reporting as to the condition of such a seal, as well as the programming of the taximeter)
- Reduction in overcharges to customers by compromised drivers, and operators.
- 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 56th St
New York, NY 10019
Phone: (212) 237-1106

At the 2011 NEWMA Interim Meeting it was noted that there is no prototype yet. The submitter explained that there is an electronic data component that is to be sealed. An official questioned how the data would get to the regulatory agency. Comments were made that a cloud-based system could be used. Officials were told that no physical seal is needed if this is implemented. An industry member commented that there should still be some type of security seal used. There would be a comfort level for consumers but not for weights and measures officials. Some questioned what would happen with regard to accessing the data if the company goes out of business. NEWMA recommends that this item be presented to the Taximeter Work Group being formed by NIST, OWM for further development. NEWMA did not forward the item to NCWM.

At the 2011 SWMA Annual Meeting, Mr. Wisniewski, Frias Transportation Infrastructure, recommended Developing status for this item. Mr. Wisniewski explained that NIST, OWM and NCWM are exploring the formation of a Taximeter Work Group to develop proposed changes to the code to reflect current technologies. He indicated that Frias Transportation Infrastructure plans to work with other manufacturers and regulators in the taximeter community as well as NIST, OWM to further develop this issue through this work group. SWMA forwarded the item to NCWM, recommending it as a Developing Item, with the provision that the submitter will work with the Taximeter Work Group being and further develop the issue through that venue.

At the 2012 NCWM Interim Meeting, Mr. McGrath, Boston ISD Weights and Measure, expressed concerns about the lack of a physical security seal on taximeters. He cited difficulty tracking down drivers for the purposes of

monitoring the use of adjustments and suggested withdrawing the item as presented. Ms. Macey, California Division of Measurement Standards, expressed concerns about the resources required to train inspectors to apply the standards referenced in the proposal and she does not believe the item is sufficiently developed as presented to go forward on the committee's agenda. Ms. Williams, NIST, OWM, reported that a small group, including Mr. Barton, NIST, OWM and herself, along with Mr. Nelson, California Division of Measurement Standards, Mr. Thompson, California Division of Measurement Standards, and Mr. Fishman, retired NY Bureau of Weights and Measures metrologist, met to begin identifying areas of the code that need to be updated, including requirements relative to device security. Ms. Williams confirmed that NIST, OWM plans to establish a formal work group to examine issues such as these relative to updating the code to reflect current technology and practices. Citing the concerns raised by NEWMA and SWMA, Ms. Williams suggested that this item might be best undertaken by that work group.

The committee agreed with the Open Hearing comments that this item needs additional work. The committee supports the formation of the work group by NIST, OWM and looks forward to further development of this issue. The 2012 S&T Committee designated this item as a Developing Item. Interested parties should contact Mr. John Barton, Legal Metrology Devices Program, NIST, OWM at (301) 975-4002 or john.barton@nist.gov.

At its 2012 Annual Meeting, the CWMA took no position on this item. At its 2012 Annual Meeting, NEWMA maintained a neutral position on this item and recommended Developing status. Mrs. Tina Butcher, NIST OWM, reported that NIST has formed a work group on taximeters and that group will hold its first meeting in May. NEWMA looks forward to the work of the NIST Taximeter Work Group and any proposals that are generate from that group.

At the 2012 NCWM Annual Meeting, Ms. Juana Williams, commented that NIST OWM issued a Federal Register notice in April 2012 announcing formation of a NIST US National Working Group (USNWG) on Taximeters. Mr. John Barton, NIST OWM, is the contact for this USNWG. Anyone interested in participating in the Work Group should contact Mr. Barton by e-mail at john.barton@nist.gov or by telephone at 301-975-4002. The USNWG held a preliminary web-based meeting in May 2012 to establish the working structure, review the USNWG charter, and lay out tasks to be completed. NIST distributed proposed revisions to the existing Taximeters Code as a "strawman" for the USNWG to consider. The revisions were based on a meeting with NTEP laboratories and other legal metrology experts. Comments were due to Mr. Barton by June 30, 2102. After addressing the comments in the proposed revisions, Mr. Barton will distribute a revised draft to work group members and interested observers. The USNWG plans to hold its next meeting in September 2012.

The Committee expressed appreciation to OWM for the update and looks forward to future recommendations from the Work Group.

Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 360-7: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
Tina Butcher, NIST Office of Weights and Measures, reported that, with the concurrence of the NCWM and at the request of weights and measures officials and industry, NIST has formed a U.S. National Work Group (USNWG) on Taximeters to address this issue. The WG met via web-conferencing in the Spring and held its first in-person meeting in mid-September. The WG welcomes participation from interested parties and plans to include web-based conferencing for its in-person meetings to assist those who are not able to travel in participating in this work. Mr. John Barton, NIST OWM, is NIST's contact for this work group.	
Committee recommendation:	
The Committee does not believe the proposal is adequately developed to recommend as a voting item. Recognizing that NIST has established a USNWG to address taxi meter system issues such as this, the Committee recommends maintaining this as a Developing Item on the NCWM S&T Committee's Interim Agenda to allow the USNWG time to continue work on this and related issues. Since the NIST WG was established in response to this item and item 354-2, the SWMA S&T Committee suggests that the NCWM S&T Committee may wish to consider consolidating these items and designating the contact point as the NIST OWM USNWG.	
Reasons for the committee recommendation:	
The Committee heard that NIST USNWG on Taximeters continues to work on this item. Consequently, the Committee agreed that this item should be maintained on the Committee's agenda as a Developing item.	
Final updated or revised proposal from the region:	
The SWMA supports the efforts of the USNWG Group on Taximeters to develop requirements to address security on these measurement systems and other related issues.	
Recommendation to NCWM for item status: <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input checked="" type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote as part of the Committee's report.	

360-8 D Global Positioning Systems for Taximeters

This item originally appeared as 354-2 in the committee's 2012 Interim Agenda.

Source:

Consumer Affairs Unit, City of Seattle (2012)

Purpose:

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

Item Under Consideration:

A specific proposal was not submitted.

Background / Discussion:

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

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

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

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

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

At the 2011 NEWMA Interim Meeting and 2011 SWMA Annual Meeting, both regions agreed that the issue should be taken up by a work group being formed by NIST, OWM and NCWM. SWMA further commented that the submitter should work with that work group and also noted that the use of technologies and devices such as GPS need to be reviewed and addressed by *NIST Handbook 44* for applications (such as that described by the submitter) where they will be used to generate commercial measurements. NEWMA and SWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2012 NCWM Interim Meeting, NIST, OWM reported that NCWM and NIST had agreed that a work group is needed to review and revise the *NIST Handbook 44* Taximeters Code to better reflect current technology and practices. After consultation with NCWM, NIST, OWM agreed to establish a work group and held a meeting of NTEP representatives and NIST, OWM representatives to identify areas of the code that require revision. Once a draft revision of the code (a “strawman”) has been prepared, NIST, OWM will expand the work group by extending an invitation for other interested parties, including regulators, manufacturers, and users to begin review and discussion of the draft.

NIST, OWM noted that this item on GPS-based systems needs additional work and review and suggested that the work group might further develop this issue. The committee also heard from representatives of two jurisdictions who expressed concerns about the ability to regulate these systems to ensure that consumers have adequate information and the ability to do value comparisons. Both cited recent examples of numerous consumer complaints during New Year's Eve when fares were raised significantly. Conventional taximeters must conform to the requirements of *NIST Handbook 44* with regard to accuracy, operation, fare changes, and posting requirements. These systems are competing with conventional taximeter, yet changes in fare can be made at any time without any control by regulatory authority. An official acknowledged the advantages that such systems can bring for consumers and encouraged the work group in its efforts to establish requirements for these systems, stating that weights and measures requirements should not inhibit new technology. A retired official also encouraged the work group to take on these issues and urged the work group to carefully study these systems to ensure that appropriate safeguards are put into place to protect consumers without placing a significant cost burden on design of the equipment.

The committee agreed with the comments that this item needs additional work. The committee supports the formation of the work group by NIST, OWM and looks forward to further development of this issue. The 2012 S&T Committee designated this item as a Developing Item. Interested parties should contact Mr. John Barton, Legal Metrology Devices Program, NIST, OWM at (301) 975-4002 at john.barton@nist.gov.

At its 2012 Annual Meeting, CWMA received no comments on this issue and took no position on it.

At its 2012 Annual Meeting, NEWMA maintained a neutral position on this item and recommended Developing status. Mrs. Tina Butcher, NIST OWM, reported that NIST has formed a work group on taximeters and that group will hold its first meeting in May. NEWMA looks forward to the work of the NIST Taximeter Work Group and any proposals that are generate from that group.

At the 2012 NCWM Annual Meeting, Ms. Juana Williams, reiterated the comments offered by NIST OWM on Item 360-5 and noted that these comments also apply to this item.

The Committee expressed appreciation to OWM for the update and looks forward to future recommendations from the Work Group.

Additional letters, presentations and data may have been part of the committee's consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

Item 360-8: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
Tina Butcher, NIST Office of Weights and Measures, reported that, with the concurrence of the NCWM and at the request of weights and measures officials and industry, NIST has formed a U.S. National Work Group (USNWG) on Taximeters to address this issue. The WG met via web-conferencing in the Spring and held its first in-person meeting in mid-September. The WG welcomes participation from interested parties and plans to include web-based conferencing for its in-person meetings to assist those who are not able to travel in participating in this work. Mr. John Barton, NIST OWM, is NIST’s contact for this work group.	
Committee recommendation:	
The Committee recommends maintaining this as a Developing Item on the NCWM S&T Committee’s Interim Agenda. Since the NIST WG was established in response to this item and item 354-1, the SWMA Committee suggests that the NCWM S&T Committee may wish to consider consolidating these items and designating the contact point as the NIST-OWM USNWG.	
Reasons for the committee recommendation:	
The Committee heard that NIST USNWG on Taximeters continues to work on this item. Consequently, the Committee agreed that this item should be maintained on the Committee’s agenda.	
Final updated or revised proposal from the region:	
There is no specific proposal associated with this item. The SWMA supports the work of the USNWG Group to develop requirements to address these commercial measurement systems.	
Recommendation to NCWM for item status: <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Withdraw the Item from the NCWM Agenda <input checked="" type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote as part of the Committee’s report.	

ADDITIONAL NEW ITEMS

ADDITIONAL ITEM – 1 V 5.56(a) Table S.2.5 Grain Moisture Meters (NEW)

Source:
 NTETC Grain Analyzer Sector

Purpose:
 Clarify that the requirements of Category 3 apply whether accessed manually using the keyboard or accessed by remote means, and that these requirements apply to all the subcategories of Category 3.

Item Under Consideration:
 Amend NIST Handbook 44 Grain Moisture Meter Code 5.56(a) as follows:

Table S.2.5. Categories of Device and Methods of Sealing	
Categories of Device	Methods of Sealing
<p>Category 1: No remote configuration capability.</p>	<p>Seal by physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.</p>
<p>Category 2: Remote configuration capability, but access is controlled by physical hardware.</p> <p>A device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for remote configuration.</p>	<p>The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.</p>
<p>Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).</p> <p>When accessed remotely for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.</p>	<p>An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants). A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to twenty-five (25) times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)</p>
<p>Category 3a: No remote capability, but operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc.) in normal operation.</p> <p><u>When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.</u></p>	<p>Same as Category 3</p>
<p>Category 3b: No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password).</p> <p><u>When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.</u></p>	<p>Same as Category 3</p>

[Nonretroactive as of January 1, 1999 and January 1, 201X]

Background / Discussion:

All of the GMMs in Categories 3, 3a, and 3b of Table S.2.5. use an electronic method of sealing, and most of them also offer access to the configuration mode through a keyboard entered password. In this mode, sealable parameters can also be changed locally through the keyboard. Category 3 of Table S.2.5. currently includes the following requirement:

When accessed remotely for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.

At its 2011 Grain Analyzer Sector Meeting the sector agreed by consensus that the following changes to Table S.2.5. of §5.56.(a) of *NIST Handbook 44* should be forwarded to the S&T Committee for consideration:

- Add a note to Table S.2.5. to recognize the expanded scope of “remote capability”.
- Delete “remotely” from the second paragraph of Category 3 requirements that begins, “When accessed remotely ...” to make it clear that the requirements of Category 3 apply whether accessed manually using the keyboard or accessed by remote means.
- Add the modified second paragraph of Category 3 requirements to Categories 3a and 3b to make it clear that these requirements apply to all the subcategories of Category 3.

After additional review of this item, the National Institute of Standards Technology (NIST), Office of Weights and Measures (OWM), recommended that the changes to Table S.2.5. approved by the sector in 2011 be separated into two independent proposals: one dealing with the changes to Category 3 and its subcategories (as shown in this proposal) and one recommending a modification of the definition of remote configuration capability appearing in Appendix D of *NIST Handbook 44* to recognize the expanded scope of “remote capability”, instead of adding a note to the bottom of Table S.2.5 to expanded the definition for remote configuration for grain moisture meters. A change to the definition of remote configuration capability will apply to other device types.

At its 2012 Grain Analyzer Sector meeting the sector agreed by consensus to separate its original proposal into two separate proposals and that the following changes to Table S.2.5. of §5.56.(a) of *NIST Handbook 44* should be forwarded to the S&T Committee for consideration:

- Delete “remotely” from the second paragraph of Category 3 requirements that begins, “When accessed remotely ...” to make it clear that the requirements of Category 3 apply whether accessed manually using the keyboard or accessed by remote means.

Add the modified second paragraph of Category 3 requirements to Categories 3a and 3b to make it clear that these requirements apply to all the subcategories of Category 3.

This proposal is consistent with the philosophy of sealing for grain moisture meters. Item 4 of the NTETC, Grain Analyzer Sector August 2012 Meeting Summary covers this subject and will be available on NCWM Website November 2012.

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

ADDITIONAL ITEM – 1: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee heard no comments on this item during its open hearings.	
Committee recommendation:	
Forward the item, as proposed in the Committee’s agenda, to the National S&T Committee with a recommendation that the item be designated as a voting item.	
Reasons for the committee recommendation:	
While the Committee heard no specific comments on this item, the Committee acknowledges that the proposal is supported by the NTETC Grain Sectors. Recognizing the expertise of the Sector members, the Committee believes it is appropriate to support the proposal as recommended by the Work Group.	
Final updated or revised proposal from the region:	
Recommendation to NCWM for item status: <input type="checkbox"/> Withdraw (not forwarded to NCWM) <input type="checkbox"/> Developing on Regional Agenda (not forwarded to NCWM) <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

ADDITIONAL ITEM – 2 W 3.30 S.1.6.4.2 (a) and UR.3.2. Liquid-Measuring Devices **(NEW)**

Source:
Missouri Department of Agriculture

Purpose:
Reduce the potential for misfueling consumer vehicles.

Item Under Consideration:
Amend NIST Handbook 44 Liquid Measuring Devices Code as follows:

S.1.6.4.2. Product Identity.

(a) A device shall be able to conspicuously display on each side the identity of the product being dispensed.

(b) A device designed to dispense more than one grade, brand, blend, or mixture of product also shall be able to display on each side the identity of the grade, brand, blend, or mixture being dispensed.

(c) The term “Gasoline”, “E15Gasoline”, “E85”, or “Flex-Fuel” shall be conspicuously displayed on the dispenser nozzle(s). This subsection applies only to spark-ignition engine fuel dispensers.
(Amended 20XX)

And

UR.3.2. Unit Price and Product Identity.

(a) The following information shall be conspicuously displayed or posted on the face of a retail dispenser used in direct sale:

(1) except for dispensers used exclusively for fleet sales, other price contract sales, and truck refueling (e.g., truck stop dispensers used only to refuel trucks), all of the unit prices at which the product is offered for sale; and

(2) in the case of a computing type or money-operated type, the unit price at which the dispenser is set to compute.

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

(b) The following information shall be conspicuously displayed or posted on each side of a retail dispenser used in direct sale:

(1) the identity of the product in descriptive commercial terms; and

(2) the identity of the grade, brand, blend, or mixture that a multi-product dispenser is set to deliver.

(c) The term “Gasoline”, “E15Gasoline”, “E85”, or “Flex-Fuel” shall be conspicuously displayed on the dispenser nozzle(s). This subsection applies only to spark-ignition engine fuel dispensers.

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

Background / Discussion:

The level of confusion for consumers fueling vehicles continues to grow with the introduction of new fuels in the marketplace. This is to ensure proper delivery of the selected product and to reduce the potential of misfueling vehicles. Missouri and other states have received complaints from consumers who have fueled their vehicles with inappropriate products. At this time practically all gasoline dispensers nationwide do not comply with section UR.3.2 or S.1.6.4.2 (a) as they do not display the product identity, i.e.: gasoline.

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

ADDITIONAL ITEM – 2: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
<p>Matt Curran, FL Bureau of Standards, provided comments on behalf of Ron Hayes, MO, who requested that his comments be conveyed to the SWMA. Mr. Hayes had noted that the intent of the proposal was not to increase labeling requirements, but to establish a way to provide an additional point at which a consumer would be informed of the product identity. Mr. Hayes also conveyed that he had more interest in establishing a user requirement than a specification. Mr. Curran noted that, in FL, there are stations which dispense E85 where the attendant specifically asks the consumer about whether or not the vehicle can accommodate the fuel.</p> <p>Steve Benjamin, NC, Department of Agriculture Standards and Consumer Services Division, questioned how the requirement would be applied on a dispenser with a single hose used to dispense multiple products. He noted that the proposal seems to be just another variation on the proposed color-coding requirement considered in the past.</p> <p>Ed Coleman, TN, supported the proposal. He pointed out that putting more labeling on the dispenser may result in having too much information on the dispenser that no one reads. However, on nozzles, he believes that the labeling would have more visibility.</p> <p>Gordon Johnson, Gilbarco, opposed the item.</p> <p>Tim Chesser, AR Bureau of Standards, opposed the item, noting concern about the impact on existing devices. He pointed out that the proposed language would require new labeling on all nozzles in use.</p> <p>Bill Studzinski, GM, expressed appreciation for the effort to further clarify product identity, but opposed the proposal, noting that there is already a requirement for marking product identity in the Handbook. He also echoed the comments questioning how the requirement would apply to devices with multiple products being dispensed through a single nozzle.</p>	
Committee recommendation:	
The Committee proposes withdrawing this item based on the reasons noted below.	
Reasons for the committee recommendation:	
The majority of comments received by the Committee were in opposition to the proposal. While the Committee appreciates the desire to improve consumer understanding, the Committee believes that the proposal will not fully address misfueling incidents. The Committee noted that there are too many questions about how the language would be applied, particularly with single-hose, multi product dispensers. Consequently, the Committee proposes that the item be withdrawn.	
Final updated or revised proposal from the region:	
The SWMA agreed to withdraw this item from its agenda.	
Recommendation to NCWM for item status: <input checked="" type="checkbox"/> Withdraw (not forwarded to NCWM) <input type="checkbox"/> Developing on Regional Agenda (not forwarded to NCWM) <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

ADDITIONAL ITEM – 3 D Appendix D - Paragraph: Definition Of Remote Configuration Capacity (NEW)

Source:

NTETC Grain Analyzer Sector

Purpose:

Expand the scope of definition to cover instances where the “other device”, as noted in the current definition, may be necessary to the operation of the weighing or measuring device or which may be considered a permanent part of that device.

Item Under Consideration:

Modify definition as follows:

remote configuration capability. – The ability to adjust a weighing or measuring device or change its sealable parameters from or through some other device that ~~is not~~ **may or may not** itself **be** necessary to the operation of the weighing or measuring device or ~~is not~~ **may or may not be** a permanent part of that device.[2.20, 2.21, 2.24, 3.30, 3.37, 5.56(a)]

(Added 1993, **Amended 20XX**)

Background / Discussion:

Removable digital storage devices can be used in GMMs as either “data transfer” devices that are not necessary to the operation of the GMM or as “data storage devices” which are necessary to the operation of the GMM. If removal data storage devices are necessary to the operation of the device, they are not covered by the current definition of remote configuration capability.

A USB flash drive is most likely to be used as a “data transfer” device. In a typical “data transfer” application, the USB flash drive is first connected to a computer with access to the GMM manufacturer’s web site to download the latest grain calibrations that are then stored in the USB flash drive. The USB flash drive is removed from the computer and plugged into a USB port on the GMM. The GMM is put into “remote configuration” mode to copy the new grain calibration data into the GMM’s internal memory. When the GMM has been returned to normal operating (measuring) mode the USB flash drive can be removed from the GMM.

Although an SD memory card could also be used as a “data transfer device” it is more likely to be used as a “data storage device”. In a typical “data storage device” application, the SD memory card stores the grain calibrations used on the GMM. The SD memory card must be plugged into an SD memory card connector on a GMM circuit card for the GMM to operate in measuring mode. To install new grain calibrations the GMM must be turned “off” or put into a mode in which the SD memory card can be safely removed. The SD memory card can either be replaced with an SD memory card that has been programmed with the new grain calibrations or the original SD memory card can be re-programmed with the new grain calibrations in much the same way as that described in the preceding paragraph to copy new grain calibrations into a USB flash drive. In either case, the SD memory card containing the new calibrations must be installed in the GMM for the GMM to operate in measuring mode. In that regard, the SD memory card (although removable) can be considered a “permanent part” of the GMM in that the GMM cannot operate without it.

Note: In the above example “SD memory card” could be any removable flash memory card such as the Secure Digital Standard-Capacity, the Secure Digital High-Capacity, the Secure Digital eXtended-Capacity, and the Secure Digital Input/Output?, which combines input/output functions with data storage. These come in three form factors: the original size, the “mini” size, and the “micro” size. “Memory Stick” is a removable flash memory card format, launched by Sony in 1998, and is also used in general to describe the whole family of Memory Sticks. In addition to the original Memory Stick, this family includes the Memory Stick PRO, the Memory Stick Duo, the Memory Stick PRO Duo, the Memory Stick Micro, and the Memory Stick PRO-HG.

At its 2011 Grain Analyzer Sector Meeting the sector agreed by consensus that the following changes to Table S.2.5. of §5.56.(a) of *NIST Handbook 44* should be forwarded to the S&T Committee for consideration:

- Add a note to Table S.2.5. to recognize the expanded scope of “remote capability”.
- Delete “remotely” from the second paragraph of Category 3 requirements that begins, “When accessed remotely ...” to make it clear that the requirements of Category 3 apply whether accessed manually using the keyboard or accessed by remote means.
- Add the modified second paragraph of Category 3 requirements to Categories 3a and 3b to make it clear that these requirements apply to all the subcategories of Category 3.

After additional review of this item, the National Institute of Standards Technology (NIST), Office of Weights and Measures (OWM), recommended that the changes to Table S.2.5. approved by the sector in 2011 be separated into two independent proposals: one dealing with the changes to Category 3 and its subcategories and one recommending a modification of the definition of “remote configuration capability” appearing in Appendix D of *NIST Handbook 44* to recognize the expanded scope of “remote capability”, instead of adding a note to the bottom of Table S.2.5 to expand the definition for remote configuration for grain moisture meters (as shown in this proposal). A change to the definition of remote configuration capability will apply to other device types.

At its 2012 Grain Analyzer Sector meeting the sector agreed by consensus to separate its original proposal into two separate proposals and that this proposal to change the definition of “Remote Configuration Capability should be forwarded to the S&T to Committee for consideration.

Item 5 of the NTETC, Grain Analyzer Sector August 2012 Meeting Summary covers this subject and will be available on NCWM Website November 2012

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

ADDITIONAL ITEM – 3: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee heard no comments on this item during its open hearings.	
Committee recommendation:	
Reasons for the committee recommendation:	
The Committee noted that this definition applies, not just to Grain Moisture Meters, but to all devices. The Committee questions whether or not adequate input has been received from other segments of the industry, considering the broad-reaching effect of the definition.	
Final updated or revised proposal from the region:	
Forward this to the NCWM S&T Committee with a proposal to include it on their 2013 Interim Agenda as a Developing Item, providing that the Sector will continue development of the issue.	
Recommendation to NCWM for item status: <input type="checkbox"/> Withdraw (not forwarded to NCWM) <input type="checkbox"/> Developing on Regional Agenda (not forwarded to NCWM) <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input checked="" type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

ADDITIONAL ITEM – 4 W 3.36. Water Meters, UR.2. Accessibility of Customer Indication (NEW)

Source:
Guardian Water and Power

Purpose:
Allow water submeters to be installed under a mobile home and within the skirting of the home.

Item Under Consideration:
Amend NIST Handbook 44 as follows:

UR.2. Accessibility of Customer Indication. – An unobstructed standing space of at least 76 cm (30 in) wide, 91 cm (36 in) deep, and 198 cm (78 in) high shall be maintained in front of an indication intended for use by the customer to allow for reading the indicator. The customer indication shall be readily observable to a person located within the standing space without necessity of a separate tool or device.

In mobile homes, the customer indicator may be located under the home in order to prevent meter freezing and to allow for installation of heat tape. In such cases, the customer indicator must be observable to a person located within the space under the mobile home.

(Added 2008, **Amended in 20XX**)

Background / Discussion:

Visually read remote water meters have been discontinued by some meter manufacturers (e.g., Sensus) and are being phased out by others (e.g., Badger). These products are being replaced by either exterior remote touchpads (which require a special tool to remotely read or by radio frequency systems which require a data collector.

All systems, whether older visually read remote readers, touchpads or radio frequency systems continue to record water usage on the meter register itself.

To prevent freezing in northern climates, mobile home parks generally install water meter on the water supply line located under the home, inside the skirting. The meter can then be easily wrapped in heat tape and enclosed in a meter jacket to prevent meter damage from freezing. Locating the meter under the home and inside the trailer skirting also helps prevent freezing and damage to the meter.

UR.2 as currently worded requires that “The customer indication shall be readily observable to a person located within the standing space without necessity of a separate tool or device.” To comply with the current wording, mobile home parks that want to install a touchpad or radio frequency system would have to re-route the water supply line to the outside, install the meter outside, extend heat tape to the outside meter location, provide a mounting platform for the meter and then re-route the water supply line back under the home.

The proposed amendment will prevent unnecessary costs and provide customer viewing access to the meter readings.

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

ADDITIONAL ITEM – 4: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
The Committee heard no comments on this item during its open hearings.	
Committee recommendation:	
The Committee recommended withdrawing this item based on the reasons described below.	
Reasons for the committee recommendation:	
While the Committee understands the concerns about environmental conditions in these installations, the Committee notes that the intent of UR.2. is to ensure visibility of indications to consumers and inspectors from a reasonable position. The Committee does not believe that forcing a consumer or inspector to crawl under a mobile home is reasonable. The Committee questions whether or not there might be other measures that could be taken to address the environmental concerns while preserving reasonable access to the information.	
Final updated or revised proposal from the region:	
The SWMA agreed to withdraw this item from its agenda.	
Recommendation to NCWM for item status: <input checked="" type="checkbox"/> Withdraw (not forwarded to NCWM) <input type="checkbox"/> Developing on Regional Agenda (not forwarded to NCWM) <input type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

ADDITIONAL ITEM – 5 W 3.30. Liquid Measuring Devices, Table T.2. Accuracy Classes and Tolerances for Liquid Measuring Devices (NEW)

Source:
NIST Office of Weights and Measures

Purpose:
Resolve inconsistencies in the temperature ranges defined for “Heated Products”.

Item Under Consideration:

Amend NIST Handbook 44 as follows:

Table T.2. Accuracy Classes and Tolerances for Liquid Measuring Devices Covered in NIST Handbook 44, Section 3.30				
Accuracy Class	Application	Acceptance Tolerance	Maintenance Tolerance	Special Test Tolerance¹
0.3	- Petroleum products delivered from large capacity (flow rates greater than 115 L/min or 30 gpm)** devices, including motor-fuel devices - Heated products (other than asphalt) at or temperatures greater than 50 °C (122 °F) - Asphalt at temperatures at or below a temperature of 50 °C (122 °F) - All other liquids not shown in the table where the typical delivery is over 200 L (50 gal)	0.2 %	0.3 %	0.5 %
0.3A	- Asphalt at temperatures greater than 50 °C (122 °F)	0.3 %	0.3 %	0.5 %
0.5*	- Petroleum products delivered from small capacity (at 4 L/min (1 gpm) through 115 L/min or 30 gpm)** motor-fuel devices - Agri-chemical liquids - All other applications not shown in the table where the typical delivery is ≤ 200 L (50 gal)	0.3 %	0.5 %	0.5 %
1.1	- Petroleum products and other normal liquids from devices with flow rates** less than 1 gpm. - Devices designed to deliver less than 1 gal	0.75 %	1.0 %	1.25 %
<p>* For test drafts ≤ 40 L or 10 gal, the tolerances specified for Accuracy Class 0.5 in the table above do not apply. For these test drafts, the following applies:</p> <p>(a) Maintenance tolerances on normal and special tests shall be 20 mL plus 4 mL per indicated liter or 1 in³ plus 1 in³ per indicated gallon.</p> <p>(b) Acceptance tolerances on normal and special tests shall be one-half the maintenance tolerance values.</p> <p>¹ Special test tolerances are not applicable to retail motor fuel dispensers. ** Flow rate refers to designed or marked maximum flow rate.</p>				

(Added 2002) (Amended 2006 **and 20XX**)

Background / Discussion:

Similar proposals are under consideration in several Handbook 44 codes and should be considered as a block to ensure consistency among the codes. The affected codes and tables are:

- Section: 3.30 Liquid-Measuring Devices; Table T.2.
- 3.31 Vehicle-Tank Meters; Table 1.
- 3.37 Mass Flow Meters; Table T.2.

The original introduction of a boundary temperature to differentiate heated and non-heated products first appeared in the 1998 Measuring Sector Summary in reference to asphalt only. Heated asphalt was defined as asphalt that was heated above 50 °C. In 2002 the range of non-heated asphalt was clarified as “at 50 °C or below.” In 2003, heated

products other than asphalt were added for the first time and defined as “at or above 50 °C.” For consistency, “heated products” both asphalt and other products should all be defined as “above 50 °C” leaving products that are “at temperatures at or below 50 °C” (both asphalt and other products) in the category of non-heated.

The Fahrenheit temperature equivalent of 50 °C has also been added for consistency with other numeric references in HB 44.

This item was initiated in the NTEP measuring labs meeting and forwarded to the Measuring Sector for review in 2011.

This definition of “heated products” is consistent with Technical Policy C (Product Families Table) in NCWM Publication 14 (Measuring Devices). A review of past editions of HB 44 and NCWM proceedings was completed to confirm there has been no prior precedent that would conflict with this solution.

There are indications that a need for standards in Handbook 44 for heated water meters may exist. The AWWA defines the boundary temperature for heated water as 90 °F.

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

ADDITIONAL ITEM – 5: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
During its open hearings, the Committee heard comments from Tina Butcher, NIST OWM, who noted that this item originated from Fall 2011 discussions at the NTEP Laboratory and NTETC Measuring Sector meetings. The item is somewhat of a housekeeping item intended to clarify the “breakpoints” for various types of heated products. While there are three proposals addressing similar changes in three different codes, the SWMA may wish to consider addressing these together. For example, if it is decided to advance these as “Voting” items, consider recommending that the items be voted on in a single vote.	
Committee recommendation:	
The Committee proposed moving the item forward to the National S&T Committee with a recommendation that the item be designated as a voting item. The Committee also proposed including a recommendation to consolidate this item with similar proposals from the VTM and MFM Codes during the voting process to avoid inconsistencies among the measuring codes.	
Reasons for the committee recommendation:	
The Committee heard no opposition to the proposal. The Committee recognized that the proposed changes are as largely editorial in nature and should not have any negative impact on existing devices.	
Final updated or revised proposal from the region:	
The SWMA agreed to the proposal as presented in the recommendation above.	
Recommendation to NCWM for item status:	Regional Position:
<input type="checkbox"/> Withdraw (not forwarded to NCWM) <input type="checkbox"/> Developing on Regional Agenda (not forwarded to NCWM) <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	<input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

ADDITIONAL ITEM – 6 V 3.31. Vehicle-Tank Meters, Table 1. Accuracy Classes and Tolerances for Vehicle-Tank Meters (NEW)

Source:
NIST Office of Weights and Measures

Purpose:
Resolve inconsistencies in the temperature ranges defined for “Heated Products”.

Item Under Consideration:

Amend NIST Handbook 44 as follows:

Table 1. Accuracy Classes and Tolerances for Vehicle-Tank Meters				
Accuracy Class	Application	Acceptance Tolerance	Maintenance Tolerance	Special Test Tolerance
0.3	<ul style="list-style-type: none"> - Petroleum products delivered from large capacity (flow rates over 115 L/min or 30 gpm)** devices, including motor-fuel devices - Heated products (other than asphalt) at or temperatures greater than 50 °C (122 °F) - Asphalt at temperatures at or below a temperature of 50 °C (122 °F) - All other liquids not shown in the table where the typical delivery is greater than 200 L (50 gal) 	0.15 %	0.3 %	0.45 %
0.3A	<ul style="list-style-type: none"> - Asphalt at temperatures greater than 50 °C (122 °F) 	0.3 %	0.3 %	0.5 %
0.5*	<ul style="list-style-type: none"> - Petroleum products delivered from small capacity (at 4 L/min (1 gpm) through 115 L/min or 30 gpm)** motor-fuel devices - Agri-chemical liquids - All other applications not shown in the table where the typical delivery is ≤ 200 L (50 gal) 	0.3 %	0.5 %	0.5 %
1.1	<ul style="list-style-type: none"> - Petroleum products and other normal liquids from devices with flow rates** less than 4 L/min (1 gpm) and - Devices designed to deliver less than 4 L (1 gal) 	0.75 %	1.0 %	1.25 %
1.5	<ul style="list-style-type: none"> - Water 	Overregistration	1.5 %	1.5 %
		Underregistration	1.5 %	1.5 %
<p>* For 5 gal and 10 gal test drafts, the tolerances specified for Accuracy Class 0.5 in the table above do not apply. For these test drafts, the maintenance tolerances on normal and special tests for 5 gal and 10 gal test drafts are 6 in³ and 11 in³, respectively. Acceptance tolerances on normal and special tests are 3 in³ and 5.5 in³.</p> <p>** Flow rate refers to designed or marked maximum flow rate.</p>				

(Added 2002, **Amended 20XX**)

Background / Discussion:

Similar proposals are under consideration in several Handbook 44 codes and should be considered as a block to ensure consistency among the codes. The affected codes and tables are:

- Section: 3.30 Liquid-Measuring Devices; Table T.2.
- 3.31 Vehicle-Tank Meters; Table 1.
- 3.37 Mass Flow Meters; Table T.2.

The original introduction of a boundary temperature to differentiate heated and non-heated products first appeared in the 1998 Measuring Sector Summary in reference to asphalt only. Heated asphalt was defined as asphalt that was heated above 50 °C. In 2002 the range of non-heated asphalt was clarified as “at 50 °C or below.” In 2003, heated products other than asphalt were added for the first time and defined as “at or above 50 °C.” For consistency,

“heated products” both asphalt and other products should all be defined as “above 50 °C” leaving products that are “at temperatures at or below 50 °C” (both asphalt and other products) in the category of non-heated.

The Fahrenheit temperature equivalent of 50 °C has also been added for consistency with other numeric references in HB 44.

This item was initiated in the NTEP measuring labs meeting and forwarded to the Measuring Sector for review in 2011.

This definition of “heated products” is consistent with Technical Policy C (Product Families Table) in NCWM Publication 14 (Measuring Devices). A review of past editions of HB 44 and NCWM proceedings was completed to confirm there has been no prior precedent that would conflict with this solution.

There are indications that a need for standards in Handbook 44 for heated water meters may exist. The AWWA defines the boundary temperature for heated water as 90 °F.

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

ADDITIONAL ITEM – 6: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
See SWMA Additional Item 5-Heated Products-LMD Code	
Committee recommendation:	
The Committee proposed moving the item forward to the National S&T Committee with a recommendation that the item be designated as a voting item. The Committee also proposed including a recommendation to consolidate this item with similar proposals from the LMD and MFM Codes during the voting process to avoid inconsistencies among the measuring codes.	
Reasons for the committee recommendation:	
The Committee heard no opposition to the proposal. The Committee recognized that the proposed changes are as largely editorial in nature and should not have any negative impact on existing devices	
Final updated or revised proposal from the region:	
The SWMA agreed to the proposal as presented in the recommendation above.	
Recommendation to NCWM for item status: <input type="checkbox"/> Withdraw (not forwarded to NCWM) <input type="checkbox"/> Developing on Regional Agenda (not forwarded to NCWM) <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments: Adopted unanimously by voice vote.	

ADDITIONAL ITEM – 7 V 3.38. Mass Flow Meters, Table T.2. Accuracy Classes and Tolerances for Mass Flow Meters (NEW)

Source:

NIST Office of Weights and Measures

Purpose:

Resolve inconsistencies in the temperature ranges defined for “Heated Products”.

Item Under Consideration:

Amend NIST Handbook 44 as follows:

Table T.2. Accuracy Classes and Tolerances for Mass Flow Meters				
Accuracy Class	Application or Commodity Being Measured	Acceptance Tolerance	Maintenance Tolerance	Special Tolerance
0.3	<ul style="list-style-type: none"> - Large capacity motor-fuel dispensers (maximum discharge flow rates greater than 100 L/min or 25 gal/min) - Heated products <u>(other than asphalt) at temperatures greater than 50 °C (122 °F)</u> - Asphalt <u>at temperatures at or below a temperature of 50 °C (122 °F)</u> - Loading rack meters - Vehicle-tank meters - Home heating oil - Asphalt at or below 50 °C - Milk and other food products - All other liquid applications not shown in the table where the minimum delivery is at least 700 kg (1500 lb) 	0.2 %	0.3 %	0.5 %
0.3A	<ul style="list-style-type: none"> - Asphalt at temperatures greater than 50 °C <u>(122 °F)</u> 	0.3 %	0.3 %	0.5 %
0.5	<ul style="list-style-type: none"> - Small capacity (retail) motor-fuel dispensers - Agri-chemical liquids - All other liquid applications not shown in the table where the minimum delivery is less than 700 kg or 1500 lb 	0.3 %	0.5 %	0.5 %
1.0	<ul style="list-style-type: none"> - Anhydrous ammonia - LP Gas (including vehicle-tank meters) 	0.6 %	1.0 %	1.0 %
2.0	<ul style="list-style-type: none"> - Compressed natural gas as a motor-fuel 	1.5 %	2.0 %	2.0 %
2.5	<ul style="list-style-type: none"> - Cryogenic liquid meters - Liquefied compressed gases other than LP Gas 	1.5 %	2.5 %	2.5 %

(Added 1994) (Amended 1999, ~~and~~ 2001 and 20XX)

Background / Discussion:

Similar proposals are under consideration in several Handbook 44 codes and should be considered as a block to ensure consistency among the codes. The affected codes and tables are:

Section: 3.30 Liquid-Measuring Devices; Table T.2.

3.31 Vehicle-Tank Meters; Table 1.

3.37 Mass Flow Meters; Table T.2.

The original introduction of a boundary temperature to differentiate heated and non-heated products first appeared in the 1998 Measuring Sector Summary in reference to asphalt only. Heated asphalt was defined as asphalt that was heated above 50 °C. In 2002 the range of non-heated asphalt was clarified as “at 50 °C or below.” In 2003, heated products other than asphalt were added for the first time and defined as “at or above 50 °C.” For consistency, “heated products” both asphalt and other products should all be defined as “above 50 °C” leaving products that are “at temperatures at or below 50 °C” (both asphalt and other products) in the category of non-heated.

The Fahrenheit temperature equivalent of 50 °C has also been added for consistency with other numeric references in HB 44.

This item was initiated in the NTEP measuring labs meeting and forwarded to the Measuring Sector for review in 2011.

This definition of “heated products” is consistent with Technical Policy C (Product Families Table) in NCWM Publication 14 (Measuring Devices). A review of past editions of HB 44 and NCWM proceedings was completed to confirm there has been no prior precedent that would conflict with this solution.

There are indications that a need for standards in Handbook 44 for heated water meters may exist. The AWWA defines the boundary temperature for heated water as 90 °F.

Additional letters, presentations and data may have been part of the committee’s consideration. Please refer to www.ncwm.net/content/2012pub-16 to review these documents.

ADDITIONAL ITEM – 7: Regional Report to NCWM	
Summary of comments considered by the regional committee (in writing or during the open hearings):	
See SWMA Additional Item 5-Heated Products-LMD Code.	
Committee recommendation:	
The Committee proposed moving the item forward to the National S&T Committee with a recommendation that the item be designated as a voting item. The Committee also proposed including a recommendation to consolidate this item with similar proposals from the LMD and VTM Codes during the voting process to avoid inconsistencies among the measuring codes.	
Reasons for the committee recommendation:	
The Committee heard no opposition to the proposal. The Committee recognized that the proposed changes are as largely editorial in nature and should not have any negative impact on existing devices.	
Final updated or revised proposal from the region:	
The SWMA agreed to the proposal as presented in the recommendation above.	
Recommendation to NCWM for item status: <input type="checkbox"/> Withdraw (not forwarded to NCWM) <input type="checkbox"/> Developing on Regional Agenda (not forwarded to NCWM) <input checked="" type="checkbox"/> Voting Item on the NCWM Agenda <input type="checkbox"/> Information Item on the NCWM Agenda <input type="checkbox"/> Developing Item on the NCWM Agenda <input type="checkbox"/> Unable to consider at this time <input type="checkbox"/> Other: <i>(Please Describe)</i>	Regional Position: <input checked="" type="checkbox"/> Supports <input type="checkbox"/> Opposes <input type="checkbox"/> Split <input type="checkbox"/> Neutral
Additional Comments:	
Adopted unanimously by voice vote.	

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 - Mr. Marvin Pound, Georgia | Member
 - Mr. Ken Ramsburg, Maryland | Member
 - Mr. Joe Benavides, Texas | Member
 - Mr. Matthew Curran, Florida | Member
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Specifications and Tolerances Committee

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Appendix A

Background and Justification for Handbook 130 Definition of “Diesel Gallon Equivalent (DGE)” of Natural Gas as a Vehicular Fuel

Clean Vehicle Education Foundation

Development of the “Gasoline Gallon Equivalent” by NCWM*

In 1993, under the auspices of the National Conference on Weights and Measures (NCWM), a Compressed Natural Gas (CNG) Working Group came together to determine the way in which CNG would be sold to the public at retail as a motor fuel. .

The working group focused on three issues:

1. How to provide the Natural Gas Vehicle (NGV) industry a method of sale that would be familiar and acceptable to consumers
2. How to provide weights and measures officials a verifiable and quantifiable means to determine the accuracy of natural gas dispensers; and
3. How to meet these requirements with a uniform, national standard.

NCWM considered three proposals for the method of sale of CNG:

1. joules, the unit of energy measurement in SI units
2. mass
3. the Gasoline Gallon Equivalent (GGE)

The Natural Gas Vehicle Coalition (now NGV America) recommended that the Gasoline Gallon Equivalent be adopted as the method of sale for CNG, and that it be based on the energy equivalent of a gallon of gasoline. The use of the GGE was recommended primarily for the convenience of the retail customer comparing the cost and fuel economy of a natural gas vehicle to a comparable gasoline vehicle. During the discussion, a proposal was made to eliminate the reference to energy content of CNG and replace it with a fixed conversion factor based on mass, with the fixed mass of CNG being equal to a gallon of gasoline. Measurement of mass in the retail dispenser and verification by W&M officials is easier and less costly than measurement of energy content.

Since the energy content of a unit measure of CNG (standard cubic foot - scf) and gasoline (gallon) vary widely depending on the sample of fuel measured, the reference gallon of gasoline was determined to be Indolene, the gasoline used by EPA to certify

* *Report of the 78th National Conference on Weights and Measures, 1993*, NIST Special Publication 854, pp 322-326.

Report of the 79th National Conference on Weights and Measures, 1994, NIST Special Publication 870, pp 213-217.

Program and Committee Reports for the National Conference on Weights and Measures, 79th Annual Meeting, July 17-21, 1994, NCWM Publication 16, pp 89-92.

emissions and fuel economy, with an energy content (lower heating value) of 114,118 BTU/gal. Work conducted by the Institute of Gas Technology and the Gas Research Institute (now combined into the Gas Technology Institute) surveyed 6811 samples of natural gas nationwide and concluded that the “average” natural gas in the US had an energy content (lower heating value) of 923.7 BTU/scf, and a density of 0.0458172 lbs/cubic foot. This translates 20,160.551 BTU/lb. Dividing gasoline’s 114.118 BTU/gal by natural gas’s 20,160.551 BTU/lb gives 5.660 lbs of natural gas = 1 GGE. Similar calculations determined that a gasoline liter equivalent of natural gas equals 0.678 kg of natural gas.

At its 79th annual meeting in July of 1994, NCWM adopted resolutions that:

“All natural gas kept, offered or exposed for sale or sold at retail as a vehicle fuel shall be in terms of the gasoline liter equivalent (GLE) or gasoline gallon equivalent (GGE), and

All retail natural gas dispensers shall be labeled with the conversion factor in terms of kilograms or pounds. The label shall be permanently and conspicuously displayed on the face of the dispenser and shall have either the statement “1 Gasoline Liter Equivalent (GLE) is equal to 0.678 kg of Natural Gas” or “1 Gasoline Gallon Equivalent (GGE) is equal to 5.660 lbs of Natural Gas” according to the method of sale used.”

These statements can be found in NIST Handbook 130^{*}, along with the definition of “natural gas” which seems to apply only to Compressed Natural Gas, not to Liquefied Natural Gas. Handbook 130, §§3.11 and 3.12 (Engine Fuels, Petroleum Products, and Automotive Lubricants Regulations) confirm that these requirements are for CNG, rather than LNG. Similar requirements and definitions are found in Handbook 44.

During the discussions it was recognized that, although diesel and gasoline are both sold in gallon units, a gallon of diesel fuel has substantially more energy content than a gallon of gasoline. While it is convenient to use the Gasoline Gallon Equivalent unit when comparing the cost and fuel economy of gasoline-powered light-duty vehicles to equivalent natural gas vehicles, a Diesel Gallon Equivalent unit would be more useful for operators of medium and heavy-duty (usually diesel powered) vehicles. However, in 1994, the NCWM working group “agreed to defer development of a “Diesel Gallon Equivalent” until the issues related to the ‘Gasoline Gallon Equivalent’ were decided by the NCWM and agreed to meet again if additional work is necessary.”** The issue of the formal definition a Diesel Gallon Equivalent (DGE) unit has not come before NCWM from that time until today, although the DGE is often used in the industry, defined as 6.31 lbs of natural gas.

* “Method of Sale Regulation,” §2.27

** *Report of the 79th National Conference on Weights and Measures, 1994*, NIST Special Publication 870, p 214

Need for a Definition of a “Diesel Gallon Equivalent” Unit

Today there are an increasing number of commercial vehicles using natural gas as a fuel, to lower emissions and Greenhouse Gases, decrease America’s use of petroleum, and lower fuel costs (U.S. DOE Clean Cities Alternative Fuel Price Report for April 2012 shows in Table 2 ‘Overall Average Fuel Price on Energy-Equivalent Basis’ that diesel is priced at \$4.12/gal and CNG at \$2.32/gal http://www.afdc.energy.gov/afdc/pdfs/afpr_apr_12.pdf).

Since the NCWM’s working group deferred development of a DGE unit in 1994, there has been little call by the natural gas vehicle industry for the formalization of that unit in the sale of **Compressed** Natural Gas. However the use of **Liquefied** Natural Gas (LNG) as a motor fuel has been growing and there is significant interest in using the DGE as a unit for the sale of that fuel.

LNG as a motor fuel is used almost exclusively by commercial vehicles, most of which view diesel as the conventional alternative. Using the same logic as was used for the development of the GGE unit, the convenience of the retail customer comparing the cost and fuel economy of a natural gas vehicle to a comparable conventional vehicle, it makes sense for NCWM to now “officially” define the DGE.

Other than §3.12. Liquefied Natural Gas, in the Engine Fuels and Automotive Lubricants Regulation section of Handbook 130, we find no specific provisions in either Handbook 44 or Handbook 130 for the retail sale of LNG as a motor fuel. However LNG is sold in California and other states on a mass basis (by the pound), which allows for easy confirmation by weights and measures authorities. An “official” definition of the DGE as a specific mass of natural gas would allow states to easily move from retail sale by pound to retail sale by DGE, simplifying the sale process for the retail customer used to dealing with “gallons of diesel” as a fuel measure.

Therefore, at this time we are asking for a definition of the Diesel Gallon Equivalent (and Diesel Liter Equivalent) units by NCWM.

Justification of the Definition of a DGE as 6.312 Pounds of Natural Gas

Handbook 130 contains the following definitions of natural Gas as a vehicle fuel*:

Gasoline liter equivalent (GLE). – Gasoline liter equivalent (GLE) means 0.678 kg of natural gas.

Gasoline gallon equivalent (GGE). – Gasoline gallon equivalent (GGE) means 2.567 kg (5.660 lb) of natural gas.

* NIST handbook 130, 2006, Method of State Regulation, §§2.27.1.2 and 2.227.1.3; also Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation, §§1.25 and 1.26.

As the NCWM working group recognized during its deliberations in 1993 on the Gasoline Gallon Equivalent unit, both gasoline and natural gas can vary in their BTU content from sample to sample. The working group determined the gasoline gallon (energy) equivalent based on a gallon of Indolene (114,118 BTU/gal – lower heating value) and a survey of 6811 natural gas samples nationwide with an average of 923.7 BTU/scf (lower heating value) and a density of 0.0458172 lbs/cubic foot. This equates to 20,160.551 BTU/lb. Dividing gasoline's 114.118 BTU/gal by natural gas's 20,160.551 BTU/lb gives 5.660 lbs of natural gas = 1 GGE. Similar calculations determined that a gasoline liter equivalent of natural gas equals 0.678 kg of natural gas.

Starting with 5.660 lbs of natural gas = 1 GGE and 0.678 kg of natural gas = 1 GLE, we can calculate the mass of natural gas necessary to make a DGE and a DLE by comparing the amount of energy in a gallon of diesel fuel to the amount of energy in a gallon of gasoline fuel and apply that ratio to scale up the masses of natural gas calculated for the GGE and GLE units.

Unfortunately it is no easier today than it was in 1993 to set one energy value as representative of a unit for all gasoline, (or diesel) fuel. EPA's certification fuel has likely changed in energy content since 1993, as both gasoline and diesel fuels have been modified for improved emissions.

We recommend using the most recent Department of Energy *Transportation Energy Data Book*^{*}, as an authoritative reference for both gasoline and diesel fuel energy values. Taking further surveys or basing our calculations on today's EPA certification fuel only delays our action, substantially increases costs, and, in the end, provides a limited potential increase in accuracy based on one point in time. Table B.4 of the *Transportation Energy Data Book*, on the heat content of fuels http://cta.ornl.gov/data/tedb30/Edition30_Full_Doc.pdf lists the net energy of gasoline as 115,400 BTU/Gal, and diesel as 128,700 BTU/Gal.

Therefore a Diesel Gallon Equivalent of natural gas is:

$$(128,700/115,400) \times 5.660 = 6.312 \text{ lb (2.863 kg)}$$

and a Diesel Liter Equivalent of natural gas is:

$$(128,700/115,400 \times 0.678 = 0.756 \text{ kg}$$

Prepared by:

Clean Vehicle Education Foundation

<http://www.cleanvehicle.org>

^{*} Stacy C. Davis and Susan W. Diegel, Oak Ridge National Laboratory, *Transportation Energy Data Book*, Edition 30, 2011, ORNL-6978, or <http://cta.ornl.gov/data/index.shtml>