

**National Type Evaluation Technical Committee
(NTETC)
Measuring Sector Annual Meeting
October 21-22, 2011 Norfolk, VA**

Meeting Agenda

Table of Contents	1
<u>Carry-over Items:</u>	2
1. Add Testing Criteria to NTEP Policy U “Evaluating electronic indicators submitted separate from a measuring element”	2
2. Development of Water Meters Checklist	3
3. Development of Hydrogen Gas-Measuring Devices Checklist.....	4
<u>New Items:</u>	5
4. Product Families Table - Include Water on Existing NTEP CC’s	5
5. Product Families Table – Change Test Requirements for Turbine Meters from Test A to Test E.....	5
6. Product Families Table – Consolidate Product Categories for PD and Turbine Meters	5
7. Add Metrological Sealing Checklist to Measuring Devices Publication 14	6
8. Product Families Table – Categorization of Liquid CO ₂	6
9. Product Families Table – Add Hydrogen (Compressed Gas)	6
10. Add Units for Compressed Gases to Technical Policy V. List of Price and Quantity Markings on Retail Motor Fuel Dispensers (RMFDs).....	7
11. Certificate of Conformance Parameters for Measuring Devices.....	7
12. Test for Mathematical Agreement of Card Reader after Power Loss	8
13. Device Marking for Electronic Linearization for Positive Displacement Meters	8
14. Product Families Table - Restore notation “(Above 50 °C)” to the heated products category definition	9
15. Next Meeting	9
<u>Additional Items as Time Allows:</u>	10
16. Section 3.31. Vehicle-Tank Meters; Paragraph T.4. Product Depletion Test (<i>S&T Carryover Agenda Item</i>)	10
17. OIML B 3 Basic Certificate System for OIML Type Evaluation of Measuring Instruments and OIML B 10 Framework for a Mutual Acceptance Arrangement (MAA) on OIML Type Evaluations	13
18. G-S.1. Marking (Software) (<i>S&T Carryover Agenda Item</i>).....	13
19. Interpretation of VTM Code 3.31., Paragraph S.2.4., With Regard to Individual vs. Multiple Deliveries.....	15

Attachments Distributed with Agenda:

- Attachment #1: Draft Hydrogen Gas-Measuring Devices Checklist [Item 3]
- Attachment #2: DES Metrological Sealing Checklist [Item 7]
- Attachment #3: Hydrogen addition to Product Families Table [Item 9]
- Attachment #4: OIML B 3 – CIML voting draft [Item 17]
- Attachment #5: OIML B 10 – CIML voting draft [Item 17]
- Attachment #6: Water Meter Code Checklist Draft Copy 101011[Item 2]

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Carry-over Items:

- 1. Add Testing Criteria to NTEP Policy U “Evaluating electronic indicators submitted separate from a measuring element”**

Source: California NTEP Lab

Background: At its 2007 meeting, the Measuring Sector heard that Section U. of the NTEP Policy in National Conference of Weights and Measures (NCWM) Publication 14 allows for testing an indicator separate from a measuring element. However, specific test criteria had not been developed for this section. The Sector heard a recommendation to develop and add specific criteria for testing an indicator separate from a measuring element for this section. From 2007 to 2010, the California NTEP laboratory worked to develop a checklist, but had received limited input on the drafts. At the 2009 Sector meeting, Dan Reiswig provided an update to the Sector on progress to develop criteria for separate electronic indicators. He reported that the draft checklist provided to the Sector follows the general format of Pub 14 and the main test procedures are at the end of the document. At the 2010 Sector meeting, Mr. Reiswig presented a list of the areas of the checklist that specifically needed further attention and review. The Sector reviewed these items and added some additional comments.

At the conclusion of its 2010 meeting, the Sector agreed to the following: Mr. Dan Reiswig (California Division of Measurement Standards (DMS)) should continue developing the Checklist for Electronic Indicators Submitted Separate from a Measuring Element.

The Sector identified the following points that require further development and input from industry in order to finalize the checklist.

1. It is recommended to run a minimum of 10,000 pulses when verifying pulses captured. Should we consider specifying a minimum number of pulses/division? For example, 100 pulses = 1 indication division or 10 pulses = 1 indication division.
2. Would a limit of “plus or minus 1 pulse in 10,000” be an appropriate tolerance?
3. Test with low, medium, and high temperature inputs to the indicator to verify a temperature compensation function, if available. Test with a minimum of two API Gravity values through the temperature test ranges tested. Identify and specify reference tables.
4. Develop a test to verify multi point calibration using pulses. Include frequencies for switchover of linearizations. For example, specify a certain number of pulses per liters.
5. The tests listed above are based on an indicator receiving pulses from a measuring element. Therefore, it would seem logical to also develop tests for an indicator to verify other process signal output from other elements in the system that is sent to indicators such as frequencies at 4-20 milliamps, or other process signals.

The Sector also identified the following people who might be able to provide additional input and asked that Mr. Reiswig also contact them to request their assistance.

Possible Industry Contacts to Assist in Review of Draft Electronic Indicators Checklist	
Organization	Name
Contrec	Jef Gaskil
Dresser Wayne	Phil Katselnik
Emerson (Daniel)	Andrew MacAllister
Endress and Hauser	Michael Keilty
FMC	Rich Miller
Gilbarco	Gordon Johnson
Invensys	Wade Mattar
Itron	Mike McGhee
Kraus Global	Gord Wedel
Liquid Controls	Dmitri Karimov
Measurement Canada	Dennis Beattie
Midwest Meter	Rick Salvesen
Toptech	Jim Xander
VeederRoot	Kevin Jensen

The Sector agreed that Mr. Reiswig should forward the latest draft of the checklist along with the five areas requiring specific attention to the people listed in the original Work Group and to the list of possible contacts above. Mr. Reiswig should ask for their assistance in reviewing and commenting on the checklist, noting that input on the five areas would be of particular help.

Recommendation: The Sector will hear an update of the Work Group's progress.

2. Development of Water Meters Checklist

Source: Andre Noel, Neptune Technology Group, Inc.

Background: At its 2010 meeting, the MS heard that utility type water meter manufacturers are receiving requests for a National Type Evaluation Program (NTEP) Certificate of Approval from State weights and measures jurisdictions. Utility type water meters under NIST Handbook 44, Section 3.36. are evaluated under the California Type Evaluation Program (CTEP). There is no National Type Evaluation Program (NTEP) for Utility Type Water Meters.

During the 2010 meeting, the Sector agreed to establish a work group to further develop the draft checklist. The Work Group consists of the following members:

Water Meters Checklist Development Work Group	
Member	Company/Organization
Andre Noel	Neptune Technology Group
Dan Reiswig	California Division of Measurement Standards
Jim Welsh	Measurement Canada (MC) (pending confirmation by Dennis Beattie)

In developing the checklist, the group was asked to:

- (1) Identify areas in NIST Handbook 44 (HB 44) Section 3.36 Water Meters Code where changes might be appropriate to update the criteria to reflect current technology and practices. For example, more specific audit trail criteria may need to be added to the Water Meters Code.

- (2) Forward any proposed changes to NIST Handbook 44 to the NCWM S&T Committee via the established NCWM process by preparing and submitting NCWM Form 15 to the regional weights and measures associations and NTETC Measuring Sector.
- (3) Consider any differences between AWWA standards and NIST Handbook 44 and consider recommendations for aligning the two documents where that makes sense.
- (4) Copy the Measuring Sector Chairman, Mr. Michael Keilty and Technical Advisor, Mrs. Tina Butcher on communications to the group.
- (5) Copy Mr. Ralph Richter (NIST Weights and Measures Division (WMD)), who is the U.S. point of contact for OIML R49 with any proposed drafts.
- (6) Distribute a subsequent draft for review by the Sector by the January 2011 NCWM Interim Meeting.
- (7) Distribute a final draft for review by the Sector at least a month prior to the fall 2011 Sector meeting.

Recommendation: The Sector will hear an update of the Work Group’s progress.

3. Development of Hydrogen Gas-Measuring Devices Checklist

Source: NIST Office of Weights & Measures

Background: At the July 2010 NCWM Annual Meeting, NCWM members voted to add a tentative code for commercial hydrogen gas-measuring devices to NIST Handbook 44. Since the majority of states require an NTEP Certificate of Conformance (CC) for commercial weighing and measuring devices, offering NTEP CCs for these devices would facilitate the acceptance of these devices in the commercial marketplace and assist states in their assessment of these devices.

At its 2010 meeting, the Measuring Sector established a small work group to develop a draft Publication 14 Hydrogen Measuring Devices Checklist for the Sector to consider at its next meeting. The Work Group consists of the following members:

Work Group on Hydrogen Gas-Measuring Devices NTEP Checklist	
Member	Company/Organization
Michael Keilty (Work Group Chair)	Endress and Hauser
Dennis Beattie	Measurement Canada (to link to expert MC’s compressed gases area)
Mike Gallo	CLEANFUEL USA
Norman Ingram Dan Reiswig John Roach Van Thompson	California Division of Measurement Standards
Juana Williams Tina Butcher Marc Buttler	National Institute of Standards and Technology

Following the Sector meeting, the Work Group held a Series of seven teleconferences from March through September and has completed their task to develop a draft checklist. The hydrogen USNWG will review the checklist during September and October, and any comments from the USNWG will be provided to the Sector. Comments received from members of the Sector prior to the meeting are encouraged and will also be provided to the Sector.

Recommendation: The Sector is requested to review the draft of the checklist [Attachment #1] and consider comments that are received up until the meeting from the USNWG and other Sector members. The Sector will be asked at the 2011 meeting to approve the checklist for adoption in Pub 14.

New Items:

4. Product Families Table - Include Water on Existing NTEP CC's

Source: Dmitri Karimov, Liquid Controls

Background: Flow meters are approved to very tight tolerances on aggressive liquids such as acids, alcohols, glycols and their mixtures with water and liquid fertilizers. Many of these liquids are water-based such as liquid fertilizers and glycol/water mixtures. Water is a significantly less aggressive fluid and has a higher NIST Handbook 44 tolerance than other liquids.

A note at the end of the Product Families Table in NCWM Publication 14 allows water to be used as a test product in the fuels product family.

Despite the above, NCWM Publication 14 requires separate tests on water in order to add water to the NTEP CC for PD and turbine meters.

Recommendation: Allow the “water” family (or specific liquids from the water family) to be added to an NTEP CC without additional testing based on approvals for certain other products. This can be accomplished by adding the following note at the bottom of the Product Families Table of NCWM Publication 14:

The water family (in its entirety or partially) can be included on an NTEP CC based on an approved product or range of products with similar metrological characteristics (specific gravity, conductivity, and viscosity - as applicable to the relevant meter technology) unless materials constituting the measuring element are known to deteriorate in contact with water.

5. Product Families Table – Change Test Requirements for Turbine Meters from Test A to Test E

Source: Dmitri Karimov, Liquid Controls

Background: In the Product Families table of NCWM Publication 14, turbine meters require testing on individual products with some exceptions. This approach, which was appropriate many years ago when turbine meters were first entering the custody transfer arena, has become outdated. Turbine meters have been tested extensively under NTEP. Turbine meters need at least to have product tests match those of PD meters because turbine meter influence factors are similar to those of PD meters.

Recommendation: Replace Test A with Test E for turbine meters and merge products into product category groups similar to those of PD meters.

6. Product Families Table – Consolidate Product Categories for PD and Turbine Meters

Source: Dmitri Karimov, Liquid Controls

Background: NCWM Publication 14 (Pub 14) has too many agri-chemical products categories for PD and turbine meters that were created many years ago and are outdated. This item also relates to the parallel proposal to match PD and turbine product categories.

Recommendation: Consolidate most of the agri-chemical product categories for PD and turbine meters:

- All solvents, glycols and alcohols, and chemicals in one group
- All crop chemicals (A, B, C, and D), fertilizers, and flowables in one group

Alternative proposal:

Add as a note at the bottom of the Product Families Table or somewhere else in the LMD-Technical Policy:

If a meter is approved for a product of low viscosity in one product family or category and the same meter is approved for a product of high viscosity in another product family or category, the meter will be approved for this viscosity range in both product families/categories.

This addresses concerns related to materials of construction and metrological influence factors.

7. Add Metrological Sealing Checklist to Measuring Devices Publication 14

Source: NTEP Measuring Labs

Background: At its Spring 2011 meeting, the NTEP Measuring Labs agreed that a sealing table checklist should be added to NCWM Publication 14 (Pub 14), Measuring Devices that is modeled after the example in the Pub 14, Digital Electronic Scales checklist, Section 10.

Recommendation: Form a work group to develop a sealing checklist to add to the Measuring Devices Pub 14 that is modeled on the example from Pub 14, Digital Electronic Scales checklist, Section 10 [Attachment #2].

8. Product Families Table – Categorization of Liquid CO₂

Source: NTEP Measuring Labs

Background: Liquid CO₂ does not appear in the Product Families Table in Technical Policy C. of the Liquid Measuring Devices (LMD). Therefore, it is difficult to determine whether the Product Category is compressed liquid, cryogenic liquid, or a new category of liquid. Without a clearly defined Product Category, it cannot be determined what tests are required to include liquid CO₂ on an NTEP CC. This item was originally introduced in 2008. At that time, the Sector had agreed to table the issue until more data was available to suggest the best approach to use for including CO₂ in the family of products table and for defining the test criteria. The Sector has not received additional data, however the issue remains that the categorization of liquid CO₂ remains undefined. In the absence of additional data to support any other categorization and in recognition of the unique properties of liquid CO₂, the most conservative approach would be to add liquid CO₂ to the Product Families Table with Test A status, which will require it to be tested individually in order to be added to an NTEP CC.

Recommendation: Liquid CO₂ should be added to the Product Families Table with input required from the Sector to determine what the Product Category should be. In the absence of data indicating otherwise, it is recommended that liquid CO₂ be introduced into the Product Families Table with Test A status (individually tested) as an interim measure to eliminate the current ambiguous status of liquid CO₂.

9. Product Families Table – Add Hydrogen (Compressed Gas)

Source: US National Work Group for the Development of Commercial Hydrogen Measurement Standards (USNWG)

Background: Section 3.39 Hydrogen Gas-Measuring Devices – Tentative Code was added to NIST Handbook 44 in 2011. There is no mention of hydrogen in the Product Families Table in Technical Policy C. Hydrogen should be added to the Product Families Table in Technical Policy C. to provide clarity as to the Test Requirements, Coverage, Product Category, and Typical Properties.

Recommendation: The Sector is asked to consider adding hydrogen to the checklist for all meter types that measure compressed gases, as shown in Attachment #3. Because of the unique properties of compressed hydrogen gas, the NTEP labs recommend that Test A, which requires individual testing, be specified for hydrogen gas.

10. Add Units for Compressed Gases to Technical Policy V. List of Price and Quantity Markings on Retail Motor Fuel Dispensers (RMFDs)

Source: US National Work Group for the Development of Commercial Hydrogen Measurement Standards (USNWG)

Background: Section 3.39 Hydrogen Gas-Measuring Devices – Tentative Code was added to NIST Handbook 44 in 2011. NCWM Publication 14, LMD Technical Policy V. List of Price and Quantity Markings on Retail Motor Fuel Dispensers (RMFDs) does not include units for CNG or hydrogen compressed gas in the list of Acceptable Delivered Quantity representations.

Recommendation: Add “kg”, “GGE”, and “GLE” to the list of “Delivered Quantity Acceptable” in the top right corner of the Table in Technical Policy V. as acceptable quantity units for CNG and hydrogen RMFDs.

11. Certificate of Conformance Parameters for Measuring Devices

Source: Marc Buttler, NIST Weights and Measures Division (WMD)

Background: The Publication 14 Administrative Policy P. Certificate of Conformance does not currently clarify what minimum required information must be included on all Certificates of Conformance (CC). While Policy P. lists several options for typical information to be included, there is no guidance on the basic minimum requirements for recording information about the device(s) covered by the CC. As a result, some CCs have been found which are missing information that is critical to the field officials. For example, some CCs do not expressly state the sealing category for the device within the CC, whereas other CCs provide detailed information on how a device is sealed and what sealing category applies. Identifying the basic components that should be included on every CC will provide for more consistent drafting by NTEP labs and easier interpretation by field inspectors.

Recommendation: Form a work group from the Sector to develop the requirements for the minimum parameters that must be included on all new CC’s for Measuring Devices to ensure that field officials have the basic information needed. One example of proposed language for amending Administrative Policy P. is indicated by underlined text below. The work group should develop this proposal to ensure that only necessary parameters are identified as being required, and that all of the necessary requirements are included.

P. Certificate of Conformance

The Certificate of Conformance may contain some or all of the typical information listed below:
[Information indicated with * is required on all certificates.]

P.1. Application of Type

- a. Approved ranges*.
- b. Maximum capacity*.
- c. Reference conditions.
- d. Normal conditions of use.
- e. Approved subjects of measurement: physical quantities, commodities, material, objects, or phenomenon that may be measured*.
- f. Special restrictions on application*.

P.2. Accuracy

- a. Accuracy class*.
- b. Nominal error(s); maximum permissible error(s).
- c. Required use of calibration charts, corrections or instrument constants.

P.3. Requirements of the Manufacturer

Required identification information, stamps, marks, and seal affixed at the factory*.

P.4. Requirements for Use

- a. Legally required auxiliary equipment and corresponding minimum characteristics*.

- b. For approved auxiliary equipment, identification of the measuring instruments in conjunction with which it may be legally used*.
- c. Operating instructions required to test or inspect the device*.
- d. Methods of sealing*.
- e. Sealing category*.

P.5. Summary of Findings

- a. The summary lists the characteristics, attributes, and conditions of the type that are subject to regulation*.
- b. Test results that include details of test method, fluid and property, meter size tested, flow rates tested, product temperature range, permanence duration and throughput, stationary or vehicle mount, and multi-product testing parameters.
- c. Photo of example device sufficient for field officials to be able to identify and confirm type.

12. Test for Mathematical Agreement of Card Reader after Power Loss

Source: Dan Reiswig, California DMS

Background: During development of the checklist for Hydrogen Gas-Measuring Devices, a gap was identified for CNG Card-Activated Retail Motor Fuel Dispensers. It has been noted in some cases that there is not mathematical agreement between the total quantity, the unit price, and the total price when executing the RMFD test 16.1. This test is designed to ensure that the dispenser will not dispense any fuel after power has been restored once there has been a shut down that was caused by a power interruption without reauthorization of the card activated device. The test does not currently call for any check of the mathematical agreement.

Recommendation: Add an additional check to test 16.1. of the RMFD checklist that verifies mathematical agreement after a power loss shut down of an RMFD (including CNG) as underlined in the following:

16.1. Authorize the dispenser and, with the pump “handle” on, interrupt power to any part (or all) of the system. The pump should deauthorize immediately. Specifically:

16.1.1. Authorize with a card and turn the “handle” on. Power down briefly, then restore power. Try to dispense product: the dispenser must not dispense because the power failure should have de-authorized the dispenser.

16.1.2. The dispenser must maintain mathematical agreement between the computed money value and the quantity (Quantity x Unit Price = Sales Price) at the point in time that de-authorization occurred.

13. Device Marking for Electronic Linearization for Positive Displacement Meters

Source: NTEP Measuring Labs

Background: During the 2010 meeting, the Measuring Sector considered the item “**Electronic Linearization for Positive Displacement Meters**” and agreed to recommend that the second paragraph of Technical Policy G be replaced with the following:

A measuring element may use factory-established linearization curves to establish the minimum flow range (5:1, 10:1, or as required) providing the linearization programming is installed during manufacturing and the programming cannot be altered after leaving the manufacturer.

Auxiliary equipment (e.g., indicator or register) with programmable multi-point calibration that alters the output signal from the measuring element to extend the flow range of the system beyond the measuring element’s required minimum flow range may be used and the auxiliary device’s multi-point calibration will be noted on the CC and must be marked on the meter.

The requirements for marking flow rate limitations on devices was discussed at the Spring 2011 NTEP Measuring Labs meeting in relation to this change, and it was determined that additional clarification is needed regarding the

marking requirement that is referenced in Publication 14, Section G. For example, if a device can have its range expanded by the addition of an optional auxiliary approved device that has multi-point calibration, do both ranges need to be marked on the device in case the auxiliary device is ever replaced or removed?

Recommendation: The Sector is asked to develop clarification as to how the multi-point calibration is to be marked on the meter and add this to the LMD checklist Section 11. Marking; “Code Reference: S.4.1.1. Marking Requirements; Limitation on Use.” The Sector is asked to consider adding the example below or offer other alternatives to clarify range of use limitations of a PD meter with and without an auxiliary multi-point indicator.

	WITHOUT AUX MULTI-POINT INDICATOR	WITH AUX MULTI-POINT INDICATOR
MIN FLOW	20 GPM	10 GPM
MAX FLOW	100 GPM	100 GPM

14. Product Families Table - Restore notation “(Above 50 °C)” to the heated products category definition

Source: NTEP Measuring Labs

Background: The NTEP Measuring Labs noted that the newly revised Product Families Table in NCWM Publication 14 Technical Policy C. is missing the statement “(Above 50 °C)” to qualify the “Heated Products” category. This statement had appeared in prior versions of the Product Families Table and the Sector had not discussed deleting the statement. Consequently, it appears that the statement was inadvertently omitted when the table was reorganized.

The Sector is asked to consider that NIST Handbook 44 currently lists Asphalt at temperatures greater than 50 °C in the Tolerances Table as Accuracy Class 0.3A with an Acceptance Tolerance of 0.3% and Heated Products (other than asphalt) at or greater than 50 °C as accuracy class 0.3 with an Acceptance Tolerance of 0.2 %. NIST Handbook 44 does not include a specific definition for “Heated Products” in the Definitions section.

Recommendation: The Sector is asked to consider restoring the term “(Above 50 °C)” to the “Heated Products” category abbreviations as shown below to clarify the temperature range that defines “Heated Products”.

Product Category Table – Category Abbreviations

Abbreviation	Product Category	Abbreviation	Product Category
Alc Gly	Alcohols, Glycols and Water Mixes Thereof	Fert	Fertilizers
CC-A	Crop Chemicals (Type A)	FL&O	Fuels, Lubricants, Industrial and Food Grade Liquid Oils
CC-B	Crop Chemicals (Type B)	Flow	Flowables
CC-C	Crop Chemicals (Type C)	Heated	Heated Products (Above 50 °C)
CC-D	Crop Chemicals (Type D)	Liq Feed	Liquid Feeds
Chem	Chemicals	Solv Chl	Solvents Chlorinated
Comp gas	Compressed Gases	Solv Gen	Solvents General
Comp liq	Compressed Liquids (Fuels and Refrigerants, NH ₃)	Sus Fert	Suspension Fertilizers
Cryo LNG	Cryogenic Liquids and Liquefied Natural Gas	Water	Water

15. Next Meeting

Recommendation: The Sector is asked to develop a proposed date and location for the next meeting.

Additional Items as Time Allows:

The NCWM S&T Committee and U.S. representation on OIML TC 3/SC 5 would appreciate input from the Measuring Sector on the following measuring-related issues on its agenda. If time permits, the Measuring Sector is asked for comments on these issues. In the interest of brevity, the narrative for each item is abbreviated to the extent practical. Full descriptions of the items can be found in the S&T Committee’s list of carryover items and its 2011 Interim Report. A copy of any regional association modifications or positions on the carryover items will be provided to the Sector when these are made available by the regions.

16. Section 3.31. Vehicle-Tank Meters; Paragraph T.4. Product Depletion Test (S&T Carryover Agenda Item)

Source: Northeast Weights and Measures Association (NEWMA). This item was originally part of the 2010 Annual NCWM Agenda Item 360-3 – Developing Items Part 3.31., Vehicle-Tank Meters - Item 1.

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

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

Option 1:

Modify Paragraph T.4. as follows:

T.4. Product Depletion Test. – The difference between the test result for any normal test and the product depletion test shall not exceed **one-half (0.5 %) percent of the volume delivered in one minute at the maximum flow rate marked on the meter. Product depletion test tolerances for typical meters are the tolerance** shown in Table T.4. Test drafts shall be of the same size and run at approximately the same flow rate.

Note: The result of the product depletion test may fall outside of the applicable test tolerance as specified in Table 1. Accuracy Classes and Tolerances for Vehicle-Tank Meters.

Delete current Table T.4.:

Table T.4. Tolerances for Vehicle Tank Meters on Product Depletion Tests, Except Milk Meters	
Meter Size	Maintenance and Acceptance Tolerances
Up to, but not including, 50 mm (2 in)	1.70 L (104 in³)[‡]
From 50 mm (2 in) up to, but not including, 75 mm (3 in)	2.25 L (137 in³)[‡]
75 mm (3 in) or larger	3.75 L (229 in³)[‡]

[‡]Based on a test volume of at least the amount specified in N.3. Test Drafts.

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

Option 1

<u>Table T.4.</u> <u>Tolerances for Typical Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters</u>			
<u>Meters Marked with Flow Rates in SI Units</u>		<u>Meters Marked with Flow Rates in Inch-Pound Units</u>	
<u>Marked Maximum Flow Rate¹</u>	<u>Maintenance and Acceptance Tolerances²</u>	<u>Marked Maximum Flow Rate¹</u>	<u>Maintenance and Acceptance Tolerances²</u>
<u>114 Lpm</u>	<u>0.57 L</u>	<u>30 gpm</u>	<u>0.15 gal (34.6 in³)</u>
<u>227 Lpm</u>	<u>1.14 L</u>	<u>60 gpm</u>	<u>0.30 gal (69.3 in³)</u>
<u>380 Lpm</u>	<u>1.90 L</u>	<u>100 gpm</u>	<u>0.5 gal (115 in³)</u>
<u>757 Lpm</u>	<u>3.78 L</u>	<u>200 gpm</u>	<u>1.0 gal (231 in³)</u>

¹Refer to T.4. for meters with maximum flow rates not listed.
²Based on a test draft volume of at least the amount specified in N.3. Test Drafts.

Option 2:

This option includes larger tolerances for smaller meters.

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

Note: The result of the product depletion test may fall outside of the applicable test tolerance as specified in Table 1. Accuracy Classes and Tolerances for Vehicle-Tank Meters.

Delete current Table T.4.:

<u>Table T.4.</u> <u>Tolerances for Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters</u>	
<u>Meter Size</u>	<u>Maintenance and Acceptance Tolerances</u>
<u>Up to, but not including, 50 mm (2 in)</u>	<u>1.70 L (104 in³)¹</u>
<u>From 50 mm (2 in) up to, but not including, 75 mm (3 in)</u>	<u>2.25 L (137 in³)¹</u>
<u>75 mm (3 in) or larger</u>	<u>3.75 L (229 in³)¹</u>

¹Based on a test volume of at least the amount specified in N.3. Test Drafts.

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

Option 2

<u>Table T.4.</u> <u>Tolerances for Typical Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters</u>			
<u>Meters Marked with Flow Rates in SI Units</u>		<u>Meters Marked with Flow Rates in Inch-Pound Units</u>	
<u>Marked Maximum Flow Rate¹</u>	<u>Maintenance and Acceptance Tolerances²</u>	<u>Marked Maximum Flow Rate¹</u>	<u>Maintenance and Acceptance Tolerances²</u>
<u>114 Lpm</u>	<u>0.68 L</u>	<u>30 gpm</u>	<u>0.18 gal (41.6 in³)</u>
<u>227 Lpm</u>	<u>1.36 L</u>	<u>60 gpm</u>	<u>0.36 gal (83.2 in³)</u>
<u>380 Lpm</u>	<u>2.28 L</u>	<u>100 gpm</u>	<u>0.6 gal (139 in³)</u>
<u>757 Lpm</u>	<u>3.78 L</u>	<u>200 gpm</u>	<u>1.0 gal (231 in³)</u>
<u>¹Refer to T.4. for meters with maximum flow rates not listed.</u>			
<u>²Based on a test draft volume of at least the amount specified in N.3. Test Drafts.</u>			

Background: At the 2011 NCWM Annual Meeting, the Committee reiterated its need for data to evaluate the impact of any proposed tolerances changes, noting that, to date, no data has been submitted to the Committee.

The Committee asks that the following test data be submitted to assist the Committee in making this assessment:

- make and model of the meter,
- marked maximum flow rate of the meter,
- actual delivery rate during the normal test,
- error (in cubic inches or percent) for the normal test,
- actual delivery rate during the product depletion test,
- error (in cubic inches or percent) for the product depletion test, and
- type of test (e.g., routine or follow-up)

[Technical Advisor's Note: This list was updated by the Committee following the Annual Meeting to include additional data points relative to the "normal test" and the "type of test."]

For information on submitting data, contact the NIST Technical Advisor, Tina Butcher by e-mail at tina.butcher@nist.gov or by phone at (301) 975-2196. The Committee also plans to distribute a request on WMD's Weights and Measures Directors' list serve for jurisdictions to submit data.

Dmitri Karimov, speaking on behalf of the MMA, indicated that the MMA continues to be concerned about the impact of any proposed changes on smaller meter sizes, particularly meter sizes that are less than 1-1/2 inches.

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

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

17. OIML B 3 Basic Certificate System for OIML Type Evaluation of Measuring Instruments and OIML B 10 Framework for a Mutual Acceptance Arrangement (MAA) on OIML Type Evaluations

Source: Chuck Ehrlich, National Institute of Standards and Technology

Background: Voting is scheduled to take place on Oct. 14 on the standards for the MAA and OIML type evaluation certificate system standards at the 46th CIML meeting in Prague, Czech Republic.

Recommendation: The Committee Drafts for both B3 and B10 are provided to the Sector as information. It is hoped that the NIST technical advisor will be able to provide the Sector with an update on the outcome of the Oct. 14 CIML voting at the time of the Sector meeting.
[Attachments #4 and #5].

18. G-S.1. Marking (Software) (S&T Carryover Agenda Item)

(The status of this item was changed from Information to Developing)

Sources: 2010 Carryover Item 310-3. This item originated from the NTETC SS and first appeared on the Committee's 2007 agenda as Developing Item Part 1, Item 1.

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

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

At its fall 2010 Interim Meeting, NEWMA stated that the WWMA proposed revision to the "item under consideration" and the questions raised during discussions of this issue have merit. NEWMA recommended this remain an Information item to give the Weighing Sector and the NCWM S&T Committee time to evaluate the new language.

At the 2011 Interim Meeting, the NCWM S&T Committee heard from Jim Pettinato, SS Co-Chairman on two key points.

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

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

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

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

At their May 2011 Annual Meetings, the CWMA recommended this item remain Informational while awaiting recommended changes from the SS. The NEWMA also recommended this item remain Informational until the SS has had the chance to report back to the NCWM S&T.

Prior to the 2011 NCWM Annual Meeting, NIST Technical Advisor Rick Harshman contacted SS Co-Chairman Jim Pettinato to obtain an update on the progress of the Sector's continuing development of this item. Mr. Pettinato provided WMD a draft summary of the March 2011 SS Meeting. Based on the information provided and Mr. Pettinato's explanation of the discussions that took place during the meeting, WMD suggested the SS consider recommending to the S&T Committee that the status of this item be changed from Informational to Developing in order to provide the SS additional time to more fully develop the item.

During the 2011 NCWM Annual Meeting, the Committee heard from WMD relative to whether or not the status of this item should be changed to Developing in order to provide the SS additional time to more fully develop the item based on the following points:

1. The current proposal is not developed enough for consideration by the S&T. Based on the diversity of comments heard on this issue, WMD believes the item is not close to a vote and that considerable work still needs to be done to develop the item before it could be considered for vote by the NCWM.
2. WMD interprets the current proposal to require software be marked with a nonrepetitive serial number when in fact it is not the intent of the SS to require such marking. Thus, it is believed that the language in the 2010 Committee's Final Report will need modification to resolve this issue.
3. The draft of the March 2011 SS Summary reported that several SS members envision G-S.1. being developed further to the extent that G-S.1.1. may not be needed.

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

During the S&T Committee's open hearings, Darrell Flocken, representing SMA, indicated that he believes the SS is intending to propose a change to the current item and looks forward to the further development of this item based on

the work of the SS. Dmitri Karimov, speaking on behalf of the MMA, agreed with the comments made by Mr. Flocken. No member of the SS provided any input during the open hearings.

There were three positions posted on the NCWM 2011 Online Position Forum. Of those three, two indicated neutral positions and the remaining one, posted by Gordon Johnson, Gilbarco, Inc. opposed the item and included the following comments:

Gilbarco does not support the current proposed language. Our pumps and dispensers have a numeric display capable of displaying 6 digits. It is not currently possible to display the version identifier or an abbreviation or symbol that identifies the version number as required in (d) (1) and (2). It is not possible to access the software version using "one or, at most, two levels of access" as noted in section G-S.1.1 (3). We do not currently offer a menu based system and do not offer functions such as "Metrology," "System Identification" or "Help." We do not have the ability not offer icons or symbols. Meeting the new marking requirements will be costly to the customer. We can currently display the software version number (i.e., Software Version number 01.8.30 would be shown on the main display as 01830 by using controls on the device). The software version will also be displayed during the power up cycle. Recommend the status be changed to informational.

The Committee discussed the comments offered by WMD, SMA, and others. After considering those comments, the Committee agreed to change the status of this item to Developing because the item lacks enough information for full consideration and a full proposal had yet to be developed.

Recommendation: This item is included on the Measuring Sector's agenda to keep Sector members informed of the item and to allow for Sector comment, discussion, and input to the S&T Committee.

19. Interpretation of VTM Code 3.31., Paragraph S.2.4., With Regard to Individual vs. Multiple Deliveries

Source: NTEP Measuring Labs and Tina Butcher, NIST WMD

Background: NIST received an inquiry from a regulatory official regarding the application of the VTM code; paragraph *S.2.4 Zero-Set-Back Interlock*. A buyer received a receipt for an individual delivery that was labeled "multiple delivery." This discussion revealed that the code is not clear regarding how the zero-set-back interlock and 3-minute timeout are to function relative to both "individual" and "multiple" deliveries. There currently is no requirement for a delivery to be designated as "individual" or "multiple." However, the NTEP Measurement Labs agreed that such a provision would be beneficial to field officials in identifying improper use of the device. The labs also discussed how paragraph S.2.4. is currently being implemented and agreed there may be confusion on how the current language applies.

Recommendation: NIST requests input on the development of a proposal to help clarify how S.2.4. was intended to apply and on the concept of requiring the type (i.e., "individual" or "multiple") of delivery to be automatically identified. Modifications to paragraph S.2.4. might include an addition of a new user requirement that explains how the operator is to control and/or document "individual" vs. "multiple" delivery status. The proposal might also clearly explain if and how the 3-minute timeout is to function depending on the "individual" vs. "multiple" status.