Specifications and Tolerances Committee
Interim Agenda

Brett Saum, Chairman
San Luis Obispo County, California
Weights and Measures

Reference
Key Number

300 INTRODUCTION

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

The recommendations are statements of proposals and are not necessarily those of the Committee. Suggested revisions to the handbook are shown in **bold face print** by ~~**striking out**~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in **bold-faced *italics.***

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

Table A
Index to Reference Key Items

Table B
Appendices

Table C
Glossary of Acronyms

AWS	Automatic Weighing Systems	NEWMA	Northeastern Weights and Measures Association
AWWA	American Water Works Association	NIST	National Institute of Standards and Technology
BCS	Belt-Conveyor Scales	NTEP	National Type Evaluation Program
CC	Certificate of Conformance	NTETC	National Type Evaluation Technical Committee
CWMA	Central Weights and Measures Association	NW&SA	National Weighing and Sampling Association
EPO	Examination Procedure Outline	OEM	Original Equipment Manufacturer
GS	NTETC Grain Analyzer Sector	Pub 14	NCWM Publication 14
GMM	Grain Moisture Meters	RMFD	Retail Motor-Fuel Dispenser
GPMA	Gasoline Pump Manufacturers Association	SI	International System of Units
HB 44	NIST Handbook 44	SMA	Scale Manufacturers Association
HB 130	NIST Handbook 130	SWMA	Southern Weights and Measures Association
LMD	Liquid-Measuring Device	WG	Work Group
LPG	Liquefied Petroleum Gas	WMD	NIST Weights and Measures Division
MDMD	Multiple Dimension Measuring Devices	WS	NTETC Weighing Sector
MFM	Mass Flow Meter	WWMA	Western Weights and Measures Association
MMA	Meter Manufacturers Association	USNWG	NIST/OIML U.S. National Working Group
MS	NTETC Measuring Sector	VTM	Vehicle-tank Meters
NCWM	National Conference on Weights and Measures, Inc.		

"Handbook 44" (HB 44) means the 2009 Edition of NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices"

"Handbook 130" (HB 130) means the 2009 Edition of NIST Handbook 130, "Uniform Laws and Regulations in the Areas of Legal Metrology and Fuel Quality"

Note: NIST does not imply that these acronyms are used solely to identify these organizations or technical topics.

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

310 GENERAL CODE

310-1 G-S.8. Provision for Sealing Electronic Adjustable Components, G-S.8.1. Access to Calibration and Configuration Adjustments, and G-S.8.2. Automatic or Semi-automatic Calibration Mechanism

Source: 2009 Carryover Item 310-1. This item originated from the Southern Weights and Measures Association (SWMA) Committee and first appeared on the Committee's 2008 agenda.

Purpose: Amend General Code paragraph G-S.8. to clarify what is considered an effective method of sealing, and requirements for indicating and recording appropriate information when a device is in a metrological adjustment mode.

Item Under Consideration: After the 2009 Interim Meeting, the Committee agreed that the proposal *was not ready* for a vote and consequently did not include proposed language in its Interim and Annual Reports. However, the Committee agreed to keep this item on its agenda with the expectation that proposed language will be submitted for the 2010 Interim Meeting.

Background/Discussion: At its 2007 Annual Meeting, the SWMA received a proposal to add requirements to G-S.8. to assure that a device could not be sealed in the configuration mode and continue to operate normally. Such

a condition could facilitate fraud. The proposal, as submitted, required that a device continuously indicate when access to the set-up mode was not disabled.

At the 2008 Interim Meeting, the Committee reviewed the comments received during the open hearing and discussed the alternate proposals provided by NIST Weights and Measures Division (WMD) and Scale Manufacturers Association (SMA). The Committee agreed that if a device designed for commercial applications is capable of being "sealed" with external or remote access to the calibration or configuration mode, it is clearly in violation of the current G-S.8. Provision for Sealing Electronic Adjustable Components and G-S.2. Facilitation of Fraud and, therefore, no change to the existing language is needed. However, because of the ongoing disagreement on the interpretation of G-S.8. among the National Type Evaluation Program (NTEP) laboratories, the Committee agreed to make changes to the proposal based on the concerns raised during the open hearing.

The changes to the original proposal made a distinction between configuring a device to either enable or disable external or remote access to the calibration and configuration modes and taking the device out of a normal mode of operation and putting it into a special mode of operation where adjustments are made to calibration and configuration parameters. In other words, if the internal position of a switch or jumper enables external access to the calibration and configuration modes, the device will operate normally until an operator takes action, such as entering a pass code, depressing and holding down a specific key, or uses other means to enter a special operating mode to make adjustments to calibration and configuration parameters. The device must be equipped with an approved audit trail, or that a physical seal is required to be broken before any metrological adjustments to comply G-S.8. The Committee also believes that an indication for the adjustment mode of operation is only necessary for devices with approved category 1, 2, or 3 audit trails and that it not be operable in normal weighing or measuring operation.

The proposal as revised in 2008 stated that:

- In the case of a device with a physical security seal, the application of the seal means that the external or remote access that enables the calibration and configuration modes is automatically disabled.

- In the case where a device has an approved audit trail, the device would be required to clearly and continuously indicate on the display (and printed if equipped with a printer) that it is in a calibration mode and not the normal operating mode.

At the 2008 Annual Meeting, the Committee heard comments from WMD which noted that the alternate language submitted by SMA would require that *all* devices provide the operator with indications in the calibration mode. This would encompass mechanical and electronic devices and devices that use category 1 physical seals. Additionally, WMD believes that a device does not need indications that it is in a calibration or configuration mode if it is incapable of providing indications that can be interpreted, printed, or transmitted to a memory device as a correct measurement value. WMD suggested that the Committee amend the recommendation to address some of the concerns noted by the Central Weights and Measures Association (CWMA), NTEP participating laboratories, and WMD since the 2008 Interim Meeting.

The Committee agreed with the comments from the CWMA and WMD and amended paragraph G-S.8.1. to:

- delete the references to the sealing categories of device,
- clarify printing requirements, and
- include an option that the device not operate or provide metrological indications that can be interpreted, or transmitted into memory or to recording elements while in this mode.

Just prior to the 2008 voting session, the Committee noted that the revised language in G-S.8.1.(a) was inadvertently changed to where it could be literally read that the physical seal itself disabled access to the adjustment mechanisms instead of preventing access to the mechanism. Consequently, the Committee changed the status of the item from Voting to "Informational." The Committee believed that the intent of the recommendation is to ensure that the access to the calibration and configuration modes is disabled.

The Committee redrafted the language in paragraph G-S.8.1. and submitted the following revised language for G-S.8.1. to the regional weights and measures associations for further review and consideration.

G-S.8.1. Access To Calibration and Configuration Adjustments - Electronic Devices. – An electronic device shall be so designed that access to calibration and configuration modes, including external and remote access, are only permitted when:

(a) the application of the physical security seal shall ensure that the access to the calibration and configuration modes is disabled, or

(b) the calibration and configuration adjustments are protected by an approved category 1, 2, or 3 audit trail, and the device shall clearly and continuously indicate and print, if equipped with a printer, that the calibration and configuration adjustment modes are enabled.

During the calibration and configuration adjustment mode, electronic devices shall either;

- ***not provide metrological indications that can be interpreted, or transmitted into memory, or printed while it is in the calibration and/or configuration adjustment mode as a correct measurement value, or***

- ***clearly and continuously indicate that it is in the calibration and/or configuration adjustment mode and record such message if capable of printing in this mode.***

(Nonretroactive as of January 1, 201X)

At its 2008 fall meeting, the SMA supported the intent of the item and recommends the following language:

G-S.8.1. Access to Calibration and Configuration Adjustments. – A device shall be so designed that:

(a) The application of the physical security seal shall ensure that the calibration and configuration modes are disabled, or

(b) The calibration and configuration adjustments are protected by an approved category 1, 2, or 3 method of sealing, and the device shall clearly and continuously indicate and print, if equipped with a printer, that the calibration and configuration adjustment modes are enabled.

During the calibration and configuration adjustment mode, electronic devices shall either;

- ***The device shall not provide metrological indications that can be interpreted, or transmitted into memory, or printed while it is in the calibration and/or configuration adjustment mode as a correct measurement value, or***

- ***The device shall clearly and continuously indicate that it is in the calibration and/or configuration adjustment mode and record such message if capable of printing in this mode.***

Nonretroactive as of January 1, 201X)

(Added 201X)

During the 2009 NCWM Interim Meeting open hearing, the committee reviewed comments from the fall 2008 Western Weights and Measures Association (WWMA), CWMA, and Northeastern Weights and Measures Association (NEWMA) meetings that supported the language in the Committee's Interim Agenda and recommended that this item move forward as an Informational item to allow further review, comments and recommendations by the other regional associations, and other interested parties.

The SWMA heard no specific recommendations for change to the proposal during its 2008 Annual Meeting open hearings. The SWMA heard that the SMA plans to further review the item and may have additional recommendations to propose for consideration. The Committee supported the changes proposed by the NCWM

S&T Committee at the July 2008 Annual Meeting, noting that there were some comments regarding portions of the language that may need to be addressed. If an agreement cannot be reached on proposed changes to these paragraphs, the SWMA recommended that additional work is needed before the item is ready for a vote and that the NCWM S&T Committee may wish to consider at least incorporating interpretations and guidelines for the existing language in its reports. Consequently, the SWMA recommended maintaining this as an Informational item on its agenda.

At its 2008 fall meeting, the SMA supported the intent of the item and suggested an alternate proposal for consideration.

At the 2009 Interim Meeting, WMD added that it had received comments questioning how the application of a physical seal (as recommended by the manufacturer and listed on the Certificate of Conformance (CC) ensures that the calibration and configuration modes are disabled. Specifically, what does that presence of the physical seal (pressure sensitive or lock and wire) do to the device that disables the calibration and configuration modes?

In considering these comments, WMD suggested that the Committee consider the following changes:

- Modify G-S.8. Provision for Sealing Electronic Adjustable Components to clarify the differences in requirements between physical seals and electronic seals (audit trails);
- Add new specifications for externally and remotely configurable devices;
- Amend G-UR.4.5. Security Seal to require the user to verify that the device is correctly configured to disable external configuration;
- Add definitions from the white paper on the "Metrological Requirements for Audit Trails" adopted by NCWM in July 1993; and
- Add a new definition for externally configurable devices.

Mr. Patoray, Consultants on Certification (CoC), LLC, related discussions from the NTETC Weighing Sector where it was reported that service agents were leaving scales configured with external calibration capability and then applying a security seal, which did not follow the manufacturer's instructions. He also expressed concerns that the language proposed in the 2009 Interim Agenda would require a manufacturer to design a device where the application of the physical seal (e.g., lock and wire, pressure sensitive) would disable external access to the configuration mode. Currently, all that a physical seal does is provide an indication that the seal has been broken and thus leave a device subject to adjustment. He believes that the language in the proposal would force the manufacturer to redesign access covers to devices so that the cover disables the external adjustment capability. Consequently, the application of the security seal secures the cover in place and then, if broken, provides an indication that the device may have been adjusted.

The Committee also received a comment from Mr. Will Wotthlie, Maryland, stating that he was concerned with the language that requires that the physical seal "shall ensure" that external access to the configuration mode is disabled. He provided examples of a mechanical automatic temperature compensation (ATC) element where a specially designed sealing pin had to be installed before the physical seal could be applied and where electronic motor-fuel devices have a specially designed cover plate where the closing of the cover plate disables the electronic configuration. The manufacturer has the option under this proposal to either specially design the device with a physical seal as a method of sealing (e.g., a specially designed sealing pin on the aforementioned mechanical ATC element) or design the device with an electronic method of sealing (i.e., an approved audit trail).

Several manufacturers stated that this proposal was not ready and that designs for the method of providing security to the metrological adjustments should be left to the manufacturers. Mr. Darrell Flocken, Mettler-Toledo, added that the intent of the proposal is that the manufacturer can either design a device so that a security seal cannot be applied without placing the device into the proper mode *or* design the device so that it has an approved audit trail.

The Committee agreed with the comments that the proposal ***is*** *not ready* to become a Voting item and suggested that further development to the proposal address the following concerns:

1. Avoid language that allows the indication of usable metrological values while a device is in the adjustment mode for devices that do not have an event logger.

2. Recognize that more than one method of sealing is acceptable on a single device; for example, using a lock and wire seal for the mechanical adjustments and an audit trail for electronic adjustments.

3. Recognize that some specific codes in HB 44 do not have language for device categories and corresponding methods of sealing.

4. Require an obvious indication when a device is being adjusted if its method of sealing is a physical security seal.

5. Clarify that the application of a physical security seal to a specially designed and sealable plate or cover that disables external access to the configuration and adjustment mode is not the only method to seal adjustable components.

Consequently, the Committee recommended that this item remain Informational. See the 2008 NCWM Annual Report for additional background information.

After the 2009 Interim Meeting, the NIST technical advisor developed language that could be further developed by the regional weights and measures associations, (NTETC) sectors, and other interested parties with the intent that a revised proposal can be forwarded to the Committee for consideration at the 2010 NCWM Interim Meeting. The NIST WMD proposal would reformat G-S.8.1. for easier reading, recommended language for device indications and recorded representations while in the adjustment mode, and proposed language to recognize that devices may have both audit trails and physical seals for different components of a device (e.g., a physical seal for meter adjustments and an event counter for blend settings).

G-S.8. Provision for Sealing Electronic Adjustable Components. *– A device shall be designed with provision(s) for:*

(a) applying a ***physical*** *security seal that must be broken, or*

(b) using other approved means of providing security (e.g., data change audit trail available at the time of inspection)

before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism.

[Nonretroactive as of January 1, 1990]

(Amended 20XX)

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

(Added 1985) (Amended 1989 and 1993)

G-S.8.1. Multiple Weighing or Measuring Elements that Share a Common Provision for Sealing. **- (Unchanged)**

G-S.8.2. Multiple Sealing Methods. – Weighing and measuring devices may be approved for use with multiple methods for sealing adjustable components, such as physical seals for calibration adjustment (e.g., load cells, meters, etc.) and event counters or event logger for the configuration parameters (e.g., capacity, interval size, octane blend settings, etc.).
[Nonretroactive as of January 1, 201X]

(Added 201X)

G S.8.3. Adjustment Mode Indications. – During the calibration and configuration adjustment mode, the device shall:

(a) Not provide metrological indications that can be interpreted, or transmitted into memory, or printed while it is in the calibration and/or configuration adjustment mode as a correct measurement value, or

(b) Clearly and continuously indicate that it is in the calibration and/or configuration adjustment mode, and record such message if capable of printing in this mode.

Nonretroactive as of January 1, 201X)

(Added 201X)

At its 2009 Annual Meeting, the CWMA supported the intent of the SMA proposed language from its 2009 spring meeting and believed that the specific wording should be thoroughly reviewed and that the terms "calibration and configurations modes" are not widely understood. The CWMA suggested that the definitions for the word "adjustment" and "adjustment mode" from the 1993 white paper on Audit Trails be included in HB 44 so that the proposed SMA language might read ". . . the calibration and/or configuration adjustment modes . . ."

At its 2009 Annual Meeting, NEWMA supported the intent of this item. However, NEWMA is concerned that this item is getting over-complicated and asks the Committee to consider requiring that a simple enunciator indicating the device is in "cal mode" might be sufficient.

At the 2009 Annual Meeting, the Committee reviewed comments from the SMA 2009 spring meeting supporting the intent of the items submitted the revised proposal to the Committee. Mr. Stephen Patoray, CoC submitted comments and additional background information on how some devices can have external access to the adjustment mode after the application of a physical seal (and is not equipped with an audit trail). In his letter to the Committee, he states that some devices are designed with a switch (not momentary) or jumper inside the case (that enables or disables external access to the adjustment mode). This switch or jumper has two positions, on or off. When the switch is in the off position, the device cannot be put into a calibration or configuration adjustment mode and is in the normal weighing mode. When the switch is in the on position, the device shows no apparent indication of being in anything other than the normal weighing mode. However, with a certain sequence of keyboard entries, and possibly a password from the keyboard, the indicating element can be placed into calibration or configuration adjustment mode. After the steps are completed from the keyboard and the operator is done with whatever adjustments in calibration or configuration are needed, the device will return to normal weighing mode. The switch is still on. The instructions say (or the design provisions state) that the switch is to be turned off before the case is put back together and the device is sealed. In jurisdictions where a registered service technician is able to seal a device, he/she can decide not to turn the switch off. The device works normally. However, upon his/her return, the service technician does not need to break the seal on the case to enter the calibration/configuration mode; they only need to enter the keystroke sequence (or possibly the password) from the keyboard. This saves them time by not having to remove the seal and the case to flip the switch or set the switch to on position. This is not how the device was "designed" to work, but this is a method that has been in use in many indicating elements for many years. One could argue this is an enforcement issue.

CoC added that the NTEP labs were and still are in a bad position. If an applicant for an NTEP CC describes the method of how the device is to be sealed, this is what the lab evaluator is going to evaluate. While in some cases, the lab evaluator may attempt to simulate other scenarios, it is not possible to ask the lab evaluator to attempt to evaluate all possible scenarios that could happen with a device in the field. Also, it was/is the opinion of some of the lab evaluators that they have no clear method or description in HB 44 to not allow a design as described above. However, all lab evaluators believe that the method described above does not provide a truly "effective method of sealing." That is why several years ago the NTEP labs asked for clarification of G-S.8. To date there has been much work on this item, with several failed attempts to rewrite this section, but at this time, this is still an Informational item and there are still indicating elements out in the field with this ineffective method of sealing. There is the appearance that the device is sealed with a physical seal that must be broken; however, the device can be calibrated or configured from the keyboard because the proper method of sealing has not been followed by registered service technicians.

CoC believes there may be nothing wrong with the current G-S.8. wording, as part of the general code. However, this issue does need to be addressed in each of the individual or specific codes. There may be several solutions for newly designed devices, but it is not the role of HB 44 to attempt to actually put design constraints on manufacturers only to place requirements that must be met by some type of design solution.

During the 2009 NCWM Annual Meeting, the Committee received comments during the open hearing that no action may be needed and that the existing language in HB 44 is sufficient. Additional comments indicated that other proposals are overly complex. Oregon and Maryland believe that amended requirements for sealing are needed by the NTEP labs and field officials in order to consistently interpret and apply sealing requirements.

The Committee believes that all parties agree with the intent of the proposal. Both the WMD and SMA proposals include language that restates the existing language in G-S.8. but is essentially reformatted for clarification. Additionally, both proposals include new requirements for providing indications when a device is in adjustment mode. WMD included further language to address devices that may have more than one method of sealing.

The Committee recommended that this item remain Informational.

At its 2009 meeting, the NTETC Weighing Sector (WS) reviewed the comments from the S&T Committee, the background information in the NCWM 2008 Annual and 2009 Interim Reports, and the summary of proposals provided by the NIST Technical Advisor. The WS believes that existing language in HB 44 is sufficient and that the Sectors review existing type evaluation criteria to verify that devices shall be designed with:

1. provision(s) for applying a physical security seal that must be broken before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism, or

2. other approved means of providing security to document any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism (e.g., data change audit trail available at the time of inspection).

At its 2009 Interim Meeting, the CWMA commented that the Committee's "redrafted" language in the 2009 NCWM Interim Report still had some contradictory language, and did not define what is considered a clear printed indication of a devices calibration or configurations status. The CWMA recommends this item remain Informational and amended the Committee's recommendation as follows:

G-S.8.1. Access to Calibration and Configuration Adjustments - Electronic Devices. – An electronic device shall be so designed that access to calibration and configuration modes, including external and remote access, are only permitted when:

(a) the application of the physical security seal shall ensure that the access to the calibration and configuration modes is disabled, or

(b) the calibration and configuration adjustments are protected by an approved category 1, 2, or 3 audit trail, and the device shall clearly and continuously indicate and print, if equipped with a printer, that the calibration and configuration adjustment modes are enabled.

During the calibration and configuration adjustment mode, electronic devices shall not provide metrological indications that can be interpreted, or transmitted into memory, or printed while it is in the calibration and/or configuration adjustment mode as a correct measurement value
(Nonretroactive as of January 1, 201X)

During the 2009 WWMA Annual Technical Conference, Mr. Darrell Flocken, Mettler Toledo, speaking as chairman of the WS, reported the Sector's position as stated above, and noted that the Sector can develop additional guidance in NCWM Publication 14 to ensure uniform interpretation of the requirement during type evaluation. Mr. Lou Straub, representing SMA, stated that SMA supported the intent of the proposed changes, but had presented specific suggestions for modifying the language to the NCWM S&T Committee. Mr. Straub noted that SMA has not met

since prior to the 2009 NCWM Annual Meeting, so SMA would need to reconsider any additional thoughts presented during that meeting and the August 2009 WS meeting.

In its review of this issue, the WWMA expressed concerns about a device which could be sealed in a mode that would allow access to calibration or configuration changes without breaking a seal. The WWMA agrees with the position of the NCWM S&T Committee that the current language in paragraph G-S.8. requires that a security seal be broken before a metrological change can be made to a device (or other approved means of security, such as an audit trail provided). Thus, once a security seal is applied, for example, it should not be possible to make a metrological change to the device without breaking that seal. Since this philosophy addresses provisions for protecting access to metrological adjustment, the philosophy should be applied consistently to all device types. Therefore, the Committee recommends this remain an Informational item.

At its October 2009 meeting, the NTETC Measuring Sector agreed that Measuring Devices with NTEP CCs have been evaluated to either:

1. not function in the calibration or configuration mode;

2. not be sealed in the calibration or configuration mode; or

3. clearly indicate the device is in the calibration or configuration mode.

The MS agreed that these options reflect the intent of paragraph G-S.8. and, because the intent of the paragraph is understood and appropriately applied by the measuring community, the Sector recommends that no changes be proposed to paragraph G-S.8.

The SWMA recommends that this proposal be made Informational. The SWMA agreed that a device should be designed so that it can either not operate or not be capable of indications that might be interpreted as a valid measurement while it is in the calibration or configuration mode. The SWMA S&T Committee is concerned that a device left to operate while in this mode may facilitate fraud since adjustments might be inadvertently or intentionally made to metrologically significant features.

The SWMA is interested in the input the NCWM S&T Committee receives from the fall 2009 Technical, Industry, and Regional Weights and Measures Association meetings on this issue for the 2010 NCWM Interim Meeting. The Committee recommends that the final modifications to the General Code ensure the intent of the requirement is clear and is uniformly interpreted.

NEWMA supported this item remaining as Informational at its 2009 Interim Meeting.

See the 2008 NCWM Annual and 2009 Interim Reports for additional background information.

310-2 Appendix D – Definition of Electronic Devices, Software-Based and Built-For-Purpose Device

Source: 2009 Carryover Item 310-2. This item originated from the NTETC Software Sector and first appeared on the Committee's 2007 agenda as Developing Item Part 1, Item 2.

Purpose: This proposal deletes the current term and definition of "built-for-purpose device" and replaces it with the term and definition for "software-based electronic devices." The proposed definitions are intended to clarify that all electronic weighing and measuring devices include software and to classify the types of software based on the way the software is installed or modified.

Item Under Consideration: Delete the current definition of built-for-purpose device as follows:

~~**built-for-purpose device. Any main device or element which was manufactured with the intent that it be used as, or part of, a weighing or measuring device or system. [1.10]**~~

~~**(Added 2003)**~~

Add a new definition and a cross-reference to Appendix D in HB 44 for "Electronic devices, software-based" as follows to replace the current definition of "built-for-purpose device":

Electronic devices, software-based. – Weighing and measuring devices or systems that use metrological software to facilitate compliance with Handbook 44. This includes:

(a) Embedded software devices (Type P), aka built-for-purpose. – A device or element with software used in a fixed hardware and software environment that cannot be modified or uploaded via any interface without breaking a security seal or other approved means for providing security and will be called a "P," or

(b) Programmable or loadable metrological software devices (Type U), aka not-built-for-purpose. – A personal computer or other device and/or element with PC components with programmable or loadable metrological software and will be called "U." A "U" is assumed if the conditions for embedded software devices are not met.

Software-based devices – See Electronic devices, software-based.

Background/Discussion: In 2005, the Board of Directors established an NTETC Software Sector. One of the tasks of the Sector is to develop a clear understanding of the use of software in today's weighing and measuring instruments.

At the Software Sector's October 2007 meeting, it was initially suggested that the term "not-built-for-purpose" be removed from the wording in NIST HB 44 paragraph G-S.1.1. since there is no definition for a not-built-for-purpose device in HB 44. After a lengthy discussion related to the terms "built-for-purpose" and "not-built-for-purpose," the Sector agreed these terms were not clear and should be replaced with the terminology proposed above. The proposed definitions are based on the revision of OIML R 76 Non-automatic weighing instruments Subsections 5.5.1. (Type P) and 5.5.2. (Type U).

At the 2008 Annual Meeting, the Committee heard comments from the former Software Sector Chairman indicating that the Sector had completed its review of this item and could not develop it any further. The Chairman requested that the Committee consider moving the item from the Developing items section of the agenda and at least make it an Informational item to facilitate discussion and comment on the proposed language. Consequently, the Committee agreed to change the status of the item from Developing to Informational in its agenda.

At its 2008 Annual Meeting, the WWMA agreed to propose this item remain Informational, based on comments heard supporting the item, until other interested parties had the opportunity to provide comments.

At its 2008 Interim Meeting, the CWMA heard comments during their open hearings in favor of the item and no comments were made in opposition. The CWMA recommends this item go forward as a Voting item.

At its 2008 Interim Meeting, NEWMA discussed how this item would affect field examination and verification of software. NEWMA recommends this item move forward as Informational.

At its 2008 Annual Meeting, the SWMA heard comments indicating that the Software Sector is seeking additional input on the proposed definitions and views the proposed changes as a first step in developing wider changes to the General Code and Definitions to better accommodate software-based devices. The SWMA agrees that additional review and study is needed before the proposal can be forwarded as a Voting item and therefore, is maintaining this item as an Informational item on its agenda. The SWMA encourages people to review this proposal and the proposal in Item 310-3 and provide input to the NCWM S&T Committee and the Software Sector. The SWMA is interested in comments from other organizations, including SMA. In the meantime, the Committee also offers the following comments for consideration:

- The term "software-based electronic devices" is not currently included in NIST Handbook 44. The Committee acknowledges that this proposal is a step toward a broader proposal; however, it believes it is inappropriate to include a definition for a term that is not currently used in the handbook.

- There needs to be a definition and/or cross-reference for the terms "Type P" and "Type U." A better approach might be to add a reference for "not-built-for-purpose;" include cross-references for terms "Type P" and "Type U" to the terms "built-for-purpose" and "not-built-for purpose;" and develop proposed changes to the General Code to incorporate the new terms "Type P" and "Type U." This would ensure references to terminology that is being used in Handbook 44.

At the 2009 NCWM Interim Meeting, the Committee received comments from the SMA stating that it now opposes this item since there is no technological justification for making a distinction in software-based device types. Mr. Flocken, Mettler-Toledo speaking on behalf of the SMA added that the SMA can only provide limited responses; SMA continues to support the efforts of the Software Sector and the SMA response is based on the concern that the proposed definitions in this recommendation and the marking requirements proposed in agenda Item 310-3 will make a weighing device more complex than what is currently produced. The Meter Manufacturers Association (MMA) indicated that it supports the item as written in the recommendation.

Mr. Wotthlie, Maryland, does not agree with the SMA position that there are no technological differences between the types of software-based devices. He added that Type P devices and separable elements have limited flexibility in changing software and indications and frequently include the sensing elements necessary for the measurement (e.g., load cells, meters, etc.), whereas Type U devices and separable elements are typically devices that:

1. do not contain measuring elements;

2. can be replaced with compatible equipment and display devices purchased from any number of sources; and

3. only process metrological information received from measuring and other sensing elements.

Mr. Patoray, CoC, LLC, agrees with the SMA that there are few differences between Type P and U software-based devices. However, there are significant differences between Type P and U devices in that a Type P device is defined as an instrument that requires a security means since the instrument has fixed hardware (including sensing components), where the metrological software is ***embedded*** into the instrument. Type U devices do not include fixed components, and metrological software cannot be sealed using physical security seals or the minimum form of an audit trail (i.e., two event counters).

Software Sector Co-chair, Mr. Jim Pettinato, FMC Technologies, added that international recommendations recognize the differences between embedded software and programmable/loadable software. Additionally, the Software Sector recommends that this item remain Informational to allow conference members to further study the proposed definitions.

The Committee agreed with the comments received during the open hearing and the request from the Co-chairman of the Software Sector and agreed that this item should remain an Informational item for further review.

At its 2009 Spring Meeting, the SMA opposed this item, restating its point that there is no longer a technological basis for making this distinction in device types.

At its 2009 Spring Meeting, the Software Sector stated that it seems resistance to this item stems not from a disagreement with the intention, but from either a misunderstanding of the applicability or unrelated concerns over marking requirements. Further discussion was related to how to best present the opinion/goals of the Sector to the interested external parties, such as the NCWM standing committees and the individual states. Some discussion on the wording of the definitions took place as well, with the slightly modified version being discussed. However, no consensus was reached on any language change. The Sector did agree that including the reason(s) for proposing these definitions as part of the effort to educate/promote external parties would be beneficial; and that we should attempt to explain the reasoning/intent of the proposed definitions together with/as part of the action items for Item 1.

At their 2009 spring meetings, the CWMA and NEWMA supported this item as being Informational and understands a report is coming from the Software Sector, which should be reviewed prior to any further recommendations. The CWMA heard comments from SMA in opposition of this item. Additionally, Mr. Patoray, CoC, strongly supported the proposed definitions and stated the Sector needed to continue to work on this item.

During the 2009 NCWM Annual Meeting, the Committee considered the comments from the SMA on the language in the Committee's Interim Report, the report from Mr. Patoray, and the Software article in the Spring NCWM newsletter. The Committee agreed to keep this item Informational to allow updated comments from the regional weights and measures associations and other interested parties based on information in the summary of the March 2009 meeting of the Software Sector.

At its 2009 Interim Meeting, the CWMA received comments that the proposal is sufficiently developed and recommends moving this item forward as a Voting item on the Committee's agenda.

At its 2009 Annual Technical Conference, the WWMA received comments from Mr. Straub, speaking on behalf of SMA, indicating the SMA continues to oppose this item, noting that requirements should apply equally to the two different device types described. The WWMA received no other input on this item and recommends this item should remain Informational until the Software Sector has had an opportunity to review comments from the 2009 NCWM Annual meeting and any comments made at subsequent regional weights and measures association meetings.

At its 2009 Annual Meeting, the SWMA recommended keeping the status of this proposal to delete the current definition of built-for-purpose device and add a new definition and a cross-reference to Appendix D in HB 44 for "Electronic devices, software-based" to replace the current definition of "built-for-purpose device" as an Informational item. The SWMA agreed that the Software Sector should continue to work on the proposal until it arrives at some final language.

During its 2009 Interim Meeting, NEWMA stated that it supports the Committee's decision to keep this item Informational to allow updated comments from the regional weights and measures associations and other interested parties based on information in the summary of the March 2009 meeting of the Software Sector.

Additional background information on this item can be reviewed in the 2008 Final Report of the Committee.

310-3 G-S.1. Identification. – (Software)

Source: 2009 Carryover Item 310-3. This item originated from the NTETC Software Sector and first appeared on the Committee's 2007 agenda as Developing Item Part 1, Item 1.

Purpose: This proposal is intended to amend the identification requirements for all electronic devices manufactured after a specified date by requiring metrological software version or revision information. Additionally, the proposal will list methods, other than "permanently marked," for providing the required information.

Item Under Consideration: Amend 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. – <u>For the purposes of identification, all equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect and manufactured on or after January 1, 201X, shall be clearly marked as specified in Table G-S.1. Identification and explained in the accompanying notes in Table G-S.1. Notes:</u>

All equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect **<u>and manufactured prior to January 1, 201X</u>**, shall be clearly and permanently marked for the purposes of identification with the following information:

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

(Amended 2003 **and 201X**)

(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 ***Type U*** ***(not-built-for-purpose) software-based devices;***
[Nonretroactive as of January 1, 2004]

(Added 2003) **(Amended 201X)**

(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 201X**)

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

(a) The required information in G-S.1. Identification. (a), (b), (d), and (e) shall be permanently marked or continuously displayed on the device; or

(b) The 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."

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 201X**)

Table G-S.1. Identification for Devices Manufactured on or after January 1, 201X (For applicable notes, see Table G-S.1. Notes on Identification)

Required Marking	Full Mechanical Devices and Separable Mechanical Elements	Type P Electronic Devices and Separable Elements	Type U Electronic Devices and Separable Elements
Name, initials, or trademark of the manufacturer or CC holder	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked, Continuously Displayed, or Via Menu (display) or Print Option (8)
Model identification information that positively identifies the pattern or design of the device (1)	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked, Continuously Displayed, or Via Menu (display) or Print Option (8)
Non-repetitive serial number (2)	Hard-Marked	Hard-Marked or Continuously Displayed	Not Acceptable
Software version or revision (3)	Not Applicable	Hard Marked (5), Continuously Displayed, or by Command (operator action) (6)	Continuously Displayed or Via Menu (display) or Print Option (8)
CC number or corresponding CC Addendum (4)	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked (7) or Continuously Displayed
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.			

(Added 201X)

Table G-S.1. Notes on Identification
For Devices Manufactured on or after January 1, 201X

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.**

2. **Except for equipment with no moving or electronic parts, the serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.**
   - **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.).**

3. **Metrologically significant software shall be clearly identified with the software version. The identification may consist of more than one part but one part shall be dedicated to the metrologically significant portion.**
   - **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.**
   - **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.).**

4. **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.).**

5. **If the manufacturer declares that the primary sensing element "software" is integral, has no end user interface and no print capability, the version/revision shall be hard-marked on the device. Example: Primary sensing element may be Positive Displacement (P.D.) meter with integral correction, digital load cell (only for reference, not limiting).**

6. **Information on how to obtain the Version/Revision shall be included on the NTEP CC.**

7. **Hard-marking of the CC Number is permitted if no means of displaying this information is available.**

8. **Information on how to obtain the name, initials, or trademark of the manufacturer or CC holder, model designation, and software version/revision information shall be included on the NTEP CC.**

(Added 201X)

Background/Discussion: In 2005, the Board of Directors established an NTETC Software Sector. One of the Sector's tasks is to develop a clear understanding of the use of software in today's weighing and measuring instruments.

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

1. The NTEP CC Number must be continuously displayed or hard-marked;

2. The version must be software-generated and shall not be hard-marked;

3. The version is required for embedded (Type P) software;

4. Printing the required identification information can be an option;

5. Command or operator action can be considered as an option in lieu of a continuous display of the required information; and

6. Devices with Type P (embedded) software must display or hard-mark make, model, S.N. to comply with G-S.1. Identification.

At the 2008 NCWM Annual Meeting, the Committee heard comments from the former NTETC Software Sector Chairman indicating that the Sector had completed its review of this item and could not develop it any further during its May 2008 Sector meeting. He requested that the Committee consider moving the item from the Developing section of the agenda and make it an Informational item on the Committee's agenda to facilitate discussion and comment on the proposed language. Consequently, the Committee agreed to forward the item to the regional weights and measures associations for consideration and included this item on its 2009 Interim Agenda.

After the 2008 Annual Meeting, WMD reviewed the following Software Sector Proposal to amend G-S.1. Identification and/or G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices in the Committee's 2008 Interim Report:

Method	NTEP CC No.	Make/Model/Serial No.	Software Version/Revision
TYPE P electronic devices shall meet at least one of the methods in each column:			
Hard-Marked	X	X	Not Acceptable[1]
Continuously Displayed	X	X	X
By command or operator action	Not Acceptable	Not Acceptable	X[2]

[1] If the manufacturer declares that the primary sensing element "software" is integral, has no end user interface and no print capability, the version/revision shall be hard marked on the device. Example: Primary sensing element may be Positive Displacement (P.D.) meter with integral correction, digital load cell (only for reference, not limiting).

[2] Information on how to obtain the Version/Revision shall be included on the NTEP CC.

Metrologically significant software shall be clearly identified with the software version. The identification may consist of more than one part, but one part shall be only dedicated for the metrologically significant portion.

Method	NTEP CC No.	Make/Model	Software Version/Revision
TYPE U electronic devices shall meet at least one of the methods in each column:			
Hard-Marked	X[3]	X	Not Acceptable
Continuously Displayed	X	X	X
Via Menu (display) or Print Option	Not Acceptable	X[4]	X[4]

[3] Only if no means of displaying this information is available.

[4] Information on how to obtain Make/Model, Version/Revision shall be included on the NTEP CC.

Metrologically significant software shall be clearly identified with the software version. The identification may consist of more than one part, but one part shall be only dedicated for the metrologically significant portion.

WMD agreed that the proposed language has merit. However, the Software Sector did not include a recommendation on how to incorporate the proposal into existing G-S.1. and G-S.1.1. language. WMD studied the current and proposed language and was not sure how to address the various existing requirements and multiple non-retroactive dates. Consequently, WMD suggested changes to the General Code language on Identification be considered in the further review of this item by the Committee. In brief, the WMD proposed language that divides the identification and marking location requirements for all devices and separable elements manufactured prior to and after a date adopted by the Conference. WMD developed two versions of proposed Table G-S.1. (with the only difference being that the rows and columns are reversed as shown in the Committee's 2008 Annual Report) for consideration by the Conference and forwarded these to the regional weights and measures associations.

At their September 2008 meetings, the WWMA and CWMA reviewed the WMD suggested changes for G-S.1. and Tables G-S.1.a. and G-S.1.b. and supported the proposal to amend G-S.1. and to include the marking requirements in a table format similar to other specific device codes. The WWMA also expressed a preference for the alternate Table G-S.1.a. and recommends that this item remain Informational for further review and discussion.

At their October 2008 Interim Meeting, NEWMA also recommended this item move forward as Informational.

At its 2008 Annual Meeting, the SWMA heard comments during its open hearings from Mr. Gordon Johnson, Gilbarco, proposing that the words "not acceptable" in the third column for the entry "By command or operator action" be replaced with an "X" and a reference to footnote 2. Mr. Wotthlie, Maryland, stated that he would support the change to an "X," but that a new footnote should be created; Will noted that, if the information is not going to be physically marked on a plate, the inspector would need a means to find the information without having to go to a CC to find out how to call it up. The SWMA acknowledged that this variation is already permitted for computer-based systems, but acknowledged that additional review is needed before proposing such a change. The SWMA believes that additional input is needed on this issue before it is ready to move forward as a Voting item. The SWMA S&T Committee is interested in comments from other organizations, including SMA on this issue. Consequently, the SWMA made this an Informational item on its agenda.

At the 2009 Interim Meeting, SMA commented that it has consistently opposed having different requirements between embedded and downloadable/programmable software-based devices and added that it continues to support the intent of the proposal and will continue to participate in the Software Sector discussions to develop alternate proposals for the marking of software-based devices. Several weights and measures officials expressed concerns that the proposed language does not specify how the identification information is to be retrieved if it is not continuously displayed noting this could result in several ways to access the information (e.g., passwords, display checks, dropdown menus). SMA added that the identification location information on the NTEP CC will become outdated anytime a manufacturer changes the way the information can be retrieved. They suggested that a limited number of methods to access the identification information be developed and specified as the only acceptable methods to retrieve identification information. This would make it easier for the inspector to verify the required identification information.

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

Software Sector Co-chairman Mr. Jim Pettinato, FMC Technologies, stated that the Software Sector recommends that this item remain Informational to allow conference members to further study the proposal in order to develop a consensus on the format for Table G-S.1. Identification.

The Committee agreed with the format of the first version of Table G-S.1. Identification since the format matches the style of similar tables in HB 44. Consequently, the Committee agreed that this item should remain an Informational item for further review.

At the 2009 spring Software Sector Meeting, it was noted by several Sector members that the perceived scope of the original proposal has been extended by the modifications made by WMD and now appears to exceed both the purview and the intent of the Sector, and it has become difficult to discern its intentions. Based on the fact that the proposed table seems to have actually made the Sector's intent less clear, it was proposed by the chair to revisit this item in relation to the current text of G-S.1. to clarify exactly what real changes to Handbook 44 would be required to achieve the intent of the Sector. It was also noted that there was some validity to the SMA argument that there is no justification for differentiation of marking requirements based on device type (P or U). After additional lengthy discussions, the following modified versions of G-S.1 and or G-S.1.1 were drafted:

G-S.1. Identification. – All equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect **and manufactured after January 1, 201X**, shall be clearly and permanently marked for the purposes of identification with the following information:

(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 nonrepetitive serial number, except for equipment with no moving or electronic component parts and ~~***not built for purpose software based***~~ ***software that is not part of a Type P (built-for-purpose) device.****;*
[Nonretroactive as of January 1, 1968]

(Amended 2003 **and 201X**)

(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 201X)**

(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 201X**)

G-S.1.1. ~~Location~~ Method of Marking Information for ~~Not Built For Purpose~~ all Software-Based Devices. – *For ~~not built for purpose, software based~~ devices* ***manufactured after January 1, 201X,*** *either:*

(a) *The required information in G-S.1. Identification. ~~(a), (b), (d), and (e)~~ shall be permanently marked or continuously displayed on the device; or*

(b) *The 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."*

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 201X**)

The Sector noted that though currently it is allowable to display the CC number via a menu, there has been some challenges locating this information in the field due to the vagueness of the term "easily recognized." Hence, since it is left to the interpretation of the NTEP laboratory to ascertain whether a device's method for displaying the CC number meets the requirements, this vagueness has not been addressed in this new recommendation.

Mr. John Roach (California NTEP Lab) indicated that if the proposed table, or some version thereof, is not eventually included as part of G-S.1. that it may be useful to incorporate a suitable table into Publication 14.

The Software Sector concluded that it does not wish to debate the merits of general marking requirements beyond that related to software identification and wishes only to address concerns related specifically to software. The Sector feels its proposed changes above better reflect the Sector's position. The Sector suggests that the following simplified version may better suit the purpose if WMD, and the Committee believes a table outlining general marking requirements would clarify the intent of paragraph G-S.1.

Table G-S.1.~~a~~ Identification for Devices Manufactured on or after January 1, 201X

Required Marking	Full Mechanical Devices and Separable Mechanical Elements	Electronic Devices, Software Based
Manufacturer or CC holder ID	**Hard Marked**	**Hard Marked, Continuously Displayed, or Via Menu (display) or by command or operator action**
Model identification	**Hard Marked**	**Hard Marked, Continuously Displayed, or Via Menu (display) or by command (operator action)**
Serial number	**Hard Marked**	**Hard Marked, Continuously Displayed** [1]
Metrologically Significant Software version	**Not Applicable**	**Continuously Displayed, Via Menu (display) or by command (operator action)** [2]
CC number	**Hard Marked**	**Hard Marked or Continuously Displayed, or Via Menu (display) or by command (operator action)**[3]

[1]**Type 'U' devices need not have a non-repetitive serial number.**

[2]**If the manufacturer declares that the primary sensing element "software" is integral, has no end user interface and no print capability, the version/revision shall be hard marked on the device. Example: Primary sensing element may be Positive Displacement (P.D.) meter with integral correction, digital load cell (only for reference, not limiting).**

[3]**If the CC number is to be displayed via menu and/or submenu, the means of access must be easily recognizable. In addition, instructions on how to obtain the remaining required information not hard-marked or continuously displayed shall be included on the NTEP CC.**

(Added 201X)

Note that this new version of the table reflects the aforementioned changes proposed for the language in paragraph G-S.1. as well, homogenizing Type P and Type U requirements, with the exception of the serial number requirement being waived for standalone software. It was also noted that much of the information previously included in the separate proposed Table G-S.1.(b) was redundant as it is already stated verbatim in the text of G-S.1; hence the Sector questions the benefit of the WMD - proposed separate Table G-S.1.(b).

In an April 2009 letter to the Committee, Mr. Patoray, CoC, agrees with the recommendation of the Software Sector. In order for CoC to fully endorse this recommendation, CoC suggests one change for the NOTE in G-S.1.1. to read as follows:

> ***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.*

In the "***Note***" for paragraph G-S.1.1., there remains one item that is inconsistent with all other requirements for marking. It is noted that it indicates **only** the information in G-S.1. (a), (b), and (d), which intentionally leaves out information in G-S.1. (c) Serial Number. It is the position of CoC that there should be NO limitation, which is any different from other markings, on the marking of the serial number of a device in the General Code. As written, it would require only the serial number to be permanently marked or continuously displayed. Since this is the General Code Section of HB 44, CoC sees no reason to create this limitation. CoC recommends that this can be handled in

the device specific code if there are any issues that might arise with allowing the serial number to be display via menu. CoC stated that is could fully support this item incorporating the above change.

At its 2009 Annual Meeting, the CWMA agreed with comments from weights and measures officials that there is a need to easily identify the software for the proposed software-based devices, especially during field inspections for "Type U" devices. They believe that a uniform or standard method for easily accessing identification information is needed to aid field inspections. The SMA stated there is no distinction between the proposed Type P and Type U devices and marking requirements should be the same for both devices. It was reported that the Software Sector had met a few weeks before the CWMA Annual meeting and that the Sector recommendations would be submitted to the committee and its report posted on the NCWM website prior to the NCWM Annual Meeting. Consequently, the CWMA recommends this item remain Informational.

At the 2009 NEWMA Annual Meeting, the members received similar comments from SMA and the Software Sector and took no position on this item pending its member review of the Software Sector's report.

At the 2009 NCWM Annual Meeting, the Committee reviewed the recommendations in the previous paragraphs from:

- the 2009 meeting of the Software Sector,

- a report of the 2009 spring meeting of the SMA opposing the marking requirement differences for "Type P" and "Type U" devices, and

- comments from Mr. Patoray, CoC, supporting the Software Sector's position with his suggested changes.

During the open hearings, the Committee received comments from the SMA, Stephen Patoray, and the Chairman of the Software Sector restating their previous positions and recommendations.

NIST WMD commented that some terminology in both the Software Sector's proposed "Table G-S.1. Identification" may need to be further defined. For example, what is meant by the term "hard-marked?" WMD believes that "hard marked" is the same as "permanently marked," which is already used in other sections of HB 44. If Committee believes a table outlining general marking requirements would clarify the intent of G-S.1., WMD recommends that the words "hard marked" be replaced by "permanently marked".

Consequently, the Committee agreed that this item remain Informational and that the regional weights and measures associations review the above information and provides the Committee with comments and recommendations.

At its 2009 Interim Meeting, the CWMA had lengthy discussions about providing the required identification information in a single uniform method. Some of the topics addressed were:

- A single operation or button is needed to view all software version information.

- Use a single function key to access or continuously display software version information.

- Electronic data for both Type U and Type P devices could be Hard Marked, Continuously Displayed or accessed by Command (operator action).

- The data is useless if it is not easy to access in the field.

- Concern about the cost of requiring a single designated button to access software version information.

The CWMA recommends this item remain Informational with the following changes to the Committee's recommendations in its 2009 Interim Report:

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

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

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

(b) The CC Number shall be:

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

(2) continuously displayed.

2. Delete note 8 in "Table G-S.1. Notes on Identification."

3. Amend "Table G-S.1. Identification . . ." by deleting the three references to "via menu display," "Print Option (8)," adding "by command (operator action)," and deleting the language at the bottom of the table as shown in following revised table.

Table G-S.1. Identification
for Devices Manufactured on or after January 1, 201X
(For applicable notes, see Table G-S.1. Notes on Identification)

Required Marking	Full Mechanical Devices and Separable Mechanical Elements	Type P Electronic Devices and Separable Elements	Type U Electronic Devices and Separable Elements
Name, initials, or trademark of the manufacturer or CC holder	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked, Continuously Displayed, or by command (operator action)
Model identification information that positively identifies the pattern or design of the device (1)	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked, Continuously Displayed, or (operator action)
Non-repetitive serial number (2)	Hard-Marked	Hard-Marked or Continuously Displayed	Not Acceptable
Software version or revision (3)	Not Applicable	Hard Marked (5), Continuously Displayed, or by Command (operator action) (6)	Continuously Displayed or (operator action)
CC Conformance number or corresponding CC Addendum (4)	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked (7) or Continuously Displayed

(Added 201X)

During the open hearings at the 2009 WWMA Annual Technical Conference, Mr. Straub, speaking on behalf of SMA, indicated SMA continues to oppose this item, referring to comments made in conjunction with Item 310-2. He also noted that even if the designations of "Type U" and "Type P" were adopted, SMA would continue to oppose the proposed changes to G-S.1., noting that requirements should apply equally to the two different device types described. The WWMA also heard from Mr. Johnson, Gilbarco, who agreed with SMA's assessment. He also

indicated that it would be desirable to have the option of using a menu to provide information, citing increasingly limited space in which to provide marking information, and noted it would be virtually impossible for their company to provide a full time display.

Based on the comments received and its position on Item 310-2 relative to corresponding definitions for the device types referenced in Item 310-3, the WWMA believes this item should remain Informational until the Software Sector has had an opportunity to review comments from the 2009 NCWM Annual meeting and any comments made at subsequent regional weights and measures association meetings.

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

During its 2009 Interim Meeting, NEWMA stated that is supports the Committee's decision to keep this item Informational to allow updated comments from the regional weights and measures associations and other interested parties based on information in the summary of the March 2009 meeting of the Software Sector.

Additional background information on this item can be reviewed in the Committee's 2008 Final Report.

310-4 G-A.6. Nonretroactive Requirements (Remanufactured Equipment)

Source: WWMA and SWMA

Purpose: Clarify the application of nonretroactive requirements to devices which have been determined to have been "remanufactured."

Item Under Consideration: Amend HB 44 General Code paragraph G-A.6. Non retroactive Requirements by adding a new bullet (d) as follows:

G-A.6. Nonretroactive Requirements. – "Nonretroactive" requirements are enforceable after the effective date for:

(a) devices manufactured within a state after the effective date;

(b) both new and used devices brought into a state after the effective date; ~~**and**~~

(c) devices used in noncommercial applications ~~**which**~~ **that** are placed into commercial use after the effective date; **and**

(d) devices remanufactured after the effective date.

Nonretroactive requirements are not enforceable with respect to devices that are in commercial service in the state as of the effective date or to new equipment in the stock of a manufacturer or a dealer in the state as of the effective date.
[*Nonretroactive requirements are printed in italic type.]*
(Amended 1989 **and 201X**)

WWMA and SWMA proposal: Amend HB 44 General Code paragraph G-A.6. by adding the words "and remanufactured" as follows:

G-A.6. Nonretroactive Requirements. – "Nonretroactive" requirements are enforceable after the effective date for:

(a) devices manufactured **and remanufactured** within a state after the effective date;

(b) both new**, ~~and~~** used**, and remanufactured** devices brought into a state after the effective date; and

(c) devices used in noncommercial applications which are placed into commercial use after the effective date.

Nonretroactive requirements are not enforceable with respect to devices that are in commercial service in the state as of the effective date or to new equipment in the stock of a manufacturer or a dealer in the state as of the effective date.
[*Nonretroactive requirements are printed in italic type.]*
(Amended 1989 **and 201X**)

Background/Discussion: WMD received an inquiry from a state Weights and Measures Director regarding whether a nonretroactive paragraph in the Liquid-Measuring Devices Code of NIST Handbook 44 would apply to a remanufactured device. In researching this inquiry, WMD discovered an unintended gap in the General Code requirements relative to remanufactured equipment.

- Paragraph G-S.1.2. Remanufactured Devices and Remanufactured Main Elements is a non-retroactive requirement enforceable as of January 1, 2002. WMD believes that this paragraph was intended to apply to remanufactured devices and remanufactured main elements that have been placed into commercial service as of the effective date of the requirement, which is January 1, 2002.

- Paragraph G-A.6. Nonretroactive Requirements. (which provides the various conditions in which nonretroactive requirements apply) does not include references to "remanufactured devices" or "remanufactured main elements." Bullet (a) (of G-A.6.) references and applies to "manufactured" devices within a state. Appendix D of HB-44 defines a "manufactured" device as any commercial weighing or measuring device shipped as new from the original equipment manufacturer (OEM). Bullet (b) could be applied to remanufactured devices that are brought into a state, but could not be applied to those devices installed by a remanufacturer or distributor operating within the state. Bullet (c) applies to devices placed into commercial service that had previously been used in noncommercial applications.

Since G-A.6. is silent with respect to remanufactured devices and remanufactured main elements, G-S.1.2., in WMD's opinion, cannot be applied. This was clearly not the intent since, as indicated by its title, it was designed to apply to "remanufactured" equipment.

Because remanufactured devices compete with newly manufactured devices, WMD believes the intent of G-A.6. Nonretroactive Requirements is intended to include such equipment in the scope of the paragraph. That is, remanufactured devices and remanufactured main elements should have to comply with the most current nonretroactive requirements in effect as of the date the devices or elements are remanufactured.

A change is needed to G-A.6. to clarify the application of G-S.1.2. and other nonretroactive requirements, which WMD believes should apply to remanufactured devices and remanufactured main elements.

An additional reason to adopt the proposed language is that the proposed modification to G-A.6. would clearly support their actions in the event that weights and measures officials are challenged regarding the application of G-S.1.2. or other nonretroactive paragraphs,

It should be noted that device owners and remanufacturers may experience difficulty in complying with applicable nonretroactive requirements in instances where states have not previously applied them to remanufactured equipment. The extent to which this has occurred may become more evident as this issue is discussed within the regional weights and measures and industry associations and alternatives to alleviate this burden on existing equipment could be considered.

While developing this proposal, WMD contacted two retail motor fuel dispenser (RMFD) original equipment manufacturers and representatives from those companies both indicated that remanufactured RMFD's should comply with the most recent HB 44 nonretroactive requirements in effect as of the date they are remanufactured.

WMD also contacted the chairman of the Remanufactured Device Task Force that was formed by the NCWM BOD in 1999. The chairman indicated, that to the best of his recollection, there was no conscious discussion from the task force of how nonretroactive requirements were to apply to remanufactured equipment. He believes that different states may be enforcing nonretroactive requirements differently with respect to remanufactured equipment.

Research into past NCWM Conference Reports indicates that a proposal to change the NIST Handbook (HB44) definition of "manufactured device" was adopted by the NCWM in 2001. The previous definition, shown below and identified as the "2001 HB44 definition," included text which was intended (WMD believes) to include remanufactured devices. The new definition deleted that text ("new device or any other device") to the extent that the definition from 2002 forward only applies to devices shipped as new from the OEM.

2001 HB 44 Definition

> **manufactured device.** Any new device or any other device that has been removed from service and substantially altered or rebuilt.

2010 HB 44 definition

> **manufactured device.** Any commercial weighing or measuring device shipped as new from the original equipment manufacturer

The following is a brief history of paragraph ***G-S.1.2. Remanufactured Devices and Remanufactured Main Elements:***

- 1997 – A proposal to add a new paragraph addressing the required marking on RMFD's that had been resold for placement into service first appeared as an Informational item on the NCWM Specifications and Tolerances Committee agenda.

- 1999 – The NCWM appoints a task force to examine the required marking issues of remanufactured equipment. The primary responsibility of the task force was to develop a marking requirement proposal for NCWM consideration.

- 2001 – The task force proposed to add several new definitions and a General Code requirement (G-S.1.2.) to NIST Handbook 44. They also proposed changing the definition of "manufactured device" which already appeared in HB 44. Of importance, they removed from the definition language that linked devices that had been substantially altered or rebuilt to G-A.6.

- 2002 – The first year the marking requirement for remanufactured devices and remanufactured main elements appeared in HB 44 along with new definitions.

The proposed change will clarify how nonretroactive paragraphs apply to remanufactured equipment.

WMD notes that the issue of applying G-A.6. to remanufactured equipment is separate from that of determining when a device or element has been "remanufactured." Definitions found in Appendix D of HB 44 along with guidance developed by the NCWM Remanufactured Equipment Task Force can be used to assist jurisdictions in determining when a device or main element has been "remanufactured." The proposed change does not suggest changing these tools or their application. The proposed change is only to clarify the application of G-A.6. to devices that have been determined to have been "remanufactured."

Even if the proposed direction of solving this problem is not supported as written, WMD believes that some alternate language needs to be added to G-A.6. to clarify its application to remanufactured equipment.

At its 2009 Interim Meeting, the CWMA recommended that this item be given Developmental status. The CWMA states that the following questions need to be addressed prior to considering this as an Informational item.

1. How would the remanufacture date be verified?

2. Is there enough of a metrological change to a device to warrant a new CC?

3. Are the current definitions for remanufactured devices in HB 44 adequate to support this proposal?

4. Would the device be out of service pending a possible NTEP approval?

During their 2009 Annual Meeting, the WWMA and SWMA agreed that nonretroactive requirements are applicable to remanufactured equipment that is remanufactured after the effective date. The WWMA states it believes these items are competing with new and used devices and should, therefore, be subject to the same requirements. The WWMA and SWMA support the proposed NIST WMD language but ask the Committee to consider the alternative language proposed by the CWMA as shown in "Item Under Consideration."

The WWMA and SWMA recommend the proposal be included as a Voting item on the Committee's 2010 Agenda.

At its 2009 Interim Meeting, NEWMA stated it does not support this proposal because it is not clear what problem the proposal is trying to solve. Additionally, NEWMA stated that this proposal is redundant, since a remanufactured device is considered a new device with its own CC and, therefore, already has to meet code requirements.

320 SCALES

320-1A S.2.3.4. through S.2.3.7. Value of Tare Indication and Recorded Representations, and Appendix D. Definitions for Gross Weight Value, Net Weight Value, Net Weight, Tare, and Tare Weight Value

Source: 2009 Carryover Item 320-1C. (This item originated from the NTETC WS and first appeared on the Committee's 2007 agenda.)

Purpose: The tare proposals and proposed definitions are intended to provide uniform application of tare requirements during field inspections and additional support for the requirements for the operation of tare and preset tare, indications recorded representation of tare during NTEP evaluation that are currently based on interpretations of General Code requirements and NCWM Report of the 65th Committee on Specifications and Tolerances agenda Item 320-1 Tare (Pages 246-218).

Item Under Consideration: Add new paragraphs S.2.3.2. through S.2.3.6., and new "gross weight," "net weight," "net weight value", "tare," and "tare weight value" definitions to Appendix D.

Add new paragraphs S.2.3.2. through S.2.3.6. as follows:

S.2.3.4. Visibility of Operation. – Operation of the tare mechanism shall be visibly indicated on the instrument. In the case of instruments with digital indications, this shall be done by marking the indicated net value with the word "NET" or the symbol "N." "NET" may be displayed as "NET," "Net," or "net." If a scale is equipped with an indicator that allows the gross value to be displayed temporarily while a tare mechanism is in operation, the "NET" symbol shall disappear while the gross value is displayed.

(Added 201X)

S.2.3.5. Subtractive Tare Mechanism. – After any tare operation and while tare is in effect, an indicating or recording element shall not display nor record any values when the gross load (not counting the initial dead load that has been canceled by an initial zero-setting mechanism) is in excess of 105 % of scale capacity after tare has been taken.

(Added 201X)

S.2.3.6. Consecutive Tare Operations. – Repeated operation of a tare mechanism (including preset tare) is permitted for single transactions with one gross, one net, and multiple tare values. If more than one tare mechanism is operative at the same time, tare weight values shall be clearly designated (identified) with either "T" for tare or "PT" for preset tare, as appropriate, when indicated or printed.

(Added 201X)

S.2.3.7. Indication and Printing of Weighing Results.

(a) Gross weight values may be printed without any designation or by using a complete word or symbol. For a designation by a symbol, only uppercase "G" is permitted.

(b) If only net weight values are printed without corresponding gross or tare values, they may be printed without any designation or by using a complete word or symbol. The complete word "Net" or symbol "N" shall be used to designate a net weight as shown in S.2.3.3. Visibility of Operation. This applies also where semi-automatic zero-setting and semi-automatic tare balancing are initiated by the same key.

(c) Gross, net, or tare values determined by a multiple range instrument or by a multi-interval instrument need not be marked by a special designation referring to the (partial) weighing range.

(d) If net weight values are printed together with the corresponding gross and/or tare values, the net and tare values shall be identified at least by the corresponding symbols "N" and "T" or by complete words using all upper-case letters, all lower-case letters, or a combination of upper- and lower-case letters.

(e) If net weight values and tare values determined by different tare mechanisms are printed separately for single transactions with multiple gross, tare, and net values, they shall be suitably identified (e.g., vehicle sequentially loaded with mixed commodities).

(Added 201X)

Add the following new definitions to Appendix D:

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

(Added 201X)

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

(Added 201X)

net weight value. Indication or recorded representation of the weight of a load placed on a weighing device after the operation of a tare mechanism. [2.20, 2.24]

(Added 201X)

tare. The weight of packaging material, containers, vehicles, or other materials that are not intended to be part of the commodity included in net weight determinations. [2.20, 2.24]
(Added 201X)

tare weight value. The weight value of a load determined by a tare mechanism. [2.20, 2.24]
(Added 201X)

Background/Discussion: Background information on this item can be found in the Background/Discussion paragraphs on agenda Item 320-1A in the 2009 Committee's Interim and Annual Reports.

During the NIST presentation on Tare during the 2009 Interim Meeting, the Committee heard several questions that indicated the need for additional clarification on:

- the justification for limiting the acceptable words and abbreviations for Gross, Tare, Preset Tare, and Net;
- what is meant by consecutive tare operations;
- whether or not itemized indications and recorded representations are required for each tare; and
- whether or not different indications and recorded representations are required for each tare value when tare and preset tare are used in the same transaction.

Consequently, the Committee recommended that this proposal remain an Informational item in its Interim Report and suggested that the WS further clarify the proposed language and consider providing examples of; 1) indications and recorded representations of tare and preset tare in consecutive tare transactions; and 2) the justification for limiting the acceptable words and abbreviations for Gross, Tare, Preset Tare, and Net.

During the 2009 Annual Meeting, the Committee received no additional comments on this proposal. However, "Tare: items 320-1A and 320-1B" on the 2009 Committee's agenda were not adopted, and consequently, the Committee recommended that the WS discuss and provide the Committee with an update on the WS position on the remaining Tare "Information" proposals for the Committee's 2010 Interim Agenda.

At its August 2009 Annual Meeting, the WS reviewed the background information regarding comments and actions during the 2009 NCWM Annual Meeting. The WS recommends that the remaining tare items (320-1A, 320-1B, 324-2A, 324-2B, and 324-C in the Committee's 2009 agenda) should be Withdrawn from the 2010 S&T Committee Agenda since the NCWM agreed with the SMA position that the tare proposals are not needed for HB 44.

Based upon comments received during their respective fall 2009 meetings and the 2009 NCWM Annual Meeting, the CWMA, WWMA, SWMA, and NEWMA recommends the remaining tare items be Withdrawn from the NCWM S&T Committee's 2010 Interim Agenda.

320-1B S.2.4. Preset Tare Mechanism and Appendix D – Definitions for Preset Tare

Source: 2009 Carryover Item 320-1D. (This item originated from the NTETC WS and first appeared on the Committee's 2007 agenda.)

Purpose: The tare proposals and proposed definitions are intended to provide uniform application of tare requirements during field inspections, allow the identification and printing of preset tares with the abbreviation "PT," and additional support for the requirements for the operation of tare and preset tare, indications recorded representation of tare during NTEP evaluation that are currently based on interpretations of General Code requirements and NCWM Report of the 65th Committee on Specifications and Tolerances agenda item 320-1 Tare (Pages 246-218).

Items Under Consideration: Add new paragraph S.2.4. and new preset tare definitions as follows:

S.2.4. Preset Tare Mechanism, Operation. – In addition to the provisions of paragraphs S.2.3. Tare and S.2.3.1. Scale Interval, a preset tare mechanism may be operated together with one or more tare devices provided:

(a) the preset tare mechanism complies with paragraph S.2.3.6. Consecutive Tare Operations,

(b) the preset tare operation cannot be modified or cancelled as long as any tare mechanism operated after the preset tare operation is still in use,

(c) the preset tare associated with a price look-up (PLU) shall be automatically cancelled at the same time a PLU is cancelled, and

(d) the preset tare values are designated by the symbol "PT"; however, it is permitted to replace the symbol "PT" with complete words.

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

(Added 201X)

S.2.4.1. Indication of Operation. – It shall be possible to temporarily indicate the preset tare value (e.g., pressing a tare display button or by indicating a negative net weight with no load on the load-receiving element). In addition to the provisions of paragraph S.2.3.7. Indication and Printing of Weighing Results, the net value and at least the preset tare value is printed, with the exception of:

(a) a Class II or a Class III instrument and point-of-sale systems with a maximum capacity not greater than 100 kg (200 lb) used in direct sales to the public,

(b) price computing scales, and

(c) nonautomatic weigh/price labeling scales.

(Added 201X)

Add new preset tare definitions to Appendix D as follows:

preset tare. A numerical value, representing a weight that is entered into a weighing device (e.g., via keyboard entry, recalling from stored data, or entered through an interface) and is intended to be applied to weighings without determining individual tares.

(Added 201X)

preset tare mechanism. A part of a weighing system for subtracting a preset tare value from a gross or net weight value and indicating the result of the calculation as a net weight. The weighing range for net loads is reduced accordingly.

Types of preset tare mechanisms include:

keyboard tare. The operation of keys on a keyboard. For example: On a scale where d = 0.01 with a typical 10-key keyboard with values 0 through 9, pushing numbered key 5, or pressing the 0 then 5 keys results in a 0.05 tare value.

digital tare. By the repeated operation of a particular key, tare values are entered in amounts equal to the value of a scale division. For example, on a 25 lb x 0.01 lb scale, each time a specifically marked key is depressed, a tare is entered equal to 0.01 lb. If that key were depressed five times, the tare value would be equal to 0.05 lb.

programmable tare. Preset (predetermined) tare values that are stored in memory for multiple transactions. They may be part of the product information on PLU (product look-up), preset product, or tare keys.

stored tare. Preset (predetermined) tare values that are stored in memory for multiple transactions and are used predominately in vehicle scale applications.

percentage tare. A preset tare value, expressed as a percentage (i.e., 5.6 %), that represents the percentage of tare material compared to the gross or net weight of the commodity. A percentage tare is one form of proportional tare.

proportional tare. A preset tare value, automatically calculated by the scale, proportional to the gross weight indicated by the scale. A proportional tare can be a percentage tare or a fixed tare value relative to a range of gross weights (i.e., a 10 g tare for gross weights between 0 and 2 kg, a 20 g tare for gross weights from 2 and 4 kg, etc.). A proportional tare is, therefore, not limited to being a percentage tare.

[2.20, 2.24]
(Added 201X)

Background/Discussion: Background information on this item can be found in the Background/Discussion paragraphs on agenda Item 320-1A in the 2009 Committee's Interim and Annual Reports.

During the NIST presentation on Tare during the 2009 Interim Meeting, the Committee heard several questions that indicated the need for additional clarification on the justification for limiting the acceptable words and abbreviations for Preset Tare. Consequently, the Committee recommended that this proposal remain an Informational item in its Interim Report.

During the 2009 Annual Meeting, the Committee received no additional comments on this proposal. However, "Tare: items 320-1A and 320-1B" on the Committee's 2009 agenda were not adopted and consequently, the Committee recommended that the WS provide the Committee with an update on the WS position on the remaining Tare "Information" proposals for the Committee's 2010 Interim Agenda.

At its August 2009 Annual Meeting, the NTETC WS reviewed the background information regarding comments and actions during the 2009 NCWM Annual Meeting. The WS recommends that the remaining tare items (320-1A, 320-1B, 324-2A, 324-2B, and 324-C in the Committee's 2009 agenda) should be Withdrawn from the 2010 S&T Committee Agenda since the NCWM agreed with the SMA position that the tare proposals are not needed for HB 44.

Based upon comments received during their respective fall 2009 meetings and the 2009 NCWM Annual Meeting, the CWMA, WWMA, SWMA, and NEWMA recommends the remaining tare items be Withdrawn from the NCWM S&T Committee's 2010 Interim Agenda.

320-2 S.2.1.7. Automatic Zero-Setting Mechanism

Source: 2009 Carryover Item 320-3. This item originated from the NTETC Weighing Sector and S&T Committee and first appeared on the Committee 2009 Interim Agenda.

Purpose: Many scales throughout the world are equipped with an automatic zero-setting feature that is typically disabled for the U.S. marketplace. This feature is not addressed or defined in HB 44, is not listed on NTEP CCs.

This proposal is intended to:

1. Establish automatic zero-setting limits to be consistent with the international recommendations in OIML R 76,

2. Add a new definition for automatic zero-setting mechanism,

3. Amend the definition for automatic zero-tracking mechanism by deleting "automatic" since the word is repeated in the definition,

4. Move the definition for automatic zero-tracking mechanism to a stand-alone definition as to clarify that zero tracking does is intended to maintain a zero condition and not set the device to zero, and

5. Move the current definition for initial zero-setting mechanism under the broad definition of "zero-setting mechanism."

Item Under Consideration: Add a new paragraph S.2.1.7. and definition for Automatic Zero-Setting Mechanism as follows:

S.2.1.7. Automatic Zero-Setting Mechanism. – If equipped, an automatic zero-setting mechanism shall operate only when the indication has remained;

(a) stable according to S.2.5. Damping Means, and

(b) below zero for at least 5 seconds.

The maximum effect of automatic zero-setting mechanism is limited to 4 % of the nominal capacity of the scale and is a sealable parameter.

(Added 201X)

Amend paragraph S.2.1.3.3. as follows:

S.2.1.3.3. Means to Disable ~~Automatic~~ Zero-Tracking *and* ***Automatic Zero-Setting Mechanisms on Class III L Devices. –*** *Class III L devices equipped with* ***~~an~~ ~~automatic~~*** *zero-tracking* ***and automatic zero-setting*** *mechanisms shall be designed with a sealable means that would allow zero-tracking* ***and automatic zero-setting*** *to be disabled during the inspection and test of the device.*
[Nonretroactive as of January 1, 2001]

(Amended 201X)

Amend HB 44 Appendix D by adding a new definition for automatic zero-setting mechanism, move the current definition for initial zero-setting mechanism under the broad heading of type of zero-setting mechanism, and move the definition for automatic zero-tracking mechanism to a stand-alone definition as follows:

zero-setting mechanism. Means provided to attain a zero balance indication with no load on the load-receiving element. **Four ~~Three~~** types of these mechanisms are: [2.20]

automatic zero-setting mechanism. Automatic means provided to maintain the zero balance indication without the intervention of an operator. [2.20, 2.22, 2.24]

(Added 201X)

~~**automatic zero-tracking mechanism.** Automatic means provided to maintain the zero balance indication, within certain limits, without the intervention of an operator. [2.20, 2.22, 2.24]~~

initial zero-setting mechanism. Automatic means provided to set the indication to zero at the time the instrument is switched on and before it is ready for use. [2.20]

(Added 1990)

manual zero-setting mechanism. Nonautomatic means provided to attain a zero balance indication by the direct operation of a control. [2.20]

semiautomatic zero-setting mechanism. Automatic means provided to attain a direct zero balance indication requiring a single initiation by an operator. [2.20]

(Amended 2010)

~~**automatic** **zero-tracking mechanism.** **Automatic means provided to maintain the zero balance indication, within certain limits, without the intervention of an operator.** ~~**See "automatic zero-tracking mechanism" under "zero-setting mechanism."**~~[2.20, 2.22, 2.24]

(Amended 2010)

Background/Discussion: At its 2008 Annual Meeting, the NTETC WS discussed an issue on an increasing number of scales submitted for NTEP evaluations that include an "automatic zero-setting" feature not addressed in NIST HB 44. It has been noted that many devices are built for a global marketplace and that the operation of this "automatic zero-setting" device may be functional on the device when installed in the United States. Currently, HB 44 does not define this function and NCWM Publication 14 has no test to determine if the device submitted for evaluation has such a function, or if it is sealable. Additionally, NTEP reported that, on a scanner/scale that had been submitted for NTEP evaluation, the automatic zero-setting feature was discovered and found to work in both the positive and negative directions and could be activated or deactivated without breaking a security seal or changing the audit trail information. The operation of the feature in the positive direction does not even comply with R 76. Competitors have also commented to NTEP that they had to disable this feature because it was not allowed by other NTEP weighing labs.

In the past, several of the NTEP labs, when asked about this "feature," have indicated that since it does not meet the definition of an "automatic zero-tracking mechanism," it is not allowed. Additionally, the NTETC WS agreed that HB 44 does not clearly state that this function is not allowed. This led to incorrect interpretations of Section 2.20. Scales paragraphs S.1.1.(c) (Zero Indication – ". . . return to a continuous zero indication") and S.1.1.1.(b) (Digital Indicating Elements – "*a device shall either automatically maintain a "center-of-zero" condition. . .*") and could also be interpreted to allow the automatic zero-setting device as described in R 76. This interpretation was not the intent of the HB 44 requirements referenced above.

The WS concluded the following:

1. There is a problem that needs to be solved, based on the current information or lack of information in HB 44.

2. There are no technical reasons why the feature automatic zero-setting as described in OIML R 76 should not be included in NIST Handbook 44.

3. The feature may not be suitable for all applications if it is allowed to function with both positive and negative weight indications.

4. Language will need to be developed for NCWM Publication 14 to either test for the correct function of "automatic zero-setting" or test to determine that the device does not have "automatic zero-setting" and it is a sealable parameter.

The WS established a small WG to develop language to be submitted to the NCWM S&T Committee and to make a recommendation addressing the suitability of scales with the capability to automatically set a positive weight indication to zero. This group, which included Mr. Scott Davidson (Mettler-Toledo), Mr. Scott Henry (NCR), Mr. Steve Cook (NIST Technical Advisor), and Mr. Stephen Patoray (CoC, LLC), volunteered to develop a proposal for the S&T Committee. (Todd Lucas, Ohio NTEP laboratory, and Jim Truex, NTEP Administrator, also contributed to the discussions and subsequent proposal.) Additionally, the WS agreed to review the language developed by the WG to confirm its support of the proposed language.

In the process of developing the proposal, the WG recommended the following:

1. Make the proposal to add automatic zero-setting "retroactive" since the group is aware that the feature has been included on several scales for nearly 20 years and may not have been activated. The group considered alternate retroactive dates, but felt that the proposed requirements for the feature should be applicable to all scales incorporating this feature. Additionally, NCWM Publication 14 NTEP technical policies state that only the standard features and options that have been evaluated will be included on the CC. As a result, an NTEP applicant will have to submit an application to NTEP in order to have the automatic zero-setting feature listed on an existing CC.

2. The automatic zero-setting mechanism shall be limited to operating only when the scale indication is below zero. The group discussed allowing the feature to operate in both directions. Although there may be valid reasons for allowing it in the positive direction, the group felt that legitimate objects on a scale could be inadvertently (or intentionally) zeroed without an obvious indication to the customer or operator when the scale was indicating zero at the start of a transaction.

3. The automatic zero-setting mechanism should be considered as a "sealable parameter" since there are applications where it is required to be disabled, or scale parameters, such as the time before initiating automatic zero-setting, motion detection, and capacity limitations can be adjusted beyond the requirements in the proposal.

4. Publication 14 evaluation and field examination procedures should be amended to verify that the automatic zero-setting mechanism cannot set the scale to a zero indication in less than five seconds; it can only operate if it complies with motion detection requirements, and its effect on the nominal scale capacity is no larger than 4 %.

5. The automatic zero-setting mechanism should be capable of being disabled for testing purposes for the same reasons that zero-tracking is capable of being disabled for Scales Code Class III L devices.

6. The group noted the current definition for initial zero-setting mechanism as a type of zero mechanism and should be included with the definition on zero-setting mechanism as shown in the recommendation.

7. The Committee is asked to consider recommending changing "automatic zero-tracking" to "zero-tracking" throughout the weighing codes in order to reduce confusion with the term and definition for "automatic zero-setting." Additionally, the word "automatic" is redundant for zero-tracking since it is used in its definition.

The WG did not have sufficient time to both develop the proposal and ballot the NTETC WS prior to the cutoff date for submitting items to the Committee. The responses to the ballot indicated that eight WS members responded to the ballot of which six voted in favor of the proposed language. It should be noted that two of the affirmative votes stated that their vote was provisional on the basis that the reference to the 4 % of scale capacity limitation be removed from the proposal. Two members opposed that item stating that the language should not be rushed through the S&T Committee and that the feature should operate with either negative or positive weight indications.

At the 2009 NCWM Interim Meeting, the Committee heard comments from the SMA stating that it was in favor of the proposal, provided the reference to the 4 % of scale capacity limitation is removed from the proposal. Mr. Paul Lewis, Rice Lake Weighing, recommended that the proposal be discussed by the regional weights and measures associations before it is ready for a vote. Mr. Ted Kingsbury, Measurement Canada (MC), stated that the language in the proposal is identical to Canadian requirements and that it is consistent with the recommendations in R 76. Any changes to the proposal involving the 4 % capacity limitation and the ability to operate in the positive direction would require that MC perform additional testing for devices submitted under the United States/Canada Mutual Recognition Agreement. Mr. Flocken, Mettler-Toledo, also pointed out the inclusion of the term and definition for "automatic zero-tracking mechanism" should stand-alone and not be included as a type of zero-setting mechanism in order to be consistent with OIML R 76. Mr. Cook, NIST Technical Advisor, added that he had received an earlier comment that the word "automatic" should be deleted from the term since the word is used in the definition and that it is not used in the corresponding term in R 76 and suggested that the Committee consider developing a proposal to delete the word "automatic" in the term "automatic zero-tracking" throughout HB 44.

The Committee reviewed the WS ballot results and comments it received during the open hearing. The Committee agreed that there was no clear consensus among the WS members and recommended that this proposal remain an Informational item. The Committee agreed with Mr. Flocken to move the definition of "automatic zero-tracking." The Committee also asked that the NTEP labs and the WS further discuss this item, develop a consensus position, and forward its recommendations to the Committee and that they also consider the suggestion from Mr. Cook to amend the term "automatic-zero tracking."

At its 2009 Spring Meeting, SMA opposed the language in the Interim Report and took the position that to be fair to the buyer and seller, the recommendation should include the ability to zero the indication in both a positive and negative direction.

During their 2009 Annual Meetings, CWMA and NEWMA heard comments from SMA in opposition of this item. Other comments supporting the proposal indicated there is a potential to zero off a load intended to be weighed if the feature were allowed to be operate in the positive direction. It was also reported that test weights were inadvertently zeroed during a routine increasing-load by several NTEP certified scanner/scales that were configured with this feature (i.e., zero-setting was configured to operate in the positive direction). Consequently, the CWMA agreed that automatic zero-setting mechanism should operate only in a negative condition or that the feature be prohibited, and they recommended the item stay "Informational." NEWMA supports the continued review, comments, and work on this item.

During the 2009 NCWM Annual Meeting open hearing, the Committee heard support of the SMA position on this item from several scale manufacturers. WMD stated that if the Committee chooses to allow automatic zero-setting feature, the language should be consistent with R76 in regards to the stipulation that only the negative weight indication permitted to automatically rezero and added that there is too great a potential for a load that is intended to be weighed to be unintentionally (or fraudulently) zeroed. Should the Committee choose to not allow this feature, WMD recommends that the Committee develop a proposal that expressly prohibits the automatic zero-setting feature. In either case, access to enable or disable the feature should be protected by an approved security means on any scale that can be configured with this feature. Additionally, the Committee agrees that the WS needs support from HB 44 in order to evaluate the feature if the requirement is adopted or verify that it can be disabled if the feature is to be prohibited on weighing devices.

The Committee agreed to leave this proposal on the agenda as an Informational item and requested that the NTETC WS discuss the comments and suggestions from the 2009 Interim and Annual Meetings and provide additional feedback to the Committee on the recommendation that either supports the proposal or recommends language for HB 44 prohibiting the feature.

At the August 2009 NTETC WS Meeting, the NIST Technical Advisor provided the WS with an update on the status and additional discussions on this item since the 2009 Interim and Annual Meetings and suggested that the WS develop a consensus position on this item and forward its conclusion to the S&T Committee. The WS discussed the following possible positions to forward to the S&T Committee.

1. Allow the feature to operate only when below zero with a capacity limit (as shown in 2009 NCWM Annual Report Committee Recommendation).

2. Consider the Spring 2009 SMA position to allow the feature to operate in either direction with no capacity limit.

3. Consider HB 44 language to prohibit the feature.

4. Make no changes to HB 44.

5. Make an alternate suggestion to amend the proposal by limiting the feature to Point-of-Sale systems interfaced with scales.

The WS discussed the options in great detail and reached a consensus among the attendees that this feature does not have any value in the U.S. marketplace, and can potentially facilitate inaccurate weight determinations against either the buyer or the seller. The WS changed its 2008 position and now recommends that no changes are needed in to address this feature in HB 44.

At its 2009 Interim Meeting, the CWMA recommended that this item remain "Informational." The CWMA added that this feature should be disallowed and recounted comments from its 2009 Annual Meeting about the accidental zeroing of weights during an inspection. The CWMA believes that the potential for this to happen still exists.

During the open hearings at the 2009 WWMA Annual Technical Conference, Lou Straub, representing SMA, indicated that SMA opposes this item, noting that a scale should be able to zero off loads in both positive and negative directions. Darrell Flocken, speaking on behalf of the WS, indicated that the WS originally proposed this issue to address a situation in which one company's device was permitted to automatically re-zero unlimited amounts of weight from the scale after a programmable period of time. While the WS was not comfortable with the operation of this feature when it was ultimately brought to light, they made an attempt to propose the addition of language to NIST Handbook 44 to recognize the feature in order to avoid putting other manufacturers at a competitive disadvantage. After much discussion and hearing many comments on this issue, the WS has since reconsidered its position and believes that its original inclination to oppose the recognition of the feature was correct. The WS feels it can address this through the type evaluation process and believes that the proposed changes to HB 44 are no longer necessary.

Based upon the comments received during this meeting and the 2009 NCWM Annual Meeting, the WWMA recommends this item and corresponding items in Item 322-1 and Item 324-1 be Withdrawn from the NCWM S&T Committee's 2010 Interim Agenda.

At its 2009 Annual Meeting, the SWMA recommended making the proposal to add a new paragraph S.2.1.7. and associated definition for Automatic Zero-Setting Mechanism an Informational item. The SWMA heard the feature conflicts with the current operation of zero-tracking and the feature is not clearly defined. Furthermore, one manufacturer has configured the feature to operate with both positive and negative weight indications, thus conflicting with R 76 requirements. If the NCWM S&T Committee agrees to address this feature, the language should harmonize with R 76.

During its 2009 Interim Meeting, NEWMA agreed with the comments and recommendations from the WWMA and recommends this item be Withdrawn.

320-3 T.N.4.5.1. Time Dependence: Class II, III, and IIII, T.N.4.5.2. Time Dependence: Class III L, and T.N.4.5.3. Zero Load Return: Non-automatic Weighing Instruments.

Source: National Type Evaluation Technical Committee - Weighing Sector

Purpose: This proposal is intended to align creep recovery tolerances on scales with the equivalent tolerances for load cells that were adopted at the 2009 NCWM Annual Meeting.

Item Under Consideration: Amend Handbook 44 Section 2.20 Scales Code paragraphs T.N.4.5.1. Time Dependence: Class II, III, and IIII Non-Automatic Weighing Instruments, and T.N.4.5s.2. Time Dependence: Class III L Non-Automatic Weighing Instruments, and add new paragraph T.N.4.5.3. Zero-Load Return - Non- Automatic Weighing Instruments as follows:

T.N.4.5.1. Time Dependence: Class II, III, and IIII Non-automatic Weighing Instruments. – A non-automatic weighing instrument of Classes II, III, and IIII shall meet the following requirements at constant test conditions. During type evaluation, this test shall be conducted at 20 °C ± 2 °C (68 °F ± 4 °F):

(a) When any load is kept on an instrument, the difference between the indication obtained immediately after placing the load and the indication observed during the following 30 minutes shall not exceed 0.5 e. However, the difference between the indication obtained at 15 minutes and the indication obtained at 30 minutes shall not exceed 0.2 e.

(b) If the conditions in (a) are not met, the difference between the indication obtained immediately after placing the load on the instrument and the indication observed during the following 4 hours shall not exceed the absolute value of the maximum permissible error at the load applied.

~~**(c) The deviation on returning to zero as soon as the indication has stabilized, after the removal of any load which has remained on the instrument for 30 minutes, shall not exceed 0.5 e.**~~

~~**For a multi-interval instrument, the deviation shall not exceed 0.5 e_1 (where e_1 is the interval of the first partial weighing range or segment of the scale).**~~

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

(Added 2005) (Amended 2006 **and 2010**)

T.N.4.5.2. Time Dependence: Class III L Non-automatic Weighing Instruments. – A non-automatic weighing instrument of Class III L shall meet the following requirements:

(a) When any load is kept on an instrument, the difference between the indication obtained immediately after placing the load and the indication observed during the following 30 minutes shall not exceed 1.5 e. However, the difference between the indication obtained at 15 minutes and the indication obtained at 30 minutes shall not exceed 0.6 e.

(b) If the conditions in (a) are not met, the difference between the indication obtained immediately after placing the load on the instrument and the indication observed during the following 4 hours shall not exceed the absolute value of the maximum permissible error at the load applied.

~~**(c) The deviation on returning to zero as soon as the indication has stabilized, after the removal of any load which has remained on the instrument for 30 minutes, shall not exceed one-half of the absolute value of the applicable tolerance for the applied load for Class III L devices.**~~

(Added 2005) **(Amended 2010)**

T.N.4.5.3. Zero Load Return: Non-automatic Weighing Instruments. – A non-automatic weighing instrument shall meet the following requirements at constant test conditions. During type evaluation, this test shall be conducted at 20 °C ± 2 °C (68 °F ± 4 °F). The deviation on returning to zero as soon as the indication has stabilized, after the removal of any load which has remained on the instrument for 30 minutes shall not exceed:

(a) 0.5 e for Class I, II, and IIII devices,

(b) 0.5 e for Class III devices with 4000 or fewer divisions,

(c) 0.83 e for Class III devices with more than 4000 divisions, or

(d) one-half of the absolute value of the applicable tolerance for the applied load for Class III L devices.

For a multi-interval instrument, the deviation shall not exceed 0.83 e_1 (where e_1 is the interval of the first partial weighing range or segment of the scale).

On a multiple range instrument, the deviation on returning to zero from Max_i (load in the applicable weighing range) shall not exceed 0.83 e_i (interval of the weighing segment). Furthermore, after returning to zero from any load greater than Max_1 (capacity of the first weighing range) and immediately after switching to the lowest weighing range, the indication near zero shall not vary by more than e_1 (interval of the first weighing range) during the following 5 minutes.

(Added 20XX)

Background/Discussion: During the 2009 Annual Meeting, the Committee agreed with the comments that the relaxation of tolerances may impact existing zero-tracking and creep recovery requirements for scales and may result in increased rejection rates unless the language is amended. The Committee encouraged the NTETC WS or other interested parties to submit proposals that address areas affected by this change.

The recently adopted changes to zero-load return tolerance for load cell created a technical inconsistency between load cells and scales that incorporate these scales (i.e., in some cases, the tolerance is larger for the load cell that the equivalent tolerance for the scale). This proposal will correct the inconsistencies to ensure that scales will not fail creep recovery due to the increased tolerance applicable to a suitable and appropriate load cell installed in the scale.

At is 2009 meeting, the NTETC WS reviewed the report of the S&T Committee and the language adopted by the NCWM. The WS noted that the Committee discussion included comments that there is a relationship between load creep recovery and a scales ability to return to a zero-balance condition after a load had been on the load-receiving element over a period of time, and that the WS should review the zero-tracking requirements and creep recovery tolerances for scales.

The WS agreed that HB 44 Scales Code paragraph T.N.4.1. should be amended to coincide with the changes to T.N.4.6. Mr. Nigel Mills (Hobart) submitted a proposal to the WS to amend creep recovery requirements for scales to coincide with the creep recovery tolerance adopted for load cells. The WS agreed with the proposed language and requested that Mr. Cook (NIST) and Mr. Davidson (Mettler-Toledo) develop the proposal as shown above and submit to the Committee.

The WS considered the Committee's comments on the impact of the amended load cell creep recovery tolerance and agreed zero-tracking requirements due to manufacturers designing scales and separable weighing/load-receiving elements with load cell capacities that are typically larger than the scale capacities, and that loading a scale to 90 % capacity for 30-minutes (a test conducted during type evaluation) rarely occurs in most Class III applications.

320-4 UR.2.6. Approaches.

Source: Western Weights and Measures Association

Purpose: This proposal is intended to provide clear guidelines for the width, and length, a level plane for approaches at temporary vehicle scale installations of less than six months.

Item Under Consideration: Amend Scales Code paragraph UR.2.6.1. as follows:

UR.2.6.1. Vehicle Scales. *– On the entrance and exit end(s) of a vehicle scale* ~~***installed in any one location for a period of 6 months or more***~~*, there shall be a straight approach as follows:*

(a) the width at least the width of the platform,

(b) the length at least one-half the length of the platform but not required to be more than 12 m (40 ft), and

(c) not less than 3 m (10 ft) of any approach adjacent to the platform shall be ***constructed ~~of concrete or similar durable material to ensure that this portion remains smooth and level and in the~~ on the*** *same plane as the platform.* ***~~However, grating of sufficient strength to withstand all loads equal to the concentrated load capacity of the scale may be installed in this portion.~~*** *Any slope in the remaining portion of the approach shall ensure (1) ease of vehicle access, (2) ease for testing purposes, and (3) drainage away from the scale.*

Scales installed in any one location for a period of 6 months or more shall have approaches constructed of concrete or similar durable material to ensure that this portion remains smooth and level and in the same plane as the platform; however, grating of sufficient strength to withstand all loads equal to the concentrated load capacity of the scale may be installed in this portion.
[Nonretroactive as of January 1, 1976]

(Amended 1977, 1983, 1993, ~~and~~ 2006**, and 201X**)

Background/Discussion: At its 2009 Annual Meeting, Doug Deiman, Alaska Department of Transportation submitted the above proposal stating that this amendment to Scales Code paragraph UR.2.6.1. will give clear design and instruction for approaches at temporary vehicle scale installations of less than six months. Currently, HB 44 leaves approaches for temporary vehicle scales unregulated and does not address: a) safety; b) access to testing; and c) scale perseveration issues that were originally considered when adopting UR.2.6.1. in 1975. Doug added that discussions with two scale manufacturers have indicated that there would be universal agreement to this addition to the scale code. Additionally, costs to scale owners are not anticipated as manufacturers' approach installation instructions are usually more stringent than this proposed change. The benefits will be measured in greater scale longevity, reduced maintenance costs, greater safety for employees, and better access for calibration and testing.

The WWMA agreed to recommend that the NCWM S&T Committee include the above proposal to amend Scales Code paragraph UR.2.6.1. Vehicle Scales, to provide clear guidelines for installing approaches at temporary vehicle scale installations of less than six months.

321 BELT-CONVEYOR SCALE SYSTEMS

321-1 N.3.1.4. Check for Consistency of the Conveyor Belt Along Its Entire Length

Source: Carryover Item 321-1. This item originated from the 2008 Western Weights and Measures Association (WWMA) (This item first appeared on the 2008 Committee's Developing Items Section of its agenda as Item 360-2 Part 3 Item 2)

Purpose: The BCS Work Group agrees that the existing language in N.3.1.4. results in an excessive allowance for the variation in a belt with larger minimum division sizes. Conversely, the 3 division requirement can impose an excessively narrow restriction for belt-conveyor scales with smaller minimum divisions. The proposed amendment corrects the issue and makes the allowable variation independent of division size.

Item Under Consideration: Amend NIST Handbook 44, Section 2.21. Belt Conveyor Scales (BCS) Systems Code, paragraph N.3.1.4. as follows:

N.3.1.4. Check for Consistency of the Conveyor Belt Along Its Entire Length. – During a zero-load test, the total change indicated in the totalizer during one revolution of the belt shall not exceed 0.18 % of the load that would be totalized at scale capacity for the duration of the test. The end value of the zero-load test must meet the ± 0.06 % requirement of paragraphs N.3.1.2. Initial Stable Zero and N.3.1.3. Test for Zero Stability. ~~After a zero-load test with flow rate filtering disabled, the totalizer shall not change more~~

~~**than plus or minus (± 3 d) 3.0 scale divisions from its initial indication during one complete belt revolution.**~~

(Added 2002) (Amended 2004 **and 201X)**

Background/Discussion: At its 2007 Annual Meeting**,** the WWMA received a proposal from the Belt-Conveyor Scale Work Group (BCS WG) to amend paragraph N.3.1.4. The BCS WG stated that existing language in N.3.1.4. results in an excessive allowance for the variation in a belt. However, for belt-conveyor scales that can benefit from a smaller minimum division, the 3-division requirement can impose an excessively narrow restriction. It should be noted that variations in belt weight tend to be sinusoidal. In other words, the error caused by belt variations would be canceled if the material test were conducted using complete revolutions. The maximum belt variation would occur at 0.5, 1.5., 2.5, etc., revolutions. However, material tests are rarely conducted using complete revolutions of the belt.

During the 2008 NCWM Interim Meeting, the Committee was informed that the USNWG on Belt-Conveyor Scales was planning to further develop the proposal during their February 2008 meeting. During that meeting, the WG discussed this item and concluded that the language needs further development before a consensus can be reached and recommended this item remain as a Developing item.

At its 2008 Annual Meeting, the WWMA heard comments that the item is sufficiently developed and is an improvement over the existing language in HB 44. The Committee agreed and recommended that this proposal move forward as a Voting item.

During the 2009 NCWM Interim Meeting, the Committee heard a comment from Bill Ripka, Thermo Ramsey, supporting the proposal as written in the Committee's recommendation and adding that the current language in HB 44 stating the current 3 scale interval deviation from an initial indication can lead to significant errors in scale accuracy. The Committee agreed with the comments from Bill Ripka and recommended this item move forward as a Voting item.

At the 2009 Annual Meeting, the Committee received comments and recommendations from the February 2009 meeting of the BCS WG. The members of the WG came to general agreement that with regard to these systems, the conveyor belt needs to be uniform (minimum variations in the weight per unit of length of the belt), but the statement as it exists in the Committee's Interim Report is not well understood. The variation during a revolution of the belt is most important and will exhibit the most impact for BCS applications that may use a portion of a belt revolution to deliver a weighment (e.g., 2.5 belt revolutions). This could occur when loading individual trucks or railcars, or in some cases, could occur with the quantity for verification testing. For large quantities, such as loading a unit train, the error becomes insignificant.

The BCS WG reported that, after their meeting adjourned, an extended session of the meeting took place with a smaller group. The smaller group developed an amended proposal. However, the smaller group recommended that this item <u>not</u> go forward as a Voting item, but be given Informational status to allow more time to consider developing a revised proposal and to conduct additional research the appropriate tolerance. The entire BCS WG was polled on the smaller group's recommendation. Two responses agreed with the recommendation that this item needed further review and development and its status be made "Informational."

During the open 2009 hearing, the Committee received comments from Bill Ripka, Thermo Ramsey and NIST WMD supporting the recommendation from the BCS WG. The Committee agreed that with the WG that this item needs more time to conduct additional research to determine the appropriate tolerance and revise the proposal and agreed to keep this item on its agenda as "Informational."

(See also the Committee's 2008 Annual Report for additional background information in Developing Item 360-2 Part 3 Item 2.)

322 AUTOMATIC BULK-WEIGHING SYSTEMS

322-1 S.2.1. Zero-Load Adjustment

Source: 2009 Carryover Item 322-1. This item originated from the NTETC Weighing Sector and S&T Committee and first appeared on the Committee's 2009 Interim Agenda.

Purpose: This proposal is intended to prohibit the automatic zero-setting mechanism for the same reasons that zero-tracking is prohibited (incorrect net weight determinations may occur when unintentional and unobserved zeroing or tracking off of material retained in a hopper).

Item Under Consideration: Amend HB 44 Section 2.22. Automatic Bulk-Weighing Systems by amending paragraph S.2.1.3.3. as follows:

> **S.2.1. Zero-Load Adjustment.** – The weighing system shall be equipped with manual or semiautomatic means by which the zero-load balance or no-load reference value indication may be adjusted. ~~**An a**~~**A**utomatic zero-tracking **and automatic zero-setting** mechanism**s** ~~**is**~~**are** prohibited.
>
> **(Amended 201X)**

Background/Discussion: At its 2008 Annual Meeting, the NTETC Weighing Sector held a discussion about the increasing number of scales submitted for NTEP evaluations that include an "automatic zero-setting" feature, which is not addressed in NIST HB 44. It has been noted that many devices are built for a global marketplace and that the operation of this "automatic zero-setting" device may be functional on the device when installed in the United States. Currently, HB 44 does not define this function. NCWM Publication 14 has no test to determine if the device submitted for evaluation has such a function or if it is sealable. Additionally, NTEP reported that, on a scanner/scale that had been submitted for NTEP evaluation, the automatic zero-setting feature was discovered and found to work in both the positive and negative directions and could be activated or deactivated without breaking a security seal or changing the audit trail information.

The 2008 NTETC WS established a small WG to develop language to be submitted to the NCWM S&T Committee and make recommendations addressing the suitability of scales with the capability to automatically set a positive weight indication to zero. The group, which included Mr. Davidson (Mettler-Toledo), Mr. Henry (NCR), Mr. Cook (NIST Technical Advisor), and Mr. Patoray (CoC, LLC), volunteered to develop a proposal for the S&T Committee. (Mr. Lucas, Ohio NTEP laboratory, and Mr. Truex, NTEP Administrator, also contributed to the discussions and subsequent proposal.) Additionally, the WS agreed to review the language developed by the WG to confirm its support of the proposed language.

In the process of developing the proposal, the WG recommended that the automatic zero-setting mechanism be prohibited for devices covered by Section 2.22. Automatic Bulk-Weighing Systems for the same reasons that zero-tracking is prohibited (incorrect net weight determinations may occur when unintentional and unobserved zeroing or tracking off of material retained in a hopper between drafts).

At the 2009 NCWM Interim Meeting, the Committee agreed that this item should remain as an Informational item pending the development of the proposal to add the term "automatic zero-setting mechanism" in agenda Item 320-2.

At the August 2009 NTETC WS Meeting, the NIST Technical Advisor provided the WS with an update on the status and additional discussions on this item since the 2009 Interim and Annual Meetings, and suggested that the WS develop a consensus position on this item and forward its conclusion to the S&T Committee. The WS discussed the possible positions to forward to the S&T Committee (see agenda Item 320-2).

The WS discussed the options in great detail and reached a consensus among the attendees that this feature does not have any value in the U.S. marketplace, and can potentially facilitate inaccurate weight determinations against either the buyer or the seller. The WS changed its 2008 position and now recommends that no changes are needed in order to address this feature in HB 44.

Based upon the comments received at the 2009 WWMA Annual Technical Conference and the 2009 NCWM Annual Meeting, the WWMA recommends this item and corresponding items in Item 320-3 and Item 324-1 be Withdrawn from the NCWM S&T Committee's 2010 Interim Agenda.

At its 2009 Interim Meeting, the CWMA supported the language as shown above and recommends this move forward as a Voting item.

During its 2009 Interim Meeting, NEWMA agreed with the comments and recommendations from the WWMA and recommends this item be Withdrawn.

See agenda Item 320-2 for additional discussions and background information on the development of this proposal.

324 AUTOMATIC WEIGHING SYSTEMS

324-1 S.2.1.3. Automatic Zero-Setting Mechanism

Source: 2009 Carryover Item 324-1. This item originated from the NTETC Weighing Sector and S&T Committee and first appeared on the Committee's 2009 Interim Agenda.

Purpose: Automatic zero-setting mechanism is a feature used in many scales throughout the world. This feature is not addressed or defined in HB 44 nor is it listed on NTEP CCs. This proposal is intended to establish automatic zero-setting limits to be consistent with the international recommendations in OIML R 51.

Item Under Consideration: Amend HB 44 Section 2.24. Automatic Weighing Systems by adding new paragraph S.2.1.3. as follows:

S.2.1.3. Automatic Zero-Setting Mechanism – If equipped, an automatic zero-setting mechanism shall operate only when the indication has remained:

(a) stable according to paragraph S.4.2. Damping, and

(b) below zero for at least 5 seconds.

The maximum effect of automatic zero-setting mechanism is limited to 4 % of the nominal capacity of the scale and is a sealable parameter.

(Added 201X)

Background/Discussion: At it 2008 Annual Meeting, the NTETC Weighing Sector discussed an issue about the increasing number of scales submitted for NTEP evaluations that include an "automatic zero-setting" feature not addressed in NIST HB 44. It has been noted that many devices are built for a global marketplace and that the operation of this "automatic zero-setting" device may be functional on the device when installed in the United States. Currently, HB 44 does not define this function. NCWM Publication 14 has no test to determine if the device submitted for evaluation has such a function or if it is sealable. Additionally, NTEP reported that, on a scanner/scale that had been submitted for NTEP evaluation, the automatic zero-setting feature was discovered and found to work in both the positive and negative directions and could be activated or deactivated without breaking a security seal or changing the audit trail information.

The 2008 NTETC WS established a small WG to develop language to be submitted to the NCWM S&T Committee and make recommendations addressing the suitability of scales with the capability to automatically set a positive weight indication to zero. The group (Mr. Davidson, Mettler-Toledo; Mr. Henry, NCR; Mr. Cook, NIST Technical Advisor; and Mr. Patoray, Consultants on Certification, LLC) volunteered to develop a proposal for the S&T Committee. (Todd Lucas, Ohio NTEP laboratory, and Jim Truex, NTEP Administrator, also contributed to the discussions and subsequent proposal.) Additionally, the WS agreed to review the language developed by the WG to confirm its support of the proposed language.

In the process of developing the proposal, the WG recommended that the automatic zero-setting mechanism should be permitted for devices covered by Section 2.24. Automatic Weighing Systems since equivalent requirements can be found in OIML R 51 Recommendation for Automatic Catchweighing Instruments.

The Committee agreed that this item should remain as an Informational item pending the development of the proposal to add the term "automatic zero-setting mechanism" in agenda Item 320-2.

At the August 2009 NTETC WS Meeting, the NIST Technical Advisor provided the WS with an update on the status and additional discussions on this item since the 2009 Interim and Annual Meetings and suggested that the WS develop a consensus position on this item and forward its conclusion to the S&T Committee. The WS discussed the possible positions to forward to the S&T Committee (see agenda Iitem 320-2).

The WS discussed the options in great detail and reached a consensus among the attendees that this feature does not have any value in the U.S. marketplace, and can potentially facilitate inaccurate weight determinations against either the buyer or the seller. The WS changed its 2008 position and now recommends that no changes are needed in to address this feature in HB 44.

Based upon the comments received at the 2009 WWMA Annual Technical Conference and the 2009 NCWM Annual Meeting, the WWMA recommends this item and corresponding items in Item 320-2 and Item 322-1 be Withdrawn from the NCWM S&T Committee's 2010 Interim Agenda.

During its 2009 Interim Meeting, NEWMA agreed with the comments and recommendations from the WWMA and recommends this item be Withdrawn.

See agenda Item 320-2 for additional discussions and background information on the development of this proposal.

324-2A S.2.2.4. Visibility of Operation and S.2.2.5. Subtractive Tare Mechanism

Source: 2009 Carryover Item 324-2C. (This item originated from the S&T Committee and first appeared on the Committee's 2007 agenda.)

Purpose: The tare proposals are intended to provide uniform application of tare requirements during field inspections and additional support for the requirements for the operation of tare indications and recorded representation of tare during NTEP evaluation that are currently based on interpretations of General Code requirements and NCWM Report of the 65th Committee on Specifications and Tolerances agenda Item 320-1 Tare (Pages 246-218).

Item Under Consideration: This recommendation clarifies the requirements for tare by adding new paragraphs S.2.2.4. and S.2.2.5. that provide new requirements for visibility and subtractive tare (i.e., balancing off tare objects does not increase the nominal scale capacity).

S.2.2.4. Visibility of Operation. – Operation of the tare mechanism shall be visibly indicated on the instrument. In the case of instruments with digital indications, this shall be done by marking the indicated net value with the word "NET" or the symbol "N". "NET" may be displayed as "NET.", "Net" or "net". If a scale is equipped with an indicator that allows the gross value to be displayed temporarily while a tare mechanism is in operation, the "NET" symbol shall disappear while the gross value is displayed.

(Added 201X)

S.2.2.5. Subtractive Tare Mechanism. – After any tare operation and while subtractive tare is in effect, an indicating or recording element shall not display nor record any values when the gross load (not counting the initial dead load that has been canceled by an initial zero-setting mechanism) is in excess of 105 % of scale capacity after tare has been taken.
(Added 201X)

Background/Discussion: Additional background information on this item can be found in the Background/Discussion paragraphs on agenda Item 320-1 in the 2009 Committee's Interim and Annual Reports.

After the NIST presentation on Tare during the 2009 Interim Meeting, several questions were asked that indicated the need for additional clarification on the indications. Consequently, the Committee recommended that this proposal remain an Informational item and suggested that the WS clarify the proposed language and consider providing examples of indications and recorded representations when multiple tares are used to determine net weights and provide the justification for limiting the acceptable words and abbreviations for the word "Net."

During the 2009 Annual Meeting, the Committee received no additional comments on this proposal. However, "Tare: Items 320-1A and 320-1B" were not adopted in the Committee's 2009. Consequently, the Committee "withdrew" the corresponding items in 324 Series "Voting items" and recommended that the NTETC WS discuss and provide the Committee with an update on the WS position on the remaining Tare "Information" proposals for the Committee's 2010 Interim Agenda.

At its August 2009 Annual Meeting, the WS reviewed the background information regarding comments and actions during the 2009 NCWM Annual Meeting. The WS recommends that the remaining tare items (Items: 324-2A, 324-2B, and 324-C in the Committee's 2009 agenda) should be Withdrawn from the 2010 S&T Committee Agenda since the NCWM agreed with the SMA position that the tare proposals are not needed for HB 44.

Based upon comments received during their respective fall 2009 association meetings and the 2009 NCWM Annual Meeting, the CWMA, WWMA, SWMA, and NEWMA recommends the remaining tare items be Withdrawn from the NCWM S&T Committee's 2010 Interim Agenda.

324-2B S.2.2.6. Consecutive Tare Operations and S.2.2.7. Indication and Printing of Weighing Results

Source: 2008 Carryover Item 324-2D. (This item originated from the S&T Committee and first appeared on the Committee's 2007 agenda.)

Purpose: The tare proposals and proposed definitions are intended to provide uniform application of tare requirements during field inspections, allow the identification and printing of preset tares with the abbreviation "PT," and additional support for the requirements for the operation of tare and preset tare, indications recorded representation of tare during NTEP evaluation that are currently based on interpretations of General Code requirements and NCWM Report of the 65th Committee on Specifications and Tolerances agenda Item 320-1 Tare (Pages 246-218).

Item Under Consideration: (**NOTE:** This item will be considered jointly with Item 320-1A.) This recommendation clarifies the requirements for tare by adding new paragraphs S.2.2.6. and S.2.2.7. that clarify the requirements for transactions that use multiple tare, tare mechanisms, and the indications and recording of weighing results.

S.2.2.6. Consecutive Tare Operations. – Repeated operation of a tare mechanism (including preset tare) is permitted for single transactions with one gross, one net, and multiple tare values. If more than one tare mechanism is operative at the same time, tare weight values shall be clearly designated (identified) with either "T" for tare or "PT" for preset tare, as appropriate, when indicated or printed.

(Added 201X)

S.2.2.7. Indication and Printing of Weighing Results.

(a) Gross weight values may be printed without any designation or by using a complete word or symbol. For a designation by a symbol, only uppercase "G" is permitted.

(b) If only net weight values are printed without corresponding gross or tare values, they may be printed without any designation or by using a complete word or symbol. The complete word (as shown in S.2.2.3. Visibility of Operation) or symbol "N" shall be used to designate a net weight.

This applies also where semi-automatic zero-setting and semi-automatic tare balancing are initiated by the same key.

(c) Gross, net, or tare values determined by a multiple range instrument or by a multi-interval instrument need not be marked by a special designation referring to the (partial) weighing range.

(d) If net weight values are printed together with the corresponding gross and/or tare values, the net and tare values shall be identified at least by the corresponding symbols "N" and "T" or by complete words using all upper-case letters, all lower-case letters, or a combination of upper- and lower-case letters.

(e) If net weight values and tare values determined by different tare mechanisms are printed separately for single transactions with multiple gross, tare, and net values, they shall be suitably identified (e.g., vehicle sequentially loaded with mixed commodities).

(Added 201X)

Background/Discussion: Additional background information on this item can be found in the Background/Discussion paragraphs on agenda Item 320-1A in the 2009 Committee's Interim and Annual Reports.

During the NIST presentation on Tare during the 2009 Interim Meeting, the Committee heard several questions that indicated the need for additional clarification on the value of specifying acceptable words and abbreviations for Gross, Tare, Preset Tare, and Net and what constitutes "consecutive tare operations." Consequently, the Committee recommended that this proposal remain an Informational item and suggested that the WS further clarify the proposed language and consider providing examples of 1) indications and recorded representations of tare and preset tare in consecutive tare transactions; and 2) indications and recorded representations when multiple tares and preset tares are used to determine net weights.

During the 2009 Annual Meeting, the Committee received no additional comments on this proposal. However, "Tare: Items 320-1A and 320-1B" in the Committee's 2009 agenda were not adopted. Consequently, the Committee "withdrew" the corresponding items in 324 Series "Voting items" and recommended that the NTETC WS discuss and provide the Committee with an update on the WS position on the remaining Tare "Information" proposals for the Committee's 2010 Interim Agenda.

At its August 2009 Annual Meeting, the WS reviewed the background information regarding comments and actions during the 2009 NCWM Annual Meeting. The WS recommends that the remaining tare items (Items: 324-2A, 324-2B, and 324-C in the Committee's 2009 agenda) should be Withdrawn from the 2010 S&T Committee Agenda since the NCWM agreed with the SMA position that the tare proposals are not needed for HB 44.

Based upon comments received during their respective fall 2009 association meetings and the 2009 NCWM Annual Meeting, the CWMA, WWMA, SWMA, and NEWMA recommends the remaining tare items be Withdrawn from the NCWM S&T Committee's 2010 Interim Agenda.

324-2C S.2.3. Preset Tare Mechanism and S.2.3.1. Indication of Operation

Source: 2009 Carryover Item 324-2E. (This item originated from the S&T Committee and first appeared on the Committee's 2007 agenda.)

Purpose: The tare proposals and proposed definitions are intended to provide uniform application of tare requirements during field inspections; allow the identification and printing of preset tares with the abbreviation "PT" and additional support for the requirements for the indications, and recorded representation of tare and preset during NTEP evaluation that are currently based on interpretations of General Code requirements and NCWM Report of the 65th Committee on Specifications and Tolerances agenda Item 320-1 Tare (Pages 246-218).

Item Under Consideration: (**NOTE:** This item will be considered jointly with Item 320-1B.) This recommendation clarifies the requirements for tare by adding new paragraphs S.2.3. and S.2.3.1. that provide new

requirements for metrological tare (e.g., tare objects weighed or balanced off at the time of the transaction), tare accuracy, operating range, visibility, and preset tares (e.g., manually entered or stored tares for multiple transactions).

Add new paragraphs S.2.3. and S.2.3.1. as follows:

S.2.3. Preset Tare Mechanism, Operation. – In addition to the provisions of paragraphs S.2.2. Tare and S.2.2.1. Scale Interval, a preset tare may be operated together with one or more tare devices provided:

(a) the preset tare mechanism complies with paragraph S.2.2.6. Consecutive Tare Operations,

(b) the preset tare operation cannot be modified or cancelled as long as any tare mechanism operated after the preset tare operation is still in use,

(c) the preset tare associated with a price look-up (PLU) shall be automatically cancelled at the same time a PLU is cancelled, and

(d) the preset tare values are designated by the symbol "PT;" however, it is permitted to replace the symbol "PT" with complete words.

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

S.2.3.1. Indication of Operation. – It shall be possible to temporarily indicate the preset tare value (e.g., pressing a tare display button or a negative net weight indication with no load on the load-receiving element). Additionally, paragraph S.2.2.7. Indication and Printing of Weighing Results applies accordingly, provided the calculated net value is printed and at least the preset tare value is printed, with the exception of:

(a) a Class II or a Class III automatic weighing system with a maximum capacity not greater than 100 kg (200 lb) used in direct sales to the public, and

(b) automatic weigh/price labeling systems.

(Added 201X)

Background/Discussion: Background information on this item can be found in the Background/Discussion paragraphs on agenda Item 320-1A in the 2009 Committee's Interim and Annual Reports.

During the NIST presentation on Tare during the 2009 Interim Meeting, the Committee heard several questions that indicated the need for additional clarification on:

- whether or not itemized indications and recorded representations and required for each tare; and
- whether or not different indications and recorded representations are required for each tare value when tare and preset tare are used in the same transaction.

Consequently, the Committee recommended that this proposal remain an Informational item and suggested that the WS further clarify the proposed language and consider providing examples of indications and recorded representations of preset tare in consecutive tare transactions and provide the justification for limiting the acceptable words and abbreviations for the words "Preset Tare."

During the 2009 Annual Meeting, the Committee received no additional comments on this proposal. However, "Tare: Items 320-1A and 320-1B" were not adopted in the Committee's 2009. Consequently, the Committee "withdrew" the corresponding items in 324 Series "Voting items" and recommended that the NTETC WS discuss

and provide the Committee with an update on the WS position on the remaining Tare "Information" for the Committee's 2010 Interim Agenda.

At its 2009 Annual Meeting, the NTETC WS reviewed the background information regarding comments and actions during the 2009 NCWM Annual Meeting. The WS recommends that the remaining tare items (Items: 324-2A, 324-2B, and 324-C) should be Withdrawn from the 2010 S&T Committee Agenda.

Based upon comments received during their fall 2009 regional association meetings and the 2009 NCWM Annual Meeting, the CWMA, WWMA, SWMA, and NEWMA recommends the remaining tare items (Items: 320-1B, 324-2A, 324-2B, and 324-2C) be Withdrawn from the NCWM S&T Committee's 2010 Interim Agenda.

330 LIQUID-MEASURING DEVICES

330-1 Temperature Compensation for Liquid-Measuring Devices Code

Source: 2009 Carryover Item 330-1. This item originated from the NCWM S&T Committee and first appeared on the Committee's 2007 agenda.

Purpose: The intent of this proposal is to establish specifications, tolerances, and other technical requirements that can be uniformly applied to retail liquid-measuring devices equipped with temperature compensation. The proposed changes are based on similar requirements for wholesale liquid-measuring devices.

Item Under Consideration: The Committee is considering the following proposed modifications to Section 3.30. Liquid-Measuring Devices (LMD) Code to recognize temperature compensation for retail devices. The Committee has modified earlier proposals based on comments received as of the 2009 NCWM Interim Meeting.

S.1.6.8. Recorded Representations from Devices with Temperature Compensation. – Receipts issued from devices or systems with activated automatic temperature compensation must include a statement that the volume of the product has been adjusted to the volume at 15 °C for liters or the volume at 60 °F for gallons.
[Nonretroactive as of January 1, 201X]
(Added 201X)

Renumber existing S.1.6.8. Lubricant Devices, Travel of Indicator to S.1.6.9., accordingly.

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

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

S.2.7.2. Display of Temperature. – For test purposes, on a device equipped with active automatic temperature compensation, means shall be provided to indicate or record the temperature determined by the system sensor to an a resolution of no greater than 0.2 °F.
[Nonretroactive as of January 1, 201X]

S.2.7.~~2~~3. Display of Net and Gross Quantity and Provision for Deactivating. – **A device or system equipped with an active electronic automatic temperature-compensating mechanism shall indicate or record both the gross (uncompensated) and net (compensated) volume for testing purposes.** On a device **or system** equipped with a**~~n~~ mechanical** automatic temperature-compensating mechanism that will indicate or record only in terms of ~~gallons~~**liters** compensated to 15 °C **or gallons compensated to (**~~60 °F~~**)**, provision shall be made for deactivating the automatic temperature-compensating mechanism so that the meter can indicate~~, and record if it is equipped to~~**or** record~~,~~ in terms of the uncompensated volume. **It is**

not necessary that both net and gross volume be displayed simultaneously on a device or system equipped with either mechanical or electronic temperature-compensating mechanisms.

(Amended 1972 **and 201X**)

S.2.7.~~3~~4. Provision for Sealing Automatic Temperature-Compensating Systems. – Provision shall be made for applying security seals in such a manner that an automatic temperature-compensating system cannot be disconnected and that no adjustment **that detrimentally affects the metrological integrity of the device** may be made to the system without breaking the seal **or automatically providing a record (e.g., audit trail) of the action**.

(Amended 201X)

S.2.7.4.1. Provision for Sealing the Temperature Sensor. – Provision shall be made for applying security seals in such a manner that the temperature sensor cannot be removed or disabled without breaking the seal or providing a record (e.g., audit trail) of the action.
[Nonretroactive as of January 1, 201X]

S.2.7.4.~~5~~. Temperature Determination with Automatic Temperature Compensation. – For test purposes, means shall be provided (e.g., thermometer well) to determine the temperature of the liquid either:

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

(b) immediately adjacent to the meter in the meter inlet or discharge line.

(Amended 1987)

S.4.3.~~2.~~ Temperature Compensation. – If a device **or system** is equipped with **active** automatic temperature compensation, the primary indicating elements, recording elements, ~~**or**~~**and** recorded representation shall be clearly and conspicuously marked to show that the volume delivered has been adjusted to the volume at 15 °C **for liters or** ~~(~~60 °F~~)~~ **for gallons.**

(Amended 201X)

Renumber existing paragraphs and subparagraphs S.4.3. Wholesale Devices, Discharge Rates and S.4.4. Retail Devices accordingly.

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

(a) by comparing the **net (**compensated**)** volume indicated or recorded to the actual delivered volume ~~**corrected**~~ **adjusted** to 15 °C **for liters or ~~(~~60 °F~~)~~ for gallons, and**

(b) ~~**with the temperature-compensating system deactivated,**~~ comparing the **gross (**uncompensated**)** volume indicated or recorded to the actual delivered volume. **(For some devices this may require that the temperature compensator be deactivated.)**

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

(Amended 1987 **and 201X**)

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

(Amended 1974 **and 201X**)

UR.3.6. Temperature Compensation~~, Wholesale~~.

UR.3.6.1. Automatic.

UR.3.6.1.1. ~~When to be~~ Use~~d~~ of Automatic Temperature Compensation. – If a device is equipped with **~~a mechanical~~ active** automatic temperature **~~compensator~~ compensation**, it shall be connected, operable, and in use at all times. An electronic or mechanical automatic temperature-compensating system may not be removed, nor may a compensated device be replaced with an uncompensated device, without the written approval of the **~~responsible~~** weights and measures jurisdiction **with statutory authority over the device**.

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

(Amended 1989 **and 201X**)

OR

UR.3.6.1.1. ~~When to be~~ Use~~d~~ of Automatic Temperature Compensation. – If a device is equipped with a mechanical automatic temperature compensator, it shall be connected, operable, and in use at all times. **Once used, ~~A~~an** electronic or mechanical automatic temperature-compensating system may not be removed **nor deactivated**, nor may a compensated device be replaced with an uncompensated device, without the written approval of the **~~responsible~~** weights and measures jurisdiction **with statutory authority over the device**.

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

(Amended 1989 **and 201X**)

UR.3.6.1.2. Condition of Use. – At a business location which offers fuel products for retail sale on the basis of a temperature-compensated volume, all devices used for retail sales shall have active automatic temperature compensation and all fuel products offered for retail sale shall be dispensed on the basis of temperature-compensated volume.

UR.3.6.1.~~2~~3. Recorded Representations (Invoices, Receipts, and Bills of Lading).

(a) A**n** ~~written~~ invoice based on a reading of a device **or recorded representation issued by a device or system** that is equipped with an **active** automatic temperature compensator shall show that the volume delivered has been adjusted to the volume at 15 °C **for liters or ~~(~~**60 °F**~~)~~ for gallons and decimal subdivisions or fractional equivalents thereof.**

(b) The invoice issued from an electronic wholesale device equipped with an automatic temperature-compensating system shall also indicate:

(1) the API gravity, specific gravity or coefficient of expansion for the product;

(2) product temperature; and

(3) gross reading.

(Amended 1987 **and 201X)**

UR.3.6.1.4. Temperature Determination. – The means for determining the temperature of measured liquid in a device with an activated automatic temperature-compensating system shall

be so located and designed that, in any "usual and customary" use of the system, the resulting indications and/or recorded representations are within applicable tolerances.

(Added 201X)

UR.3.6.4. Temperature-Compensated Sale. – All sales of products, when the quantity is determined by an approved measuring system with temperature compensation, shall be in terms of the liter at 15 °C or the U.S. gallon of 231 in^3 at 60 °F.

(Added 201X)

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

At the 2007 Interim Meeting, the Committee considered moving the proposal forward as a priority Voting item. However, the Board instructed the Committee to retain the item as Informational and established a steering committee to provide the S&T and L&R Committees with guidance on temperature compensation issues.

At the 2008 Interim Meeting, the Committee made some additional modifications to the proposal and, believing the proposal to be essentially complete and based on urging from officials who anticipated installation of ATC equipment in their jurisdictions, the Committee agreed to designate Item 310-1 as a Voting item on its agenda for the 2008 Annual Meeting.

At the 2008 NCWM Annual Meeting, the Committee heard numerous comments on the proposed changes to include specifications, test procedures, and user requirements for devices equipped with automatic temperature compensation systems.

Based on the many suggestions that it heard between the 2008 Interim and Annual Meetings to allow time for additional study and development of the related method of sale requirements, the Committee decided to change the status of this item from Voting to Informational at the 2008 Annual Meeting.

See the 2007 and 2008 NCWM S&T Final Reports for additional details and background information.

During the 2008 WWMA Annual Technical Conference, an update on the California Energy Commission (CEC) cost benefit analysis was given. The WWMA was told that the study is being delayed due to difficulty in obtaining device information. The CEC report to the California legislature, due December 2008, was granted an extension until February 2009, after the NCWM Interim Meeting. Several industry members and weights and measures officials stated that the S&T and L&R Committees needed to work in concert; therefore, this item should remain Informational until the CEC and GAO reports are completed.

One jurisdiction stated during the WWMA meeting that they would like to see technically sound language in HB 44 in the event that temperature-compensated devices are installed and activated. No jurisdictions reported ATC devices in operation at this time. However, one jurisdiction stated that California type approved devices have been installed but the ATC feature has not been activated. Another jurisdiction stated that a company informed them they were considering ATC but would not take action until after the NCWM had made their decision on the L&R and S&T proposals. For these reasons, the WWMA agreed this item should remain "Informational."

At its 2008 Interim Meeting, the CWMA took the position that having guidelines in Handbook 44 does have a value in the event that a model law is passed. However, the CWMA believes that until a model law is passed, the guidelines cannot be fully drafted for this item. Therefore, the CWMA recommends this item be a Developing item.

At its 2008 Interim Meeting, NEWMA discussed the following points related to this item:

1. waiting for GAO and California study;
2. financial impact to consumer and retail station owners;
3. extra time for testing and cost of additional equipment;
4. several problems with language of item (e.g., 15.56 ºC versus 15 ºC, gravity to be used?);
5. connection to L&R item; and
6. possible perpetuation of fraud.

NEWMA recommends this item be made "Developing."

The SWMA heard comments during the open hearings at its 2008 Annual Meeting that the item should remain Informational to allow time for additional information to be gathered. The SWMA also heard that there may be additional information provided from the California Energy Commission study (due to be completed in February 2009, with a possible draft available in December 2008) and the GAO study (due to be completed in the fall of 2008). With regard to the proposed changes to the LMD Code, the SWMA heard suggestions that the requirements for indicating temperature-compensated deliveries be examined to ensure that existing equipment can meet the requirements, particularly with regard to the service station consoles. The SWMA also heard a suggestion that action on the proposed changes to the LMD Code be held off until the NCWM L&R Committee completes its deliberations on the method of sale issue. The SWMA noted the NCWM S&T Committee raised a number of questions during its deliberations in July and asks that, in addition to the NCWM ATC Steering Committee, people provide input to assist the National S&T Committee in its deliberations on this issue. Because of the comments received and the number of outstanding issues, the SWMA decided to maintain this item as Informational on its agenda.

The Committee received copies of the GAO study (available on the GAO website at www.gao.gov), as well as a draft of the California Energy Commission study. (Technical Advisor's Note: A final version of this report is now available from the CEC at www.energy.ca.gov.)

The Committee received comments from several members of the ATC Steering Committee in response to the questions it raised in July. A copy of these comments is included in Appendix B of the Committee's Interim Report.

Based on input from these Steering Committee members and the regional weights and measures associations, comments received at the 2009 Interim Meeting, and the Committee's deliberations at the 2009 Interim, the Committee addressed the points it raised in its 2008 Final Report as follows:

- **The reference to the word "active."** The Committee reviewed the paragraphs and inserted the word as appropriate. The Committee noted that the original intent of paragraph UR.3.6.1.1. was that mechanical compensators should be activated and in use at all times.

- **Division size of temperature sensor.** The Committee changed the reference to "resolution" rather than accuracy. (See S.2.7.3. below.)

- **Should there be a corresponding reference to the accuracy requirements for the temperature sensor in the Tolerances section?** The Committee changed the reference to "resolution" rather than accuracy. (See S.2.7.3. below.)

- **Should inspector test accuracy of temperature sensor?** There is no intention for an inspector to test the temperature sensor in the field. The proposed requirements will be patterned after other NIST Handbook 44 code references in which the results of gross and net test drafts are compared against a specified tolerance.

- **A User Requirement is needed to specify that, if a single business offers products for sale on the basis of a temperature-compensated volume, all devices in that business shall be equipped with active automatic temperature compensation systems.** The Committee agreed that a similar paragraph to that being considered in agenda Item 331-2 should be included in the LMD Code. The proposed paragraph is included as UR.3.6.1.2. as outlined in the recommendation above.

- **Reference to 15.56 ºC.** The Committee agreed to change the reference to 15 ºC.

- **Ability to sense when a device is in the ATC mode.** The Committee heard mixed opinions on this issue, with some manufacturers and officials commenting that equipment should be able to automatically detect when in the ATC mode and print and display accordingly and some officials stating that equipment should not be required to automatically detect this. The Committee also noted that a longer lead time could be given on the non-retroactive status of the requirement. The Committee is interested in comments on how this point should be addressed.

- **UR.3.6.1.3. needs clarification.** The Committee made some changes to the language to improve the clarity of the paragraph, including clarifying that this requirement applies to systems with activated ATC.

At the 2009 NCWM Interim Meeting, the Committee heard a number of suggestions for changes to specific portions of the recommendation and addressed these comments in its recommendation as follows:

- **S.1.6.8. Recorded Representations from Devices with Temperature Compensation**

  - **Question/Comment:** Depending upon method of sale requirements adopted in a given jurisdiction, devices equipped with electronic temperature compensation systems may not be required to have the ATC feature activated. Should not the provision of S.1.6.8. only apply to systems with activated ATC?
  - **Conclusion:** The Committee agrees and added the word “activated” to clarify that the paragraph only applies to systems with the feature activated.

- **S.2.6. Temperature Determination**

  - **Question/Comment:** Should the term wholesale be deleted? If so, this will require a thermometer well even on non-ATC RMFDs.
  - **Conclusion:** The Committee agreed that the intent was not to require the installation of thermometer wells on existing RMFDs that are not equipped with ATC. Since S.2.7. includes provisions for a thermometer well, or other means, for determining the temperature at the meter on liquid-measuring devices equipped with ATCs, the Committee deleted the proposed change to S.2.6. and has eliminated the proposed change from the recommendation above.

- **S.7.2. Display of Net and Gross Quantity and S.2.7.4. Display and Provision to Deactivate**

  - **Question/Comment:** Is it necessary to have both paragraphs S.7.2. and S.2.7.4. as shown in the Publication 15 proposal? Could these paragraphs be combined?
  - **Conclusion:** The Committee agreed that the paragraphs can be combined, noting that the language needs to reflect the differences between provisions for mechanical and electronic ATC mechanisms. The proposed paragraph numbered S.2.7.2. in the Committee’s Interim agenda has been deleted and its provisions incorporated into the existing S.2.7.2. In making these revisions, the Committee also noted that existing User Requirement paragraph UR.3.6.1.1. requires a mechanical compensator to be activated and in use at all times.

- **S.2.7.3. Display of Temperature**

  - **Question/Comment:** Is this paragraph intended to specify a tolerance for the temperature sensor? If so, will this be a field test?
  - **Conclusion:** Based on guidance provided by the ATC Steering Committee, the Committee agreed to change "accuracy" to "a resolution of no greater than" in proposed paragraph S.2.7.2. (shown as S.2.7.3. in the Committee's Interim agenda). The Committee also agreed that the intent was not to test the accuracy of the system's temperature sensor in the field. The approach for testing devices with ATCs will continue to be a comparison between compensated and non-compensated test drafts.

- **UR.3.6.1.1. Use of Automatic Temperature Compensation**

  - **Question/Comment:** Should the words "once used" be inserted prior to "it shall be connected" to clarify that some systems may be equipped with the feature, but the feature may not be activated.
  - **Conclusion:** The Committee notes that the intent of the original User Requirement paragraph UR.3.6.1.1. was that mechanical compensators should be activated and in use at all times.

- **References to 15.56 ºC:**

  - The Committee changed all references to 15 ºC to correspond with the proposals on the L&R Committee's agenda for method of sale. The Committee acknowledged that 15.56 ºC is an exact conversion for 60 °F. However, the Committee agreed that 15 ºC is more appropriate since this is the value used internationally and in light of comments from industry questioning whether or not existing equipment can display values to two decimal places.

- **The Committee also made the following editorial corrections/changes based on comments received:**

  - **UR.3.6. Temperature Compensation**. – The word "wholesale" should appear at the end of the title as struck, since it is currently in the code.
  - **S.4.3. Temperature Compensation.** – The word "active" should not be in italics.

The Committee discussed whether or not this item is ready to move forward for a vote at the 2009 Annual Meeting. The Committee recognizes the need for standards to be in place to encourage uniform evaluation of RMFDs equipped with ATC, and acknowledges that some jurisdictions are already facing the imminent possibility of such equipment in their jurisdictions. While the Committee believes that these standards are necessary whether or not the issue of a model method sale regulation has been resolved, based on the number of comments received on the proposed changes to the LMD code, the Committee believes that the item should be retained as an Informational item until the changes outlined above have been studied by interested stakeholders. The Committee also acknowledged that the General Code paragraph G-A.3. Special and Unclassified Equipment coupled with relevant provisions in existing code paragraphs can be used by jurisdictions to address equipment with ATC features in the meantime. The Committee also does not believe that delaying the revisions to the LMD code should delay a decision on the method of sale item before the L&R Committee.

(See also the Committee's 2007 and 2008 Final Reports for additional background information on this issue.)

Based on comments heard from the floor at the 2009 NCWM Annual Meeting, the Committee acknowledged that additional work may be needed to specific sections of the proposed changes to the code. Points raised and discussed by the Committee include the following:

- There was a question of whether to reference "15 ºC" or "15.56 ºC." The Committee agreed that industry practice has been to use "15 ºC" and that this is the reference used internationally; consequently, they believe it should be kept as "15 ºC." This is also supported by the L&R Committee's 2009 Interim Report which references a statement by the Meter Manufacturers' Association indicating that 15 ºC is used internationally and industry would likely follow that convention should SI units be used.

- Clarification is needed for the differences between wholesale devices and systems. Specific paragraphs in question were S.1.6.8. and S.2.7.2.
- Clarification is needed for how S.2.7.2. applies to electronic registers that can only indicate in terms of compensated quantities when the compensator is activated; the compensator would need to be activated and an additional run completed in order to view an uncompensated reading.
- Review the use of the term "invoice" and consider if the term is well understood for retail transactions which have typically used terminology, such as "printed receipt" or recorded representation.
- Review the language in the VTM code under Item 331-2 and consider where changes might be needed to ensure consistency.

The Committee decided to keep the status of this item as an Informational item and acknowledges that some jurisdictions are already facing the imminent possibility of such equipment in their jurisdictions. The Committee believes that these standards are necessary whether or not the issue of a model method sale regulation is adopted in NIST Handbook 130 since weights and measures jurisdictions may decide to permit this equipment based upon their individual State laws or regulations.

At their Fall 2009 meetings, the CWMA, NEWMA, and the SWMA agreed to recommend that this item be withdrawn from the Committee's agenda. The CWMA heard no comments in support of this item, but numerous comments in opposition. The SWMA indicated that it considered the NTETC Measuring Sector's need for procedures to evaluate temperature compensated retail devices, but concluded that it is highly unlikely such devices will be submitted for evaluation. The SWMA notes that the proposal was discussed at length during the past three NCWM sessions and appears no closer to resolution. The SWMA also cites the conclusion in the report issued by the California Energy Commission that there is no economic advantage to temperature compensation at the retail dispenser.

At its 2009 Annual Meeting, the WWMA heard comments suggesting that this item be withdrawn, that states should regulate temperature compensation individually, and that there is a need for a better definition distinguishing between wholesale and retail. There was concern about the display of temperature and display of net and gross, whether it needed to be deactivated and how this deviates from the Vehicle-Tank Meters code. Another comment heard was that there is confusion regarding the condition of use and the term "invoice" in UR.3.6.1.3. Further work is needed to clarify how paragraph UR.3.6.1.2. would apply in businesses locations that sell wholesale and retail from the same device.

The WWMA reported receiving the following written comments from Andrea Martincic, Executive Director of the Arizona Petroleum Marketers Association. At the request of Ms. Martincic, these comments were entered directly into the WWMA final report as submitted.

1) Item should be withdrawn given the NCWM's annual meeting outcome on ATC as a legal method of sale from L&R. Conflict for states that automatically adopt Handbook 44.

2) If an individual jurisdiction decides to allow the use of an ATC device, they should accept responsibility for the regulation of that equipment.

3) Would like better explanation for wholesale transactions using a liquid measuring device. Should there be a differentiation between a wholesale transaction made from a liquid measuring device versus a vehicle tank meter. Most background discussion and discussion on this issue seems to mostly reference retail.

4) 2.7.2 Display of temperature for testing: .2 degrees (This is the same tolerance being advocated for a mechanical ATC device for VTMs under 331-1) Would like to hear W&M debate on why this is the appropriate tolerance.

5) 2.7.3 Display net & gross for testing. Can this occur? Have not heard from the US manufacturers of this potential ATC device.

6) 3.6.1.2 Condition of use- At a business location all pumps and all fuel must be sold ATC---would this be problematic for E-85 or other alt. fuels.

7) 3.6.1.3 Recorded Representatives (Invoices, Receipts and BOL's) Retail transactions result in receipts for customers, on the wholesale side they result in Invoices for customers. BOL's are between a shipper on the pipeline and the distributor/jobber picking up the fuel at the rack.

The WWMA also forwarded the following written comments from Jay McKeeman, Vice President, Government Relations and Communications, California Independent Oil Marketers Association (CIOMA). These comments are included as written in the submission.

- We strongly recommend that WWMA withdraw additional discussion of ATC requirement development. It has become even clearer in these recent discussions that development of ATC requirements in Handbook 44 will legitimize the potential of dual distribution requirements in states where a permissive ATC condition is authorized or permitted. Having two distribution systems (gross and ATC) in place at the same time is the worse-case scenario for the distributing industry, the customer and the weights and measures officials. It creates confusion, competitive disadvantage, dual inspection and accuracy measurements and will sweep away the years of hard work and good efforts instilling consumer and industry confidence that there is a level, honest playing field in the purchase of motor fuels.

- States, such as California, are perfectly capable of issuing regulations if an ATC system, type-certified by the state, is put in place. We have had a long-standing offer to work with DMS and local agencies in the development of such regulations, but have not seen that offer taken up. Trying to take California's situation (CIOMA strongly believes state law prohibits ATC at retail) of a possible permissive condition and use it as justification for national standards is inappropriate and unwarranted.

- We strongly believe, based upon statements made in open session and during the S&T Committee deliberations that the national consensus will be to withdraw further discussion of ATC requirements in Handbook 44.

- We believe a table or matrix needs to be devised that better articulates the various Handbook 44 provisions related to petroleum sales ATC, with organization by transaction type (wholesale, retail), area of governance (accuracy testing, labeling, signage, conditions of use, invoice requirements, etc.) and which provides insight into stationary location vs. mobile fueling device requirements. This would be a useful guide for the regulated community, as well as a place where a state could determine what regulations might be needed to cover any gaps, if they needed to do their own regulations.

The WWMA acknowledges that this item needs further work. However, based on comments heard at the NCWM annual meeting and at the WWMA open hearings stressing that jurisdictions and manufacturers need criteria in HB 44 in order to ensure uniformity in instances where needed, the WWMA recommends it be maintained as an Informational item on the NCWM S&T Committee's Agenda.

330-2 Price Posting and Computing Capability and Requirements for a Retail Motor-Fuel Dispenser (RMFD)

Source: 2009 Carryover Item 330-3. This item originated from WMD and the regional associations and first appeared on the Committee's 2007 agenda.

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

Item Under Consideration: The Committee is considering a proposal to make the following modifications to Section 3.30. Liquid-Measuring Devices (LMD) Code to address price posting and computing capability for retail motor-fuel dispensers as follows:

S.1.6.4. Display of Unit Price and Product Identity.

S.1.6.4.1. Unit Price.

(a) A computing or money-operated device shall be able to display on each face, the unit price at which the device is set to compute or to dispense.

*(b) Whenever a grade, brand, blend, or mixture is offered for sale from a device at more than one unit price, then all of the unit prices at which that product is offered for sale shall be displayed or shall be capable of being displayed on the dispenser using controls available to the customer prior to the delivery of the product. It is not necessary that all of the unit prices for all grades, brands, blends, or mixtures be simultaneously displayed prior to the delivery of the product. This subsection shall not apply to fleet sales, other contract sales, ~~or~~ truck refueling sales**, or all purchases of fuel accompanied by an automatically printed receipt of the transaction containing the discount unit price, the total gallons delivered, and total price of the sale***.

[Effective and nonretroactive as of January 1, 1991]

(Amended 1989**, ~~and~~** 1997**, and 201X**)

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

[Nonretroactive as of January 1, 1991]

(Added 1989) (Amended 1991, 1992, 1993, **~~and~~** 1996**, and 201X**)

S**.1.6.6. Agreement of Indications.** – No changes.

S.1.6.7. Recorded Representations. *– No changes.*

UR.3. Use of Device.

UR.3.2. Unit Price and Product Identity. – No changes.

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

(Added 1989) (Amended 1992)

The following exceptions apply:

(a) Fleet sales and other price contract sales are exempt from this requirement.

(b) A truck stop dispenser used exclusively for refueling trucks is exempt from this requirement provided that:

(1) all purchases of fuel are accompanied by a printed receipt of the transaction containing the applicable price per gallon, the total gallons delivered, and the total price of the sale; and
(Added 1993)

(2) unless a dispenser complies with S.1.6.4.1. Display of Unit Price, the price posted on the dispenser and the price at which the dispenser is set to compute shall be the highest price for any transaction which may be conducted.
(Added 1993)

(c) All purchases of fuel accompanied by an automatically printed receipt of the transaction containing the discount unit price, the total gallons delivered, and total price of the sale.
(Added 201X)

UR.3.4. Printed ~~Ticket~~ Receipt. – Except for purchases conducted under UR.3.3(c) (*see note below), **~~T~~t**he total price, the total volume of the delivery, and the price per **unit ~~liter or gallon~~** shall be shown, **on a receipt by** either **being automatically** printed or **printed** in clear hand script**~~, on any printed ticket issued by a device and containing any one of these values~~**.

***Note: Purchases conducted under UR.3.3(c) shall only be automatically printed, containing at minimum the total price, the total volume of the delivery, and the discount price per unit.**
(Amended 2001 **and 201X**)

Background/Discussion: In the early 1990s, various sections of the Liquid-Measuring Devices Code in HB 44 (including paragraphs S.1.6.4. Display of Unit Price and Product Identity, S.1.6.5.4. Selection of Unit Price, UR.3.2. Unit Price and Product Identity, and UR.3.3. Computing Device) were modified to address multi-tier pricing applications, such as cash or credit. 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 WMD regarding the requirements for posting unit prices, calculation of total price, customer-operated controls, and other related topics, such as the definitions for associated terminology.

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

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

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

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

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

The WWMA acknowledged that marketing practices change on a daily basis and the task to ensure HB 44 codes address each scenario is monumental. However, the WWMA encouraged NIST in its efforts to tackle this ongoing issue. Therefore, the WWMA recommended this item be considered and move forward to the national level as a Developing item as did the SWMA and NEWMA.

At its 2007 Annual Meeting, the SWMA was informed that the National Association of Convenience Stores recognized a problem with the current price posting and computing capability requirements in HB 44 and was currently working on information on this item to provide to the NCWM S&T Committee.

At the 2008 Interim Meeting, Ohio Weights and Measures submitted a proposal to the Committee that included specific language for modifying Section 3.30. to address the various pricing and marketing structures being used in retail motor-fuel applications. Based on its review of that proposal, the fact that a specific proposal has now been developed and presented, and the number of jurisdictions reporting a need to move forward with this item, the Committee decided to elevate the status of this item from Developing to "Informational." Consequently, the Committee is considering the specific language submitted by Ohio and encourages the weights and measures community to review the proposal and submit comments on this item.

At its spring 2008 meeting, the CWMA S&T Committee reported hearing comments that current language does not meet the needs of what is actually happening in the marketplace. Currently, there are economic issues dealing with fair competition, and there are numerous marketing techniques that the language in NIST HB 44 cannot address. The CWMA S&T Committee believes the item as proposed is a good start on addressing this issue, but it does not entirely provide adequate language to aid in enforcement. The CWMA S&T recommended that a WG be formed to further evaluate this item. Some examples of the panel discussion were, but not limited to:

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

NEWMA's spring 2008 meeting report stated that this is a very important item and NEWMA supports continued work on it as an Informational item. One member suggested that at the next NEWMA Interim Meeting, a WG spend some time coming up with suggestions for this item.

At the 2008 Annual Meeting, the Committee heard comments on the proposed changes to the Liquid-Measuring Devices Code. Several weights and measures officials expressed concern about the provision in the proposed language that would allow discounts to be calculated at the console after the customer has dispensed product. These officials felt that devices should be able to compute the total sales price at the unit price at which the product is offered for sale. Several industry members expressed support of the proposed language. One member stated that it is important for retailers with mechanical dispensers to be able to offer their customers a cash discount.

Current NIST Handbook 44 requirements state that the selection of the unit price must be made by the customer using controls on the device or other customer-activated controls. One industry member questioned whether making arrangements for a given method of payment at the console might be considered as satisfying that requirement since the customer is initiating the sale and the conditions of payment prior to the transaction. Weights and measures

officials acknowledged the comment, but emphasized the need for the customer to retain control over the selection of the price, preferably by making a selection at the dispenser or using customer controls.

The Committee expressed appreciation for the work that had been done thus far, acknowledging that additional work is needed on this item and noted that a WG is being formed to develop this item. The Committee looks forward to receiving input and suggestions from the WG and encourages interested parties to participate in the WG and/or forward comments to the Committee.

A meeting was held on July 15, 2008, (in conjunction with the NCWM Annual Meeting) of individuals interested in the issue of pricing requirements for retail motor-fuel dispensers. Participants in the meeting included weights and measures officials, gasoline pump manufacturers, and other interested parties. The purpose of the meeting was to establish an informal WG to review the issue of price posting and computing capability for retail motor-fuel dispensers. The WG will focus on the development of proposed changes to NIST Handbook 44 necessary to provide flexibility to marketers while ensuring that the buyer and seller have adequate information about all aspects of the transaction with respect to the pricing and method of payment. The CWMA had suggested the formation of this small WG to study this issue with the idea that the issue could be more thoroughly developed than could be done in the limited time available during the NCWM Interim and Annual Meetings. Note that this work does not replace the discussion of this issue at the NCWM Interim and Annual Meetings, but rather is intended to supplement the work and provide the S&T Committee with some proposals to consider.

Participants at that meeting were asked to indicate their interest in the work as either "work group participants" (expected to regularly participate and contribute to the work) or "observers" (will be kept abreast of WG activities, including meeting agendas and summaries). Because there is no budget to support the cost of regular face-to-face meetings, the WG will attempt to accomplish its objectives through e-mail and other electronic communication. Anyone interested in the details of this work should contact Tina Butcher (NIST WMD) by e-mail at tbutcher@nist.gov or by telephone at (301) 975-2196.

During the open hearings at its 2008 Annual Technical Conference, the WWMA received comments that the Committee wait until a national WG is established to develop this item further. The WWMA agreed that the item should be "Informational."

During its 2008 Interim Meeting, the CWMA heard the following comments during discussions of this item:

- Lighten the rules of dispensing so consumer can see the actual sale – transparency in the marketplace
- Not enough room on marquee or on pump for posting all prices
- What will appear on customer receipt or final receipt

The CWMA agrees that the item should be Informational until more information is obtained from the national WG.

At its 2008 Interim Meeting, NEWMA supported work on this item and looks forward to information from the WG.

At its 2008 Annual Meeting, the SWMA acknowledged the need to review and revise the requirements in the Liquid-Measuring Devices Code regarding price posting and computing capability. However, the SWMA does not support the proposed language as written. The SWMA heard comments in opposition to the proposed changes to the LMD Code. The SWMA S&T Committee noted that it is important for consumers to have full information about the purchase price of the product before they dispense the fuel and to be able to follow all aspects of the transaction. Also, the Committee is concerned that the proposed language does not provide for this.

The SWMA heard from Tina Butcher, NIST, that a WG has been established to study this issue. The group met in conjunction with the NCWM Annual Meeting in July, and anyone interested in participating in the work should contact Tina. The SWMA supports the continued efforts of the WG and encourages interested parties to provide comments to the WG. Because of the ongoing efforts to develop this item, the SWMA agrees that this item should remain an Informational item and encourages people to study the proposal that has been presented thus far.

At the 2009 NCWM Interim Meeting, the Committee heard from Tina Butcher, NIST WMD, who indicated that, due to staff shortages, she has not been able to devote time to work on this issue further. Several NCWM members offered help in continuing the work, including John Eichberger, National Association of Convenience Stores, who indicated he could coordinate assistance from some of the association's interested members.

The Committee also heard some specific comments on the proposed language from Will Wotthlie, Maryland Weights and Measures, who noted that, should the Committee proceed with its consideration of the proposed changes in the recommendation; the following issues should be addressed:

- Paragraphs S.1.6.4.1.(a); UR.3.2.(a)(1); UR.3.2.(b)(1) and (2) are already in the handbook and should not be underlined. (**Technical Advisor's Note:** These corrections have been made in the report.)

- Where did the printed receipt referenced in S.1.6.4.1.(b) and in UR.3.3.(c) originate?

- Could the references to "computing or money-operated devices" currently found in paragraph S.1.6.4.1. be carried over into paragraph UR.3.3. in the lead statement: "Any computing or money-operated device…"?

- In the proposed changes to UR.3.4., should the reference to "printed" in the phrase "or printed in clear hand script" be "written" instead?

- Does the note under UR.3.4. Printed Ticket infer that all computing devices will be required to have a printer?

The Committee believes that additional work is required on this proposal before it is ready to move forward for a Vote and the Committee supports continued work by the WG. The Committee agreed to maintain this item as an Informational item.

At the 2009 NCWM Annual Meeting, the Committee heard continued comments in support of continuing this work.

At its Fall 2009 Interim meeting, the CWMA recommended that this item remain Informational and urged resources be committed to its further development. CWMA members commented that price posting continues to be a problem, noting that the current language in NIST Handbook 44 does not reflect current market practices and the language needs to be either fixed or removed from the Handbook. The CWMA also requested that the NCWM sponsor a WG to address this issue.

At its 2009 Interim Meeting, NEWMA agreed that this is a priority item and wants to encourage the formation of a WG as soon as possible. NEWMA further noted comments heard during its meeting:

- As long as terms and conditions are made clear prior to sale, the transaction should be allowed.

- Businesses should purchase the correct equipment (according to HB 44) for their marketing strategy.

- This items needs to move forward as a priority.

- We need to find some remedy for businesses that have older equipment.

- It is very difficult to take a hard line (follow HB 44 exactly) on this item.

- We must enforce equally and provide a level playing field.

- HB 44 is antiquated and should be revised.

At its 2009 Annual Meeting, the SWMA recommended that NIST WMD resume working on this proposal as soon as resources are available. NIST should include John Eichberger, National Association of Convenience Stores, and

other sectors that are interested in the work and that will be impacted by proposals to modify the LMD code relative to price posting and computing for RMFDs.

At its 2009 Annual Meeting, the WWMA recommended that the item remain Informational and, hearing that NIST plans to hire an additional staff member soon, urged NIST to allocate the necessary resources to the project. The WWMA feels that the suggested working group needs to be activated. The WWMA further commented that in reviewing the proposed language currently being considered, their members had some concerns that the customer may not be given adequate information until after the transaction is completed.

331 VEHICLE-TANK METERS

331-1 T.2.1. Automatic Temperature-Compensating Systems

Source: 2009 Carryover Item 331-1. This item originated from the Western Weights and Measures Association (WWMA) and first appeared on the Committee's 2008 agenda.

Purpose: To reduce tolerances applicable to comparisons of test results for compensated and non-compensated test runs to better reflect the performance of these systems.

Item Under Consideration: Amend paragraph T.2.1. as follows:

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

(a) **~~0.4~~0.2 %** for mechanical automatic temperature-compensating systems; and

(b) **~~0.2~~0.1 %** for electronic automatic temperature-compensating systems.

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

(Amended 201X)

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

To illustrate how the current tolerances may mask problems, such as broken temperature probes or incorrect settings, consider the following example:

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

- A net test draw is run and the result is + 2.0 gal or + 0.2 %. This meets the maintenance tolerance of 0.3 % or 3.0 gal.
- A gross draw is run and the result is – 2.0 gal or – 0.2 %. This still meets the tolerance and the difference between the two runs is 0.4 %.

- With the temperature of the fuel at 60 °F, both of these runs should have been equal.

- If an inspector used the system indication of temperature rather than using a certified thermometer in the meter temperature well, calculations show that the current tolerance of 0.4 % for a mechanical automatic temperature-compensating system could allow a system malfunction that provided a temperature error of up to 9 °F difference from the actual temperature taken in the prover and not be recognized as being caused by a faulty system.

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

In 2008 and 2009, the Committee heard mixed comments on this item. The MMA, some individual meter manufacturers, and some weights and measures officials opposed the proposal. While being comfortable with a tighter tolerance for type evaluation applications, they were generally uncomfortable with applying the tighter tolerances applied to routine field examinations, citing greater uncertainties in field testing and expressing concern over the consistency and adequacy of test equipment used in some field tests. The Committee heard similar concerns at the 2009 Interim and Annual Meetings. Several regional associations expressed the opinion that additional data is needed in order to better evaluate the proposal, with the CWMA and the WWMA noting that if no more information is received by the 2009 Interim Meeting, the item should move forward for a vote in 2009. NIST WMD supported the collection of additional data and suggested that the Committee re-examine and compare the tolerances for stationary and vehicle-mounted meters to ensure consistency across codes for the same meter type as part of this effort. NIST also highlighted comments made by some manufacturers and weights and measures officials regarding the importance of using NIST Handbook 105-compliant and traceable standards, such as thermometers and following appropriate test procedures for assessing compliance with ATC tolerances.

The Committee has repeatedly requested additional data in support of the proposal, as well as data from those who oppose the proposal indicating why the proposed change is inappropriate. The Committee maintained the item as an Informational item to allow for the submission of additional data. The Committee appreciates the data provided by Alaska and emphasizes that this position should not be taken to imply that the Committee questions the validity of the data or procedures used in collecting it. However, the Committee is reluctant to propose a change as significant as that of changing a tolerance based upon data from a single source. The NIST Technical Advisor contacted multiple states (including the majority of those along the northern U.S. border) for possible input, but found that many jurisdictions are not finding equipment with activated ATC systems in use on VTMs.

During the 2009 NCWM Annual Meeting, the Committee reported receiving additional VTM test data from the State of Maine. This data supports the proposed change to the tolerances; Maine noted the change would not impact the compliance rate for the devices included in these tests. The Committee pointed out that to date it has received only data in support of the proposed change.

The Committee reiterates its request for jurisdictions to supply test data in support or opposition of the proposal to assist the Committee in making a decision on the item. The Committee also encourages input of data from equipment manufacturers.

At its 2009 Annual meeting, the CWMA requested more data to support the item, noting that if none was received the CWMA would recommend the item move to a Voting item. Hearing no further comments at its 2009 Interim Meeting, the CWMA recommended that this proposal move forward as a Voting item.

At its 2009 Interim Meeting, NEMA recommended that this item remain “Informational,” noting that New York has offered to provide alternative proposed tolerances and offering the following additional comments:

- Tolerances should be based on the expansion coefficient of the product being tested.
- The higher the expansion coefficient,t the more accurate the thermometer must be.
- The tolerance should be based on temperature (e.g., ± 2 ºF) of the given products expansion coefficient.

At its 2009 Annual Meeting, the WWMA reiterated its 2008 position, the item should be moved forward for a vote. The WWMA heard from the Alaska representative that there has been no additional data submitted that would contradict the proposed tolerance change. The WWMA noted that the NCWM S&T Committee has repeatedly requested data from industry and state jurisdictions to support or refute the proposed tolerances and to date has received only supporting data.

The WWMA received written comments from Andrea Martincic, Executive Director of the Arizona Petroleum Marketers Association, as follows:

> Petroleum tankers and tank wagons do not have VTMs equipped with ATC—why is there a tolerance change being proposed for VTMs? Again seems to be a problem for 2 states. What products are being delivered by VTMs ATC? Is this to address an issue with heating oil?

The SWMA received no input on this item at its 2009 Annual Meeting and, therefore, took no position, recommending that the item remain "Informational."

331-2 UR.2.5.2.1. Automatic Temperature Compensation for Refined Petroleum Products

Source: 2009 Carryover Item 331-3. This item originated as a companion proposal to 2009 Interim agenda Item 331-2.

Purpose: Add a user requirement to address continual use of a compensator and consistent use of automatic temperature compensation equipment for all fuel products in a single business location.

Item Under Consideration: Add the following subparagraphs to the Vehicle-Tank Meters Code:

> **UR.2.5.1.3. Condition of Use. – At a business location which offers fuel products for sale on the basis of a temperature-compensated volume, all vehicle-tank meters shall have active automatic temperature compensation and all fuel products offered for sale shall be dispensed on the basis of temperature-compensated volume.**

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

The Committee was originally asked by the SWMA to consider adding two paragraphs intended to help (1) to eliminate the potential for facilitation of fraud with ATC; and (2) to eliminate consumer confusion regarding why certain products are currently sold using ATC and others are not. The Committee was able reach agreement on a proposal to address the "Period of Use" and put forward a proposal as outlined in Item 331-2 in the Committee's 2009 Final Report. Under that item, the NCWM ultimately adopted the following changes at the 2009 Annual Meeting: (1) Proposed changes to UR.2.5.1.1. to require continual use of an automatic temperature compensator; and (2) the addition of a new UR.2.5.1.2. to require year-round use of temperature compensation unless otherwise agreed to in writing by the buyer and the seller.

In discussing the larger issue of ATC use on VTMs in January 2009, the Committee was not able to reach agreement on the "Conditions of Use" for ATC systems; that is, criteria for stipulating how ATC is used to sell similar products within a single company. Consequently, the Committee created this item at the 2009 Interim Meeting as a companion to 2008 Item 331-2 to enable further review and discussion of the proposed criteria.

In reaching this decision, the Committee considered the following comments received during the 2008 Interim and Annual Meetings, as well as comments from the regional associations regarding "condition of use."

The Committee considered several iterations of the original proposal based on the following points raised in open hearings and regional associations in 2008. Details can be found in the Committee's 2008 Final Report (see Item 331-2).

- The proposal should only apply to fuel products.
- A number of people voiced concern over the possibility of consumers (who generally are not educated regarding the import of compensated versus uncompensated deliveries) unwittingly signing contracts agreeing to gross or net deliveries that may put them at a disadvantage.
- Questions were raised over uniformity between buyer and seller agreements at the retail level.
- The numbering of the proposals is not consistent with current code format.
- Would the language inappropriately allow a seller to include a shorter time period than 12 months facilitating use of the system when it is of most advantage to the business?

During the 2008 CWMA Interim Meeting, one jurisdiction stated they would not support this item with UR.2.5.2.2. Condition of Use. This jurisdiction believes that all VTMs at a location should *not* be made to be temperature-compensate at a given facility. Other jurisdictions attending the meeting supported the item. For clarification purposes, the CWMA recommends the words "through a vehicle-tank meter" (see italics type below for illustrative purposes) be inserted after the words "offered for sale…" in UR.2.5.2.2. Condition of Use.

In addition to proposed changes specifying the "period of use," the CWMA supported recommending the following proposed paragraph to address "condition of use" for a vote:

UR.2.5.2.2. Condition of Use. – At a business location, which offers fuel products for sale on the basis of a temperature-compensated volume, all vehicle-tank meters shall have active automatic temperature compensation and all fuel products offered for sale *through a vehicle-tank* meter shall be dispensed on the basis of temperature-compensated volume.

At its 2008 Interim Meeting, NEWMA heard discussion that allowing uncompensated sales when agreed to by both parties could result in consumers getting sales contracts that contained this language, and consumers may not understand fully what this means. When the phrase "unless otherwise agreed to by both the buyer and seller in writing" language is removed, it appears that UR.2.5.1. already addresses this issue.

Consequently, NEWMA recommended the following changes and suggested the item remain "Informational":

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

UR.2.5.2.~~2~~1. Condition of Use. – At a business location which offers fuel products for sale on the basis of a temperature-compensated volume, all vehicle-tank meters shall have active automatic temperature compensation and all fuel products offered for sale shall be dispensed on the basis of temperature-compensated volume.

At its 2008 Annual Meeting, the SWMA raised the following concerns and questions about the proposal:

- The SWMA questioned the need for the new proposed paragraph UR.2.5.1. since the VTM Code currently includes a paragraph (also numbered UR.2.5.1.) that appears to cover similar criteria.

- The SWMA heard a suggestion to eliminate the phrase "unless otherwise agreed to by both the buyer and the seller" from the proposed UR.2.5.1. The Committee noted that the same language is already included in the Liquid-Measuring Devices Code; however, the references in that code are to wholesale meters and the buyer and seller are fully educated and understand the ramification of a temperature-

compensated versus non-temperature-compensated sale.

- The SWMA questioned how the proposed paragraph UR.2.5.2.2. is intended to apply to metering devices at a single location. Does the reference to "all fuel products" in this paragraph refer to all vehicle-tank meters? Or does it refer to vehicle-tank meters, as well as RMFDs at a single location?

- The SWMA questions the proposed numbering of the paragraphs and whether or not the proposed paragraphs should be included under the section of "invoices" or in another section.

The SWMA also considered a suggestion to split the item into two parts in order to facilitate addressing these and other concerns. While the SWMA is amenable to this approach, it believes the above concerns and questions should be addressed prior to taking additional action and recommended the item remain "Informational."

At the 2009 NCWM Interim Meeting, concerns were expressed that the language in the recommendation may not allow a business that has a VTM dedicated to serving a single customer to have the option of providing the sale on an uncompensated basis. Comments in support of the language indicate that this will prevent business owners from selectively using a VTM without ATC to serve retail customers (who are not generally well educated with respect to the distinction between compensated and non-compensated deliveries) when a non-compensated sale would be disadvantageous to the customer. The CWMA has proposed alternative language, as shown in Item 331-2, to emphasize that the paragraph applies only to sales from a VTM by a business, not all of the business' fuel sales (for example, fuel sales made through loading-rack meters also operated by the business).

The Committee invited additional comments and suggestions on how to modify the proposed language to address the concerns raised. The Committee is also interested in comments on how the issue of a meter that can be programmed with multiple products should be addressed; specifically, whether such a meter should be permitted to be programmed to offer compensated and non-compensated sales through the same meter and, if so, what language is needed to address its use. The Committee agreed to keep this proposal on its agenda as an Informational item.

See Item 331-2 in the Committee's 2009 Interim and Final Reports for additional background information.

At their 2009 Annual Meetings, the CWMA, NEWMA, and SWMA heard no comments on the item; these regions not take a position on the item and recommended it remain "Informational." At its 2009 Interim Meeting, the CWMA heard comment from one jurisdiction in opposition of the item, but no other comments. At its 2009 Interim Meeting, NEWMA offered the following additional comments:

- A problem exists where businesses deliver gross/net from the same vehicle (e.g., different states with different requirements).
- This item is device focused but should be customer focused.

At its 2009 Annual Meeting, the WWMA also recommended the item remain "Informational," commenting that use of an ATC device should be linked to the customer, not the business location, because it appears that the way the section is currently written, all customers would be required to receive compensated deliveries where ATC is not required or desired.

The WWMA also received written comments from Andrea Martincic, Executive Director of the Arizona Petroleum Marketers Association. At the request of Ms. Martincic, these comments were entered directly into the WWMA final report as submitted:

"Still presents a problem for jobbers/distributors operating in multiple states. Could S&T somehow tie it to the customer—so there must be consistency of ATC usage for those customers sold product ATC through VTMs?"

The WWMA heard comments reiterating concerns about how the current proposed language in UR.2.5.2.1. would apply in instances where a single VTM is used to make retail and wholesale deliveries both in jurisdictions permitting ATC and in jurisdictions prohibiting it.

The WWMA believes this language is not yet ready for adoption and encourages further refinement to address the concerns noted above.

336 WATER METERS

336-1 N.3. Test Drafts and N.4. Testing Procedures

Source: 2009 Carryover Item 336-3. This item originated from the Southern and Western Weights and Measures Associations (SWMA and WWMA).

Purpose: To increase the test draft size for water meters to reduce the impact of uncertainties contributed by the test process.

Item Under Consideration: The Committee is studying following recommendation and encourages input from interested parties.

Amend requirements in paragraphs N.3. Test Drafts and N.4. Testing Procedures Section 3.36. Water Meters as follows by changing the test draft quantities of Tables N.4.1. and N.4.2. of HB 44 as follows:

N.3. Test Drafts. – ~~**The normal test of a meter shall be made at the maximum discharge rate developed by the installation. Meters with maximum gallon per minute ratings higher than the values specified in Table N.4.1. Flow Rate and Draft Size for Water Meters Normal Tests may be tested up to the meter rating, with meter indications no less than those shown.**~~

~~**(Amended 1990, 2002, and 2003)**~~

(a) Non Utility-Type Water Meters. – Test drafts should be equal to at least the amount delivered by the device in 2 minutes and in no case less than the amount delivered by the device in 1 minute at the actual maximum flow rate developed by the installation. The test draft sizes shown in Table N.4.1. Flow Rate and Draft Size for Non Utility-Type Water Meters Normal Tests, and in Table N.4.2. Flow Rate and Draft Size for Non Utility-Type Water Meters Special Tests, shall be followed as closely as possible.

(b) Utility-Type Water Meters. – The test draft sizes shown in Table N.4.X. and N.4.Y. shall be followed as closely as possible. Testing shall be done in like volumes (meters with gallon registration tested in gallon volumes, meters with cubic feet registration tested in cubic feet volumes).

Table N.4.1. Flow Rate and Draft Size for Non Utility-Type Water Meters
Normal Tests

Meter Size (inches)	Rate of Flow (gal/min)	Maximum Rate	
		Meter Indication/Test Draft	
		gal	ft^3
Less than 5/8	8	50	5
5/8	15	50	5
¾	25	50	5
1	40	100	10
1½	80	300	40
2	120	500	40
3	250	500	50
4	350	1000	100
6	700	1000	100

(Table Added 2003) **(Amended 201X)**

Table N.4.X. Flow Rate and Draft Size for Utility-Type Water Meters Normal Tests			
Meter Size (inches)	**Rate of Flow (gal/min)**	**Maximum Rate**	
		Meter Indication/Test Draft	
		gal	**ft^3**
Less than 5/8	**8**	**100**	**10**
5/8	**15**	**100**	**10**
5/8 x ¾	**15**	**100**	**10**
¾	**25**	**100**	**10**
1	**40**	**100**	**10**
1½	**50**	**300**	**40**
2	**100**	**500**	**40**

(Table Added 201X)

Table N.4.2. Flow Rate and Draft Size for Non Utility-Type Water Meters Special Tests						
Meter Size (inches)	**Intermediate Rate**			**Minimum Rate**		
	Rate of Flow (gal/min)	**Meter Indication/Test Draft**		**Rate of Flow (gal/min)**	**Meter Indication/Test Draft**	
		gal	**ft^3**		**gal**	**ft^3**
Less than or equal to 5/8	2	10	1	1/4	5	1
¾	3	10	1	1/2	5	1
1	4	10	1	3/4	5	1
1½	8	50	5	1½	10	1
2	15	50	5	2	10	1
3	20	50	5	4	10	1
4	40	100	10	7	50	5
6	60	100	10	12	50	5

(Table Added 2003) **(Amended 201X)**

Table N.4.Y. Flow Rate and Draft Size for Utility-Type Water Meters Special Tests						
Meter Size (inches)	**Intermediate Rate**			**Minimum Rate**		
	Rate of Flow (gal/min)	**Meter Indication/Test Draft**		**Rate of Flow (gal/min)**	**Meter Indication/Test Draft**	
		gal	**ft^3**		**gal**	**ft^3**
Less than 5/8	**2**	**10**	**1**	**¼**	**10**	**1**
5/8	**2**	**10**	**1**	**¼**	**10**	**1**
5/8 x ¾	**2**	**10**	**1**	**¼**	**10**	**1**
¾	**3**	**10**	**1**	**½**	**10**	**1**
1	**4**	**10**	**1**	**¾**	**10**	**1**
1½	**8**	**100**	**10**	**1½**	**100**	**10**
2	**15**	**100**	**10**	**2**	**100**	**10**

(Table Added 201X)

Background/Discussion: At its 2007 Annual Meeting, the SWMA received a proposal from a meter manufacturer

with two options for modifying Section 3.36. The proposals were intended to address concerns regarding the impact of uncertainties contributed by the test process during repeatability testing by increasing the test draft size specified in the code.

At the 2009 NCWM Interim Meeting, the Committee heard comments from meter manufacturers regarding the urgency for moving this item forward for a vote. The Committee also heard comments from regulators questioning whether or not the proposed changes would address the problems being found during meter testing.

Because the other regional associations have essentially deferred to the WWMA's position and the WWMA's support in the event of a vote was questionable based on comments received from the region, the Committee did not feel it was appropriate to advance this item to a Voting status. However, given the possibility of additional data prior to the 2009 Annual Meeting, the Committee did agree that the item could be elevated to an Informational status; this would allow a higher degree of visibility for an issue which is of evident concern to the manufacturers without compromising the due process for issue development.

During the 2009 NCWM Annual Meeting, Tina Butcher, NIST Technical Advisor, reported that the Committee received additional information on this item. These items as well as copies of previously submitted data are available from the Committee upon request.

At the 2009 NCWM Annual Meeting, the Committee heard a report from Kristin Macey, California Division of Measurement Standards (DMS), on an intercomparison conducted by DMS since the 2009 NCWM Interim Meeting involving 18 California counties.

The Committee heard comments from George DeJarlais, Badger Meter, and Andre Noel, Neptune, who both expressed continued concern about the lack of progress on this issue and impact of the requirements on their ability to market meters. Both manufacturers who were present reported disappointment that Item 336-2 was withdrawn and noted that they are still studying the data from CA, which they received during the Committee's agenda review session.

Jeff Humphreys, LA County, acknowledged problems with testing at the lower flow rates. He went on to express concern about the quality of multi-jet meters they are encountering. The positive displacement meters that they are testing appear to meet the needs of the marketplace with a good compliance rate. Jeff also provided additional data to the Committee that was collected by LA County over the period of January to June 2009; this information will be included in the Committee's final report.

Ed Williams, CA DMS, indicated that in its review of the data collected, CA has observed some validity to the manufacturers' concerns over the requirements for repeatability tests. Both Jeff and Ed encouraged the Committee to do a thorough review of the full range of test requirements for these meters, including not only basic accuracy tests, but also repeatability test requirements.

During the Committee's 2009 Annual Meeting work session, Kristin Macey (representing CA DMS) and the water meter manufacturers present agreed to work to further review requirements for water meter testing with the goal of identifying changes or modifications to the scope of this item (336-1) in time for review by one or more of the fall 2009 regional weights and measures associations.

See the 2007, 2008, and 2009 S&T Committee reports for additional details and background information on this issue.

At its 2009 Annual Meeting, the WWMA heard comments from Ed Williams, Director, California Division of Measurement Standards, regarding water meter compliance in California and referencing testing that has been conducted at the State and county level. Ed provided a written copy of these comments to the WWMA; that document is included in Appendix A to this agenda.

The WWMA heard from George DeJarlais on behalf of five water meter manufacturers including Badger Meter, Neptune Technology Group, Master Meter, Elster-AMCO, and Sensus Metering Systems that there is an inadequate draft size in HB 44 for 1 ½ and 2 inch size meters and there is inequity in test draft sizes in Table N.4.2. between the five-gallon and corresponding one cubic foot drafts. Since the 2008 WWMA meeting, significant data has been submitted by the device manufacturers and CA DMS. In light of this data, George stated that eight new proposals were submitted to the WWMA that represent alternatives to 336-1, several of which would incorporate the changes proposed in this item. George also stated that the type evaluation compliance rate was somewhat misleading because it involves only four meter product lines that have passed type evaluation since 2002. In the meantime, some manufacturers have deferred submitting meters for evaluation until some of the HB 44 issues are resolved.

The WWMA S&T Committee was advised by George that the eight new proposals were submitted as multiple alternatives for solving the three concerns identified by the water meter manufacturers: accuracy test drafts for 1 ½ and 2 inch meters, gallon test drafts for meters ≤ 1 inch size, and accuracy test drafts with respect to repeatability requirements. After reviewing these proposals and considering the original proposal in 336-1, the WWMA recommended that this item be withdrawn and forwarded two new proposals (as outlined Item 336-2 and 336-3 of this agenda) to the NCWM S&T Committee for consideration.

At its 2009 Interim Meeting, the CWMA requested comments on this item; however, hearing none, the CWMA recommended that the item remain an Informational item.

At its 2009 Interim Meeting, NEWMA recommended withdrawing this item until a solid proposal can be made.

At its 2009 Annual Meeting, the SWMA recommended withdrawing this proposal in favor of supporting two alternate related proposals, developed by the September 2009 WWMA (as outlined in Items 336-2 and336-3 in this agenda).

336-2 N.4.2 Special Tests.

Source: WWMA

Purpose: To increase the test draft size for special tests of Utility Type Water meters to reduce the impact of uncertainties contributed by the test process.

Item Under Consideration: Modify paragraph N.4.2. Special Tests and Table N.4.2. and add a new table as follows:

N.4.2. Special Tests. – Special tests to develop the operating characteristics of meters may be made according to the rates and quantities shown in Table N.4.2. Flow Rate and Draft Size for Water Meters Special Tests.
(Amended 2003)

Table N.4.2.
Flow Rate and Draft Size for Batching Water Meters Special Tests

Meter Size (inches)	Intermediate Rate			Minimum Rate		
	Rate of Flow (gal/min)	Meter Indication/Test Draft		Rate of Flow (gal/min)	Meter Indication/Test Draft	
		gal	ft^3		gal	ft^3
Less than or equal to 5/8	2	10	1	¼	5	1
¾	3	10	1	½	5	1
1	4	10	1	¾	5	1
1 ½	8	50	5	1 ½	10	1
2	15	50	5	2	10	1
3	20	50	5	4	10	1
4	40	100	10	7	50	5
6	60	100	10	12	50	5

(Table ~~Added 2003~~ Amended 2011)

Table N.4.X. Flow Rate and Draft Size for Utility Type Water Meters Special Tests						
Meter Size (inches)	Intermediate Rate			Minimum Rate		
	Rate of Flow (gal/min)	Meter Indication/Test Draft		Rate of Flow (gal/min)	Meter Indication/Test Draft	
		gal	ft^3		gal	ft^3
Less than 5/8	2	10	1	¼	5	1
5/8	2	10	1	¼	5	1
5/8 x ¾	2	10	1	¼	5	1
¾	3	10	1	½	5	1
1	4	10	1	¾	5	1
1 ½	8	100	10	1 ½	100	10
2	15	100	10	2	100	10

(Table Added 2011)

Background/Discussion: The WWMA heard from Andre Noel, Neptune Technology Group, representing five water meter manufacturers. The meter manufacturers state that meters 1 ½ and 2 inch size are guaranteed to fail type evaluation because of inadequate test draft sizes. The test draft size only represents ten graduations on the proving indicator, only one-tenth the revolutions of the proving indicator. This results in larger meter uncertainties.

The WWMA heard that field testing of 1 ½ and 2 inch meters seldom occurs in California, but these meters are type evaluated by the California Type Evaluation Program laboratory on a more frequent basis. The WWMA recognizes that the current draft sizes are inadequate to obtain valid test results. Increasing the test draft size in this case would not create undue hardship during field testing, since field tests are not being conducted on a routine basis.

The WWMA also received a comment regarding the consistent use of words describing non-utility, batch-type, and batching type meters. The WWMA suggests that the term "batching meters" be used throughout this code. The WWMA also recognizes the need for including of the 5/8 x ¾ size meter, which is commonly found in commercial sub-metering applications.

At its 2009 Interim Meeting, the CWMA heard no comments on this item and recommended it be maintained as an Informational item.

At its 2009 Annual Meeting, the SWMA supported the WWMA in its proposed modifications to Table N.4.2. to address the flow rates and test draft sizes for special tests of batching meters. The SWMA also supports the WWMA's including a new Table N.4.X. to address the flow rates and test draft sizes for special tests of utility type water meters. The SWMA acknowledges the change in flow rates and test drafts for special tests of utility type water meters are needed to address the operating characteristics of these meters. Since tests are conducted on an infrequent basis, the increase in the test draft sizes as proposed in new Table N.4.X. would not create undue hardship for a jurisdiction. The SWMA also recognizes the proposed new Table N.4.X. now addresses meter sizes in actual use that were not previously addressed in the code. The SWMA relies on WWMA experience and expertise in the regulation this technology. Consequently, the SWMA recommends this proposal be included as a Voting item on the NCWM S&T's 2010 agenda.

336-3 T.1.1. Repeatability.

Source: WWMA

Purpose: To return the tolerances for repeatability tests of water meters to the values specified prior to 2003 for water meters (and many other measuring devices) in the General Code in an effort to reduce the impact of uncertainties contributed by the test process.

Item Under Consideration: Modify paragraph T.1.1. Repeatability as follows:

T.1.1. Repeatability. - When multiple tests are conducted at approximately the same flow rate, ~~the range of the test results shall not exceed 0.6 % for tests performed at the normal and intermediate flow rates, and 1.3 % for tests performed at the minimum flow rate, and~~ each test shall be within the applicable tolerances and the range of test results shall not exceed the following values:

	Batching Meters	Utility-Type Meters
Normal Flow Rates	**0.6 %**	**0.6 %**
Intermediate Flow Rates	**0.6 %**	**2 %**
Minimum Flow Rate	**1.3 %**	**4 %**

(Added 2002) (Amended 2011)

Background/Discussion: The WWMA heard from George DeJarlais, with Badger Meter, representing a group of five water meter manufacturers. One of the primary concerns of the manufacturers is the inability of meters to pass repeatability requirements during type evaluation testing. Based upon the data collected by the State of California and multiple California counties, the WWMA noted that three separate ranges of repeatability are appropriate for the maximum, intermediate, and minimum flow rates when current HB 44 test draft sizes are used. The WWMA also noted that an increase to the range of the test results performed at the intermediate and minimum flow was warranted, notwithstanding the requirement for each test to be within the applicable tolerance.

At its 2009 Interim Meeting, the CWMA heard no comments on this item and recommended it be maintained as an Informational item.

At its 2009 Annual Meeting, the SWMA heard from Andre Noel (Neptune Technology) about the primary concerns of the manufacturers over the inability of meters to pass repeatability requirements during type evaluation testing. Mr. Noel indicated that the data collected by the State of California and multiple California counties support the proposed new ranges of repeatability tolerances for the maximum, intermediate, and minimum flow rates when current HB 44 test draft sizes are used. The SWMA relies on WWMA experience and expertise in the regulation this technology. Consequently, the SWMA recommended this proposal be included as a Voting item on the NCWM S&T's 2010 agenda.

360 OTHER ITEMS

360-1 Tentative Code for Hydrogen Gas-Measuring Devices.

Source: WWMA and SWMA

Purpose: To provide the U.S. Weights and Measures community (manufacturers, users, and weights and measures officials) with legal metrology requirements to address gaseous hydrogen refueling dispensers already in operation in 24 states.

Item Under Consideration: Adopt the proposed Section 3.39. Hydrogen Gas-Measuring Devices Code outlined in **Appendix B** as a tentative code in NIST Handbook 44.

Background/Discussion: The U.S. National Work Group (USNWG) for the Development of Commercial Hydrogen Measurement Standards recommends changing the status of the NCWM S&T Committee Developing Item proposing development of a new hydrogen code from Developing to "Voting." The latest Draft 5.0 of the proposed new NIST HB 44 Section 3.39. Hydrogen Gas-Measuring Devices Code was distributed to the four regional weights and measures associations in September 2009 for consideration. Note that a corresponding recommendation that proposes including hydrogen fuel quality and method of sale requirements in NIST HB 130 "Uniform Laws and Regulations in the Areas of Legal Metrology and Engine Fuel Quality"(HB 130) was also submitted to the four regional weights and measures association Laws and Regulations (L&R) Committees.

The USNWG makes this recommendation for an upgrade in the proposal's status as a result of 22 months of work to ready the draft code language for national approval and adoption. The USNWG will be collecting additional data in the coming months to confirm that the proposed tolerances are adequate and fair given today's hydrogen technology and the test equipment available. These tolerances are derived from performance requirements in use for similar compressed gas applications in HB 44 and OIML R 139 "Compressed gaseous fuel measuring systems for vehicles." The USNWG will update the weights and measures community on its findings in the event that the proposed tolerances for these systems require further refinement.

As additional justification, the USNWG notes that the proposed new hydrogen code provides the U.S. Weights and Measures community with legal metrology requirements to address gaseous hydrogen refueling dispensers already in operation in twenty-four states. Thirty additional stationary/mobile refueling systems are in the planning stages. Existing requirements for other compressed gas refueling applications, primarily compressed natural gas (CNG), were the starting point for many hydrogen standards. CNG requirements are not entirely suitable for some of the unique features of hydrogen gas dispensers (e.g., product density). While some jurisdictions feel it is premature for hydrogen requirements because there are limited refueling stations, the USNWG feels that this is the ideal time to set the stage for weights and measures requirements. The hydrogen community is looking to the weights and measures community for their expertise, and this is the opportunity to be involved in the early stages of the development of commercial measurement standards that was not possible with CNG.

The United States has the largest number of hydrogen refueling dispensers worldwide. By taking the lead in developing appropriate requirements for this growing alternative fuel technology, the United States can fill a critical gap in the hydrogen infrastructure and can move closer to its goal for a clean fuel source and independence from imported energy.

The USNWG members represent: (1) federal and state government, (2) dispenser, meter, and related component manufacturers, (3) fuel providers, (4) fuel partnerships, (5) fuel quality administrators, (6) related standards organizations, and (7) type evaluation and research and development laboratories. The USNWG is recommending design, performance, installation, and use requirements for hydrogen dispensers based on its experience with compressed gas delivery systems and hydrogen's properties and measurement technology. The draft code is the first phase of a five-year project, which starts with a tentative code. The tentative code is necessary for providing guidelines to device manufacturers and, once finalized, will be the basis for test procedures, type evaluation criteria, and eventual training of industry and field officials.

The ongoing work to develop the hydrogen code has been documented and is under review through posting on the websites:

1. http://www.fuelcellstandards.com/ tracks over 200 hydrogen and fuel cell standards,

2. http://ts.nist.gov/WeightsAndMeasures/Developing-Commercial-Hydrogen-Measurement-Standards.cfm a NIST WMD outreach project providing the latest updates on work to develop legal metrology requirements for hydrogen measurement,

3. http://www.hydrogenandfuelcellsafety.info/ lists updates on the latest USNWG work reported to the National Hydrogen Fuel Cell Codes and Standards Coordinating Committee (NHFCCSCC). The committee is sponsored by U. S. Department of Energy (DOE), U.S. Fuel Cell Council, and National Hydrogen Association and is chartered with coordinating the development of hydrogen codes and standards to harmonize national and international codes. The NHFCCSCC fosters this collaborative effort between industry and government to encourage sharing of information, avoiding duplication, and to ensure all essential elements are in place for a safe, cost effective, and viable commercial program.

The USNWG work on these requirements has been reported in detail in multiple outreach projects such as the:

1. Weights and Measures Quarterly news article series on "Hydrogen, What's Next?" a NIST WMD technical news publication distributed to the weights and measures community,

2. Open hearings of the 2008 and 2009 meetings of the National Conference on Weights and Measures, S&T and L&R Committees, and Meter Manufacturers Association meetings,

3. Three U.S. Weights and Measures Administrators' Workshops on Commercial Hydrogen Measurement, and

4. Two Regional Weights and Measures Association Technical Training Seminars on Commercial Hydrogen Measurement, which like the workshop were sponsored in part by the DOE and NIST to familiarize weights and measures officials with the latest developments in the operation, performance, and safety of hydrogen refueling technology

The work to fully develop the new hydrogen infrastructure included representation and input from affected sectors, including weights and measures officials and equipment manufacturers and operators. This is an opportunity to influence the direction of the work prior to commercialization of this application. The work represents a unique and collaborative effort.

The USNWG initially focused its efforts on the development of requirements for retail refueling dispensers. As discussions and work progressed, the USNWG discussed at what point to address wholesale applications acknowledged. The USNWG is aware that other measuring device codes address wholesale applications, but does not agree as some have suggested that the code should wait until wholesale applications are addressed. The update of codes is an ongoing process. The USNWG agreed that retail dispensers have the more immediate need for marketplace standards. The USNWG has begun to consider code language to addresses both retail and wholesale devices.

The USNWG is working to provide guidance documents and training that are necessary for the start-up and implementation of a hydrogen device inspection and test program. The USNWG is examining the resources necessary to test hydrogen refueling equipment and has, with the assistance of California's Division of Measurement Standards, created an equipment list with an estimated average cost for a test standard of $111,000.

Jurisdictions may rely on the provisions of HB 44 General Code paragraph G-UR.4.4. Assistance in Testing Operations to ensure suitable test equipment is available. The USNWG is also considering the incorporation of User Requirements which would provide more specific equipment and assistance requirements that apply to the official test, such as those specified in paragraph UR.3.8. Return of Product to Storage, Retail Compressed Natural Gas Dispensers in the Mass Flow Meters Code. It should be noted that the USNWG and CSA/HGV 4.3 Temperature Compensation Devices for Hydrogen Gas Dispensing Systems Work Group are exploring the advantages of cost sharing a single test standard for use to test for over pressurization and over-heating as well as for the accuracy of the delivery system.

The USNWG anticipates input from both the weights and measures and hydrogen communities in support of the proposed code during the regional fall meetings.

At its 2009 Interim Meeting, the CWMA recommended changing the status of the Developing Item on the S&T Committee's 2009 agenda to a Voting item as a tentative code in NIST Handbook 44 to address gaseous hydrogen refueling applications.

At its 2009 Interim Meeting, NEWMA stated that, if an EPO has been developed and all safety considerations have been addressed then NEWMA supports as "Voting." Otherwise, NEWMA supports the proposal as "Informational." NEWMA offered the following additional points and questions to address in considering this proposal:

- Is there an urgency to move this from developing to "Voting?" Why not move to Informational first?

- An EPO should be developed before this goes for a vote.

- What equipment will be necessary for testing?
- Are there any safety considerations?
- This is very new for Weights & Measures inspectors.
- Should a hydrogen specification chart be included as part of the code or in the EPO?

At its 2009 Annual Meeting, the WWMA heard from Ms. Kristin Macey, California, Chair of the USNWG on Hydrogen Device Standards Subcommittee, about the necessity for a tentative hydrogen gas-measuring device code to further the development of a retail infrastructure for commercial hydrogen as a motor fuel. There are eighteen states where hydrogen stations are under current operations. Ms. Macey urged state directors at the WWMA meeting to visit and learn more about these sites and provide written and/or oral support at upcoming NCWM meetings. The WWMA recommends this as a "Voting" item and also encourages the collection of data in the coming months to validate the proposed tolerances and test notes.

At its 2009 Annual meeting, the SWMA supported the USNWG's proposal for a new Section 3.39 Hydrogen Gas-Measuring Devices Code and recommends the proposal move forward for adoption as a tentative code. The SWMA S&T Committee recommends the USNWG consider the comments made during its open hearing session and all other comments made at the fall 2009 regional weights and measures association meetings as it prepares the final draft of the hydrogen code for consideration at the January 2010 NCWM.

The USNWG is scheduled meet December 15, 2009, and January 13, 2010, to review and develop a position on the comments it received on the draft code. The USNWG responses to those comments and any updates to the draft code will be posted on the website http://ts.nist.gov/WeightsAndMeasures/Developing-Commercial-Hydrogen-Measurement-Standards.cfm and made available to all interested parties. The USNWG notes that the WG agreed in October 2007 to simultaneously develop a device code and corresponding test procedures. Currently, the USNWG has a draft examination procedure outline (EPO 29) under review for the gravimetric test method to include safety guidelines.

360-2 International Organization of Legal Metrology (OIML) Report

Many issues before the OIML, the Asian-Pacific Legal Metrology Forum (APLMF), and other international groups are within the purview of the Committee. Additional information on OIML activities will appear in the Board of Directors agenda and Interim and Final Reports and on the OIML website at http://www.oiml.org. NIST WMD staff will provide the latest updates on OIML activities during the open hearing sessions at NCWM meetings. For more information on specific OIML-related device activities, contact the WMD staff listed in the table below. The OIML projects listed below represent only currently active projects. For additional information on other OIML device activities that involve WMD staff, please contact WMD using the information listed below:

NIST Weights and Measures Division (WMD) Contact List for International Activities	
Contact Information	**Responsibilities**
Postal Mail and Fax for all Contacts:	NIST WMD 100 Bureau Drive MS 2600 Gaithersburg, MD 20899-2600 Tel: (301) 975-4004 Fax: (301) 975-8091
Mr. John Barton (LMDG) (301) 975-4002 john.barton@nist.gov	• R 21 "Taximeters" • R 50 "Continuous Totalizing Automatic Weighing Instruments (Belt Weighers)" • R 60 "Metrological Regulations for Load Cells" (jointly with Ken Butcher) • R 106 "Automatic Rail-weighbridges"

NIST Weights and Measures Division (WMD) Contact List for International Activities	
Contact Information	**Responsibilities**
Mr. Kenneth Butcher (LMG) (301) 975-4859 kenneth.butcher@nist.gov	• D 1 "Elements for a Law on Metrology" • TC 3 "Metrological Control" • TC 3/SC 1 "Pattern Approval and Verification" • TC 3/SC 2 "Metrological Supervision" • TC 6 "Prepackaged Products" • R 60 "Metrological Regulations for Load Cells" (jointly with John Barton)
Mr. Steven Cook (LMDG) (301) 975-4003 steven.cook@nist.gov	• R 76 "Non-automatic Weighing Instruments"
Dr. Charles Ehrlich (ILMG) (301) 975-4834 charles.ehrlich@nist.gov	• CIML Member • B 3 "OIML Certificate System for Measuring Instruments" • B 6 "OIML Directives for the Technical Work" • B 10 "Framework for a Mutual Acceptance Arrangement (MAA) on OIML Type Evaluations" • TC 3/SC 5 "Expression of Uncertainty in Measurement in Legal Metrology Applications," "Guidelines for the Application of ISO/IEC 17025 to the Assessment of Laboratories Performing Type Evaluation Tests" • TC 3 "Metrological Control"
Mr. Richard Harshman (LMDG) (301) 975-8107 richard.harshman@nist.gov	• R 51 "Automatic Catchweighing Instruments" • R 61 "Automatic Gravimetric Filling Instruments" • R 107 "Discontinuous Totalizing Automatic Weighing Instruments" (totalizing hopper weighers) • R 134 "Automatic Instruments for Weighing Road Vehicles In-Motion and Measuring Axle Loads"
Ms. Diane Lee (LMDG) (301) 975-4405 diane.lee@nist.gov	• R 59 "Moisture Meters for Cereal Grains and Oilseeds" • R 92 "Wood Moisture Meters – Verification Methods and Equipment" • R 121 "The Scale of Relative Humidity of Air Certified Against Saturated Salt Solution" • TC 17/SC 8 "Measuring Instruments for Protein Determination in Grains"
Mr. Ralph Richter (ILMG) (301) 975-3997 ralph.richter@nist.gov	• R 35 "Material Measures of Length for General Use" • R 49 "Water Meters" (Cold Potable Water & Hot Water Meters) • R 71 "Fixed Storage Tanks" • R 80 "Road and Rail Tankers" • R 85 "Automatic Level Gauges for Measuring the Level of Liquid in Fixed Storage Tanks" • R 105 & R 117 "Measuring Systems for Liquids Other Than Water" (all measuring technologies) • R 118 "Testing Procedures and Test Report Format for Pattern Examination of Fuel Dispensers for Motor Vehicles" • TC 3/SC 4 "Verification Period of Utility Meters Using Sampling Inspections" • R 137 "Gas Meters" (Diaphragm, Rotary Piston, & Turbine Gas Meters) • R 140 "Measuring Systems for Gaseous Fuel" (i.e., large pipelines)

NIST Weights and Measures Division (WMD) Contact List for International Activities	
Contact Information	**Responsibilities**
Dr. Ambler Thompson (ILMG) (301) 975-2333 ambler@nist.gov	• D 11 "General Requirements for Electronic Measuring Instruments" • 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" • R 34 "Accuracy Classes of Measuring Instruments" • R 46 "Active Electrical Energy Meters for Direct Connection of Class 2" • TC 5/SC 2 "General Requirements for Software Controlled Measuring Instruments"
Ms. Juana Williams (LMDG) (301) 975-3989 juana.williams@nist.gov	• R 81 "Dynamic Measuring Devices and Systems for Cryogenic Liquids" • R 139 "Compressed Gaseous Fuel Measuring Systems for Vehicles"

LIST OF ACRONYMS			
B	Basic Publication	LMDG	Legal Metrology Devices Group
CIML	International Committee of Legal Metrology	P	Project
D	Document	R	Recommendation
ILMG	International Legal Metrology Group	SC	Subcommittee
LMG	Laws and Metrics Group	TC	Technical Committee

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

360-3 Developing Items

The NCWM established a category of items called Developing items as a mechanism to share information about emerging issues which have merit and are of national interest, but have not received sufficient review by all parties affected by the proposal or that may be insufficiently developed to warrant review by the Committee. The Developing items are currently under review by at least one regional association, technical committee, or organization.

Developing items are listed in Appendix C according to the specific HB 44 code section under which they fall. Periodically, proposals will be removed from the Developing item agenda without further action because the submitter recommends it be withdrawn. Any remaining proposals will be renumbered accordingly.

The Committee encourages interested parties to examine the proposals included in Appendix C and send their comments to the contact listed in each item. The Committee asks that the regional associations and NTETC sectors continue their work to develop each proposal fully. Should an association or sector decide to discontinue work on an item, the Committee asks that it be notified.

Mr. Brett Saum, San Luis Obispo County, California, Chairman

Mr. Carol Fulmer, South Carolina
Mr. Steve Giguere, Maine
Mr. Kenneth Ramsburg, Maryland
Mr. Paul Moyer, Nebraska

Mr. Ted Kingsbury, Measurement Canada, Technical Advisor
Mr. Steven Cook, NIST, Technical Advisor
Ms. Tina Butcher, NIST, Technical Advisor

Specifications and Tolerances Committee

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Appendix A

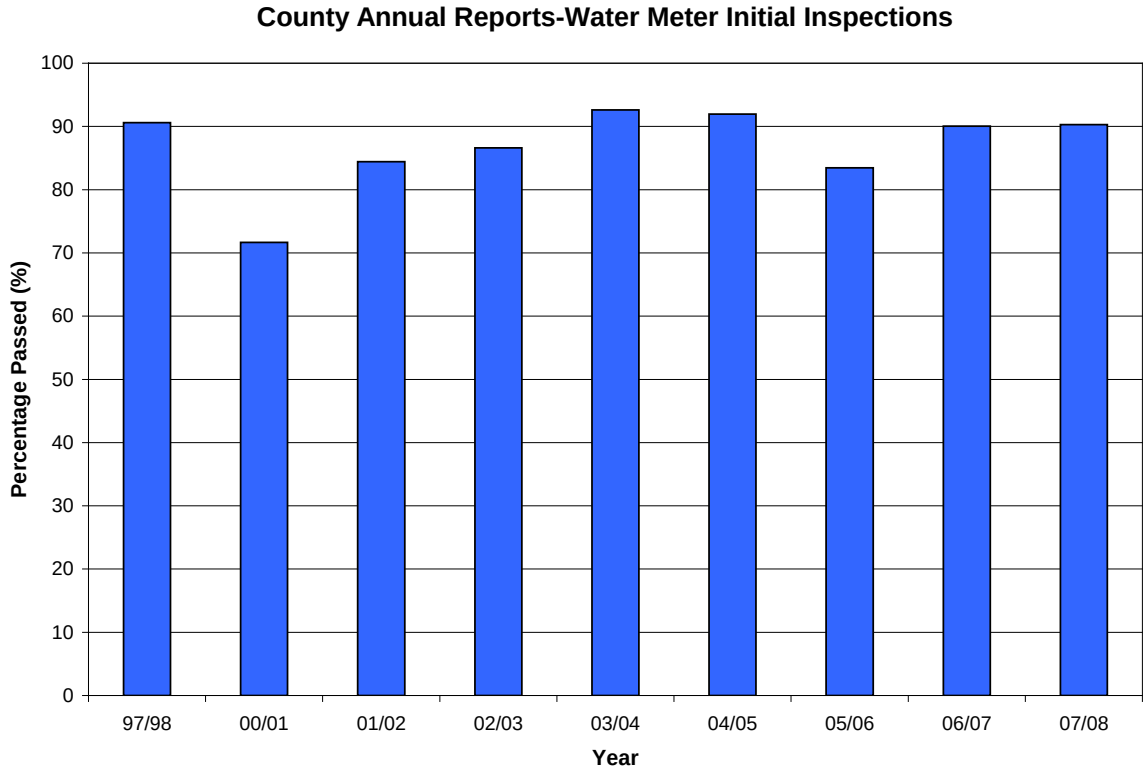
Letter from Ed Williams, California Department of Agriculture Division of Measurement Standards submitted to the 2009 WWMA Annual Meeting (see NCWM Interim Agenda Item 336-1).

Water Meter Compliance in California - 1998 to 2008

The compliance rate of water meters submitted for **type evaluation** has risen in the last ten years. Before the repeatability requirements were added to Handbook 44 in 2003 the percentage of devices passing evaluation was 60%. After this date the percentage rose to 66%, with only one failure for repeatability alone. Of the five meter manufacturers submitting proposals and claiming high failure rates, two have not submitted meters for testing since the introduction of the repeatability requirements

Compliance of water meters submitted to **county** officials has been comparatively high. In 1997/98 the compliance rate was 90% however in 2000/2001 this dropped to the low 70% presumably because one meter manufacturer was not submitting complete meters; registers only were submitted and county officials installed these into a preexisting body. After the manufacturer was instructed to submit only complete meters compliance gradually improved.

Compliance has been above 90% for five of the last ten years



Type Approval

Before Repeatability Requirements
10 applications, 6 certificates issued Compliance **60 %**
After Repeatability Requirements
9 applications, 6 certificates issued Compliance **66 %**

This does not support the meter manufacturers' claim that they experienced a high failure rate. After the introduction of repeatability requirements compliance actually increased; only one failure was for repeatability alone, the others failed tolerance.

Two of the five meter manufacturers did not submit a meter for testing; they could not have experienced any failure.

County Testing

Five years; 98, 04, 05, 07, and 08 compliance was above **90%**
Three years; 02, 03, and 06 compliance was above **80%**
Only in 01 was compliance in the low **70%**
This does not support the claim of a high rejection rate by county officials

Appendix B

Item 360-1: New NIST Handbook 44 Section 3.39
Hydrogen Gas-Measuring Devices Code
Draft 5.0

360-1 Tentative Code for Hydrogen Gas-Measuring Devices

Sec. 3.39. Hydrogen Gas-Measuring Devices

This tentative code has only a trial or experimental status and is not intended to be enforced. The requirements are designed for study prior to the development and adoption of a final code. Requirements that apply to wholesale applications are under study and development by the U.S. National Work Group for the Development of Commercial Hydrogen Measurement Standards. Officials wanting to conduct an official examination of a device or system are advised to see paragraph G-A.3. Special and Unclassified Equipment.

A.1. This code applies to devices that are used for the measurement of hydrogen gas in the vapor state used as a vehicle fuel.

A.2. This code does not apply to:

(a) devices used solely for dispensing a product in connection with operations in which the amount dispensed does not affect customer charges.

(b) the wholesale delivery of hydrogen gas

A.3. In addition to the requirements of this code, hydrogen gas-measuring devices shall meet the requirements of Section 1.10 General Code.

S. Specifications

S.1. Indicating and Recording Elements.

S.1.1. Indicating Elements. – A measuring assembly shall include an indicating element that continuously displays measurement results relative to quantity and total price. Indications shall be clear, definite, accurate, and easily read under normal conditions of operation of the device.

S.1.2. Vehicle Fuel Dispensers. – A hydrogen gas dispenser used to fuel vehicles shall be of the computing type and shall indicate the mass, the unit price, and the total price of each delivery.

S.1.3. Units. -

S.1.3.1. Units of Measurement. - Deliveries shall be indicated and recorded in kilograms and decimal subdivisions thereof.

S.1.3.2. Numerical Value of Quantity-Value Divisions. - The value of a scale interval shall be equal to:

(a) 1, 2, or 5, or

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

Examples: quantity-value divisions may be 10, 20, 50, 100; or 0.01, 0.02, 0.05; or 0.1, 0.2, or 0.5 etc.

S.1.3.3. Maximum Value of Quantity-Value Divisions. - The maximum value of the quantity-value division shall be not greater than 0.5 % of the minimum measured quantity.

S.1.3.4. Values Defined. - Indicated values shall be adequately defined by a sufficient number of figures, words, symbols, or combinations thereof. A display of "zero" shall be a zero digit for all displayed digits to the right of the decimal mark and at least one to the left.

S.1.4. Value of Smallest Unit. The value of the smallest unit of indicated delivery, and recorded delivery if the device is equipped to record, shall not exceed the equivalent of:

(a) 0.001 kg on devices with a maximum rated flow rate of 30 kg/min or less

(b) 0.01 kg on devices with a maximum rated flow of more that 30 kg/min

S.2. Operating Requirements.

S.2.1. Return to Zero.

(a) The primary indicating and the primary recording elements, if the device is equipped to record, shall be provided with a means for readily returning the indication to zero either automatically or manually.

(b) **It shall not be possible to return primary indicating elements, or primary recording elements, beyond the correct zero position.**

S.2.2. Indicator Reset Mechanism. - The reset mechanism for the indicating element shall not be operable during a delivery. Once the zeroing operation has begun, it shall not be possible to indicate a value other than the latest measurement, or "zeros" when the zeroing operation has been completed.

S.2.3. Nonresettable Indicator. - A device may also be equipped with a nonresettable indicator if the indicated values cannot be construed to be the indicated values of the resettable indicator for a delivered quantity.

S.2.4. Provisions for Power Loss.

S.2.4.1. Transaction Information. - In the event of a power loss, the information needed to complete any transaction in progress at the time of the power loss (such as the quantity and unit price, or sales price) shall be determinable for at least 15 minutes at the dispenser or at the console if the console is accessible to the customer.

S.2.4.2. User Information. - The device memory shall retain information on the quantity of fuel dispensed and the sales price totals during power loss.

S.2.5. Display of Unit Price and Product Identity.

S.2.5.1. Unit Price. - A computing or money-operated device shall be able to display on each face the unit price at which the device is set to compute or to dispense.

S.2.5.2. Product Identity. - A device shall be able to conspicuously display on each side the identity of the product being dispensed.

S.2.5.3. Selection of Unit Price. - When a product is offered for sale at more than one unit price through a computing device, the selection of the unit price shall be made prior to delivery using

controls on the device or other customer-activated controls. A system shall not permit a change to the unit price during delivery of a product.

S.2.5.4. Agreement Between Indications. – All quantity, unit price, and total price indications within a measuring system shall agree for each transaction.

S.2.6. Money-Value Computations. - A computing device shall compute the total sales price at any single-purchase unit price for which the product being measured is offered for sale at any delivery possible within either the measurement range of the device or the range of the computing elements, whichever is less.

S.2.6.1. Auxiliary Elements. - If a system is equipped with auxiliary indications, all indicated money value and quantity divisions of the auxiliary element shall be identical with those of the primary element.

S.2.6.2. Display of Quantity and Total Price. - When a delivery is completed, the total price and quantity for that transaction shall be displayed on the face of the dispenser for at least 5 minutes or until the next transaction is initiated by using controls on the device or other user-activated controls.

S.2.7. Recorded Representations, Point of Sale Systems. A printed receipt shall be available through a built-in or separate recording element for transactions conducted with point-or-sale systems or devices activated by debit cards, credit cards, and/or cash. The printed receipt shall contain the following information for products delivered by the dispenser:

(a) the total mass of the delivery,

(b) the unit price,

(c) the total computed price, and

(d) the product identity by name, symbol, abbreviation, or code number.

S.2.8. Indication of Delivery. - The device shall automatically show on its face the initial zero condition and the quantity delivered (up to the nominal capacity).

S.3. Design of Measuring Elements and Measuring Systems.

S.3.1. Maximum and Minimum Flow-Rates. - The ratio of the maximum to minimum flow-rates specified by the manufacturer for devices measuring gases shall be 10:1 or greater.

S.3.2. Adjustment Means. – An assembly shall be provided with means to change the ratio between the indicated quantity and the quantity of gas measured by the assembly. A bypass on the measuring assembly shall not be used for these means.

S.3.2.1. Discontinuous Adjusting Means. - When the adjusting means changes ratio between the indicated quantity and the quantity of measured gas in a discontinuous manner, the consecutive values of the ratio shall not differ by more than 0.1 %.

S.3.3. Provision for Sealing. - Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or physically applying security seals in such a manner that no adjustment may be made of:

(a) each individual measurement element,

(b) any adjustable element for controlling delivery rate when such rate tends to affect the accuracy of deliveries

(c) the zero adjustment mechanism, and

(d) any metrological parameter that detrimentally affects the metrological integrity of the device or system.

When applicable, the adjusting mechanism shall be readily accessible for purposes of affixing a security seal. Audit trails shall use the format set forth in Table S.3.3.

Table S.3.3.
Categories of Device and Methods of Sealing

Categories of Device	Method of Sealing
Category 1: No remote configuration capability.	Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.
Category 2: Remote configuration capability, but access is controlled by physical hardware. The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.	The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password). The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.	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. 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 ten 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.)

~~*S.3.4. Automatic Density Correction. - An automatic means to determine and correct for changes in product density shall be incorporated in any hydrogen gas measuring system where measurements are affected by changes in the density of the product being measured.*~~

S.3.5. Pressurizing the Discharge Hose. - The discharge hose for hydrogen gas shall automatically pressurize to a pressure equal to or greater than the receiving vessel prior to the device beginning to register the delivery. Neither initial hose pressurization or purging/bleeding of the discharge hose shall advance the indications.

S.3.6. Zero-Set-Back Interlock, Retail Vehicle Fuel Devices. - A device shall be constructed so that:

(a) when the device is shut-off at the end of a delivery an automatic interlock prevents a subsequent delivery until the indicating elements, and recording elements if the device is equipped and activated to record, have been returned to their zero positions;

(b) it shall not be possible to return the discharge nozzle to its start position unless the zero set-back interlock is engaged or becomes engaged

(c) in a system with more than one dispenser supplied by a single measuring element, an effective automatic control valve in each dispenser prevents product from being delivered until the indicating elements on that dispenser are in a correct zero position.

(d) in a system with more than one hose supplied by a single measuring element, effective automatic means must be provided to prevent product from being delivered until the indicating element(s) corresponding to each hose are in a correct zero position.

S.4. Discharge Lines and Valves.

~~**S.4.1. Diversion of Measured Product. - No means shall be provided by which any measured product can be diverted from the measuring device.**~~

S.4.2. Directional Flow Valves. - If a reversal of flow could result in errors that exceed the tolerance for the minimum measured quantity, a valve or valves or other effective means, automatic in operation (and equipped with a pressure limiting device, if necessary) to prevent the reversal of flow shall be properly installed in the system. (See N.1.)

S.4.3. Other Valves. - Check valves and closing mechanisms that are not used to define the measured quantity shall have relief valves (if necessary) to dissipate any abnormally high pressure that may arise in the measuring assembly.

S.5. Markings. - A measuring system shall be conspicuously, legibly, and indelibly marked with the following information:

(a) pattern approval mark (i.e., type approval number);

(b) name and address of the manufacturer or his trademark and, if required by the weights and measures authority, the manufacturer's identification mark in addition to the trademark;

(c) model designation or product name selected by the manufacturer;

(d) nonrepetitive serial number;

(e) the accuracy class of the device as specified by the manufacturer consistent with Table T.2.;

(f) maximum and minimum flow rates in kilograms per unit of time;

(g) maximum working pressure;

(h) applicable range of ambient temperature if other than - 10 °C to + 50 °C;

(i) minimum measured quantity; and

(j) product limitations (such as fuel quality), if applicable.

S.5.1. Location of Marking Information; Hydrogen-Fuel Dispensers. – The marking information required in General Code, paragraph G-S.1. Identification shall appear as follows:

(a) within 60 cm (24 in) to 150 cm (60 in) from the base of the dispenser;

(b) either internally and/or externally provided the information is permanent and easily read; and accessible for inspection and

(c) on a portion of the device that cannot be readily removed or interchanged (i.e., not on a service access panel).

Note: The use of a dispenser key or tool to access internal marking information is permitted for retail hydrogen-measuring devices.

S.6. Printer. – When an assembly is equipped with means for printing the measured quantity, the printed information must agree with the indications on the dispenser for the transaction and the printed values shall be clearly defined.

S.6.1. Printed Receipt. - Any delivered, printed quantity shall include an identification number, the time and date, and the name of the seller. This information may be printed by the device or pre-printed on the ticket.

S.7. Totalizers for Vehicle Fuel Dispensers. - Vehicle fuel dispensers shall be equipped with a nonresettable totalizer for the quantity delivered through each separate measuring device.

S.8. Minimum Measured Quantity. – The minimum measured quantity shall satisfy the conditions of use of the measuring system as follows:

(a) Measuring systems having a maximum flow rate less than or equal to 4 kg/min shall have a minimum measured quantity not exceeding 0.5 kg.

(b) Measuring systems having a maximum flow rate greater than 4 kg/min but not greater than 12 kg/min shall have a minimum measured quantity not exceeding 1.0 kg.

N. Notes

N.1. Minimum Measured Quantity. - The minimum measured quantity shall be specified by the manufacturer.

N.2. Test Medium. - The device shall be tested with the product commercially measured except that, in a type evaluation examination, hydrogen gas as specified in NIST Handbook 130 shall be used.

N.3. Test Drafts. - The minimum test shall be one test draft at the declared minimum measured quantity and one test draft at approximately ten times the minimum measured quantity or 1 kg, whichever is greater. More tests may be performed over the range of normal quantities dispensed. (See T.3.)

The test draft shall be made at flows representative of that during normal delivery. The pressure drop between the dispenser and the proving system shall not be greater than that for normal deliveries. The control of the flow (e.g., pipework or valve(s) size, etc.) shall be such that the flow of the measuring system is maintained within the range specified by the manufacturer.

NOTE: Corresponding SAE requirements are under development and this paragraph will be revisited.

N.4. Tests.

N.4.1. Master Meter (Transfer) Standard Test. - When comparing a measuring system with a calibrated transfer standard, the minimum test shall be one test draft at the declared minimum measured quantity and one test draft at approximately ten times the minimum measured quantity or 1 kg, whichever is greater. More tests may be performed over the range of normal quantities dispensed.

N.4.1.1. Verification of Master Metering Systems. – A master metering system used to verify a hydrogen gas-measuring device shall be verified before and after the verification process. A master metering system used to calibrate a hydrogen gas-measuring device, shall be verified before starting the calibration and after the calibration process.

N.4.2. Gravimetric Test. – The weight of the test drafts shall be equal to at least the amount delivered by the device at the declared minimum measured quantity and one test draft at approximately ten times the minimum measured quantity or 1 kg, whichever is greater. More tests may be performed over the range of normal quantities dispensed.

~~***N.4.3. PVT Pressure Volume Temperature Test. – The minimum test with a calibrated volumetric standard shall be one test draft the declared minimum measured quantity and one test draft at approximately ten times the minimum measured quantity or 1 kg, whichever is greater. More tests may be performed over the range of normal quantities dispensed.***~~

N.5. Minimum Measured Quantity. - The device shall be tested for a delivery equal to the declared minimum measured quantity when the device is likely to be used to make deliveries on the order of the declared minimum measured quantity.

N.6. Testing Procedures.

N.6.1. General. - The device or system shall be tested under normal operating conditions of the dispenser.

The test draft shall be made at flows representative of that during normal delivery. The pressure drop between the dispenser and the proving system shall not be greater than that for normal deliveries. The control of the flow (e.g., pipework or valve(s) size, etc.) shall be such that the flow of the measuring system is maintained within the range specified by the manufacturer.

N.6.1.1. Repeatability Tests. - Tests for repeatability should include a minimum of three consecutive test drafts of approximately the same size and be conducted under controlled conditions where variations in factors are reduced to minimize the effect on the results obtained.

N.7. Density. – Temperature and pressure of hydrogen gas shall be measured during the test for the determination of density or volume correction factors when applicable. For the thermophysical properties of hydrogen the following publications shall apply: for density calculations at temperatures above 255 K and pressures up to 120 MPa, a simple relationship may be used that is given in the publication of Lemmon et al., J. Res. NIST, 2008. Calculations for a wider range of conditions and additional thermophysical properties of hydrogen are available free of charge online at the "NIST Chemistry WebBook" http://webbook.nist.gov/chemistry, or available for purchase from NIST as the computer program NIST Standard Reference Database 23 "NIST Reference Fluid Thermodynamic and Transport Properties Database (REFPROP): Version 8.0" http://www.nist.gov/srd/nist23.htm. These calculations are based on the reference Leachman, J.W., Jacobsen, R.T, Lemmon, E.W., and Penoncello, S.G. "Fundamental Equations of State for Parahydrogen, Normal Hydrogen, and Orthohydrogen" to be published in the Journal of Physical and Chemical Reference Data. More information maybe obtained from NIST online at http://www.boulder.nist.gov/div838/Hydrogen/Index.htm.

T. Tolerances

T.1. Tolerances, General.

(a) The tolerances apply equally to errors of underregistration and errors of overregistration.

(b) The tolerances apply to all products at all temperatures measured at any flow rate within the rated measuring range of the device.

T.2. Tolerances. - The tolerances for hydrogen gas measuring devices are listed in Table T.2. (Proposed tolerance values are based on previous work with compressed gas products and will be confirmed based on performance data evaluated by the U.S. National Work Group.)

Table T.2. Accuracy Classes and Tolerances for Hydrogen Gas-Measuring Devices

Accuracy Class	Application or Commodity Being Measured	Acceptance Tolerance	Maintenance Tolerance
2.0	Hydrogen gas as a vehicle fuel	1.5 %	2.0 %

T.3. Repeatability. - When multiple tests are conducted at approximately the same flow rate and draft size, the range of the test results for the flow rate shall not exceed 40 % of the absolute value of the maintenance tolerance and the results of each test shall be within the applicable tolerance. See also N.6.1.1.

T.4. Tolerance Application.

T.4.1. Type Evaluation Examinations for Devices. - For type evaluation examinations, the tolerance values shall apply under the following conditions:

(a) at any temperature and pressure within the operating range of the device, and

(b) for all quantities greater than the minimum measured quantity.

T.4.2 Transfer Standard Test Method. - To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard when compared to a basic reference standard.

UR. User Requirements

UR.1. Selection Requirements.

UR.1.1. Computing-Type Device; Retail Dispensers. – A hydrogen gas dispenser used to refuel vehicles shall be of the computing type and shall indicate the mass, the unit price, and the total price of each delivery.

UR.1.2. Discharge Hose-Length. – The length of the discharge hose on a retail fuel dispenser:

(a) shall not exceed 4.6 m (15 ft) unless it can be demonstrated that a longer hose is essential to permit deliveries to be made to receiving vehicles or vessels;

(b) shall be measured from its housing or outlet of the discharge line to the inlet of the discharge nozzle; and

(c) shall be measured with the hose fully extended if it is coiled or otherwise retained or connected inside a housing.

An unnecessarily remote location of a device shall not be accepted as justification for an abnormally long hose.

UR.1.3. Minimum Measured Quantity.

(a) The minimum measured quantity shall be specified by the manufacturer.

(b) The minimum measured quantity appropriate for a transaction may be specified by the weights and measures authority. A device may have a declared minimum measured quantity smaller than that specified by the weights and measures authority; however, the device must perform within the performance requirements for the declared or specified minimum measured quantity up to deliveries at the maximum measurement range.

(c) The minimum measured quantity shall satisfy the conditions of use of the measuring system as follows:

(1) Measuring systems having a maximum flow rate less than or equal to 4 kg/min shall have a minimum measured quantity not exceeding 0.5 kg

(2) Measuring systems having a maximum flow rate greater than 4 kg/min but not greater than 12 kg/min shall have a minimum measured quantity not exceeding 1.0 kg

UR.2. Installation Requirements.

UR.2.1. Manufacturer's Instructions. – A device shall be installed in accordance with the manufacturer's instructions, and the installation shall be sufficiently secure and rigid to maintain this condition.

UR.2.2. Discharge Rate. – A device shall be installed so that after initial equalization the actual maximum discharge rate will not exceed the rated maximum discharge rate. Automatic means of flow regulation shall be incorporated in the installation if necessary.

UR.2.3. Low-Flow Cut-Off Value. – If a measuring system is equipped with a programmable or adjustable "low-flow cut-off" feature:

(a) the low-flow cut-off value shall not be set at flow rates lower than the minimum operating flow rate specified by the manufacturer on the measuring device; and

(b) the system shall be equipped with flow control valves, which prevent the flow of product and stop the indicator from registering product flow whenever the product flow rate is less than the low-flow cut-off value.

UR.3. Use of Device.

UR.3.1. Unit Price and Product Identity for Retail Dispensers. – The unit price at which the dispenser is set to compute shall be conspicuously displayed or posted on the face of a retail dispenser used in direct sale.

UR.3.2. Ticket Printer; Customer Ticket. – Vehicle-mounted measuring systems shall be equipped with a ticket printer, which shall be used for all sales where product is delivered through the device. A copy of the ticket issued by the device shall be left with the customer at the time of delivery or as otherwise specified by the customer.

UR.3.3. Printed Ticket. – The total price, the total quantity of the delivery, and the price per unit shall be printed on any ticket issued by a device of the computing type and containing any one of these values.

UR.3.4. Ticket in Printing Device, Vehicle-Mounted Measuring Systems. – A ticket shall not be inserted into a device equipped with a ticket printer until immediately before a delivery is begun, and in no case shall a ticket be in the device when the vehicle is in motion while on a public street, highway, or thoroughfare.

UR.3.5. Steps After Dispensing. – After delivery to a customer from a retail dispenser:

(a) the device shall be shut-off at the end of a delivery, through an automatic interlock that prevents a subsequent delivery until the indicating elements and recording elements, if the device is equipped and activated to record, have been returned to their zero positions; and

(b) the discharge nozzle shall not be returned to its start position unless the zero set-back interlock is engaged or becomes engaged by the act of disconnecting the nozzle or the act of returning the discharge nozzle.

UR.3.6. Return of Indicating and Recording Elements to Zero. – The primary indicating elements (visual), and the primary recording elements shall be returned to zero immediately before each delivery.

UR.3.7. Return of Product to Storage, Retail Hydrogen Gas Dispensers. – Provisions at the site shall be made for returning product to storage or disposing of the product in a safe and timely manner during or following testing operations. Such provisions may include return lines or cylinders adequate in size and number to permit this procedure.

UR.3.8. Conversion Factors. – Established correction values (see references in N.7.) shall be used whenever measured hydrogen gas is billed. All sales shall be based on kilograms.

NOTE: Current NIST Handbook 44 definitions that will need to be modified to correspond with the proposed new code for hydrogen gas measuring devices.

Appendix D

Definitions

The specific code to which the definition applies is shown in [brackets] at the end of the definition. Definitions for the General Code [1.10] apply to all codes in Handbook 44.

A

audit trail. An electronic count and/or information record of the changes to the values of the calibration or configuration parameters of a device. [1.10, 2.20, 2.21, 2.24, 3.30, 3.37, **3.39**, 5.56(a)]

automatic temperature or density compensation. The use of integrated or ancillary equipment to obtain from the output of a volumetric meter an equivalent mass, or an equivalent liquid volume at the assigned reference temperature below and a pressure of 14.696 lb/in^2 absolute.

Cryogenic liquids, – 21 °C (70 °F) [3.34,]
Hydrocarbon gas vapor – 15 °C (60 °F) [3.33]
Hydrogen gas – 21 °C (70 °F) [3.39]
Liquid carbon dioxide – 21 °C (70 °F) [3.38]
Liquefied petroleum gas (LPG) and Anhydrous ammonia – 15 °C (60 °F) [3.32]
Petroleum liquid fuels and lubricants – 15 °C (60 °F) [3.30]

C

calibration parameter. Any adjustable parameter that can affect measurement or performance accuracy and, due to its nature, needs to be updated on an ongoing basis to maintain device accuracy, e.g., span adjustments, linearization factors, and coarse zero adjustments.[2.20, 2.21, 2.24, 3.30, 3.37, **3.39**, 5.56(a)]

D

discharge hose. A flexible hose connected to the discharge outlet of a measuring device or its discharge line.[3.30, 3.31, 3.32, 3.34, 3.37, 3.38, **3.39**]

discharge line. A rigid pipe connected to the outlet of a measuring device.[3.30, 3.31, 3.32, 3.34, 3.37, **3.39**]

E

event counter. A nonresettable counter that increments once each time the mode that permits changes to sealable parameters is entered and one or more changes are made to sealable calibration or configuration parameters of a device. [2.20, 2.21, 3.30, 3.37, **3.39**, 5.54, 5.56(a), 5.56(b), 5.57]

event logger. A form of audit trail containing a series of records where each record contains the number from the event counter corresponding to the change to a sealable parameter, the identification of the parameter that was changed, the time and date when the parameter was changed, and the new value of the parameter.[2.20, 2.21, 3.30, 3.37, **3.39**, 5.54, 5.56(a), 5.56(b), 5.57]

I

indicating element. An element incorporated in a weighing or measuring device by means of which its performance relative to quantity or money value is "read" from the device itself as, for example, an index-and-graduated-scale combination, a weighbeam-and-poise combination, a digital indicator, and the like. (Also see "primary indicating or recording element.")[1.10]

M

minimum measured quantity (MMQ). The smallest quantity delivered for which the measurement is to within the applicable tolerances for that system . . . 3.37, 3.39]

N

nonresettable totalizer. An element interfaced with the measuring or weighing element that indicates the cumulative registration of the measured quantity with no means to return to zero.[3.30, 3.37, 3.39]

P

point-of-sale system. An assembly of elements including a weighing or measuring element, an indicating element, and a recording element (and may also be equipped with a "scanner") used to complete a direct sales transaction.[2.20, 3.30, 3.32, 3.37, **3.39**]

R

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 itself necessary to the operation of the weighing or measuring device or is not a permanent part of that device. [2.20, 2.21, 2.24, 3.30, 3.37, **3.39**, 5.56(a)]

retail device. A measuring device primarily used to measure product for the purpose of sale to the end user. [3.30, 3.32, 3.37, **3.39**]

W

wet hose. A discharge hose intended to be full of product at all times. (See "wet-hose type.")[3.30, 3.31, 3.38, **3.39**]

wet-hose type. A type of device designed to be operated with the discharge hose full of product at all times. (See "wet hose.")[3.30, 3.32, 3.34, 3.37, 3.38, **3.39**]

Appendix C

Item 360-3: Developing Items

Part 3, Item 1 Vehicle-Tank Meters: T.4. Product Depletion Test

Source: Northeast Weights and Measures Association (NEWMA)

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. 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: Amend paragraph T.4. as follows:

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

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

Table T.4. Tolerances for Typical Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters Refer to T.4. for meters with maximum flow rates not listed.	
Meter ~~Size~~ Maximum Flow Rate	**Maintenance and Acceptance Tolerances**
~~**Up to, but not including, 50 mm (2 in)**~~ **114 LPM (30 GPM)**	~~**1.70 L (104 in^3)[1]**~~ **0.57 L (0.15 gal) (34.6 in^3)[1]**
~~**From 50 mm (2 in) up to, but not including, 75 mm (3 in)**~~ **225 LPM (60 GPM)**	~~**2.25 L (137 in^3)[1]**~~ **1.1 L (0.30 gal) (69.3 in^3)[1]**
~~**75 mm (3 in) or larger**~~ **378 LPM (100 GPM)**	~~**3.75 L (229 in^3)[1]**~~ **1.9 L (0.5 gal) (115 in^3)[1]**
758 LPM (200 GPM)	**3.8 L (1.0 gal) (231 in^3)[1]**
[1] Based on a test volume of at least the amount specified in N.3.	

(Table Added 2005) **(Amended 201X)**

Alternative language for T.4. with larger tolerance 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 378 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 378 LPM (100 GPM) or lower. Tolerances for typical meters are** ~~**tolerance**~~ shown in Table T.4. Test drafts shall be of the same size and run at approximately the same flow rate.

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

Table T.4.
Tolerances for Typical Vehicle-Tank Meters on Product Depletion Tests, Except Milk Meters
Refer to T.4 for meters with flow rates not listed.

Meter ~~Size~~ Maximum Flow Rate	Maintenance and Acceptance Tolerances
~~Up to, but not including, 50 mm (2 in)~~ 114 LPM (30 GPM)	~~1.70 L (104 in^3)[1]~~ 0.57 L (0.18 gal) (41.6 in^3)[1]
~~From 50 mm (2 in) up to, but not including, 75 mm (3 in)~~ 225 LPM (60 GPM)	~~2.25 L (137 in^3)[1]~~ 1.1 L (0.36 gal) (83.2 in^3)[1]
~~75 mm (3 in) or larger~~ 378 LPM (100 GPM)	~~3.75 L (229 in^3)[1]~~ 1.9 L (0.6 gal) (139 in^3)[1]
758 LPM (200 GPM)	3.8 L (1.0 gal) (231 in^3)[1]

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

(Table Added 2005) **(Amended 201X)**

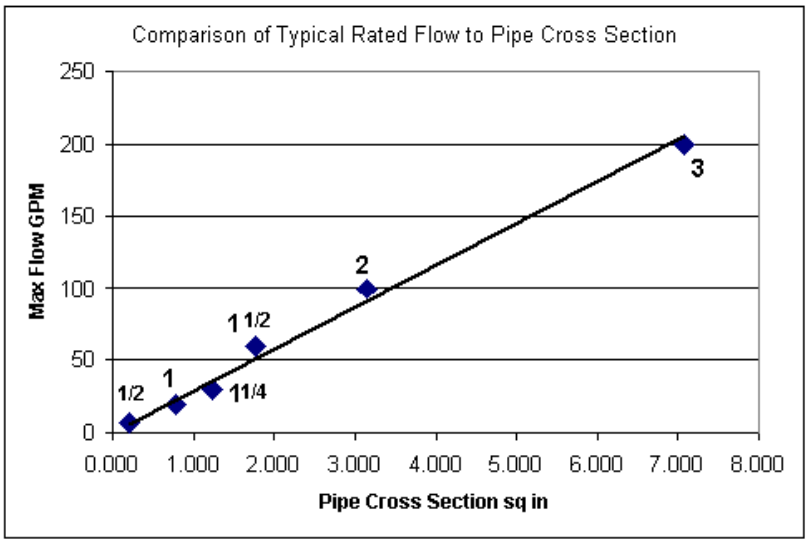
Background/Discussion: This item was submitted to NEWMA at its 2008 Interim Meeting as an alternative to Item 331-1 (S.5.7. Meter Size) in 2008 Publication 16. It would base the tolerances for the product depletion test on a percentage of the maximum flow rate rather than meter size. Justification provided to NEWMA by the submitter is as follows:

> The NCWM S&T Committee received a proposal in 2008 to add new marking requirements to provide inspectors with a basis on which to assess tolerances since the meter size in inches is not currently marked on meters used in VTM systems. This solution would add a new marking requirement non-retroactively, which will not solve the problem until the entire fleet of meters presently in use are replaced with new meters. This could take a very long time since VTMs can see many years of service. In addition, the compromise made when this item originally passed did not address the possibility that smaller meters, (e.g. down to ¼ in could be mounted on a vehicle and thus subject to these tolerances). Allowing the smallest current tolerance (104 in^3) on a ¼-in meter delivering 2 GPM would be 22.5 % relative error for one minute of flow due to air passing through the meter. Even at 20 GPM for a 1-in meter, the relative error only drops to 2.25 %. That seems unconscionable. New York recommends going back to the 0.5 % of 1 minute of flow at the maximum rated flow rate for the meter that was part of the original proposal. The max flow rate must be marked on every meter under current HB 44 requirements and thus the inspector will have the information necessary to correctly apply the tolerance. It is further recommend that the table provide tolerances for the common meter sizes which will handle most cases encountered in the field (i.e., 1¼-, 1½-, 2- and 3-inch meters with 30, 60, 100 and 200 GPM respectively).
>
> There may be concern that users will move to larger meter sizes to take advantage of the larger tolerances. It is not thought that this will happen since these systems cannot deliver much over 100 GPM without damaging storage tanks. In fact, most systems we have seen delivering heating oil are actually delivering at less than 80 GPM. If they move to a 200 GPM, 3-inch meter, rated at 40 to 200 GPM, they will then have to meet acceptance tolerances all the way down to 60 GPM which it is not believed that they can do on a consistent basis. We believe the typical 2-inch system will remain the mainstay of the industry.
>
> Graphs of the relationship of typical meter ratings to pipe cross section area show that PD flow rates are clearly a function of pipe size. Any tolerance that does not reflect that relationship is fundamentally flawed in our view. For comparison, we have included a graphic comparison of the proposed tolerances.

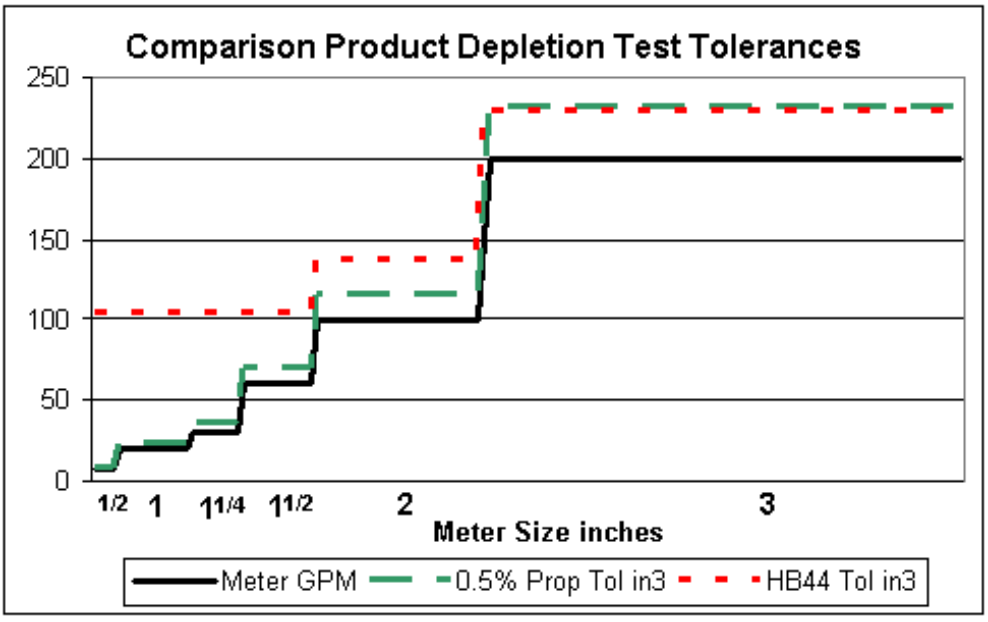
The submitter also noted the following:

> We recognize that the tolerances proposed will reduce the tolerances for meter sizes 2 inch and under. We could support some compromise to recognize diminishing returns on smaller meters and thus allow a slightly larger tolerance (e.g., 0.6 %) at or below 100 gpm rated flow rate. At 0.6 for a 2 inch (100 gpm) meter the tolerance would be 139 in^3, virtually identical to the existing tolerance.

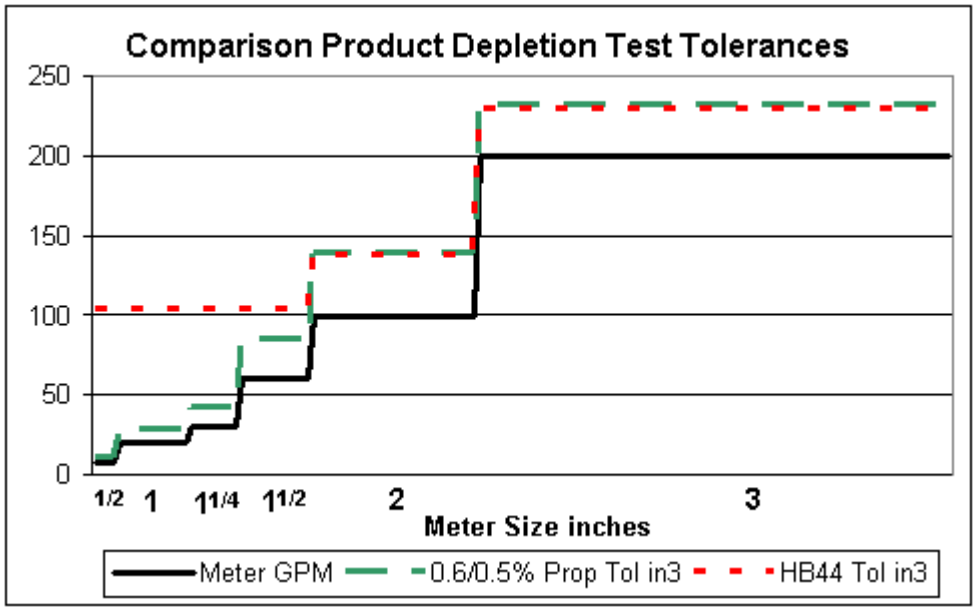
The submitter also provided the following supporting graphics:



Option 1 – 0.5 % across the board:



Option 2 – 0.6 % up to and including 100 gpm and 0.5 % thereafter:



In reviewing this item at its 2008 Interim Meeting, some NEWMA members felt that what is currently in HB 44 is sufficient and did not feel there was a problem determining meter size. Until NEWMA hears further about problems determining meter size from other states, it recommends this item be made "Informational."

Part 4, Item 1 Farm Milk Tanks: N.5.1. Verification of Master Metering Systems

Source: Central Weights and Measures Association (CWMA)

Purpose: Eliminate unnecessary verification testing for master meters capable of operating within a prescribed percent of the applicable tolerance.

Item Under Consideration: Amend paragraph N.5.1. as follows:

> **N.5.1. Verification of Master Metering Systems.** – A master metering system used to gauge a milk tank shall be verified before and after the gauging process. A master metering system used to calibrate a milk tank shall be verified before starting the calibration and reverified every quarter of the tank capacity or every 2000 L (500 gal), whichever is greater. **A master metering system capable of operating within 25 % of the applicable tolerance in T.3. Basic Tolerance Values needs only be verified before and after the gauging process.**
>
> **(Added 201X)**

Background/Discussion: The CWMA received a proposal at its fall 2008 Interim Meeting to modify paragraph N.5.1. Verification of Master Metering Systems in NIST Handbook 44 Section 4.42. Farm Milk Tanks. USDA provided data suggesting that mass flow meters currently used to test milk tanks would not have to be verified every quarter of the tank capacity, or every 2000 L (500 gal), whichever is greater. The CWMA does not have data that supports that all mass flow meters will perform to the same standard. Based on this information the CWMA recommends this proposal be Informational and is considering the proposal outlined in the recommendation above.

At its fall 2008 Interim Meeting, NEWMA recommended this proposal be "Informational." NEWMA forwarded the following additional justification for the proposed change from Mr. Richard Koeberle, Federal Milk Market Administrator:

The use of a mass flow meter has eliminated the variations seen in other types of meters used to calibrate or check farm bulk milk tanks. The reverification of the meter at every quarter of tank capacity adds time and potentially introduces errors by requiring the hose or valves to be moved before the tank is totally filled. This proposal originated by Tom MacNish from the Cleveland Market Administrator and was presented to the CWMA in September [2008]. Mass flow meters have been used extensively in their market with excellent results.

Data submitted with this item is posted on the S&T Committee's web page on the Members Only section of the NCWM website at:

http://www.ncwm.net/members/index.cfm?fuseaction=st

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