OWM's Analysis of the NCWM 2020 Annual and 2021 Interim Meeting S&T Agenda Items

The NIST OWM analysis includes all items that were on the 2020 Interim Meeting agenda and all new items that were added on the 2021 Interim Meeting agenda. Items with Voting status for the NCWM 2020 Annual Meeting are highlighted in the Appendix and the titles of the voting items are highlighted throughout the OWM Analysis. All items are in chronological order by agenda item number within the individual technical sections.

OWM's comments are intended to offer technical information to the NCWM for its consideration in its deliberations before the Conference.

Subject Series List

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ABWS	Automatic Bulk Weighing System	NCWM	National Conference on Weights and Measures
AAR	Association of American Railroads	NEWMA	Northeastern Weights and Measures Association
API	American Petroleum Institute	NIST	National Institute of Standards and Technology
CNG	Compressed Natural Gas	NTEP	National Type Evaluation Program
CWMA	Central Weights and Measures Association	OIML	International Organization of Legal Metrology
EPO	Examination Procedure Outline	OWM	Office of Weights and Measures
EVFS	Electric Vehicle Fueling Systems	RMFD	Retail Motor Fuel Dispenser
EVSE	Electric Vehicle Supply Equipment	S&T	Specifications and Tolerances
FHWA	Federal Highway Administration	SD	Secure Digital
GMM	Grain Moisture Meter	SI	International System of Units
GPS	Global Positioning System	SMA	Scale Manufactures Association
HB	Handbook	SWMA	Southern Weights and Measures Association
LMD	Liquid Measuring Devices	TC	Technical Committee
LNG	Liquefied Natural Gas	USNWG	U.S. National Work Group
LPG	Liquefied Petroleum Gas	VTM	Vehicle Tank Meter
MMA	Meter Manufacturers Association	WIM	Weigh-in-Motion
MDMD	Multiple Dimension Measuring Device	WWMA	Western Weights and Measures Association

Details of All Items
(In order by Reference Key)

GEN – GENERAL CODE

GEN-20.1 D G-T.3. Application and Appendix D-Definitions: True Value

At the 2020 Interim meeting the S&T committee agreed to remove GEN-20.1 from block 2 and make it a separate item and agreed to assign a developing status. Responses from regionals are the decision from the regionals to Block 2 Items. See regional comments in Block 2

Organization (*) not submitted (**) no meeting (***) no recommendation	Gen-20.2 – G-T.1 Acceptance Tolerance- Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA			✔				
SWMA		✔					
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)			✔				
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
SMA (Industry)						✔	
NCWM S&T Committee Interim		✔					

NIST OWM:

It may be beneficial to include error formulas in paragraph G-T.3., because the formulas might make possible a more consistent means of presenting the direction of error (plus or minus) associated with testing and provide better understanding of how that direction is associated with how one views its determination. That is, direction of error depends on whether the error being observed is viewed as a "delivery error" or a "registration error" and this has long been somewhat of a confusing concern to many. We offer the following two examples to show how direction of error is affected based upon how one views its determination:

- When a vehicle scale under test indicates a 10 lb greater value than the applied test load, the 10 lb error is considered a "registration error" and is recorded as + 10 lb. In this example, the scale is over-registering because it provides an indication that is 10 lb greater than the applied test load. Customers purchasing product from this scale would receive less product than the amount being charged (i.e., they would receive only 10,000 lb for each 10,010 lb charged) even though the error is considered positive (plus).
- In contrast, a minus (–) 6 cubic inch error read from a 5-gallon prover used to test a retail motor-fuel dispenser is considered a "delivery error." Just as with the vehicle scale, the meter has over-registered by providing an indication that is greater than the amount actually delivered; but in this case the direction of error is minus because it is viewed as a "delivery error," instead of a "registration error." As with the vehicle scale, customers would receive less product (in this case fuel), than the amount charged.

We think input from the community on these proposed changes, especially the regulators, is needed because of the importance of being able to explain how error in a device is determined and to whose favor that error benefited during legal proceedings. Of concern is how might regulators be able to explain the difference in direction of error in legal proceedings had they been accustomed to recording them opposite the direction that will result from the application of these new formulas, should this proposal be adopted? We also believe input from the community is particularly important in light of terminology used by manufacturers and the service community when making adjustments to devices. This will also affect how error is recorded. OWM notes there is an apparent error in part (b) of the proposed

changes to G-T.3. The sign included in the parentheses following the word "minus" should be "-" rather than "+" as it is currently shown. Additionally, the proposed new definition of "true value" should appear in **bold face print** and be **underlined** in the Item Under Consideration for this item.

OWM opposes use of the term "true value" in both formulas. There is no standard in existence having no error or no uncertainty. Might the submitter consider use of a different term, e.g., "calibrated standard," "reference standard," or something similar, and perhaps consult with the NCWM Field Standards Task Group to define it.

CWMA: 2020 Interim Meeting**.** The S&T committee heard from numerous regulatory officials questioning that if the purpose of this item is to provide clarity, it seems to provide more confusion. We feel this item is not a necessary addition to the handbook, and recommend this item be withdrawn.

GEN-20.2 W G-T.1. Acceptance Tolerances

Organization (*) not submitted (**) no meeting (***) no recommendation	Gen-20.2 – G-T.1 Acceptance Tolerance- Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
WWMA		✔					
SWMA		✔					
CWMA Interim (2019 Fall)			✔				
**CWMA Annual (2020 Spring)							
NEWMA Interim (2019 Fall)			✔				
**NEWMA Annual (2020 Spring)							
SMA (Industry)						✔	
NCWM S&T Committee Interim			✔				

NIST OWM: OWM recognizes that there are statements addressing the application of acceptance tolerances in different sections of NIST HB 44 that appear to be in conflict. As shown in the Item Under Consideration, the current General Code requirement G-T.1. states acceptance tolerances are applied to devices that:

- are being placed into commercial service for the first time;
- are being officially tested for the first time if placed into service within the preceding 30 days;
- are being returned to commercial service after rejection based on performance and have been repaired within the preceding 30 days;
- are being officially tested within 30 days following major reconditioning or overhaul; or
- undergoing type evaluation.

What is not explicitly stated in this General Code requirement is whether acceptance tolerances are to be applied within 30 days after any *routine* calibration adjustment(s) have been made to improve the device's performance. This type of adjustment would not be prefaced by an official rejection of the device. The absence of any statement addressing this specific circumstance has led to differences in interpretation regarding the appropriate application of acceptance tolerances. This difference in interpretation is fueled when the General Code requirement (G-T.1.) is compared to the statement found in HB 44 Appendix A - Fundamental Considerations, Section 2.1. Acceptance and Maintenance Tolerances where acceptance tolerances are addressed. In Appendix A, acceptance tolerances are described as follows:

> "Acceptance tolerances are applied to new or newly reconditioned ***or adjusted equipment*** and are smaller than (usually one-half of) the maintenance tolerances."

It should be recognized that some commercially used equipment is officially tested and not afforded the less stringent maintenance tolerances. In general, this includes volumetric equipment such as graduated glassware, dry measure apparatus. This is done with the understanding that accuracy for this type of apparatus does not significantly degrade over time. Thus, it would be reasonable to presume that only equipment whose performance is expected to deteriorate over periods of use should be afforded the application of maintenance tolerances. In other words, maintenance tolerances are applied to equipment that can reasonably be expected to gradually lose accuracy and performance over periods of time and use.

A strict interpretation of the statement in Section 2.1. of the Fundamental Considerations may prompt some to consider that since the device has undergone any adjustment within the preceding 30 days, that device should be capable of meeting acceptance tolerances. Therefore, some weights and measures officials have required devices that were recently adjusted (within 30 days) to comply with the more stringent tolerances whether or not that device had been officially rejected following an inspection and test within that 30-day period.

OWM recognizes that the proposed changes to G-T.1. in this item could help to clarify when acceptance tolerances are applied. Following some extensive research into the history regarding the application of tolerances however, there was no advocacy evident for the application of more stringent tolerances to equipment that had undergone adjustment unless, that corrective action was preceded by an official rejection of the device. This research included a review of early Bureau of Standards publications (as far back as 1918) where the application of tolerances was addressed.

We also note however, that the proposed language under the new sub-part (d) could lead to confusion since it is not specified what type of "evidence" that calibration has been performed in the previous 30 days would justify the application of acceptance tolerances. OWM questions if acceptance tolerances are to apply within 30 days after any routine adjustment (i.e., regular periodic service on the device), will weights and measures jurisdictions have their field officials perform a review the device owner's records of service to establish that any adjustment made was done to the device within the preceding 30 days?

OWM notes that changes to G-T.1. were recommended in 1990 when a proposal was submitted that would have had acceptance tolerances apply whenever a security seal was broken. If the previously referred to "evidence" is to include a broken security seal on the device, it is conceivable that the seal could have been broken to make changes that did not affect the accuracy. This 1990 proposal was withdrawn following comments stating that the broken seal would not always positively indicate an adjustment affecting the device's accuracy.

This issue was also addressed during the 2009 NCWM Annual Meeting where comments were offered in opposition to the application of acceptance tolerances following "metrological adjustments." The proposal was not adopted for reasons related to some device owners entering into service contracts that could include routine adjustments. At that time, those opposing this change also pointed out that devices may not be capable of continuously operating within acceptance tolerances however, could be maintained to operate within maintenance tolerances. The proposed changes to G-T.1. at that time were withdrawn due to a lack of support from industry and weights and measures officials.

OWM recognizes two opposing perspectives for the resolution of this matter. There are those that will support the idea when adjustments to commercial weights and measures equipment are made within a reasonable period of time, that equipment should perform within acceptance tolerances. If this notion is supported, then the proposed changes to G-T.1. appear to be appropriate. Alternatively, others may take the position that device owners who proactively have entered in a contract for periodic routine service on their equipment will be penalized when that equipment is consistently held to more stringent, acceptance tolerances.

When a device owner has entered into a contract with a service agency to provide routine inspection and maintenance on their equipment. The frequency of these service visits will vary; such as on an annual or semi-annual basis although some may occur as frequently as on a monthly basis. During those contractual inspections, well-intentioned service agents may make minor adjustments to a device to ensure the best accuracy and performance from that device. As stated in the General Code requirement G-UR.4.3., adjustments made to equipment shall be made to bring the performance errors to as close to zero as practicable. The equipment owners/operators who are paying for this proactive service do so with the expectation that their devices are operating consistently at peak efficiency and accuracy. According to General Code requirement G-UR.4.1. this is the owner/operator's responsibility. This practice will may provide more equitable transactions based on the measurements/weighments made by that equipment.

Considering potential consequences of having equipment held to more stringent performance requirements on a frequent basis, owners/operators may elect to not have any regular service done to maintain optimum performance of their devices. This could potentially lead to less accurate equipment and larger errors in measuring and weighing operations during the interim period between official examinations. The change being proposed to G-T.1. could potentially lead to service agents ignoring errors that fall within the broader range of maintenance tolerance in order to avoid the application of acceptance tolerances when an official examination is anticipated within 30 days.

As found in HB 44 General Code G-UR.4.3. "Use of Adjustments," service agents are expected to make any adjustments to a device so as to bring its performance to as close as possible to zero error. This expectation would support the notion of maintaining all weights and measures commercial device in prime operating condition. Therefore, it would be reasonable to expect that devices covered under a regular, routine service contract would be capable of performing within acceptance tolerances.

OWM notes that an alternative to the proposed change of the General Code requirement, G-T.1. could be to amend the Fundamental Considerations in Appendix A of HB 44 under Section 2.1. by deleting the wording "…or adjusted…" in that sentence. OWM believes however, that if a change to the Fundamental Considerations such as this would be adopted, it should also be accompanied by a specific explanation including details for why acceptance tolerances are not to be applied to equipment that has undergone only routine adjustment. Additionally, if this alternative was supported, OWM would recommend changes to G-T.1. be made to explicitly exclude the application of acceptance tolerances to equipment that has undergone routine adjustment that was not precipitated by an official rejection.

WWMA: - 2019 Annual Meeting. The Committee agrees that item has merit. The Committee also agreed that item is not yet fully developed, and the item should move forward as a developing item. The Submitter is encouraged to address all requirements currently in NIST Handbook 44 that are lacking in consistency with regard to the application of acceptance tolerance. The Committee would also encourage additional input from other regional associations and stakeholders as to what tolerances should be applied in these cases.
During the open hearing session, the Committee heard testimony from Ms. Michelle Wilson (AZ) submitter of the item. Ms. Wilson pointed out that there are inconsistent references in HB 44 including G-UR.4.3., G-T.1., and Appendix A, section 2.1. Arizona is questioning the correct tolerance (maintenance or acceptance) to apply following adjustments to a device. Arizona does not have a position on which tolerance should apply and is seeking clarification on this issue.
Mr. John Barton (NIST) stated that this issue has been noted in the past and that it presents concerns to device owners and service agents as to the implications of making routine adjustments during regular service intervals. For example, a service agent may have reservations about making adjustments to a device knowing that there would be a possibility that the device would be subject to the application of acceptance tolerances by regulatory agents within 30 days following such adjustment.

SWMA: - 2019 Annual Meeting. During the Open Hearings the Committee heard comments from Hal Prince (Florida) who stated that the submitters' main objective with this item is to gain clarity on when to apply Acceptance Tolerance. After considering this item the Committee recommends this item become Developing. The committees' main concern on this issue is the language "where evidence exists." The committee would like that language to become more defined.

NEWMA: - 2019 Interim Meeting. The Committee agrees with the body that the changes proposed are unnecessary and that the item should be withdrawn. During open hearings, the Committee heard from Mr. Jim Willis (NY) and Mr. John McGuire (NJ) who believes the proposal has no merit and is redundant.

CWMA: - 2019 Interim Meeting. Several regulators recommended the item be withdrawn. Adding this requirement could place an undue burden on the owners of devices that are capable of performing within applicable tolerances as currently required by G-T.1.

SMA: - 2019 Fall Meeting. The SMA opposes this item.
Rationale: Handbook 44 specifies in section G-T.2. that Maintenance tolerance shall apply to equipment in actual use. Only devices that have undergone major reconditioning are required to meet Acceptance tolerances.

GEN-21.1 Use-for-Fee Vehicle and Axle-Load Scales

Organization (*) not submitted (**) no meeting (***) no recommendation	Gen-21.1 – Use-For-Fee Vehicle and Axle-Load Scales (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA		✔					
SWMA		✔					
CWMA Interim (2020 Fall)		✔					
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)		✔					
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM: OWM submitted this item to solicit input from the weights and measures community concerning the use of vehicle and axle-load scales in charging a fee for the service of providing axle loads, axle-group loads, and total weight of a vehicle. This item currently does not propose any specific changes to any parts of NIST Handbook 44. It is hoped that from the feedback received on this item, a better understanding of how NIST Handbook 44 was intended to apply to such scales will emerge, at which time changes can be introduced to provide the necessary additional clarifications.

Members of OWM's Legal Metrology Devices Program (LMDP) felt the need to draft this item after receiving an inquiry from a state weights and measures jurisdiction requesting guidance pertaining to the application of NIST Handbook 44 requirements to a multi-platform vehicle scale system used to weigh spread-axle and oversized trucks that exceeded the overall length of the scale. That is, not all axles and axle groups of the spread-axle or oversized vehicle would fit onto a live portion of the vehicle scale system simultaneously, resulting in these trucks having to be weighed in multiple drafts (i.e., split weighed).

Multi-platform vehicle scale systems, axle-load scales, and to a lesser extent, single platform vehicle scales have long been used to determine the individual axle loads, axle-group loads, and the total weight of vehicles for the purpose of verifying conformance with state and federal highway legal load limits. Owners of these scales and scale systems often charge a fee for this service and for this reason alone, OWM believes most states currently consider them commercial application scales. OWM notes that total vehicle weight, obtained by weighing a vehicle single draft on many of these same multi-platform vehicle scale systems and single platform vehicle scales, is often used for the purpose of buying and selling commodities or charging transportation fees. There is no question that when total vehicle weight is used for this purpose, the application of the scale is commercial.

NIST Handbook 44 paragraph G-A.1., subpart (a), is rather ambiguous as to whether or not charging a fee for such a service constitutes commercial application. OWM notes subpart (a) is a 78-word continuation of a single sentence which, perhaps by itself, is cause for much confusion in its interpretation. Adding to the confusion, Scales Code paragraph UR.3.3. Single-Draft Vehicle Weighing requires a vehicle or a coupled vehicle combination to be commercially weighed only as a single draft, although subparts (a) and (b) of this paragraph provide two acceptable alternatives. A "Note" added in 1992 exempts the application of the paragraph to highway-law-enforcement scales and scales used for the collection of statistical data. No such exemption was provided for scales used to determine axle-loads, axle-group loads, and total vehicle weight when the only intended use of these values is to establish whether or not a vehicle complies with state and federal highway legal load limits.

This item seeks to first clarify whether or not use of such scales to charge a fee for the service of providing axle-loads, axle-group loads, and total weight, alone, constitutes commercial use; thereby legitimizing the application of NIST Handbook 44 to these scales and scale systems. If such use alone does constitute commercial application, OWM recommends the weights and measures community consider the different weighing procedures that would need to be followed to determine the individual axle and axle-group loads of vehicles having different axle configurations and whether those procedures provide an accurate weighment of those different components. OWM notes that the approach requirements in HB 44 applicable to axle-load scales is different from vehicle scales and consideration of their differences might lead to a good starting point for discussion. Another topic of possible discussion is how might the different values be identified on a hand-written ticket or a ticket generated from one of these scales (including an axle-load scale) or scale systems and it be made clear that when total vehicle weight is determined from split-weighing the vehicle, it is not be used as a basis for commercial transaction.

WWMA: The committee heard comments from John Barton (NIST-OWM) Not all vehicles do not fit on a single draft weighment resulting in multi draft weighments. HB 44 requires a single draft weighment for commercial draft transaction. In addition, there is confusion whether or not an axle weight is a commercial transaction when there is a fee applied to the weighment process. NIST recommends it is a developing item. Mr. Barton further clarified the different approach requirement between axle scales and vehicle scales. Eric Golden (Cardinal Scales) Discussed weighing sector a whether or not it was a commercial transaction. Cardinal scale views these axle load weighments as a commercial transaction. Lou Straub (Fairbanks Scale) He wanted data on how many oversized vehicles there really are being weighed. On a CAT scale printout if it is a multi-draft ticket has a statement that the weight listed are not certifiable. Steven Harrington (Oregon W&M) Axle Weight with a fee is a commercial transaction. He stated many different axel configurations are available. Oregon ODOT uses axle weight for law enforcement. The Committee agreed to assign this item with a developing status with recommendation that the submitter poll jurisdictions on whether or not these are commercial transactions.

SWMA: During the Open Hearings the Committee heard comments from John Barton (OWM) who stated that OWM would like the item to move forward as Developing. The issue originated from a field inspector who witnessed a truck trying to get a weighment from a scale that was much shorter than the truck. He stated that many issues have arisen around the Handbooks lack of clarity such as excessively long trucks, the validity of axle weight scales, the issue of single draft weighing vs split weighing, and whether or not paying for a weighment constitutes a commercial transaction. The committee also heard from Lou Straub (Fairbanks) who stated that he agrees with Mr. Barton, and the item should be made Developing. He stated that the Handbook does not apply to law enforcement scales, and that the majority of these scales are not used commercially. He stated that split weighing is not appropriate for commercial transactions, but that we need to clarify this for the big picture. The committee also heard from Eric Golden (Cardinal Scales) who agrees that this item should be made developing. He also stated that split weighing can be used if a truck is too long, but that it is not legal for trade. He questioned whether this would apply to CAT scales or just small axle load scales, and that he believed that charging for a weighment is a commercial transaction. The committee also heard from Tim Chesser (Arkansas) who stated that this was a non-issue in Arkansas. The committee also heard from Hal Prince (Florida) who stated that he would like a clarification on the definition of charging for weighments as a commercial transaction added to the handbook. The Committee also heard from Ken Ramsburg (Maryland) who stated that he agrees with the item being made developmental. He stated that paying for weighments is considered a commercial transaction in Maryland. He also stated that the issue of split weighing needs to be dealt with to protect from fraud. He stated that notice of split weighing should be required on the ticket. Lou Straub also stated that the Handbook does not currently require vehicle scales to have a ticket printer, nor does it have specific recording requirements. Tim Chesser also stated that he agreed that the Handbook was behind on Recording Requirements, and whether NIST and SMA would develop this. John Barton stated that NIST OWM would develop the issue, and Russ Vires (Scale Manufacturers Association) stated that SMA would review the issue in November and that Mettler Toledo will participate in the development of this issue. After considering this item the Committee recommends the item be given a Developing Status.

NEWMA: The Committee agrees with the body that this proposal has merit and recommends this be a Developing Item. The submitter (NIST) described the motivation for the item and the desired results to be achieved in development. This may require modifications/additions to the general code, scale code and possibly other sections. Differences in the requirements for vehicle scales and axle load scales were outlined. There are requirements for trucks traveling on public highways to obtain weights for compliance with highway weight limits and the length of these

trucks does not always allow for single draft weighments. During open hearings, the Committee heard comments from industry and state officials defining current regulations in HB44 and current State practices. The submitter is open to further discussion and development to address issues and concerns.

CWMA: The S&T committee received comments from both regulatory officials and industry representatives discussing the numerous issues that this item has brought to light. The developer requested this item be given a developing status. We agree with the developer and recommend a developing status.

SMA:

GEN-21.3 W G-UR.4.1. Maintenance of Equipment

Organization (*) not submitted (**) no meeting (***) no recommendation	Gen-21.3 – Maintenance of Equipment (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
(*) WWMA							
SWMA			✔				
*CWMA Interim (2020 Fall)							
CWMA Annual (2021 Spring)							
(*) NEWMA Interim (2020 Fall)							
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

WWMA: This item was not submitted to the WWMA.

SWMA: During the Open Hearings the Committee heard from John Barton (OWM) who stated that NIST was unclear on the rationale for the proposed change, and that the current requirement seems clear. The Committee also heard from Ken Ramsburg (Maryland) who stated that he believed the item should be withdrawn. The Committee also heard from Tim Chesser (Arkansas) who stated that "predominantly" applies to the equipment, not error, and supports withdrawal of the item. The Committee also heard from Gene Robertson (Mississippi) who stated that he agrees with withdrawing the item. After considering this item the Committee recommends the item be withdrawn.

NEWMA: This item was not submitted to the NEWMA.

CWMA: This item was not submitted to the CWMA.

SMA:

Block 2 Items (B2) A Define True Value for Use in Error Calculations

B2: SCL-20.3 S.5.4. Relationship of Minimum Load Cell Verification Interval to the Scale Division

B2: SCL-20.4 Table 3. Parameters of Accuracy Classes.

B2: SCL-20.5 Table S.6.3.a. Marking Requirements, Note 3.

B2: SCL-20.6 T.N.1.2. Accuracy Classes and T.N.1.3. Scale Division.

B2: SCL-20.7 Table 7. Maintenance Tolerances

B2: SCL-20.8 Table 8. Recommended Minimum Load

NOTE: At the 2020 NCWM Interim Meeting the committee agreed that GEN-20.1, SCL-20.1 and SCL-20.2 should be removed from Block 2 and given individual consideration. The items included in this block 2 are SCL-20.3, SCL-20.4, SCL-20.5, SCL-20.6, SCL-20.7 and SCL-20.8.

Organization (*) not submitted (**) no meeting (***) no recommendation	B2 – Define True Value for Use in Error - Initial Status – New Item (Originally 9 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM (either D or A with modifications)							
WWMA			✔				
SWMA		✔					
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)				✔			
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
NEWMA Interim 2020 Fall				✔			
SMA (Industry)						✔	
NCWM S&T Committee Interim				✔			

NIST OWM:

The different proposals included in this block present several very significant changes to the General and Scales codes of HB 44 with respect to:

- the application of HB 44 tolerances and the determination of device error during performance tests; and
- clearly identifying differences between "d" and "e" so that code requirements are correctly applied to the correct entity

OWM is supportive of some changes being proposed; others not.

Since the ratio of "e" to "d" is most often 10 to 1 (i.e., on Class I and II scales with different values of "e" and "d") the selection of one value over the other for the purpose of applying HB 44 requirements is of chief consequence. For this reason, OWM believes it is important to consider the views of others in the W&M community on these proposed changes and not rely solely on the perspective of the submitter.

We recognize there are paragraphs and tables of information throughout the Scales Code where it is not clear which value, "scale division (d)" or "verification scale division (e)" is their application to be based when (d) and (e) are different values on a scale. While it might seem an easy solution to simply conclude that in all cases the application of HB 44 requirements is to be based on the verification scale division (e), we know of instances where some scale manufacturers have designed their Class I and Class II scales to comply with one or more existing HB 44 requirements based on the "d" value for scales in which "d" and "e" are different. Additionally, based on our research and understanding of the operational characteristics of Class I and Class II scales with different values of "e" and "d," it should not be taken for granted that when a HB 44 paragraph specifies "d," the intended increment is, in fact "d," and not "e."

We appreciate the submitter's efforts in proposing changes to try and make clear which value should the application of some paragraphs be based, but we also believe the magnitude of this effort to clean up the Handbook with respect to "e" and "d" should involve input from the weighing community as a whole and would require specific identification of changes needed. We believe changes are long overdue based on the frequency of questions OWM receives relating

to this concern. To this end, over the past two years OWM has submitted several new proposals to the Weighing Sector and NTEP labs and has reached out to U.S scale manufacturers of Class I and Class II scales and other weighing experts to determine their views on the correct application of HB 44 requirements to scales in which "e" and "d" are different values. This work is ongoing, and we can report that much progress has been made, but not to the extent where we think we're ready to move forward by proposing numerous amendments to the Scales Code. We believe the best approach forward is the one currently being taken; that is, to involve as many manufacturers of Class I and II scales as possible and other stakeholders in discussions to determine which value "e" or "d" should the application of existing HB 44 requirements be based. Once a consensus is reached, changes to HB 44 can then be proposed to provide the clarification needed and new test procedures drafted (if appropriate) to determine compliance with those changes.

As a final comment to an individual item in this block, we note that a guiding principle of HB 44 is that the same requirements should apply to scales used in the same application regardless of technology or design. We believe the changes proposed to Table 8 in Item SCL-20.8, if adopted, would violate this principle. That is, because accuracy class and tolerances are based (e) when (e) and (d) are different values on a scale, so should the smallest acceptable load to be weighed on that scale.

WWMA: - Spring Interim Meeting. Block 2 includes the following individual items: GEN-20.1; SCL-20.1; SCL-20.2; SCL-20.3; SCL-20.4; SCL-20.5; SCL-20.6; SCL-20.7; and SCL-20.8.
During the open hearings the Committee heard testimony from Mr. Kurt Floren (LA County, CA.) stating that footnote #1 under Table 3 in item SCL-4 should have the words "be" and "to" stricken to correct grammatical errors. Mr. Kevin Merrit (ID), stated that the term "certified" as used in the proposed new language being recommended under item SCL-20.1 for Scales Code paragraph T.1. General, should be clarified/defined. He suggested the replacement of "certified" test load with language more in line with NIST traceable standards.
Regarding item SCL-20.2, Mr. Steve Harrington (OR) commented that he still believes there is merit in the proposed changes but suggested removing the retroactive date to allow devices now in service to remain in service. Mr. Russ Vires (SMA) provided some history of the use of both "d" and "e" for scales and that field inspectors did not have the appropriate test weight to properly test these scales to the finest resolution. While supported initially by the SMA, it was not realized that this proposal would have unintended consequences related to the jewelry industry where "d" is commonly used in weight determinations. The SMA recommends that the retroactive date be eliminated to allow manufactures additional time to change the designs on their equipment and so existing scales can continue to be used. Mr. Vires also suggested that this requirement could be formatted as a user's requirement.
Mr. John Barton (NIST) stated that the exclusion of jeweler's scales in this requirement could provide reason to exclude other applications and this may be a "slippery slope."
Mr. Harrington stated that he could also support the proposal formatted as a user requirement.
The Committee agreed that this proposal does not address any known significant issues and has the potential to create additional confusion. The Committee agrees that the changes proposed are unnecessary and that the item should be withdrawn.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard comments from Diane Lee (NIST) who expressed concern about whether or not "True Value" is the appropriate term to be used in this item. The Committee also heard comments from Tim Chesser (Arkansas) who stated that he doesn't like the "True Value" language. The Committee also heard comments from Russ Vires (SMA) who stated that the Scale Manufacturer's Association has not met on this issue. Steve Benjamin (North Carolina) also pointed out two typographical errors. On page 7, lines 12 and 17, the "(+)" next to "Minus" should be changed to "(-)". After consideration of this item the Committee recommends this item become Developing. The committee would like more input from other regions on this item.

NEWMA: - 2019 Interim Meeting. The Committee agrees with the body that the item has merit and should be assigned a Developing status. No comments were heard during open hearings.

NEWMA: - 2020 Interim Meeting. B2 – SCL-20.4 The Committee agrees with the body that this proposal has merit and should be designated an Assigned Item with the current Assigned items of Block 2. During open hearings, Mr. Ross Anderson (Submitter; NY, Retired) indicated that the Scale Verification Work Group is currently drafting a report that includes reference to this item.

CWMA: - 2019 Interim Meeting. Comments were received in support of these items. There was concern that the definition for "true value" may not be appropriate. There are some other editorial issues that need to be addressed including footnote 1 in Table 3. The use of the term verification scale division in Table 6 may also be confusing in instances when the division in use is not the value specified by the manufacturer.
2020 Interim Meeting. The S&T committee heard an update from Doug Musick (KS & Chair of Verification Scale Division (e) Task Group) on the progress of this item. The committee looks forward to the work of the task group.

SMA: - 2019 Fall Meeting. The SMA opposes the item being presented as a Block.
Rationale: The only commonality between the items in the Block is the submitter. The SMA recommends that the National S&T Committee breaks the Block into separate proposals going forward so they can each be evaluated based on their merit.

SCL – Scales

SCL-17.1 V S.1.8.5. Recorded Representations, Point of Sale Systems, Appendix D-Definitions: tare

Originally SCL-2

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL – 17.1 – S.1.8.5. Recorded Rep, POS Systems, App D - Initial Status – I (1 Items), 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
SWMA	✔						
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)			✔				
**NEWMA Annual (2020 Spring)							
SMA (Industry)						✔	
NCWM S&T Committee 2020 Interim	✔						

NIST-OWM:
OWM views the adoption of this item an important step towards improving harmonization of the weight information provided to consumers witnessing items being weighed and priced in their presence on scales interfaced with a cash register in a POS system with that provided during transactions involving standalone retail-computing scales. OWM appreciates the effort extended by members of the POS Tare Task Group to work through their differences to be able to eventually agree on a proposal that the Committee could advance for vote.

The added text included in proposed new subpart (e) of the paragraph is the only portion of the paragraph intended to be nonretroactive. The POS Tare Task Group previously agreed to assign a 2022 effective date to this new subpart to provide industry the opportunity to spread the cost of implementation over a two-year time horizon; or longer, if equipment isn't replaced as of this date. The Committee should consider amending the proposal to italicize the proposed text in subpart (e) and add a nonretroactive date of 2022 to the subpart. OWM notes the proposed effective date currently specified is January 1, 20XX, which means subpart (e) would become enforceable, if adopted, the 1st day of January of the year following adoption.

As previously noted in OWM comments and recommendations, this item should be considered of utmost importance to any consumer wanting to someday be able to determine if tare was taken on products weighed in their presence from a scale interfaced with a cash register in a POS system. It makes possible for customers and scale operators to be able to determine not only if tare was taken on products weighed at the front checkout, but also how much tare was

taken when those products were weighed. While we acknowledge adoption of this item will improve harmonization, slight differences in the information provided by these scales and systems will still remain. For example, standalone retail-computing scales are required to provide indication to both the scale's operator and customer that a tare has been taken when those scales are being used in a direct sale application. A ticket printer is not required because the customer is able to witness the entire weighing transaction, although most retail computing scales in use today are equipped with a ticket printer.

Scales interfaced with a cash register in POS system are not required to provide any indication that a tare has been taken at the time an item is weighed, but with the adoption of this proposal, new replacement equipment installed in the future will be required to record on the sales receipt the amount of tare taken for each item weighed as well as other transaction information already required by Scales Code paragraph S.l.8.5 Recorded Representations, Point of Sale Systems. During previous POS Tare Task Group teleconferences, these differences were discussed, and members of the TG concluded including only an indication that tare had been taken on a scale interfaced with a cash register in a POS system, alone, would not be sufficient; the actual amount of tare taken would need to be recorded on the sales receipt for each item weighed because of the speed with which weighing transactions are completed on these systems. Members of the TG felt consumers are not provided enough time to be able to readily and easily understand the weight information displayed by these systems because it is not displayed long enough for them to fully comprehend it.

The following are some key points offered previously by OWM in written comments and recommendations to this item:

- Currently, the only way a customer can tell if a tare has been taken for items weighed at the checkout is to remember the gross weight value indicated for each item as it is weighed and then compare those gross weight values to the net weight values printed on the receipt for those same items. This is a feat we, ourselves as shoppers, have not been able to master, particularly when purchasing multiple items that are sold by weight. Few customers would know to do this because most customers have little or no knowledge of such operational intricacies of these systems to know they function as described.

- When the Specifications and Tolerances Committee first reported its view of weights and measures enforcement considerations concerning POS systems and its incumbent technology in supermarkets in 1973, the following statement was included in the Committee's report:

> When commodities are weighed at the checkout stand with this type equipment, as is the case with use of existing equipment, it is a direct sale situation. All of the requirements of the Model State Weights and Measures Law and Handbook 44 directed to computing scales for over-the-counter sales, as in the delicatessen section, for example, are applicable.

> **G-S.5.1. General.** – All weighing and measuring devices shall be provided with indicating or recording elements appropriate in design and adequate in amount. Primary indications and recorded representations shall be clear, definite, accurate, and easily read under any conditions of normal operation of the device.

NIST Handbook 44 Paragraph G-S.5.1. (1973 and remaining unchanged through 2020)

- The 1973 S&T Committee also provided its philosophy regarding the application of paragraph G-S.5.1. General (shown in the text box above) to these systems as follows:

> The philosophy expressed in this requirement is that the indications of weighing and measuring devices are readily and easily understood by all those affected. The key words in this paragraph are "clear," "definite," and "easily read." Consequently, the equipment must be so designed that the indications and printed representations must meet these criteria for the owner or operator of the equipment and the customer. The decision regarding the amount of time necessary for weight values to be displayed to the customer is based on this requirement. That is, the values displayed must be clear, definite, and easily read. They must be displayed long enough for the information to be fully comprehended by the customer. Paragraph G-S.5.1. requires primary indications and recorded

representations to be clear, definite, accurate, and easily read under any conditions of normal operation of the device.

- Paragraph G-S.5.1. requires customers and scale operators be provided with the opportunity to be able to clearly observe all parts of the weighing transaction on items weighed in their presence (i.e., direct sale application). Declarations of net weight, identity, unit price, and other information which are required on packages put up in advance of sale are not required for items weighed in a direct sale. This is because the customer is present during a direct sale to witness all parts of the weighing transaction, including aspects such as: the scale is on zero before the load is applied; proper tare is taken, the correct unit price has been entered; and the scale operator hasn't manipulated the scale in any way. Thus, weighed items sold in a direct sale are not regulated at the same level as packages put up in advance of sale, which are routinely inspected by weights and measures.

- We can say with utmost confidence that weighing transactions occur so rapidly on many of today's POS systems, the information being displayed is not displayed long enough for it to be meaningful to the customer. We know this to be true based on our own experiences as customers purchasing products weighed and priced at today's retail outlets. Thus, paragraph G-S.5.1. is not being met today based on the 1973 S&T Committee's interpretation of it.

- Not only does the rapid speed of a weighing transaction contribute to a customer's inability to interpret the information in a meaningful way, nowhere is there marking on most POS display equipment to indicate the weight values being displayed are "gross" or "net" values. Scales interfaced with cash registers provide a display of the live gross weight, but nowhere on the display is that indicated. Likewise, there is no indication to a customer that a tare has been deducted once a price look-up code has been entered for many of these systems. Therefore, it is not reasonable to state that the weight information displayed to a customer at the time a product is weighed is meaningful if it is not the weight value on which the transaction will be based.

- The POS Tare Task Group considered whether the additional tare weight information might be made available from a display rather than requiring it to be recorded on the printed receipt. Members of the TG concluded the information needs to be printed on the receipt for the same reasons we've outlined above to show paragraph G-S.5.1. is not being met today. The TG agreed weighing transactions are completed so quickly on today's systems that a customer doesn't have sufficient time to understand the display information being provided. As a result, the TG concluded it should **not** be an option for this information to only be displayed; the information needs to be printed on the receipt.

- Several grocery industry associations, including FMI have opposed this item (in written comments to the Committee and voiced during Committee open hearings) since its introduction in 2017. The predominant reasons offered by those in the grocery industry for opposing this item has been the cost of implementation and that customers aren't interested in viewing the tare weight information. OWM is not aware of any detailed cost estimates provided by the grocery industry to the TG, which, in OWM's view, has been a missing component of this commentary. OWM believes that if there are other reasons for not implementing this proposal they should be provided to the Committee so those reasons could be given consideration. The current proposal addresses the cost concern by relaxing the time stores would have to comply; this being a concession offered in an attempt to gain industry acceptance.

  Note: Should detailed cost estimates be provided to the Committee in the future, it would be important for those estimates to show the additional costs associated only with having to comply with either version of the current proposal and not the entire cost of a new upgraded system.

- The SMA also has opposed this item; reporting previously that regulators already verify tare values in POS systems are accurate and that the proposal would provide little or no benefit to the consumer. While it might be true some jurisdictions verify tare values that are programmed into POS systems, these verifications may be far and few between and not all jurisdictions perform them. With respect to the SMA's comment that the

proposal would provide little or no benefit to the consumer, paragraph G-S.5.1. was only ever intended to provide consumers the *opportunity* to be able to view the transaction information. It is important customers be provided this opportunity. Whether or not they choose to take advantage of it is a completely different matter.

- The decision to include or exclude information that a customer needs to be able to tell if items were correctly weighed and priced during direct sale applications, should not be one of the retailer.

- Given that many of the newer POS systems in use today are capable of providing not only a display of the tare value and net weight value of items weighed at checkout; but also print those values on the receipt, it is only reasonable to work towards requiring the tare weight information be printed on the receipt. OWM does not have a preference as to whether the addition of the tare weight information on the receipt be made nonretroactive or retroactive with a sunset date. We do encourage the Committee to keep this item active for the reasons provided herein.

At the heart of the issue, is whether new replacement POS equipment should be required in the future to provide indication that tare has been taken on items weighed at checkout, which is a requirement of other scales used in a direct application (e.g., retail-computing scales), or be allowed to operate indefinitely under an exemption granted in 1973; a time when the technology didn't exist to be able to provide this information cost efficiently.

WWMA: 2019 Annual Meeting. The Committee agrees that this item be given a voting status and recommends that additional input be solicited from the other regional associations and that input then be forwarded to the NCWM S&T Committee. The Committee agreed to support the non-retroactive version of this item as proposed in the item under consideration. The Committee also deliberated on the establishment of an effective date for the non-retroactive requirement. The Committee agreed to recommend that the effective date be January 1, 2024. The Committee heard testimony from Mr. Russ Vires (SMA) that the SMA had provided a position from their 2019 April meeting stating that this proposal would provide little if any benefit to the consumer. Mr. John Barton (NIST) stated that to not provide some indication to the consumer that tare has been taken violates the principle behind the General Code requirement G-S.5.1. That requirement states that weight indications for commercial transactions be clear, definite, and easily read. The consumer deserves to be assured that the commodity is being sold by net weight and that appropriate tare has been deducted. He also noted that the TG assigned to this item has offered two versions of the proposal. One is non-retroactive version and the other is a retroactive version. The Committee is encouraged to consider the implications of the status for the proposed requirement. The retroactive version will require that all POS systems comply with the requirement, and the non-retroactive version would allow those systems that are currently in service to be grandfathered. Mr. Kurt Floren (LA County, CA.) stated he supports the retroactive version of this proposal as long as it is not cost-prohibitive however, he does oppose the item even if the proposal was adopted as non-retroactive. He also recommended that the term "defined" as it appears in both versions of this proposal should be replaced with "indicated" or "designated." Mr. Steve Harrington (OR) stated he was concerned with the potential that smaller businesses will need to absorb the cost to comply with the requirement if the retroactive version was adopted.

NEWMA: - 2019 Spring Annual Meeting. Mr. Mike Sikula (NY) stated that NY opposes this item. He believes this will place an all-around burden on inspectors with no benefit. Mr. Russ Vires (representing the SMA) commented that the SMA opposes this item and believes inspectors are already sufficiently regulating tare. The NEWMA recommends this item continue to be developed as an Assigned item on the NCWM S&T Committee agenda.

2019 Interim Meeting. The Committee agrees with the body that the changes proposed are unnecessary and that the item should be withdrawn. During open hearings, the Committee heard from Mr. Jim Willis (NY) who believes the proposal will cause consumer confusion because while the tare is printed, there is no guarantee that it will be correct. Mr. John McGuire (NJ) agrees with the comments from NY.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Russ Vires (SMA) who opposes this item on the grounds that it provides no benefit to the consumer. After consideration of this item the Committee recommends the non-retroactive version of this item be made a Voting Item

CWMA: - 2019 Annual Meeting. Mr. Loren Minnich, Chair of the NCWM POS task group, recommends the item remain as "assigned" and indicated that the TG will give an update at the Annual NCWM Meeting in July 2019.

Mr. Doug Musick (Kansas Weights & Measures) commented about scale operators using these devices by sliding items across the scale at a speed that does not allow the weight to display long enough for consumers to fully observe the weighing operation. Mr. Russ Vires (SMA) opposes the item because tare is routinely verified by regulators.

2019 Interim Meeting. Several comments were received in support of the non-retroactive version. There were suggestions that gross weight may be a better value to include since it could be clearer to consumers that they were charged on a net weight basis. We recommend the non-retroactive version move forward as a voting item and suggest the committee might consider replacing tare with gross weight.

2020 Interim Meeting. The S&T committee heard comments in opposition from the SMA. Many regulatory officials made comments in support of the item. The committee recommends the item moving forward as a voting item with the proposed amendments by the NCWM S&T Committee.

SMA: - 2019 Fall Meeting. The SMA opposes this item.
Rationale: Since regulators verify that the tare values in POS systems are accurate, the SMA feels that the proposal would provide little or no benefit to the consumer, and opposes both Retroactive and Non-retroactive versions.

SCL-16.1 A Sections Throughout the Code to Include Provisions for Commercial Weigh-in-Motion Vehicle Scale Systems

Originally SCL-3

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL – 16.1 – Sections Throughout the Code to Include Provisions for Commercial Weigh-in-Motion Vehicle Scale Systems - Initial Status–A (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
WWMA			✔				
SWMA				✔			
CWMA Interim (2019 Fall)				✔			
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)			✔				
NEWMA Interim (2019 Fall)				✔			
**NEWMA Annual (2020 Spring)							
SMA (Industry)			✔				
NCWM S&T Committee Interim				✔			

NIST OWM:

OWM recognizes that the Committee has assigned a Task Group to further develop this item. This Task Group was formed in 2016 and OWM is an active participant on that Task Group.

OWM had the understanding that the submitter would provide an opportunity for the TG to witness data collection from the preliminary testing of their WIM system in order to provide evidence that their claim for that type of WIM system complying with Class III L tolerances is valid. To date, only a very limited amount of data was generated by Rinstrum and presented to the TG. The collection of this data was not witnessed by other TG members as had been promised by the submitter. Other members of the TG have raised questions regarding the validity and interpretation of the data provided. OWM, and other TG members have provided recommendations to Rinstrum for test procedures believed to be appropriate for this data collection. OWM looks forward to participating in this data collection process and is anticipating the opportunity to work with Rinstrum and to witness testing for data collection along with other members of the TG (and possibly others).

OWM also recognizes that the TG has held a single meeting (via webinar) since the 2018 NCWM Annual Meeting and it is OWM's understanding that the continued efforts of the TG are dependent upon substantiation of the submitter's claims on their system's performance.

OWM notes a difference in opinion among members of the Task Group regarding the establishment of appropriate test procedures for the official certification of these devices. OWM believes that appropriate test procedures developed for inclusion in NIST Handbook 44 must be: based on sound principles; provide confirmation of the declared performance capabilities; and verify the device's compliance with Accuracy Class III L tolerances (and other performance requirements) as stated in the Task Group's draft proposal.

An additional concern noted by OWM is that the proposed new requirement S.1.8.6. "Values to be Recorded, Weigh-In-Motion Vehicle Scales" is shown as being located under the parent paragraph of S.1.8. "Computing Scales." Since the focus of this proposal, WIM vehicle scales are not what would likely be considered "computing scales," this paragraph would seem to be more appropriately located elsewhere (e.g., a new S.1.14.).

In view of these current circumstances, OWM would recommend that the Assigned status of this item be changed to Developing where this proposed would be returned to the submitter.

WWMA: - 2019 Annual Meeting. The Committee recommends this item be withdrawn due to the lack of substantiated evidence that the submitter's claims of their device performance capabilities can be validated.

Mr. Russ Vires (SMA) does not support the proposal as written, the SMA has submitted written comments in opposition to this item. Mr. John Barton (NIST) informed the Committee that a commitment made by the submitter to provide an opportunity to members of the TG to witness data collection that will provide evidence that their device is capable of meeting the HB 44 Scales Code Class IIIL tolerances has not been met. As a member of the WIM TG, it is necessary to have evidence through the collection of test data showing that the submitter's device will meet the claimed performance and that the efforts of the TG are justified and worth continuing.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Tim Chesser (Arkansas, WIM Task Group) who stated that the WIM Task Group is awaiting direction from the National S&T Committee on this item. The Committee also heard comments from Russ Vires (SMA) who stated that he opposes the item as written. The Committee also heard comments from Eric Golden (Cardinal Scales) who asked if additional testing had been completed. Alan Walker (Florida, WIM Task Group) stated that additional testing had not yet been completed, and that they were currently waiting on direction from the chair of the National S&T Committee.

NEWMA: - At the NEWMA 2019 Spring Annual Meeting, Mr. Russ Vires (representing the SMA) commented that the SMA opposes this item as written. The SMA believes there is a lack of data from the submitter on the actual performance capabilities of these systems and developments as discussed within the Task Group. Mr. Russ Vires (on behalf of Mettler Toledo), supports the concept but needs more information and recommends Task Group continues the effort to move forward and develop the item further. The NEWMA recommends that development continues as an Assigned item on the NCWM S&T Committee agenda.

2019 Interim Meeting. The Committee agrees with the body that this item has merit and should remain Assigned. During open hearing, the Committee heard comments from Mr. Dick Suiter (Richard Suiter Consulting) as a WIM Task Group member. He indicated that TG is waiting for more direction from S&T committee. The major concerns are that test data given by submitter was not witnessed by a weights and measures official.

CWMA: - 2019 Spring Annual Meeting. Russ Vires, SMA, opposes this item as written because there is insufficient data. There has been no response to suggested test procedures, nor further development by the WIM task group in over one year. However, Mettler Toledo supports continuation of this item. There is still opposition to this item, and if there is no data presented, the Committee recommends this item be withdrawn after the Annual NCWM. Diane Lee, NIST OWM, stated there are concerns in the differences in opinions of the task group about test procedures.

2019 Interim Meeting. A member of the WIM Task Group indicated that the group is waiting on data from the submitter. We recommend this item remain assigned to the WIM Task Group.

2020 Interim Meeting. The S&T committee heard from both regulatory officials and industry representatives requesting this item be withdrawn for lack of progress. Loren Minnich (KS & NCWM S&T Chair) advised that Rinstrum, Inc. has been

SMA: - 2019 Fall Meeting. The SMA recommends withdrawal of the item from the NCWM agenda.
Rationale: For over four years, there has been a lack of substantiated evidence that the submitter's claims of their device performance capabilities can be validated. In addition, no suitable test procedures for a weigh-in-motion vehicle scale have been established.

SCL-19.2 V UR.5. Coupled-in-Motion Railroad Weighing Systems.

NOTE: This item replaces the 2018 Items, Block 2 items: SCL-1 & SCL-2, and 2017 individual items 3200-4 and 3200-8 and 2019 SCL-7

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL -19.2 –UR.5, Appendix D) - Initial Status – I (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM			✔				
WWMA	✔						
SWMA	✔						
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)						✔	
NCWM S&T Committee Interim	✔						

NIST OWM: -

OWM reiterates comments included in the 2019 NCWM Final Report. Additionally, OWM has concerns that apply to the amended proposal as follows.

Statements made by the submitter in previous Committee open hearings have implied point-based railroad weighing systems are not intended to be used for static weighing. The submitter amended the original proposal to include a new subpart (b) under current paragraph UR.5., which specifies it is the responsibility of the user to provide an alternate certified scale to be used as a reference scale. Use of the term "certified scale" raises the question, to what standard is the submitter referencing to qualify "certification" of the reference scale? Is it NIST Handbook 44? We view a certified device (e.g., a scale, a retail motor-fuel dispenser, etc.) as one having undergone official inspection and determined to comply with all applicable NIST Handbook 44 requirements. Is this what was intended with respect to the alternate scale that will be used as a reference?

Proposed part (b) of UR.5. also specifies the weights and measures authority is responsible for determining whether or not the reference scale is suitable in terms of size, capacity, minimum division, performance requirements, and the proximity to the weighing system under evaluation. OWM does not believe this statement is relevant or needed because weights and measures officials are already provided this authority by virtue of NIST Handbook 44 paragraph G-UR.4.4. Assistance in Testing Operations (copied below).

> **G-UR.4.4. Assistance in Testing Operations.** – If the design, construction, or location of any device is such as to require a testing procedure involving special equipment or accessories or an abnormal amount of labor, such equipment, accessories, and labor shall be supplied by the owner or operator of the device as required by the weights and measures official.

NIST Handbook 44 paragraph G-UR.4.4.

Additionally, the criteria for reference cars used for in-motion testing and the reference scale used to weigh them are addressed in Sections 1.8. and 1.9. of the most recent edition of the Association of American Railroads (AAR) Scales Handbook.

OWM believes that allowing "point-based" systems to be used for commercial transactions only involving the weighing of unit trains will place additional enforcement responsibilities on regulatory officials to ensure that single cars are not weighed on these systems and that these systems are not used in a static mode when they have not been officially approved to operate in that manner.

Following the 2019 NCWM Annual Meeting, the submitter requested in writing that an amendment for the proposed new UR.5.(b) be accepted to the Committee, The amendment included the insertion of the term "point-based railroad weighing systems" within that proposed subpart. OWM believes this request to modify the original language in UR.5.(b) was done simply to justify the addition of a proposed new definition in HB 44 Appendix D. Definitions contained in HB 44 Appendix D define terms used in HB 44 that have specific meaning and are of limited context concerning their use within a code or codes of HB 44. OWM does not view the term "point-based railroad weighing systems" as needing to be defined because its only appearance is in proposed subpart (b) of paragraph UR.5., which we view as an unnecessary addition.

Additional comments from OWM can be found in the 2019 NCWM Final Report.

WWMA: - 2019 Annual Meeting. Prior to the 2019 Annual WWMA Meeting, the submitter provided a written recommendation to amend the proposed new subparagraph, UR.5.b. by adding the terminology of "point-based railroad weighing system" to that paragraph and to also include the definition in HB 44 Appendix D for "point-based railroad weighing system." The Committee agreed this proposal as amended by the submitter has merit and to also recommend a Voting status for the item.

The Committee also recommends that this proposal's purpose be modified to only include the changes being suggested to add new subparagraph UR.5.b. and the definition for "point-based railroad weighing systems" in HB 44 Appendix D.

The Committee heard comments from Mr. Russ Vires (SMA) stating opposition to this item pointing out the initial proposal's increase of tolerances for this type of device. Mr. Eric Golden (Cardinal Detecto) stating that this proposal has been in the agenda for quite some time and that the submitter has amended the proposal by removing several of the elements that were included in the initial proposal. Cardinal is opposed even though that the proposal contains less changes than originally presented. Mr. Golden also requested that clarification be made of the phrase "reference scale in close proximity."

Mr. John Barton (NIST) stated that the proposal has been pared down and that the user's requirement included in the current version of the proposal adds nothing since the regulatory official already possesses the authority to declare a reference scale as appropriate. Also, if the users requirement is omitted, then the definition for "point-based railroad weighing systems" is not needed.

Mr. Steve Harrington (OR) commented that considerable angst has been removed from this proposal given that many of the original changes in the proposal have been deleted.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Russ Vires (SMA) who opposes the item because he believes the current standards are fine. The Committee also heard comments from Dick Suiter (Richard Suiter Consulting representing Meridian Engineering) who stated that Meridian Engineering withdrew this item in July and has since removed the Creep Test and Tolerance changes from the item. He also stated that he believes the item should be made into a Voting Item with the term "Point Based" added to UR.5 B, and also the following definition of Point Based to HB 44: **UR.5. (b) <u>For coupled-in-motion Point-Based weighing systems used only for dynamic weighing, the user shall provide an alternate certified scale to be used as a reference scale. The weights and measures authority having jurisdiction over the weighing system shall determine if the reference scale provided is suitable in terms of size, capacity, minimum division, performance requirements, and the proximity to the weighing system under evaluation. The reference weight cars weighed on the reference scale may then be used for calibration and annual inspection by the jurisdiction with statutory authority for the system.</u>** (Added 1990) (Amended 1992 **<u>and 20XX</u>**)

The Committee also heard comments from Tim Chesser (Arkansas) who stated that he supports moving this forward as a Voting Item. Eric Golden (Cardinal Scales) pointed out that the post-July changes that Dick Suiter laid out were still included in our copy of the item on S&T p.20 Lines 4 and 5 and should have been removed. After consideration of this item the Committee recommends this item be moved forward as a Voting Item with the language corrected as described.

NEWMA: - 2019 Spring Annual Meeting. Mr. Russ Vires (representing the SMA) commented that the SMA opposes this item. Mr. Russ Vires (on behalf of Mettler Toledo) stated opposition to the item as written due to same concerns as he expressed for the SMA. Mr. Dick Suiter (Richard Suiter Consulting, Representing the Submitter) submitted written comments by email and requests that the proposed changes to T.N.4.6. be withdrawn and the remaining items be separated for individual votes. Mr. Ed Luthy (Schenck Process LLC) commented that accuracy should be the number one goal and that devices entering the marketplace need to meet current tolerances. Mr. Eric Golden (Cardinal Scale) echoed previous comments by the SMA and Mr. Ed Luthy and does not believe tolerances should be modified for new devices. Mr. Golden stated that devices are meeting tolerances currently and do not need tolerances to be expanded. He also stated that withdrawing T.N.4.6. does not resolve all of his concerns regarding the item. NEWMA does not believe the item has merit and recommends withdrawal from the NCWM S&T Committee agenda.

2019 Interim Meeting. The Committee agrees with the body and finds merit in this item, sees it as fully developed and recommends it be assigned Voting status. Dick Suiter (Richard Suiter Consulting) commented on behalf of submitter, Meridian Engineers, and provided a written statement that is included in the Appendix.

CWMA: - 2019 Spring Annual Meeting. Mr. Russ Vires (SMA) expressed opposition to this item and recommends it be withdrawn because there are existing devices that comply with the current standards and meet with existing tolerances. Several people (NIST OWM, state and industry officials) spoke in opposition to expanding the tolerances. Mr. Dick Suiter, representing Meridian, requested the item move forward as a voting item without T.N.4.6. included and requested the other proposed changes be separated for the NCWM's Annual Meeting agenda. In addition, Mr. Suiter read a letter in support of this item from Mr. Steve Lind of Covia Holdings Corporation (see NCWM website for the letter). Mr. Ed Luthy (Schenck Process LLC.) stated his company has a WIM scale that can meet HB44 requirements, including the current tolerances. The CWMA recommends this item be withdrawn based on comments received in opposition to this proposal.

2019 Interim Meeting. Dick Suiter, Richard Suiter Consulting, provided written comments suggesting the above amendments to the item, including updating the title and purpose to reflect the removal of items from the proposal and adding the term "Point-based railroad" to UR.5. (b). We recommend the item move forward as a voting item with these amendments.

2020 Interim Meeting. The S&T committee heard only comments in opposition to this item from the SMA, NIST OWM and state regulators. The committee feels this item, with the proposed amendments by the NCWM S&T Committee, is developed to the extent that it can be and recommends this item move forward as a voting item.

SMA: - 2019 Fall Meeting. The SMA opposes this item.
Rationale: The requirements for a reference scale should be specific, and not decided by "…the jurisdiction with statutory authority…". Requirements for traceability and accuracy are specified in Handbook 44 Appendix A "Fundamental Considerations", and should be followed in situations such as this.

The SMA also recommends the following corrections/cleanup be made to the proposal:

SCL-19.2 I ~~T.N.3.6. Coupled-In-Motion Railroad Weighing Systems., T.N.4.6. Time Dependence (Creep) for Load Cells during Type Evaluation.,~~ UR.5. Coupled-in-Motion Railroad Weighing Systems. and Appendix D – Definitions: point-based railroad weighing systems.

~~a) Increase the tolerance for dynamic weighments of unit trains,~~

~~b) Provide an exception from "creep" tolerances for point-based in-motion railroad weighing systems,~~

~~c)~~ a) Require the user of coupled-in-motion railroad weighing systems to provide a static scale in close proximity for testing purposes, and

~~d)~~ b) Add a definition for Point-Based Railroad Weighing Systems to support those proposals.

SCL-20-1 W N.1.12 Reducing Rounding Error, T.1. General, T.N.2.1. General

At the 2020 Interim meeting the S&T committee agreed to remove item SCL 20.1 from block 2 and make it a separate item and agreed to withdraw this item. Responses below are the decision from the regionals to Block 2 Items. See regional comments in Block 2

Organization (*) not submitted (**) no meeting (***) no recommendation	N.1.12 Reducing Rounding Error, T.1. General, T.N.2.1. General (originally 9 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM (either D or A with modifications)							
WWMA			✔				
SWMA		✔					
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
SMA (Industry)						✔	
NCWM S&T Committee Interim			✔				

NIST OWM

OWM offers the following comments relating exclusively to proposed new paragraph N.1.12.:

- We're confused by the proposed text, "the rounding error resulting from rounding the indication to the nearest digital division shall be reduced whenever the scale division d is greater than 0.2 e." We interpret this to mean that when "e" and "d" are equal values on a digital scale, error weights would need to be used when verifying performance. Based on this proposed text, error weights would also need to be used when testing a Class I and II digital indicating scale with different values of "e" and "d" when the ratio of "d" to "e" was 2 to 1 (d = 0.5e). Although we favor the concept of reducing digital rounding error by using error weights to test, this may not be practical for field testing, nor do we view it as a necessity. We recognize scales equipped with digital indication are unable to display values in increments less than the value of their smallest division. Current NIST training courses for scales include proper procedures for applying HB 44 acceptance and maintenance tolerances, including procedures for applying tolerance when that tolerance happens to be ½ d on a digital scale.
- We believe the proposed paragraph was likely drafted based on an assumption that the value of "d" and "e" are equal (as is the case for most scales) or that "d" would equal 0.5 e, which is a permissible design for Class I and II scales. Depending on a scale's Accuracy Class, however, the value of a scale division "d" can be equal to, less than, or greater than "e." We wouldn't know how to apply proposed new paragraph N.1.12. for each of these designs. For example, how is the rounding effect reduced through the use of error weights when the value of "d" is greater than "e" (as can be the case for Class III and Class IV scales)? An additional comment relating to the reduction of the rounding effect; nowhere is it specified in the proposal to what degree the rounding error needs to be reduced.
- Field officials may not have test weights small enough to perform the reduction specified on some scales. For example, on a class II scale with d = 0.005 g and e = 0.01 g, the reduction would likely require decimal milligram test weights. Weights this small are not typically provided to field staff, nor do some of the NTEP labs possess them.

- Use of error weights to determine scale error extends the amount of time it takes to perform a test and will also require training on how this is to be done.
- Paragraph N.1.12. already exists. The proposed new paragraph would be titled N.1.13.

The clarifying text proposed for paragraph T.1 General and T.N.2.1., we believe is appropriate; and although we've not received any recent inquiries expressing concern with the existing text in those paragraphs, we do think the proposed additions improve clarification on how tolerances are to be applied.

SCL-20.2 W Verification Scale Division

At the 2020 Interim meeting the S&T committee agreed to remove SCL-20.2 from block 2 and make it a separate item and agreed to withdraw this item. Responses below are the decision from the regionals to Block 2 Items. See regional comments in Block 2

Organization (*) not submitted (**) no meeting (***) no recommendation	Verification Scale Division (originally 9 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM (either D or A with modifications)							
WWMA			✔				
SWMA		✔					
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
SMA (Industry)						✔	
NCWM S&T Committee Interim			✔				

NIST OWM:

The proposed new title for paragraph S.1.2.2. provides better indication of the paragraph's substance. We do think the proposed title should be expanded to include text identifying (e) and (d) as "values." We propose the following title: "Scales Designed With a Value of (e) Not Equal to (d)"

It is appropriate to make paragraph S.1.2.2.2. a user requirement and delete it as a specification because it is a user's responsibility to select a suitable scale. This should be shown (in the proposal) as striking paragraph S.1.2.2.2. and adding a new UR.3.X.

Values of (e) do not round to the nearest increment when (e) and (d) are different values on Class I and II scales. It is not until the full range of the (d) resolution is exceeded that the (e) value advances or declines, whichever the case. This truncating effect can be used to one's advantage when a scale is used in a direct sale application by simply ignoring the (d) value and basing transactions on (e) alone. Additionally, a displayed value in which the numbers place furthest out is differentiated from the rest is confusing and begs the question what that digit is to be used for to those unfamiliar with how the scale was designed to operate (e.g., customers). Consequently, as a general rule we believe "e" and "d" should be equal value on scales used for direct sales and oppose Option 2 of the proposal for this reason.

We note that OIML R 76 Non-Automatic Weighing Instruments does not permit auxiliary indicating devices, of which a differentiated scale division is a type, on Class II scales used for direct sales to the public. R 76 specifies that the interpretation of what is included in "direct sales to the public" is left up to national legislation. We interpret "direct sales to the public" to be less restrictive than "direct sales," which means all direct sales (i.e., to the public and otherwise). In the US, there may be some wholesale applications that warrant allowing "direct sale" use of a Class I or II scale with different values of "d" and "e" (e.g., two gemstone dealers trading precious gems and both knowledgeable of how the scale in which the gems are being weighed functions, etc.). If an exception were made to allow "direct sale" use of such scales in certain wholesale applications, such exception should make clear it applies

only to those scales that are used solely in wholesale application and not to those that are used for both wholesale and retail. Alternatively, or in addition, the Committee may want to consider language that would limit use to specific types of applications as deemed appropriate by the Committee.

SCL-20.9 D S.1.1.3. Zero Indication, Load Receiving Elements Separate from Weighing Elements. and Appendix D – Definitions: no load reference value

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL -20.9 – S.1.1.3 Zero Indication, Load Rec Ele Sep from Weigh Ele, App D Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
***WWMA							
***SWMA							
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
***NEWMA Interim (2019 Fall)							
**NEWMA Annual (2020 Spring)							
SMA (Industry)						✔	
NCWM S&T Committee Interim		✔					

NIST OWM: OWM believes this proposal to be the second of two that have been submitted by the State of Kansas to address, what we believe are the same concerns pertaining to hopper scale systems. The other item (ABW-16.1) proposes changes to the ABWS Code of NIST Handbook 44 -. If our interpretation is correct, might Kansas decide which proposal they prefer to advance forward for consideration and then recommend to the Committee withdrawing the other.

OWM recognizes that there are some weighing systems that operate autonomously following an initial action by the operator to start the process. It is our understanding this proposal is intended to address hopper scale systems designed to be operated in an automatic mode to weigh and discharge successive drafts of product in bulk to either:

a. achieve some targeted amount entered into the system by its operator; or
b. provide a summed total of some unknown amount of product needing to be weighed in multiple drafts due to the limited capacity of the hopper.

Although similar in operation to an automatic bulk weighing system, we believe some of the hopper scale systems this proposal is intended to address are designed to weigh more than a single product; that is, a combination of different products comprised of the individual ingredients that form a recipe. Some of these products may be weighed on a separate scale or measured by a meter upstream of and prior to being conveyed into the hopper scale to ensure proper proportion to the overall recipe. Generally, however, it is the hopper scale that determines the final weight of the mixture in each draft that makes up a particular targeted amount or load. There exists varying designs of these systems and the arrangement of the different weighing and/or measuring devices used to weigh/measure the different individual ingredients included in the installation also varies with the design of the system.

This proposal seems to address only one particular type of hopper scale system with automatic operation. That is, one which records the no-load starting or no-load ending reference (depending on its use as a weigh-in or weigh-out system) and determines from subtraction the net weight of each draft and then provides a summed total. Not all hopper scale systems equipped with automatic operation, however, are designed to function in this manner. There exists some hopper scale systems with automatic operation designed with an interlock, which prevents a subsequent draft from being initiated until all of the product in the previous draft has been discharged and the scale returned to a zero-load balance condition. With these systems, there is no subtraction of the starting or ending reference from the weight of the draft load in the hopper because for each draft, the scale starts the weighing process with the scale displaying zero and no product in the hopper. A very important consideration during field inspection of these systems is to verify proper operation of the interlock system during automatic operation. Additionally, for these systems, the

owner/operator is required to maintain the hopper scale system on zero at all times in accordance with Scales Code paragraph UR.4.1. Balance Condition. This, however, would not be necessary with respect to a hopper scale system that determines the amount of each draft load by recording the starting no-load or ending no-load reference and subtracts to determine the net weight of each draft.

We believe the operational differences in the two designs we've described to be significant enough to warrant a proposal that clearly distinguishes between the two and includes proposed changes and added paragraphs to address each separately. We encourage the submitter to continue developing this item to adequately address either design.

A point we wish to make clear is that we believe it is unnecessary and inappropriate to require a no-load starting and/or no-load ending reference be recorded by a hopper scale system when designed with a functioning interlock that prevents the next subsequent draft load from being initiated until all product comprised of a previous draft load has been discharged from the hopper and the scale has returned to zero.

For the sake of consistency in testing, we think part of the discussion in the development of this item going forward should be whether or not each individual scale and meter comprised of a system would need to be tested by officials. We note that some recipes may produce a final product offered for sale as certified through some form of guaranteed analysis. In this case, some jurisdictions may conclude all of the individual scales and meters may not need to be certified. If it is agreed that the individual scales and meters installed in a system need to be tested along with the hopper scale, new test procedures will likely need development to address the testing of the individual scales installed in those systems.

WWMA: - 2019 Annual Meeting. The Committee recognizes this as a new proposal and that there were no comments heard on the item during the open hearings. Due to the lack of comments regarding this proposal, the Committee does not offer any recommendation for its status.

SWMA: - 2019 Annual Meeting. No comments were made to the Committee on this item during the Open Hearings. The Committee has decided to make No Recommendation on this item.

NEWMA: - 2019 Interim Meeting. The Committee and the body take no position on this item as no comments were heard during open hearing.

CWMA: - 2019 Interim Meeting. Loren Minnich, KS, the submitter of the item requested the item be assigned a developing status to receive input on the item. Dick Suiter, Richard Suiter Consulting, suggested further clarification regarding what is a load receiving element vs. weighing element. Jason Smith, SD, agreed that there is clarification needed. We recommend the item move forward as developing.
2020 Interim Meeting. The S&T committee heard from the developer of this item, who requested this item remain developing to allow more time for input from all parties.

SMA: - 2019 Fall Meeting. The SMA opposes this item.
Rationale: The intent of the proposal is not understood well enough to evaluate properly and provide an appropriate recommendation.

SCL-20.10 V S.1.2.2.2. Class I and II Scales Used in Direct Sale and S.1.2.2.3. Deviation of a "d" Resolution.

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL -20.10 – S.1.2.2.2 Class 1 and II Scales use in Direct Sales & S.1.2.2.3 Dev of a "d " Resolution - Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA			✔				
SWMA			✔				

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL -20.10 – S.1.2.2.2 Class 1 and II Scales use in Direct Sales & S.1.2.2.3 Dev of a "d " Resolution - Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)	✔						
NCWM S&T Committee Interim	✔						

NIST OWM:

What is most concerning about allowing use of a Class I or II scale with different values of "e" and "d" in a direct sale application is the confusion created by the scale displaying a differentiated value and, not having a clear understanding whether or not the user will include that value as part of each and every weight determination. Because the value is differentiated, it instinctively raises a question to customers (and perhaps some scale users not having knowledge of its purpose) whether or not it was intended to be used when reading the scale.

As noted in previous OWM comments and recommendations pertaining to this item, when "e" and "d" are different values on Class I and Class II scales, values of "e" do not round to the closest increment. It is not until the full range of the "d" resolution is exceeded by either increasing or decreasing the applied load that the next displayed increment of "e" increases or decreases. Someone aware of this functional characteristic of these scales, such as the user, may be inclined to use this truncating effect to their advantage when buying or selling from the scale in a direct sale application. If a weighing operation is performed where "d" is ignored and only the "e" value is read, there can be as much as nine-tenths the value of "e" error in the weight determination. For this reason, the combined value "e" and "d" must be read when determining the weight of all applied loads. Someone not aware of this functional characteristic may simply ignore the differentiated portion believing it to be insignificant.

If officials are basing the suitability of a scale, including the minimum acceptable load to be weighed, on the verification scale division (e), which they should be, then we question why a "d" resolution is needed? That is, why not simply select a suitable scale in which "e" and "d" are equal and eliminate all possibility of confusion? The small amount of enhanced accuracy provided by a scale having a "d" resolution isn't necessary when scale suitability, including the minimum acceptable load to be weighed, is based on the verification scale division (e). Any added benefit of having a smaller displayed "d" value, in our view, will be far outweighed by the risk of scale operators either simply ignoring the value when reading the scale or using it to their advantage when buying or selling from the scale in a direct sale application. We also question the cost benefit of ownership between two scales, both having the same "e" resolution and one having a smaller "d" resolution, given that the application of Handbook 44 tolerances is based on the "e" resolution.

In the Background/Discussion portion of this item, which is included in S&T Appendix A, it is mentioned that during the 2020 NCWM Interim Meeting open hearings, Mr. Steve Harrington (OR) supported a change to make the current specification requirement S.1.2.2.2. into a user requirement as proposed in B2: SCL-20.2. In written comments to the Committee provided during the 2020 Interim Meeting, OWM also supported this change. It is appropriate to make paragraph S.1.2.2.2. a user requirement and delete it as a specification because it is a user's responsibility to select a suitable scale. That is, we believe a requirement specifying that values of "e" and "d" be equal is needed and that it should only apply to scales used for direct sale. Because it is a user's responsibility to select a scale suitable for the application intended, paragraph S.1.2.2.2. should be changed to a user requirement. We recommend the Committee consider the following proposed new paragraph to replace current paragraph S.1.2.2.2.

UR.3.X. Class I and II Scales Used in Direct Sales. – When Accuracy Class I and II scales are used in direct sale applications, the value of the scale division "d" shall be equal to the value of the verification scale division "e."

[Nonretroactive as of January 1, 20XX; to become retroactive as of January 1, 2023]

(Added 20XX) (Amended 20XX)

We note that OIML R 76 Non-Automatic Weighing Instruments does not permit auxiliary indicating devices, of which a differentiated scale division is a type, on Class II scales used for direct sales to the public. R 76 specifies interpretation of what is included in "direct sales to the public" is left up to national legislation. We interpret "direct sales to the public" to be less restrictive than "direct sales," which means all direct sales (i.e., to the public and otherwise). In the US, there may be some wholesale applications that warrant allowing "direct sale" use of a Class I or II scale with different values of "d" and "e" (e.g., two gemstone dealers trading precious gems and both knowledgeable of how the scale in which the gems are being weighed functions, etc.). If an exception were made to allow "direct sale" use of such scales in certain wholesale applications, such exception should make clear it applies only to those scales that are used solely in wholesale application and not to those that are used for both wholesale and retail. OWM believes proposing such an exception to be a more reasonable solution than the one currently proposed (i.e., to delete paragraphs S.1.2.2.2 and S.1.2.2.3.) and would allow for better harmonization of NIST Handbook 44 and OIML R76.

We could find no justification offered by the submitter of this item in the Discussion/Background portion of S&T Appendix A for proposing paragraph S.1.2.2.3. Deactivation of a "d" Resolution be deleted. We believe it is important for this paragraph to remain in the Scales Code. OWM proposed this paragraph be added in 2018 to heighten awareness of the existence of some Class I and II scales having different values of "e" and "d "that fail to round properly if the "d" resolution is disabled or turned off. We request the Committee amend this item by removing the proposed deletion of paragraph S.1.2.2.3.

WWMA: - 2019 Annual Meeting. The Committee agrees that this proposal should be withdrawn. The Committee acknowledges paragraph S.1.2.2.2. has merit as it appears currently in HB 44 with the exception of the non-retroactive status, becoming retroactive at a later date. The Committee will address the issue of the non-retroactive and retroactive status in item SCL-20.11.
During the open hearing session, comments were taken as a group to include items SCL-20.2, SCL-20.10, and SCL-20.11.
Mr. Steve Harrington (OR) commented that still believes there is merit in the proposed changes but suggested removing the retroactive date to allow devices now in service to remain in service. Mr. Russ Vires (SMA) provided some history of the use of both "d" and "e" for scales and that field inspectors did not have the appropriate test weight to properly test these scales to the finest resolution. While supported initially by the SMA, it was not realized that this proposal would have unintended consequences related to the jewelry industry where "d" is commonly used in weight determinations. The SMA recommends that the retroactive date be eliminated to allow manufactures additional time to change the designs on their equipment and so existing scales can continue to be used. Mr. Vires also suggested that this requirement could be formatted as a users requirement.
Mr. John Barton (NIST) stated that the exclusion of jewlers scales in this requirement could provide reason to exclude other applications and this may be a "slippery slope."
Mr. Harrington stated that he could also support the proposal formatted as a user requirement.

SWMA: - 2019 Annual Meeting. No comments were made to the Committee on this item during the Open Hearings. After consideration of this item the Committee recommends this item be Withdrawn. The Committee prefers SCL-20.11

NEWMA: - 2019 Interim Meeting. The Committee and the body find merit in this item and finds it fully developed and agrees it should be assigned a voting status. Submitter. Mr. Jim Willis (NY) presented a short power point explaining the unintended consequences of 2.20.S.1.2.2.2 in 2019 HB44 for certain industries. He also stated that NY will not enforce the current language in HB44 as it puts undue burden on those that have used NTEP certified scales for decades and now will be forced to buy new devices. Mr. John McGuire (NJ) asked what the difference is between SCL-20.10 and SCL-20.11? Mr. Steve Timar (NY) says the exception in 20.11 has a carve out just for jewelry scales, but submitter wants language to return to 2017 HB44. Mr. John McGuire (NJ) supports submitters position.

CWMA: - 2019 Interim Meeting. Loren Minnich, KS, commented that the item should move forward as a voting item with the above amendment. We recommend the item move forward as a voting item with the above amendment.

2020 Interim Meeting. The S&T committee heard comments from the SMA and NIST OWM. The committee recommends the item moving forward as a voting item with the proposed amendments by the NCWM S&T Committee. **SMA: -** 2019 Fall Meeting. The SMA supports this item and recommends it be assigned a status of Voting.

SCL-20.11 W S.1.2.2.2. Class I and II Scales Used in Direct Sales.

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL -20.11 – S.1.2.2.2 Class 1 and II Scales use in Direct Sales Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA	✔ (with chngs.)						
SWMA	✔ (with chngs.)						
CWMA Interim (2019 Fall)			✔				
**CWMA Annual (2020 Spring)							
NEWMA Interim (2019 Fall)			✔				
**NEWMA Annual (2020 Spring)							
SMA (Industry)							✔ (with changes)
NCWM S&T Committee Interim			✔				

NIST OWM: See comments under previous Item SCL-20.10.

WWMA: - 2019 Annual Meeting. The Committee recommends this item be given a voting status as amended in the proposal including the exception for jeweler's scales. The Committee recommends to further add an exception for grain test scales used in USDA applications as shown.

> ***S.1.2.2.2. Class I and II Scales Used in Direct Sales.*** *–* ***Except for jewelers' scales and grain test scales used in USDA applications, W****when accuracy Class I and II scales are used in direct sale applications, the value of the displayed division "d" shall be equal to the value of the verification scale interval "e.*
>
> *[Nonretroactive as of January 1, 2020****3****;* ***to become retroactive as of January 1, 2023****]*

Comments heard during the open hearing session included statements from Mr. Steve Harrington (OR) commenting that he still believes there is merit in the proposed changes but suggested removing the retroactive date to allow devices now in service to remain in service. Mr. Russ Vires (SMA) provided some history of the use of both "d" and "e" for scales and that field inspectors did not have the appropriate test weight to properly test these scales to the finest resolution. While supported initially by the SMA, it was not realized that this proposal would have unintended consequences related to the jewelry industry where "d" is commonly used in weight determinations. The SMA recommends that the retroactive date be eliminated to allow manufactures additional time to change the designs on their equipment and so existing scales can continue to be used. Mr. Vires also suggested that this requirement could be formatted as a users requirement.
Mr. John Barton (NIST) stated that the exclusion of jewlers scales in this requirement could provide reason to exclude other applications and this may be a "slippery slope."
Mr. Harrington stated that he could also support the proposal formatted as a user requirement.

SWMA: - 2019 Annual Meeting. During the open hearings the Committee heard comments from Russ Vires (Mettler Toledo, Submitter) who suggested the following change.

S.1.2.2.2. Class I and II Scales Used in Direct Sales. – **Except for jewelers' scales and grain test scales used in USDA applications, ~~W~~w**hen accuracy Class I and II scales are used in direct sale applications, the value of the displayed division "d" shall be equal to the value of the verification scale interval "e".

[Nonretroactive as of January 1, 202**0~~3; to become retroactive as of January 1, 2023~~3]**

After consideration of this item, the Committee recommends moving this item forward as a Voting Item with the proposed changes.

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item is redundant and would cause a special carve out for devices used in certain industries. The Committee believes this item should be withdrawn and urges the submitter to work with the submitter of SCL-20.10. Mr. Ethan Bogren (Westchester County, NY), Mr. John McGuire (NJ), Mr. Jim Willis (NY) and Mr. Marc Paquette (VT) all voiced concerns about the redundancy of the item. Mr. Dick Suiter (Richard Suiter Consulting) commented that the Southern Weights and Measures Association recommended also including grain test scales in this proposal.

CWMA: - 2019 Interim Meeting. Loren Minnich, KS, commented that it is inappropriate to make this exemption and this item should be withdrawn. We recommend the item be withdrawn.

SMA: - 2019 Fall Meeting. The SMA supports this item if SCL-20.10 is withdrawn.
Rationale: This item resolves the unintended consequences associated with the previously added paragraph "S.1.2.2.2. Class I and II Scales Used in Direct Sales" for the jewelry and grain moisture analyzer applications and the associated Retroactive and Nonretroactive dates.

SCL-20.12 D Multiple Sections to Add Vehicle Weigh-in-Motion to the Code and Appendix D – Definitions; vehicle scale and weigh-in-motion vehicle scale.

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL -20.12 – Multi Secs to Add WIM to the Code and Appendix D Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM				✔			
WWMA		✔					
SWMA				✔			
CWMA Interim (2019 Fall)				✔			
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
NEWMA Interim (2019 Fall)				✔			
**NEWMA Annual (2020 Spring)							
SMA (Industry)		✔					
NCWM S&T Committee Interim		✔					

NIST OWM:

OWM acknowledges the submitter's efforts to draft changes to the HB 44 Scales Code that will have it apply to WIM vehicle scales. Noting the extensive amount of changes being proposed, we question however, whether these changes are being made to the appropriate HB 44 code. We note that the tentative "Weigh-In-Motion Systems Used for Vehicle Enforcement Screening" Code might also serve as an appropriate location for requirements pertaining to WIM vehicle scales used in commercial transactions. Alternatively, it may be appropriate to create a new HB 44 Code to encompass all types of in-motion weighing devices used in commercial service.

OWM has noted the submitter (Mettler Toledo) has provided the Committee with a written request to implement an updated and amended proposal based on comments it received following the 2020 NCWM Interim Meeting and demonstration of their equipment on March 10, 2020. That demonstration was witnessed by representatives of several state Weights and Measures agencies, NCWM/NTEP, and NIST OWM. Many of OWM's comments offered during the 2020 NCWM Interim Meeting have been addressed by the submitter in the revised version of this proposal.

OWM also notes this proposal is similar to the S&T Item SCL-16.1 in that it addresses the use of weigh-in-motion operation of vehicle type scales. One significant difference in these two proposals is that SCL-16.1 incorporates a scale system that would generate a gross weight for a vehicle using multiple drafts (of axles or axle groups) and under SCL-20.12, the weight of the vehicle is determined in a single draft while the entire vehicle is positioned on the load-receiving element.

OWM believes that while SCL-16.1 and SCL-20.12 incorporate somewhat different technologies to obtain WIM weight values that would comply with the current HB 44 Scales Code Class III L tolerances, both proposals may have value in establishing a pathway of the eventual adoption of WIM systems as commercial devices.

WWMA: - 2019 Annual Meeting. The Committee agrees the item has merit and that the item be given a Developing status. The Committee notes that the submitter has stated there is an opportunity for having members of the NCWM, NIST, and/or regulatory officials to witness the operation of the systems referenced in this proposal thus providing evidence the systems will meet current Class IIIL tolerances.
During the open hearing session, the Committee heard comments from Mr. Russ Vires (Mettler Toledo) as the submitter of the item that input is requested from the regional associations, regulators, and other sources on the changes being proposed. Mr. Vires stated that he believes the item is fully developed and requested that it be assigned as a Voting item. Mr. John Barton (NIST) stated that OWM has not had a sufficient opportunity to review this item fully but that it is encouraging to note that the submitter is offering others the opportunity to observe the submitter's device being tested to provide evidence that it will meet Class IIIL tolerances. Mr. Eric Golden (Cardinal Detecto) stated that as a member he has experienced the frustration in the past 18 months with the existing WIM TG addressing item SCL-16.1. Mr. Golden stated that Cardinal could support this proposal as a Developing item with some reservations.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard comments from Tim Chesser (Arkansas) who recommended this item be given an Assigned status. Russ Vires (Mettler Toledo) stated that he did not support an Assigned status and is willing to demonstrate the capabilities of the device by the 2020 NCWM Interim Meeting. He also stated that he feels the item is well developed but would rather the item be recommended as Developing back to Mettler Toledo, the submitter. Eric Golden (Cardinal Scales) asked how multi-platform scales would be considered moving forward, and that he supports single draft weighing. Dick Suiter (WIM Task Group) stated that this item conflicts with the task groups' proposal if single draft weighing became the only allowable method. He also stated that the task group wants to remove the single draft requirement for WIM Vehicle Scales. After consideration of this item the Committee recommends this item be Assigned to the WIM Task Group.

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item has merit and should be given an assigned status. During open hearings, Mr. Dick Suiter (Richard Suiter Consulting) commented that as a WIM member, recommend the item be assigned. He explained that this proposal is different than SCL-16.1 because it proposes using a single draft with a full-length truck scale. Mr. John McGuire (NJ) and Mr. Jim Willis (NY) agree with this position.

CWMA: - 2019 Interim Meeting. Eric Golden, Cardinal Scale, commented that they support the single draft requirement for WIM vehicle scales and this item should be separate from SCL-19.2. Dick Suiter, Richard Suiter Consulting, commented that other regions recommended assigning the item and that the WIM TG can develop both items. Charlie Stutesman, KS commented that SCL-19.2. has been held back by disagreement over test procedures and this item shouldn't be assigned to the WIM TG. Jason Smith, SD, commented that the WIM TG was developing code for all devices and could consider both. We recommend the item be assigned to the WIM TG so that group can determine how these items move forward.

2020 Interim Meeting. Russell Vires (Mettler-Toledo, LLC) gave a presentation to the S&T committee on this item. The presenter answered a number of questions from the committee and from both regulatory officials and industry representatives on this item. A concern that was highlighted questioned if placing the reference scale into high resolution, the reference scale may not comply with the N max requirement. Another concern of regulatory officials was the need to test the reference scale to used capacity with known field standards. This could require an additional burden to both the regulatory officials and the device owners. Russell Vires commented that this item was still being developed with the goal of presenting a final version at the NCWM meeting in January. Not having seen the final version of the item, the committee recommends this item remain a developing item.

SMA: - 2019 Fall Meeting. The SMA recommends this be a Developing item.
Rationale: The SMA recognizes that the item has merit and looks forward to the planned demonstration of the equipment as well as other comments related to the proposed scale code changes.

SCL-20.13 V N.1.5. Discrimination Test

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL -20.13 – N.1.5. Discrimination Test – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
*WWMA							
*SWMA							
CWMA Interim (2019 Fall)			✔				
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
*NEWMA Interim (2019 Fall)							
**NEWMA Annual (2020 Spring)							
SMA (Industry)							✔ (with changes)
NCWM S&T Committee Interim	✔						

NIST OWM:

OWM restates our comments from the 2020 NCWM Interim Meeting in that we recognize that conducting a discrimination test on a Class I or II scale where e = d and that value is less than 5 mg, would be very difficult given the need to use test weights of exceedingly small denominations (e.g., 0.1 x e) and that most weights and measures agencies would not typically issue their field staff such test standards. It is also unlikely that conducting a field test on such scales could include a discrimination test in an environment where anything other than severely controlled conditions exists.

OWM agrees with the NTEP Weighing Sector and believes this proposal has merit.

Note: *This item was not submitted to the WWMA, SWMA, or NEWMA.*

CWMA: - 2019 Interim Meeting. Several regulators opposed creating an exemption for these scales and supported withdrawing the item. We recommend the item be withdrawn.

2020 Interim Meeting. The S&T committee heard comments in support of this item moving forward as a voting item from the SMA and NIST OWM. Charlie Stutesman (KS) made comments of concern with this item opening the door to future exceptions from the discrimination test. The committee recommends this item moving forward as a voting item.

SMA: - 2019 Fall Meeting. The SMA supports the concept of this item and suggests the following changes:

N.1.5. Discrimination Test. – Except for digital electronic scales ~~designated Accuracy Class I or II~~ in which the value of e ~~= d and~~ is less than 5 mg,

SCL-21.1 S.1.1. Zero Indication

Organization (*) not submitted (**) no meeting (***) no recommendation	SCL-21.1 – S.1.1 Zero Indication (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA			✔				
SWMA			✔				
CWMA Interim (2020 Fall)			✔				
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)							
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM: OWM notes that this HB 44 Scales Code requirement was amended in 1993 by changing subpart (c) to permit all types of weighing devices to display other than numerical weight values when the system is at a zero-balance condition. This amendment allowed systems to display screen savers, store special offers, product advertisements, etc. instead of a decimal weight display when the scale is not conducting a weighing operation but is at the required zero-balance condition.

The current requirement also specifies that when there is no load applied and the system displays something other than a numeric weight indication, there shall be automatic means to prohibit the start of a weighing operation or a return to a digital weight indication if at an out-of-balance condition is present.

The current requirement also specifies that when there is no load applied and the system displays something other than a numeric weight indication, there shall be automatic means to prohibit the start of a weighing operation or a return to a digital weight indication if at an out-of-balance condition is present.

We understand that a zero indication will not be seen, but we believe that the code includes the safeguards needed to protect the consumer. We also understand that W&M have been trained to look for a zero indication and that additional training may be needed to inform W&M of other safeguards that are in place such as S.1.1. (c). for options to starting on zero. OWM agrees with the conclusions of WWMA, SWMA, and CWMA that as required in the current S.1.1.(c) when a zero-balance condition is not present and an automatic means prevents a weighing operation from being initiated, there is no risk of erroneous weighments due to the operation beginning when not at zero-balance indication.

WWMA: Steven Harrington (Oregon) commented to take a look at the retroactive date and give plenty of time for adjustments/modifications. John Barton (NIST-OWM) John commented that there is a 1993 amendment to an existing requirement in place that allows for display other than zero and it would not be allowed to display other than zero if it was not on zero. That requirement requires an interlock that would not allow any weighments to take place unless a zero balance exists. Eric Golden (Cardinal Scale) Echoes Johns comments and stated it would not be that hard to accomplish. However, there may be a cost for the operators of such devices. Russel Vires (Mettler Toledo) commented that NTEP scales are tested for the functionality described by NIST. Additionally, he concurs with Steven Harrington and feels a 2027 retroactive date would be appropriate.

The Committee agrees that this item does not have merit and should be withdrawn.

SWMA: During Open Hearings the Committee heard from John Barton (OWM) who stated that the handbook was amended in 1993 to permit systems to have screensavers, advertisements, or other alternate displays once a zero balance had been achieved. The Committee also heard from Ken Ramsburg (Maryland) who stated that this issue was already covered by the NTEP evaluation process. After consideration of this item the Committee recommends that it be Withdrawn.

NEWMA: Testimony was heard from the submitter and others that there are situations where scales have not returned to zero indication when weighing from a displayed screensaver or out-of-balance-condition. Arguments were made that meeting S.1.1. (c) would resolve this problem and that it may be an enforcement issue and not a code issue. Industry commented that the retroactive date of 2023 may not allow for the appropriate time to make the necessary software changes for an alternative like a split screen. The Committee believes this proposal has the potential to add information and clarity to the Handbook but should be investigated to ensure that current problem situations are not in violation of the Handbook as written. The item was discussed as a potential voting item with the following language edit to include a split screen display.

(d) When a screen saver, power saver, or text is displayed prior to the beginning of weighing operation both the operator and customer indicators shall display a split screen showing the numerical zero(s) condition when performing an actual weighing operation.
Retroactive January 1, 2024
Amended 2021

CWMA: The S&T committee received comments from both regulatory officials and industry representatives that this item is not a needed addition to the handbook and recommended this item be withdrawn. We agree with the comments received, and recommend this item be withdrawn.

ABW – Automatic Bulk Weighing Systems

ABW-16.1 D A. Application, S Specifications, N. Notes, UR. User Requirements and Appendix D – Definitions: automatic bulk weighing system.

Originally ABW-3

Organization (*) not submitted (**) no meeting (***) no recommendation	ABW -16-1 – A., S. N. UR and Appendix D - Initial Status – D (Several Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM			✔				
WWMA			✔				
***SWMA							
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
NEWMA Interim (2019 Fall)			✔				
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim		✔					

NIST OWM:

OWM is not aware of any further development occurring to this proposal since the 2019 NCWM Annual Meeting and therefore we reiterate our comments from the previous analysis. We also recognize that there may be some benefit to modernize the HB 44 ABWS Code to address the newer types of technologies used in the ABWS systems however, we see no benefit to expand the ABWS Code to include systems that do not conform with the very unique operational features and processes associated with ABWS.

This proposal eliminates the carefully developed language in the application requirement (A.1.) designed to limit the application of the ABWS Code to an exclusive category of weighing devices. This language (proposed to be eliminated) very clearly distinguishes ABWS from other types of automated weighing systems. The changes

proposed would therefore expand the scope of the ABWS Code to include other weighing systems that would be more appropriately covered by other codes (or perhaps a new code).

The proposed change to the Appendix D definition for ABWS strips from that existing description the fundamental and basic principles that clearly identify ABWS and distinguish them from other types of weighing systems. In addition, other parts of this proposal that OWM believes to need further development are listed below.

- Use of the terms: "loaded weight value" (paragraph S.1.8.); "weighing process" (paragraph S.10.); and "weighment" (paragraphs S.1.8., S.1.9., and S.1.10) in this proposal are ambiguous terms that need to be more adequately defined.
- The proposed new paragraph S.1.7. should be amended to address the following three issues.

    1. The issue of indication and recording of no-load reference values is already addressed by the existing paragraph S.1.1. "Zero Indication."

    2. The function of motion detection at no load doesn't need to be addressed because if a system were to record values when product was still flowing in or out of the load-receiving element, it would result in inaccurate net weight indications. Motion detection is verified as part of an official inspection and would detect such a violation.

    3. An automatic shutdown feature when the no-load reference value is outside user design parameters. OWM questions if it should also be necessary for an automatic shutdown feature to activate if the "gross-load reference values" were to fall outside of the user designed parameters. If so, the first two sentences in proposed new paragraph S.1.7. could be eliminated and the remaining two sentences amended to include "gross load reference values." The title of this paragraph could then also be changed to "Automatic Shutdown Feature." OWM also notes that requirements for automatic shutdown feature don't address the accuracy of the weight determination once design parameters are exceeded requiring the system to shut down. This requirement only addresses the need for operator intervention to get the system started again.

- We also believe the proposed changes in paragraph S.3.3.(a) and (b) are lacking in clarity and should provide additional detail. It is important to specify in (a) that product flow to the load-receiving element must automatically stop rather than be stopped. Also, the terminology "other equipment" needs better clarification in the first sentence proposed for sub-paragraph (b).

Additional comments from OWM can be found in our analysis for the 2019 NCWM Annual Meeting agenda items.

WWMA: - 2019 Annual Meeting. The Committee agreed to recommend this item be withdrawn. The Committee recognizes that there have been no changes to the proposal since the last cycle of hearings. During the open hearing session, the Committee heard comments from Mr. Russ Vires (SMA) have no opinion at this time. Mr. John Barton (NIST) stated that the submitter proposal to modify the ABWS Code by introducing terminology that reflects the newer technology in use today however, he believes that there is too much focus being given to "automation" and not enough focus on the unique and specific characteristics of ABWS devices. Also, that by removing the description of ABWS from the Applications Section of the Code, this proposal will widen the scope to include systems not intended to be covered under the ABWS Code.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Russ Vires (SMA) stating he had no position on this item at this time. The Committee decided to make No Recommendation on this item.

NEWMA:

2019 Fall Interim Meeting. The Committee and the body agree with comments made in the Western Weights and Measures Association report that this item should be withdrawn as no changes or additional information has been provided since 2016. No comment was heard during open hearing.

CWMA: - 2019 Spring Annual Meeting. Mr. Russ Vires (SMA) took no position on this item. Ms. Diane Lee (NIST OWM) stated the view that changes proposed to paragraph A.1. are seen as expanding the scope of the current HB 44

Automatic Bulk Weighing Systems Code (ABWS) to encompass types of systems not previously considered as ABWS. While OWM agrees with the concept of updating the current code to pave the way for its application to newer automated weighing systems. OWM believes the current proposal as drafted, is not sufficiently developed enough to be considered for adoption. CWMA recommends this item be given an information status because the item has merit, but the submitter (Kansas) has stated they will not develop it any further.

2019 Interim Meeting. Loren Minnich, KS, commented that work is continuing on this item to address concerns that have been raised and would like it to remain developing. We recommend the item remain developing.

2020 Interim Meeting. Loren Minnich (KS) the developer of the item gave an update to the item to the S&T committee and requested the item remain developing to allow for more time to fully develop the item. We ask the NCWM S&T Chair to give the developer a deadline of one year to present substantial progress on this item or withdraw it.

SMA: - 2019 Fall Meeting. The SMA takes no position on this item.

WIM – Weigh-in-motion systems used for vehicle enforcement screening tentative code

WIM-19.11 W Title of Tentative Code, S.1.7.1. Values to be Recorded., S.4.1. Designation of Accuracy., N.1. Test Procedures, T.2. Tolerance Values for Accuracy Class A Classes., UR.1.1. General, Table 1. Typical Class or Type of Device for Weighing Applications.

Originally WIM-1

Organization (*) not submitted (**) no meeting (***) no recommendation	WIM – 19.11 – Title of Ten Code, S.1.7.1, S.4.1., N.1., T.2, UR.1.1., Gen, Tbl 1 (1 Items), Initial Status – D 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM			✔				
WWMA			✔				
SWMA			✔				
CWMA Interim (2019 Fall)			✔				
**CWMA Annual (2020 Spring)							
NEWMA Interim (2019 Fall)			✔				
**NEWMA Annual (2020 Spring)							
NCWM S&T Committee Interim			✔				
SMA (Industry)			✔				

NIST OWM: - OWM reiterates our comments from the 2019 NCWM Annual Meeting analysis and notes that the submitter of this proposal has not provided any further comment or update during the 2019 NCWM Interim or Annual Meetings. OWM points out that the changes being recommended in this proposal if adopted would set a precedent where the scope of NIST Handbook 44 (as described in the Introduction – sections A. and F. and in the General Code, paragraph G-A.1.) would be expanded to also apply to devices used in non-commercial applications. We are not aware of any further development that has been done on this item. Therefore, OWM believes that unless the submitter provides an update on any progress made on additional development of this proposal, it should be withdrawn since there is a predominance of opposition to adopting standards intended for devices used in non-commercial applications. OWM also believes that there must be additional detail provided for justification to add these types of requirements in Handbook 44.

WWMA: - 2019 Annual Meeting. The Committee notes that the numeric designation of this item is incorrect and recommends the numbering be amended to WIM-19.1. The Committee also recommended this item be withdrawn given that the proposal seeks to include requirements for non-commercial weighing devices and that this approach could possibly increase the scope of NIST HB 44 to an excessive level. Mr. Russ Vires (SMA) stated that the SMA takes no position on this item and looks forward to more input from the submitter. Mr. Eric Golden (Cardinal Scale)

stated that he has discussed the item with the submitter. He stated that the submitter seeks to develop a standard to be used for scales used in shipping ports to satisfy requirements established by the Maritime regulation SOLAS (Safety of Life at Sea) and OSHA (Occupational Safety and Health Administration). He does not support the tolerances proposed stating that they are excessive. Mr. Golden also stated that he does support the overall concept and the efforts of the submitter.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comment from Russ Vires (SMA) who stated that he had no position on this item at this time. The Committee also heard comments from Diane Lee (NIST) who stated that this item sets a precedent expanding the scope of Handbook 44 beyond commercial applications. After consideration of this item the Committee recommends this item be Withdrawn, based on it being in conflict with Hand Book 44 Introduction Sections A and F, and General Code Paragraph G.A.1 which stated that the code only applies to commercial devices. The Committee doesn't want to open the door to approval of any other noncommercial devices

NEWMA:

2019 Interim Meeting. The Committee and the body agree that this item be withdrawn. During open hearing, Mr. Dick Suiter (Richard Suiter Consulting) commented that opposition to this item is primarily due to the use of the term "non-commercial" and HB44 deals with commercial device applications.

CWMA: - 2019 Spring Annual Meeting: Mr. Russ Vires (representing the SMA) commented that the SMA takes no position. Diane Lee, NIST OWM, pointed out that the changes being recommended in this proposal if adopted would set a precedent where the scope of NIST Handbook 44 (as described in the Introduction – sections A. and F. and in the General Code, paragraph G-A.1.) would expand to also apply to many devices that are used in non-commercial applications. The Committee recommends this item be withdrawn because it is not clear why OSHA needs HB44 to certify these devices.

2019 Interim Meeting. Charlie Stutesman (KS) commented that this item is not necessary, and that each jurisdiction can determine how to properly evaluate devices used in this application to satisfy OSHA requirements. We recommend the item be withdrawn.

SMA: - 2019 Fall Meeting. The SMA recommends this item be withdrawn due to the lack of additional development by the submitter.

Block 4 items (B4) Electronically captured tickets or receipts

B4: GEN-21.2 G-S.5.6. Recorded Representations.

B4: LMD-21.2 S.1.6.5. Money Value Computations., UR.3. Use of a Device.

B4: VTM-21.1 S.1.1. Primary Elements., UR.2. User Requirements

B4: LPG-21.1 S.1.1. Primary Elements., UR.2. User Requirements

B4: CLM-21.1 S.1.4.1. Printed Ticket Recorded Representation., UR.2.6.3. Printed 29 Ticket Recorded Representation.

B4: MFM-21.2 S.6. Printer Recorded Representations., UR.2.6. Ticket Printer, Customer Ticket, 8 Recorded Representation., UR.3.4. Printed Ticket. Recorded Representation.

B4: CDL-21.1 S.1.4.1. Printed Ticket Recorded Representations., UR.2.4.2. Tickets or Invoices. 2 Recorded Representation.

B4: HGM-21.1 S.2.6. Recorded Representations, Point of Sale Systems., S.6. Printer. Recording Element., UR.3.2. Vehicle-mounted Measuring Systems Ticket Printer Recording Element., UR.3.3. Printed Ticket. Recorded Representation.

B4: OTH-21.2 Appendix D - Definitions.: recorded representations, recording element.

Organization (*) not submitted (**) no meeting (***) no recommendation	Block 4 items – Electronically captured tickets or receipts (9 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA		✔					
SWMA		✔					
CWMA Interim (2020 Fall)	✔						
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)	✔						
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee 2021 Interim							

NIST OWM: The key purpose of this block of proposals is to eliminate the term print/printed in specific NIST HB 44 codes to make it broader so that it is understood that providing an electronic receipt or ticket in lieu of a printed ticket is an acceptable option as was adopted in G-S.5.6.

- NIST OWM worked with the submitter of this item to review the items in the proposal and the submitter made some appropriate changes which are reflected in the revised proposal.
- Since the device-specific code supersedes the General code, replacing references to "print" or "printed" in specific codes throughout NIST HB 44 as noted in this proposal with "recorded representation" will allow customers an option to receive an electronic form of receipt.
- NIST OWM recognizes that this item needs some editorial changes, but is in support of this item moving forward as a voting item.
- Some of the editorial changes that were found during the NIST OWM review included:
  - LMD UR.3.4. should show a strike-out of ~~Printed Ticket~~
  - CLM "S.1.4.2." is the incorrect paragraph number and should be changes to "S.1.4.1."
  - The title of B4: MFM-21.2 paragraph number "UR.2.6" is incorrect and should be changed to paragraph UR.3.3 and S.6.1. should be added to the title.
  - B4: MFM-21.2 Paragraph UR.2.6 should be changed to UR.3.3.
- Charles Stutesman, Kansas Department of Agriculture, and submitter of this item e-mailed revisions to Block 4 Items to regional chairs. The revisions are dated 9/23/2020 and are provided below:

Revised Version for Block 4 Items – 9/23/20
Definitions:

recorded representation. – The printed, embossed, **electronic,** or other representation that is recorded as a quantity**, unit price, total price, product identity or other information required** by a weighing or measuring device. [1.10**, 2.20, 2.21, 2.22, 2.24, 2.25, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.36, 3.37, 3.38, 3.39, 3.40, 5.54, 5.55, 5.56(a), 5.56(b), 5.57, 5.58, 5.60**]

recording element. – An element incorporated in a weighing or measuring device by means of which **it's ~~it's~~ the device's** performance relative to quantity or money value is permanently recorded **electronically ~~or~~** on a tape, ticket, card, or the like, in the form of a printed, stamped, punched, or perforated representation **or recorded electronically in instances where that option is permitted by specific code**. [1.10, **2.20,** 2.21**, 2.22, 2.24, 2.25, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.36, 3.37, 3.38, 3.39, 3.40, 5.54, 5.55, 5.56(a), 5.56(b), 5.57, 5.58, 5.60**]

General Code:

G-S.5.6. Recorded Representations. – Insofar as they are appropriate, the requirements for indicating and recording elements shall also apply to recorded representations. All recorded values shall be ~~printed~~ **presented** digitally. In applications where recorded representations are required **by a specific code**, the customer may be given the option of not receiving the recorded representation. **Unless otherwise specified, recorded**

representations referenced in specific codes shall be made available to the customer as a minimum in hard copy form. However, ~~F~~for systems equipped with the capability of issuing an electronic receipt, ticket, or other recorded representation, the customer may be given the option to receive any required information electronically (e.g., via cell phone, computer, etc.) in lieu of or in addition to a hard copy.
(Amended 1975, 2014 and **20XX**)

Specific Codes:

From 3.30 Liquid Measuring Devices

S.1.6.5.6. Display of Quantity and Total Price, Aviation Refueling Applications.
(a) The quantity shall be displayed throughout the transaction.
(b) The total price shall also be displayed under one of the following conditions:
(1) The total price can appear on the face of the dispenser or through a controller adjacent to the device.
(2) If a device is designed to continuously compute and display the total price, then the total price shall be computed and displayed throughout the transaction for the quantity delivered.
(c) The total price and quantity shall be displayed for at least five minutes or until the next transaction is initiated by using controls on the device or other customer-activated controls.
*(d) A **~~printed~~** receipt shall be available and shall include, at a minimum, the total price, quantity, and unit price. [Nonretroactive as of January 1, 2008]*
(Added 2007)
Amended 20XX)

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

*(a) the total volume of the delivery;**
*(b) the unit price;**
*(c) the total computed price;**
(d) the product identity by name, symbol, abbreviation, or code number; and*
*(e) the dispenser designation by either an alphabetical or numerical description.***

[Nonretroactive as of January 1, 1986] *[Nonretroactive as of January 1, 2021]*
(Added 1985) (Amended 1997, 2012, 2014, 2018 and **20XX**)

S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. – Except for fleet sales and other price contract sales, a **~~printed~~** receipt providing the following information shall be available through a built-in or separate recording element that is part of the system for transactions involving a post-delivery discount:
(a) the product identity by name, symbol, abbreviation, or code number;
(b) transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount(s), including the:
*(1) total volume of the delivery;
(2) unit price; and
(3) total computed price of the fuel sale.
(c) an itemization of the post-delivery discounts to the unit price;
(d) the final total price of the fuel sale after all post-delivery discounts are applied; and
(e) the dispenser designation by either an alphabetical or numerical description.
[Nonretroactive as of January 1, 2021]
(Added 2012) (Amended 2014**, and** 2018**,and 20XX**)

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.
(Became retroactive 1999)
(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) A dispenser used in an application where a price per unit discount is offered following the delivery is exempt from this requirement, provided the following conditions are satisfied:
(1) the unit price posted on the dispenser and the unit price at which the dispenser is set to compute prior to the application of any discount shall be the highest unit price for any transaction;
(Amended 2014)
(2) all purchases of fuel are accompanied by a receipt recorded by the system. The receipt shall contain:
a. the product identity by name, symbol, abbreviation, or code number;
b. transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount including the:
1. total volume of the delivery;
2. unit price; and
3. total computed price of the fuel sale prior to post-delivery discounts being applied.
c. an itemization of the post-delivery discounts to the unit price; and
d. the final total price of the fuel sale.
(Added 2012) (Amended 2014)
(Added 1989) (Amended 1992, 1993, 2012, **and** 2014**, and 20XX**)

UR.3.4. Printed Ticket. Recorded Representation – The total price; the total volume of the delivery; the price per liter or gallon; *and a corresponding alpha or numeric dispenser designation** shall be ~~**shown, either printed**~~ **recorded** by the device ~~**or in clear hand script,**~~ on any ~~**printed ticket issued by a device and**~~ **recorded representation** containing any one of these values. Establishments where no product grades are repeated are exempt from the dispenser designation requirement.
**[Nonretroactive as of January 1, 2021]*
(Amended 2001, 2018, and 2019**, and 20XX**)

From 3.31 Vehicle- Tank Meters

S.1.1. Primary Elements.
Change:
S.1.1.1. General. – A meter shall be equipped with a primary indicating element and may also be equipped with a primary recording element.
Note: Except for systems used solely for the sale of aviation fuel into aircraft and for aircraft-related operations, vehicle-tank meters shall **also** be equipped with a primary recording element as required by paragraph UR.2.2.
~~**Ticket Printer; Customer Ticket.**~~ **Recorded Representation**
(Amended 1993)

TO:

S.1.1. Primary Elements.
S.1.1.1. General. – A meter shall be equipped with a primary indicating element. Except for systems used solely for the sale of aviation fuel into aircraft and for aircraft-related operations, a meter shall be equipped with a primary recording element.
(Amended 1993 **and 20XX**)

S.1.4.2. ~~Printed Ticket~~ Recorded Representation – If a computing-type device issues a **~~printed ticket~~ recorded representation** which displays the total computed price, the **~~ticket~~ recorded representation** shall **~~also have printed clearly thereon~~ record** the total quantity of the delivery, the appropriate fraction of the quantity, and the price per unit of quantity.
(Amended 1989, **and 20XX**)

UR.2.2. ~~Ticket Printer, Customer Ticket~~ Recording Element. – Vehicle-Mounted metering systems shall be equipped with **a ~~ticket printer which shall be used for~~ means to record** all sales where product is delivered through the meter. A copy of the ticket issued by the device shall be **~~left with~~ provided to** the customer at the time of delivery or as otherwise specified by the customer.
(Added 1993) (Amended 1994**, and 20XX**)

From 3.32 LPG and Anhydrous Ammonia Liquid-Measuring Devices

S.1.1. Primary Elements.
S.1.1.1. General. – A meter shall be equipped with a primary indicating element and may also be equipped with a primary recording element.
Note: Vehicle-mounted metering systems shall be equipped with a primary recording element as required by paragraph UR.2.6. **~~Ticket Printer; Customer Ticket~~** .**Recorded Representation**
(Amended 20XX)

S.1.1.6. ~~Printed Ticket.~~ Recorded Representation – Any **~~printed ticket issued~~ recorded representation** created by a device of the computing type **~~on~~** which **~~there is printed~~ includes** the total computed price, shall **~~have printed clearly~~ also include** thereon the total volume of the delivery in terms of liters or gallons, and the appropriate decimal fraction of the liter or gallon, and the corresponding price per liter or gallon.
(Added 1979) (Amended 1987**, and 20XX**)

S.1.5.5. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. – Except for fleet sales and other price contract sales, a **~~printed receipt~~ recorded representation** providing the following information shall be available through a built-in or separate recording element that is part of the system for transactions involving a post-delivery discount:

(a) the product identity by name, symbol, abbreviation, or code number;
(b) transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount(s), including the:
    (1) total volume of the delivery;
    (2) unit price; and
    (3) total computed price of the fuel sale.
(c) an itemization of the post-delivery discounts to the unit price; and
(d) the final total price of the fuel sale after all post-delivery discounts are applied.

(Added 2016) **(Amended 20XX)**

UR.2.6. ~~Ticket Printer, Customer Ticket.~~ Recorded Representation– Vehicle-Mounted metering systems shall be equipped with **~~a ticket printer which shall be used for~~ means to record** all sales where product is delivered through the meter. A copy of the **~~ticket~~ recorded representation** issued by the device shall be **~~left with~~ provided to** the customer at the time of delivery or as otherwise specified by the customer.
(Added 1993) (Amended 1994**, and 20XX**)

UR.2.7.2. 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. 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**~~ **recorded representation** of the transaction containing the applicable price per unit of measure, the total quantity delivered, and the total price of the sale; and

(2) unless a dispenser complies with S.1.5.1. 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.

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

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

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

a. the product identity by name, symbol, abbreviation, or code number;

b. transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount including the:

1. total volume of the delivery;
2. unit price; and
3. total computed price of the fuel sale prior to post-delivery discounts being applied.

c. an itemization of the post-delivery discounts to the unit price; and

d. the final total price of the fuel sale after all post-delivery discounts are applied.

(Added 2016) **(Amended 20XX)**

From 3.34. Cryogenic Liquid-Measuring Devices

S.1.4.1. ~~Printed Ticket.~~ Recorded Representation– Any ~~**printed ticket**~~ **recorded representation** issued by a device of the computing type ~~**on**~~ which ~~**there is printed**~~ **includes** the total computed price shall ~~**have printed clearly thereon**~~ also **include** the total quantity of the delivery and the price per unit.
(Amended 20XX)

UR.2.6.2. ~~Tickets or Invoices.~~ Recorded representation– Any ~~**written invoice, or printed ticket,**~~ **recorded representation** based on a reading of a device that is equipped with an automatic temperature or density compensator shall have shown thereon that the quantity delivered has been adjusted to the quantity at the NBP of the specific cryogenic product or the equivalent volume of gas at NTP.
(Amended 20XX)

UR.2.6.3. ~~Printed Ticket.~~ Recorded Representation. – Any ~~**printed ticket issued**~~ **recorded representation provided** by a device of the computing type ~~**on**~~ which ~~**there is printed**~~ **includes** the total computed price, the total quantity of the delivery, or the price per unit, shall also ~~**show**~~ **include** the other two values~~. (either printed or in clear hand script).~~**.**

From 3.35. Milk Meters

S.1.4.2. ~~Printed Ticket~~ Recorded Representation – If a computing-type device issues a ~~**printed ticket**~~ **recorded representation** which ~~**displays**~~ **includes** the total computed price, the ~~**ticket**~~ **recordedrepresentation** shall ~~**also have printed clearly thereon**~~ **include** the total quantity of the delivery, the appropriate fraction of the quantity, and the price per unit of quantity.
(Amended 1989, **and 20XX**)

UR.2.6.3. ~~Printed Ticket.~~ Recorded Representation. – Any ~~**printed ticket issued**~~ **recorded representation created** by a device of the computing type ~~**on**~~ which ~~**there is printed**~~ **includes** the total computed price, the total

quantity of the delivery, or the price per unit, shall also ~~**show**~~ **include** the other two values ~~**(either printed or in clear hand script)**~~.
(Amended 20XX)

From 3.37. Mass Flow Meters

S.6. ~~Printer.~~ Recording Element – When an assembly is equipped with means for ~~**printing**~~ **recording** the measured quantity, the following conditions apply:

(a) the scale interval shall be the same as that of the indicator;
(b) the value of the ~~**printed**~~ **recorded** quantity shall be the same value as the indicated quantity;
*(c) the ~~**printed**~~ **recorded** quantity shall also include the mass value if the mass is not the indicated quantity; [Nonretroactive as of January 1, 2021]*
(d) a quantity for a delivery (other than an initial reference value) cannot be recorded until the measurement and delivery has been completed;
(e) the ~~**printer**~~ **recording element** is returned to zero when the resettable indicator is returned to zero; and
(f) the ~~**printed**~~ **recorded** values shall meet the requirements applicable to the indicated values.

(Amended 2016**, and 20XX**)

S.6.1. ~~Printed Receipt~~ Recorded Representations. – ~~**Any**~~ **When a quantity is** delivered, ~~**printed quantity**~~ **the recorded representation** 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.**~~
(Amended 20XX)

UR.2.6. ~~Ticket Printer, Customer Ticket,~~ Recorded Representation . – Vehicle-Mounted metering systems shall be equipped with ~~**a ticket printer which shall be used for**~~ **means to record** all sales where product is delivered through the meter. A copy of the ~~**ticket**~~ **recorded representation** issued by the device shall be ~~**left with**~~ **provided to** the customer at the time of delivery or as otherwise specified by the customer.
(Added 1993) (Amended 1994**, and 20XX**)

UR.3.4. ~~Printed Ticket.~~ Recorded Representation. – The total price, the total quantity of the delivery, and the price per unit shall be ~~**recorded**~~ **provided** on any ~~**ticket**~~ **recorded representation** issued by a device of the computing type and containing any one of these values.
(Added 1993) **(Amended 20XX)**

From 3.38. Carbon Dioxide Liquid-Measuring Devices

S.1.4.1. ~~Printed Ticket.~~ Recorded Representation– Any ~~**printed ticket**~~ **recorded representation** issued by a device of the computing type ~~**on**~~ which ~~**there is printed**~~ **includes** the total computed price shall ~~**have printed clearly thereon**~~ also **include** the total quantity of the delivery and the price per unit.
(Amended 20XX)

UR.2.4.2. ~~Tickets or Invoices~~ Recorded Representation. – Any ~~**written invoice or printed ticket**~~ **recorded representation** based on a reading of a device that is equipped with an automatic temperature or density compensator shall ~~**have shown thereon**~~ **include** that the quantity delivered has been temperature or density compensated.
(Amended 20XX)

From 3.39. Hydrogen Gas-Measuring Devices Code

S.2.6. 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-of-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.
(Amended 20XX)

S.6.1. ~~Printed Receipt.~~ Recorded Representation – **~~Any~~ When a quantity is delivered, ~~printed quantity~~ the recorded representation** 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.~~**
(Amended 20XX)

UR.3.2. Vehicle-mounted Measuring Systems ~~Ticket Printer~~ Recording Element.
(Amended 20XX)

S.6. ~~Printer.~~ Recording Element – When an assembly is equipped with means for **~~printing~~ recording** the measured quantity, the **~~printed~~ recorded** information must agree with the indications on the dispenser for the transaction and the **~~printed~~ recorded** values shall be clearly defined.
(Amended 20XX)

UR.3.2.1. ~~Customer Ticket~~ Recording Element. – Vehicle-Mounted metering systems shall be equipped with **~~a ticket printer which shall be used for~~ means to record** all sales where product is delivered through the meter. A copy of the **~~ticket~~ recorded representation** issued by the device shall be **~~left with~~ provided to** the customer at the time of delivery or as otherwise specified by the customer.
(**Amended 20XX**)

UR.3.3. ~~Printed Ticket.~~ Recorded Representation. – The total price, the total quantity of the delivery, and the price per unit shall be recorded on any ticket issued by a device of the computing type and containing any one of these values.
(Added 1993) **(Amended 20XX)**

- Charles Stutesman, Kansas Department of Agriculture, and submitter of this item sent additional revisions to Block 4 Items to NIST OWM on 10/29/2020 following the Central Weights and Measures Meeting that are provided below:

General Code:

G-S.5.6. Recorded Representations. – Insofar as they are appropriate, the requirements for indicating and recording elements shall also apply to recorded representations. All recorded values shall be **~~printed~~ provided** digitally. In applications where recorded representations are required **by a specific code**, the customer may be given the option of not receiving the recorded representation. **Unless otherwise specified, recorded representations referenced in specific codes shall be made available to the customer in hard copy form. However, ~~F~~f**or systems equipped with the capability of issuing an electronic receipt, ticket, or other recorded representation, the customer may be given the option to receive any required information electronically (e.g., via cell phone, computer, etc.) in lieu of or in addition to a hard copy.
(Amended 1975, 2014 and **20XX**)

OR

G-S.5.6. Recorded Representations. – Insofar as they are appropriate, the requirements for indicating and recording elements shall also apply to recorded representations. All recorded values shall be **~~printed~~ provided** digitally. In applications where recorded representations are required **by a specific code**, the customer may be given the option of not receiving the recorded representation. **Unless otherwise specified, recorded representations referenced in specific codes shall be made available to the customer as a minimum in hard copy form. However, ~~F~~f**or systems equipped with the capability of issuing an electronic receipt, ticket, or other

recorded representation, the customer may be given the option to receive any required information electronically (e.g., via cell phone, computer, etc.) in lieu of or in addition to a hard copy.
(Amended 1975, 2014 and **20XX**)

Specific Codes:

From 3.30 Liquid Measuring Devices

S.1.6.5.6. Display of Quantity and Total Price, Aviation Refueling Applications.
(a) The quantity shall be displayed throughout the transaction.
(b) The total price shall also be displayed under one of the following conditions:
(1) The total price can appear on the face of the dispenser or through a controller adjacent to the device.
(2) If a device is designed to continuously compute and display the total price, then the total price shall be computed and displayed throughout the transaction for the quantity delivered.
(c) The total price and quantity shall be displayed for at least five minutes or until the next transaction is initiated by using controls on the device or other customer-activated controls.
*(d) A **~~printed~~** receipt shall be available and shall include, at a minimum, the total price, quantity, and unit price. [Nonretroactive as of January 1, 2008]*
(Added 2007)
Amended 20XX)

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

*(f) the total volume of the delivery;**
*(g) the unit price;**
*(h) the total computed price;**
(i) the product identity by name, symbol, abbreviation, or code number; and*
*(j) the dispenser designation by either an alphabetical or numerical description.***

**[Nonretroactive as of January 1, 1986] **[Nonretroactive as of January 1, 2021]*
(Added 1985) (Amended 1997, 2012, 2014, 2018 and **20XX**)

S.1.6.8. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. – Except for fleet sales and other price contract sales, a **~~printed~~** receipt providing the following information shall be available through a built-in or separate recording element that is part of the system for transactions involving a post-delivery discount:
(a) the product identity by name, symbol, abbreviation, or code number;
(b) transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount(s), including the:
*(1) total volume of the delivery;
(2) unit price; and
(3) total computed price of the fuel sale.
(c) an itemization of the post-delivery discounts to the unit price;
(d) the final total price of the fuel sale after all post-delivery discounts are applied; and
(e) the dispenser designation by either an alphabetical or numerical description.
[Nonretroactive as of January 1, 2021]
(Added 2012) (Amended 2014**, and** 2018**,and 20XX**)

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.

(Became retroactive 1999)
(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:

(3) 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)
(4) 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) A dispenser used in an application where a price per unit discount is offered following the delivery is exempt from this requirement, provided the following conditions are satisfied:
(2) the unit price posted on the dispenser and the unit price at which the dispenser is set to compute prior to the application of any discount shall be the highest unit price for any transaction;
(Amended 2014)
(2) all purchases of fuel are accompanied by a receipt recorded by the system. The receipt shall contain:
e. the product identity by name, symbol, abbreviation, or code number;
f. transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount including the:
1. total volume of the delivery;
2. unit price; and
3. total computed price of the fuel sale prior to post-delivery discounts being applied.
g. an itemization of the post-delivery discounts to the unit price; and
h. the final total price of the fuel sale.
(Added 2012) (Amended 2014)
(Added 1989) (Amended 1992, 1993, 2012, **and** 2014**, and 20XX**)

UR.3.4. ~~Printed Ticket.~~ Recorded Representation – The total price; the total volume of the delivery; the price per liter or gallon; *and a corresponding alpha or numeric dispenser designation** shall be ~~**shown, either printed**~~ **recorded** by the device ~~**or in clear hand script,**~~ on any ~~**printed ticket issued by a device and**~~ **recorded representation** containing any one of these values **and shall comply with G-S.5.6**. Establishments where no product grades are repeated are exempt from the dispenser designation requirement.
**[Nonretroactive as of January 1, 2021]*
(Amended 2001, 2018, and 2019**, and 20XX**)

Commented [BTG(1]: I have no objections to these proposed changes (and think it's a good change); however, would just note this goes beyond the issue of just permitting/recognizing electronic forms of the recorded representation.

From 3.31 Vehicle- Tank Meters

S.1.1. Primary Elements.
Change:
S.1.1.1. General. – A meter shall be equipped with a primary indicating element and may also be equipped with a primary recording element.
Note: Except for systems used solely for the sale of aviation fuel into aircraft and for aircraft-related operations, vehicle-tank meters shall be equipped with a primary recording element as required by paragraph UR.2.2. ~~**Ticket Printer; Customer Ticket.**~~ **Recorded Representation**
(Amended 1993**, 20XX**)
Note: Except for systems used solely for the sale of aviation fuel into aircraft and for aircraft-related operations, vehicle tank meters shall be equipped with a primary recording element as required by paragraph UR.2.2. Ticket Printer; Customer Ticket. (Amended 1993)

TO:

S.1.1. Primary Elements.

S.1.1.1. General. – A meter shall be equipped with a primary indicating element. Except for systems used solely for the sale of aviation fuel into aircraft and for aircraft-related operations, a meter shall be equipped with a primary recording element.
(Amended 1993 **and 20XX**)
(*Delete Note entirely)*

S.1.4.2. ~~Printed Ticket~~ Recorded Representation – If a computing-type device issues a **~~printed ticket~~ recorded representation** which displays the total computed price, the **~~ticket~~ recorded representation** shall **~~also have printed clearly thereon~~ record** the total quantity of the delivery, the appropriate fraction of the quantity, and the price per unit of quantity.
(Amended 1989, **and 20XX**)

UR.2.2. ~~Ticket Printer, Customer Ticket~~ Recording Element. – Vehicle-Mounted metering systems shall be equipped with **a ~~ticket printer which shall be used for~~ means to record** all sales where product is delivered through the meter **and shall comply with G-S.5.6**. A copy of the ticket issued by the device shall be **~~left with~~ provided to** the customer at the time of delivery or as otherwise specified by the customer.
(Added 1993) (Amended 1994**, and 20XX**)

From 3.32 LPG and Anhydrous Ammonia Liquid-Measuring Devices

S.1.1.1. General. – A meter shall be equipped with a primary indicating element and may also be equipped with a primary recording element.
Note: Vehicle-mounted metering systems shall be equipped with a primary recording element as required by paragraph UR.2.6. ~~**Ticket Printer; Customer Ticket**~~ .**Recorded Representation**
(Amended 20XX)

S.1.1.6. ~~Printed Ticket.~~ Recorded Representation – Any ~~**printed ticket issued**~~ **recorded representation** created by a device of the computing type ~~**on**~~ which ~~**there is printed**~~ **includes** the total computed price, shall ~~**have printed clearly**~~ **also include** thereon the total volume of the delivery in terms of liters or gallons, and the appropriate decimal fraction of the liter or gallon, and the corresponding price per liter or gallon.
(Added 1979) (Amended 1987**, and 20XX**)

S.1.5.5. Recorded Representations for Transactions Where a Post-Delivery Discount(s) is Provided. – Except for fleet sales and other price contract sales, a ~~**printed receipt**~~ **recorded representation** providing the following information shall be available through a built-in or separate recording element that is part of the system for transactions involving a post-delivery discount:

(e) the product identity by name, symbol, abbreviation, or code number;
(f) transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount(s), including the:
  (1) total volume of the delivery;
  (2) unit price; and
  (3) total computed price of the fuel sale.
(g) an itemization of the post-delivery discounts to the unit price; and
(h) the final total price of the fuel sale after all post-delivery discounts are applied.

(Added 2016) **(Amended 20XX)**

UR.2.6. ~~Ticket Printer, Customer Ticket.~~ Recorded Representation– Vehicle-Mounted metering systems shall be equipped with ~~**a ticket printer which shall be used for**~~ **means to record** all sales where product is delivered through the meter **and shall comply with G-S.5.6**. A copy of the ~~**ticket**~~ **recorded representation** issued by the device shall be ~~**left with**~~ **provided to** the customer at the time of delivery or as otherwise specified by the customer.
(Added 1993) (Amended 1994**, and 20XX**)

UR.2.7.2. 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. The following exceptions apply:

(d) Fleet sales and other price contract sales are exempt from this requirement.
(e) 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**~~ **recorded representation** of the transaction containing the applicable price per unit of measure, the total quantity delivered, and the total price of the sale; and
  (2) unless a dispenser complies with S.1.5.1. 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.
(f) A dispenser used in an application where a price per unit discount is offered following the delivery is exempt from this requirement, provided the following conditions are satisfied:
  (1) the unit price posted on the dispenser and the unit price at which the dispenser is set to compute shall be the highest unit price for any transaction;
  (2) all purchases of fuel are accompanied by a receipt recorded by the system for the transaction containing:
    e. the product identity by name, symbol, abbreviation, or code number;
    f. transaction information as shown on the dispenser at the end of the delivery and prior to any post-delivery discount including the:
      1. total volume of the delivery;

2. unit price; and
3. total computed price of the fuel sale prior to post-delivery discounts being applied.

g. an itemization of the post-delivery discounts to the unit price; and
h. the final total price of the fuel sale after all post-delivery discounts are applied.

(Added 2016) **(Amended 20XX)**

From 3.34. Cryogenic Liquid-Measuring Devices

S.1.4.1. ~~Printed Ticket.~~ Recorded Representation– Any ~~**printed ticket**~~ **recorded representation** issued by a device of the computing type ~~**on**~~ which ~~**there is printed**~~ **includes** the total computed price shall ~~**have printed clearly thereon**~~ also **include** the total quantity of the delivery and the price per unit.
(Amended 20XX)

UR.2.6.2. ~~Tickets or Invoices.~~ Recorded representation– Any ~~**written invoice, or printed ticket,**~~ **recorded representation** based on a reading of a device that is equipped with an automatic temperature or density compensator shall have shown thereon that the quantity delivered has been adjusted to the quantity at the NBP of the specific cryogenic product or the equivalent volume of gas at NTP.
(Amended 20XX)

UR.2.6.3. ~~Printed Ticket.~~ Recorded Representation. – Any ~~**printed ticket issued**~~ **recorded representation provided** by a device of the computing type ~~**on**~~ which ~~**there is printed**~~ **includes** the total computed price, the total quantity of the delivery, or the price per unit, shall also ~~**show**~~ **include** the other two values~~. (either printed or in clear hand script)~~ **and shall comply with G-S.5.6.**

From 3.35. Milk Meters

S.1.4.2. ~~Printed Ticket~~ Recorded Representation – If a computing-type device issues a ~~**printed ticket**~~ **recorded representation** which ~~**displays**~~ **includes** the total computed price, the ~~**ticket**~~ **recorded representation** shall ~~**also have printed clearly thereon**~~ **include** the total quantity of the delivery, the appropriate fraction of the quantity, and the price per unit of quantity.
(Amended 1989, **and 20XX**)

UR.2.2. ~~Printed Ticket.~~ Recorded Representation. – Any ~~**printed ticket issued**~~ **recorded representation created** by a device of the computing type ~~**on**~~ which ~~**there is printed**~~ **includes** the total computed price, the total quantity of the delivery, or the price per unit, shall also ~~**show**~~ **include** the other two values ~~**(either printed or in clear hand script)**~~ **and shall comply with G-S.5.6**.
(Amended 20XX)

From 3.37. Mass Flow Meters

S.6. ~~Printer.~~ Recording Element – When an assembly is equipped with means for ~~**printing**~~ **recording** the measured quantity, the following conditions apply:

(g) the scale interval shall be the same as that of the indicator;
(h) the value of the ~~**printed**~~ **recorded** quantity shall be the same value as the indicated quantity;
(i) the ~~***printed***~~ ***recorded*** *quantity shall also include the mass value if the mass is not the indicated quantity; [Nonretroactive as of January 1, 2021]*
(j) a quantity for a delivery (other than an initial reference value) cannot be recorded until the measurement and delivery has been completed;
(k) the ~~**printer**~~ **recording element** is returned to zero when the resettable indicator is returned to zero; and
(l) the ~~**printed**~~ **recorded** values shall meet the requirements applicable to the indicated values.

(Amended 2016**, and 20XX**)

S.6.1. ~~Printed Receipt~~ Recorded Representations. – ~~**Any**~~ **When a quantity is** delivered, ~~**printed quantity**~~ **the recorded representation** 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.** *(Removed strikeout from original proposal)*

(Amended 20XX)

UR.3.3. ~~Ticket Printer, Customer Ticket,~~ Recorded Representation . – Vehicle-Mounted metering systems shall be equipped with **~~a ticket printer which shall be used for~~ means to record** all sales where product is delivered through the meter **and shall comply with G-S.5.6.** A copy of the **~~ticket~~ recorded representation** issued by the device shall be **~~left with~~ provided to** the customer at the time of delivery or as otherwise specified by the customer.
(Added 1993) (Amended 1994**, and 20XX**)

UR.3.4. ~~Printed Ticket.~~ Recorded Representation. – The total price, the total quantity of the delivery, and the price per unit shall be **~~recorded~~ provided** on any **~~ticket~~ recorded representation** issued by a device of the computing type and containing any one of these values.
(Added 1993) **(Amended 20XX)**

From 3.38. Carbon Dioxide Liquid-Measuring Devices

S.1.4.1. ~~Printed Ticket.~~ Recorded Representation– Any **~~printed ticket~~ recorded representation** issued by a device of the computing type **~~on~~** which **~~there is printed~~ includes** the total computed price shall **~~have printed clearly thereon~~** also **include** the total quantity of the delivery and the price per unit.
(Amended 20XX)

UR.2.4.2. ~~Tickets or Invoices~~ Recorded Representation. – Any **~~written invoice or printed ticket~~ recorded representation** based on a reading of a device that is equipped with an automatic temperature or density compensator shall **~~have shown thereon~~ include** that the quantity delivered has been temperature or density compensated.
(Amended 20XX)

From 3.39. Hydrogen Gas-Measuring Devices Code

S.2.6. 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-of-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:

(e) the total mass of the delivery;
(f) the unit price;
(g) the total computed price; and
(h) the product identity by name, symbol, abbreviation, or code number.

(Amended 20XX)

S.6.1. ~~Printed Receipt.~~ Recorded Representation – **~~Any~~ When a quantity is delivered, ~~printed quantity~~ the recorded representation** 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.~~**
(Amended 20XX)

UR.3.2. Vehicle-mounted Measuring Systems ~~Ticket Printer~~ Recording Element.
(Amended 20XX)

S.6. ~~Printer.~~ Recording Element – When an assembly is equipped with means for **~~printing~~ recording** the measured quantity, the **~~printed~~ recorded** information must agree with the indications on the dispenser for the transaction and the **~~printed~~ recorded** values shall be clearly defined.
(Amended 20XX)

UR.3.2.1. ~~Customer Ticket~~ Recording Element. – Vehicle-Mounted metering systems shall be equipped with **~~a ticket printer which shall be used for~~ means to record** all sales where product is delivered through the meter **and**

shall comply with G-S.5.6. A copy of the ~~**ticket**~~ **recorded representation** issued by the device shall be ~~**left with**~~ **provided to** the customer at the time of delivery or as otherwise specified by the customer.
(**Amended 20XX**)

UR.3.3. ~~Printed Ticket.~~ Recorded Representation. – The total price, the total quantity of the delivery, and the price per unit shall be recorded on any ticket issued by a device of the computing type and containing any one of these values.
(Added 1993) **(Amended 20XX)**

Definitions:

recorded representation. – The printed, embossed, **electronic,** or other representation that is recorded as a quantity**, unit price, total price, product identity or other information required** by a weighing or measuring device. [1.10**, 2.20, 2.21, 2.22, 2.24, 2.25, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.36, 3.37, 3.38, 3.39, 3.40, 5.54, 5.55, 5.56(a), 5.56(b), 5.57, 5.58, 5.60**]

recording element. – An element incorporated in a weighing or measuring device by means of which its performance relative to quantity or money value is permanently recorded ~~**electronically or**~~ on a tape, ticket, card, or the like, in the form of a printed, stamped, punched, or perforated representation **or recorded electronically when specifically recognized as an option by a specific code or at the request of the customer**. [1.10, **2.20,** 2.21**, 2.22, 2.24, 2.25, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.36, 3.37, 3.38, 3.39, 3.40, 5.54, 5.55, 5.56(a), 5.56(b), 5.57, 5.58, 5.60**]

OR

recording element. – An element incorporated in a weighing or measuring device by means of which its performance relative to quantity or money value is permanently recorded ~~**electronically or**~~ on a tape, ticket, card, or the like, in the form of a printed, stamped, punched, or perforated representation **or recorded electronically in instances where that option is permitted by specific code or is provided at the request of the customer**. [1.10, **2.20,** 2.21**, 2.22, 2.24, 2.25, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.36, 3.37, 3.38, 3.39, 3.40, 5.54, 5.55, 5.56(a), 5.56(b), 5.57, 5.58, 5.60**]

WWMA: No comments were received during open hearings. However, the submitter did provide additional changes and continues to develop the item. The Committee recommends this block be assigned a developing status.

SWMA: During the Open Hearings the Committee heard from Dianne Lee (OWM) who stated that the purpose of this item is to allow an option for an electronic ticket by revising the language of the Recording Requirements in Handbook 44. She also stated that NIST OWM supports this block.

The Committee also heard from Hal Prince (Florida) that electronic tickets are already allowed, and that this revision would allow electronic only tickets. The Committee also heard from Tina Butcher (OWM) who stated that she had the same concerns as Hal but was assured the intent was only to allow an electronic option for customers. The Committee also heard from Ken Ramsburg (Maryland) who stated that he agreed with Hal Prince, and that the General Code already covered this. The Committee also heard from Tory Brewer (West Virginia) who stated that he was concerned that this item would make it difficult for customers to receive a printed ticket if it was not set as a default, and how the customer would choose a printed ticket instead of an electronic one. Tina Butcher also stated that Specific Code superseded the General Code, so that is why a change is likely needed to allow electronic tickets. After considering this item the Committee recommends that it be given Developing Status

NEWMA 2020 Interim: The Committee agrees with the body that the revised edition of this proposal has been fully developed by the submitter and recommends it move forward as a Voting Item. Discussion was heard both for and against the proposal. Comments against the proposal included that there was no significant change or that the location in the handbook was not appropriate or may conflict with current State laws regarding electronic records. Comments in favor of the proposal were that it allowed clarity through definitions and where "printed" hard copies are currently required, allows for an electronic option without adding conflict.

CWMA 2020 Interim: Charlie Stutesman (KS) the developer of the item gave a presentation to the S&T committee updating the current changes on the item. The committee received comments from both regulatory officials and industry representatives expressing a need for this item. The committee feels this item is fully developed and we recommend this item move forward as a voting item.

Block 1 items (B1) A Terminology for Testing Standards (verification standards, Field Standards, transfer standards, Field Reference standards, etc.,) Tolerances on Tests when transfer standards are used, minimum quantity for field reference standard meter tests

NOTE: During the 2019 NCWM S&T Committee Meeting, the S&T Committee considered the comments during the opening hearing and recommended that the 2019 B1, B2, LPG-3 and MFM-5 agenda items be combined with GEN-3 and gave these items an assign status. This block of items ("New" BLOCK 1) now includes previously numbered items: GEN-3; Block 1; Block 2; LPG-3; and MFM-5. The Item Under Consideration for all individual items has been included in the listing that follows.

B1: GEN-19.1 A G-T.5. Tolerances on Tests When Transfer Standards are Used., Appendix D – Definitions: <u>standards, field.</u>, ~~transfer standard.~~ and <u>standard, transfer.</u>

Organization (*) not submitted (**) no meeting (***) no recommendation	Gen 19.1 – General Code Initial Status – A (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM				✔			
WWMA				✔			
***SWMA							
CWMA Interim (2019 Fall)				✔			
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)				✔			
NEWMA Interim (2019 Fall)				✔			
**NEWMA Annual (2020 Spring)							
NCWM S&T Committee Interim				✔			

NIST OWM:

NIST OWM continues to provide updates and comments to Block 1 items to keep the weights and measures community current on the activities occurring to move Block 1 items forward. The following list summarizes those activities:

- NIST OWM recognizes that one of the issues concerning the use of the term "Field Standard" and having the term apply to all standards is that all standards may not be able to meet the requirements for field standards addressed in Section 3.2 of the Fundamental Considerations in NIST HB 44. There is also an issue of who has the authority to accept a standard for use. To address these and other concerns NIST, OWM believes a possible approach to resolving the issues included in Block 1 items:
  1. Add a statement to Section 3.2 in NIST HB44, Fundamental Considerations, to address another option for standard accuracy during testing, elaborate on traceability and how it is achieved and language concerning regulatory responsibility similar to what is included in NIST HB 130.
  2. Find and examine different terminology used in HB 44 for standards used in testing commercial devices and select an appropriate term for these standards.
  3. Make appropriate changes in NIST HB 44, HB130 and other documents as appropriate.
  4. Collect data using NIST Purchased Coriolis meters to demonstrate that master meters are a viable option for use in testing devices
  5. Develop a guidance document with clear processes to describe how standards are validated and values are assigned.

- NIST OWM continues to agree with the WWMA, CWMA, and NEWMA regional weights and measure associations that this item remain assigned. In addition, it may be beneficial to the task group to consider the data currently being collected by NIST, prior to considering and developing a position for block 1 items. As such, an informational status, until such time that all data is available, could be considered.

- NCWM appointed a task group to develop B1 items. The chair of the committee is Jason Glass of the SWMA and there are representatives from NEWMA, WWMA, CWMA, GA Sector and NIST OWM

- NIST OWM purchased master meters of various sizes to collect data on the use of master meters. NIST OWM met with State representatives at the interim meeting to discuss plans for testing and also via teleconference in early September 2019.

- Preliminary Field testing was conducted October 28-November 1, 2019 and States and industry participation included Colorado, Florida, Oregon, Emerson and Tulsa Gas Technology.

- The assigned task group has been meeting virtually several times throughout the 2020 year. At its last two meeting the task group expressed an interest in test protocols that can be used by States to collect data and the task group agreed that before moving forward, data needs to be reviewed to determine whether or not master meters can be used as a field standard.

- The task group was updated on the activities of the NIST master meter work group activities on their efforts to collect field data and the NIST master meter project draft test protocol was shared with the task group members. The field standard task group members were encouraged to attend a December 1, 2020 NIST Master Meter project meeting where the test protocol and process for collecting data was discussed.

- Some members of the task group expressed and offered to participate in the NIST Master Meter Project data collection that is a collaborative effort with the States and industry that had expressed an interest in working with NIST OWM to collect the data which includes Colorado, Florida, Emerson and Tulsa Gas Technology.

- The NIST Master Meter Project is starting with CNG testing and NIST working with States are ready to begin collecting data on master meters for CNG. At the December 15, 2020 meeting the group provided an extensive review of the Excel spread sheet that will be used to collect the data on CNG. Proper set-ups are needed for other products before testing will begin.

WWMA: - 2019 Annual Meeting. Committee agrees to recommend that the Assigned status is maintained and looks forward to the work in progress by the TG.

During open hearings Mr. Russ Vires (SMA) stated that SMA supports the proposal as it related to the items addressing scale requirements and would also recommend the use of uniform terminology in the proposed changes.
Mr. Kurt Floren (LA County, CA) stated that this issue should be addressed from a metrologist's perspective. Mr. Floren also stated that if there was a challenge to whether mass field standards are tested under all possible environmental conditions there may be no substantial evidence that this procedure is followed.

SWMA: 2019 Annual Meeting. During Open Hearings the Committee heard comments from Russ Vires (SMA) who stated that he supports this item as it pertains to SCL 18.1, ABW 18.1, and ABS 18.1. Diane Lee (NIST) provided guidance based on last year's comments. This item is already assigned to a task group. The Committee did not have a recommendation as to the status of this item.

NEWMA:

2019 Interim Meeting. The Committee and body agree that this item should be assigned. During open hearings, Mr. John McGuire (NJ) asked if this had been assigned yet. Mr. Dick Suiter (Richard Suiter Consulting) indicated that it has been marked as assigned to a TG and the TG is gathering members in order to be working by January

CWMA:

2019 Interim Meeting. Greg VanderPlaats, MN, commented that the task group has not met. We recommend the item remained assigned.

2020 Interim Meeting. G. Diane Lee (NIST OWM), a member of the Field Standards Task Group gave an update of the progress of this item to the S&T committee. We look forward to the work of the task group.

BLOCK 1 ITEMS (B1) A TERMINOLOGY FOR TESTING STANDARDS

(original B1 items)

B1: SCL-18.1 A N.2. Verification (Testing) Standards

B1: ABW-18.1 A N.2. Verification (Testing) Standards

B1: AWS-18.1 A N.1.3. Verification (Testing) Standards, N.3.1. Official Tests, UR.4. Testing Standards

B1: CLM-18.1 A N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards

B1: CDL-18.1 A N.3.2. Transfer Standard Test, T.3. On Tests Using Transfer Standards

B1: HGM-18.1 A N.4.1. Master Meter (Transfer) Standard Test, T.4. Tolerance Application on Test Using Transfer Standard Test Method

B1: GMM-18.1 A 5.56(a): N.1.1. Air Oven Reference Method Transfer Standards, N.1.3. Meter to Like-Type Meter Method Transfer Standards and 5.56(b): N.1.1. Transfer Standards, T. Tolerances[1]

B1: LVS-18.1 A N.2. Testing Standards

B1: OTH-18.1 A Appendix A: Fundamental Considerations, 3.2. Tolerances for Standards, 3.3. Accuracy of Standards

B1: OTH-18.2 A Appendix D – Definitions: fifth-wheel, official grain samples~~, transfer standard~~ and Standard, Field

Organization (*) not submitted (**) no meeting (***) no recommendation	B1 Terminology For Testing Standards - Initial Status -A (10 Items)-B1: SCL-18.1, ABW-18.1, AWS-18.1, CLM-18.1, CDL-18.1, HGM-18.1, GMM-18.1, LVS-18.1, OTH-18.1, OTH-18.2 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM				✔			
WWMA				✔			
***SWMA							
CWMA Interim (2019 Fall)				✔			
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)				✔			
NEWMA Interim (2019 Fall)				✔			
**NEWMA Annual (2020 Spring)							
SMA (Industry)							✔
Seraphin							
NCWM S&T Committee Interim				✔			

NIST, OWM: See comments under "NEW" Block 1

SMA: - 2019 Fall Meeting. The SMA supports the proposal as it applies to the items SCL-18.1, ABW-18.1, and AWS-18.1 items, and looks forward to further development by the Task Group.
Rationale: It is important to be consistent in our use of terms across multiple sections of Handbook 44.

Block 1 items (B1) A define "field REFERENCE standard"

(original block 2 items)

B1: CLM-18.2 A N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards

B1: CDL-18.2 A N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards

B1: HGM-18.2 A N.4.1. Master Meter (Transfer) Standard Test and T.4. Tolerance Application on Test Using Transfer Standard Test Method

B1: OTH-18.3 A Appendix D – Definitions: field reference standard meter ~~and transfer standard~~

Organization (*) not submitted (**) no meeting (***) no recommendation	Originally B2 Define "Field Reference Standard" - Initial Status – A (4 Items) – CLM-18.2, CDL-18.2, HGM-18.2, OTH-18.3 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM				✔			
WWMA				✔			
***SWMA							
CWMA Interim (2019 Fall)				✔			
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)				✔			
NEWMA Interim (2019 Fall)				✔			
**NEWMA Annual (2020 Spring)							
Seraphin							
NCWM S&T Committee Interim				✔			

NIST, OWM: See comments under "NEW" Block 1

B1: LPG-15.1 A N.3. Test Drafts.

Originally LPG-3 N.3 Test Drafts

Organization (*) not submitted (**) no meeting (***) no recommendation	(Originally LPG - 3 N.3 Test Drafts) LPG-15.1 N.3 Test Drafts - Initial Status – A (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM				✔			
WWMA				✔			
***SWMA							
CWMA Interim (2019 Fall)				✔			
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)				✔			
NEWMA Interim (2019 Fall)				✔			
**NEWMA Annual (2020 Spring)							
NCWM S&T Committee Interim				✔			

NIST, OWM: See comments under "New" Block 1

B1: MFM-15.1 A N.3. Test Drafts.

Originally MFM-5 N.3 Test Drafts

Organization (*) not submitted (**) no meeting (***) no recommendation	(Originally MFM-5 N.3 Test Drafts) MFM-15.1 N.3 Test Drafts - Initial Status – A (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM				✔			
WWMA				✔			
SWMA							
CWMA Interim (2019 Fall)				✔			
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)				✔			
NEWMA Interim (2019 Fall)				✔			
**NEWMA Annual (2020 Spring)							
NCWM S&T Committee Interim				✔			

NIST, OWM: See comments under "New" Block 1

LMD – LIQUID MEASURING DEVICES

LMD-19.1 V UR.4.2. Security for Retail Motor-Fuel Devices.

Note: This replaces Item GEN-1: G-A1 Commercial and Law-Enforcement Equipment. and G-S.2. Facilitation of Fraud.

Organization (*) not submitted (**) no meeting (***) no recommendation	LMD-19.1 – General Code - Initial Status – I (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA	✔						
SWMA	✔						
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim	✔						

NIST OWM:
This item was originally a proposal to change the general code to address the illegal use of credit card "skimmers" to criminally obtain private information from consumer's credit cards but is now a proposal to add a user requirement to the Liquid Measuring Device Code to address these or other similar devices.

OWM reiterates some of our comments made in our analysis of this item on the 2018 and 2019 S&T agendas. While we recognize the seriousness of consumers being deceived by criminals able to extract their financial information using credit- and/or debit-card "skimmers," hidden cameras, etc., and then using this information for personal gain, we do not view this as a primary focus of weights and measures authority since the devices (skimmers) don't affect the measurement transaction. It is also not clear if weights and measures jurisdictions would have the authority to take action on these devices. It seems that the installation of illegal card readers attached to a payment terminal —

like a gas pump — that captures data off a credit or debit card's magnetic stripe without the consumer's knowledge is more of a concern for the manufacturers of commercial weighing and measuring equipment and the regulatory agencies that already have the authority to take action on these illegal acts (i.e., the FBI and the FTC).
We note that in most instances it is a third-party thief installing these illegal devices to obtain a customer's financial information for benefit and not the owner/operator of a piece of commercial equipment simply trying to manipulate the equipment for a little extra profit. Care needs to be taken not to impose requirements on the device owner that would appear to be burdensome or punitive since the device owner may have limited control over these situations.

We do agree that Weights and Measures jurisdictions should continue to play a cooperative role (as many are doing today) in helping to identify, reduce and/or eliminate these illegal acts by immediately reporting these illegal devices, when found, to the proper authorities. It is unreasonable and beyond the scope of weights and measures authority to require manufacturers of commercial weights and measures equipment to design equipment to be completely tamper proof when it doesn't affect the measurement transaction.

Given a scenario where a device owner does not meet the proposed changes to the LMD Code UR.4.2., and a jurisdiction has adopted the revisions to the requirements, OWM believes the following are some issues that should be considered:

- Will the device owner be held responsible?
- If the device owner is held responsible, will the jurisdiction require the device owner to correct the device for a non-commercial violation for which the device owner cannot control?
- What is the cost to the device owner to correct any violations and depending on the frequency to which skimmers are installed at a station, what is the total burden to the device owner?

At the 2020 Interim Meeting most comments were in support of this item and Mr. Hal Prince, chair of the skimmer task group, explained that this proposal gives weights and measures the authority to enforce security and that concerns raised by NIST OWM as to device owner responsibility, would be under the purview of the weights and measures authorities. NIST OWM suggests that jurisdictions consider further how they will enforce this requirement.

WWMA: - The Committee acknowledges this item is an Informational item and that during the July 2019 NCWM Annual meeting the submitters recommended this item be vetted further during the next cycle. During the open hearing sessions Mr. Clark Cooney (CA) supported this item as does Mr. Brent Price (Gilbarco).

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Hal Prince (Florida, Skimmer Task Group) who stated that he and the Task Group feel the item is fully developed and they support this item being made a Voting Item. Tim Chesser stated that he supported this as a Voting Item. Brent Price (Gilbarco) stated that he supports moving the item to a Voting Item. Ed Coleman (Tennessee) stated that he supported moving the item to a Voting Item. After consideration of this item the Committee agreed that this item is fully developed and recommends making it a Voting Item.

NEWMA:

2019 Interim Meeting. The Committee and the body agree that this item should have a voting status. During open hearings, Mr. John McGuire (NJ) offered support of the item while, Mr. Jim Willis (NY) comments that NY feel this item does not belong in HB44 but supports actions to thwart fraud. Mr. Marc Paquette (VT) agrees with NY and has no objection moving this item forward for voting.

CWMA:

2019 Interim Meeting. Several regulators commented in support of moving the item forward as voting. We recommend the item move forward as voting.

2020 Interim Meeting. The only comments that the S&T committee heard during open hearings on this item were from NIST OWM, who expressed concerns as to how this item would be enforced and what added burdens this item would place on device owners. The committee would like to thank the skimmer task group for the work that they put into this item. We feel this item is fully developed and recommend that it move forward as a voting item.

LMD-20.1 D Table S.2.2. Categories of Device and Methods of Sealing.

(Note: Now included as an agenda item under Block 5 with item LMD 21.1. See current comments in block 5)

Organization (*) not submitted (**) no meeting (***) no recommendation	LMD-20.1 – Table S.2.2 Cat. Of Dev and Methods of Sealing Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
WWMA	✔						
SWMA	✔						
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim		✔					

NIST OWM: See current comments in Block 5

WWMA: See current comments in Block 5

SWMA: See current comments in Block 5

NEWMA: See current comments in Block 5

CWMA: See current comments in Block 5

LMD-20.2 V S.1.6.10. Automatic Timeout – Pay-at-pump Retail Motor-Fuel Devices.

Organization (*) not submitted (**) no meeting (***) no recommendation	LMD-20.2 – S.1.6.10. Automatic Timeout – Pay-at-pump RMFD Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM (w/ suggested chgs.)	✔						
WWMA	✔						
SWMA	✔						
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim	✔						

NIST OWM:

As noted by the submitter, the automatic timeout is valid to ensure that a customer's purchased fuel is not dispensed to another customer (e.g., one customer activates the dispenser but, leaves the dispenser prior to dispensing fuel and the pump is then used by another customer). There were a number of people in support of this item moving forward as voting at the 2020 NCWM Interim Meeting. Some opposing comments regarding concerns with POS systems and

elderly customers needing additional time were also made at the 2020 NCWM Interim Meeting. Considering these comments, the S&T Committee agreed to move this item forward with a voting status and with a three-minute deauthorization time. The Committee also revised language in the proposal to remove "180 seconds (or five minutes where conditions warrant)."

OWM believes a change for automatic timeout from 2 minutes to 3 minutes is appropriate. When considering whether or not to change the existing code requirements for this paragraph from 2 minutes to 3 minutes, NIST OWM recommends considering scenarios such as:

- When a customer would be at risk of having another customer use the activated system if he or she leaves the location.
- How likely would a customer's transaction be compromised given the amount of time a system must deactivate the transaction when not in use?

If the proposal to change the current time limit from two minutes to three minutes is adopted, then the change should also be made to similar paragraphs for other retail fuel devices including VTM, LPG, MFM, H_2, and EVSE systems in a future proposal.

NIST OWM agrees with the S&T Committee that this item should move forward as voting.

WWMA: - 2019 Annual Meeting. The Committee agreed that the item has merit. The Committee believes the item should be given Voting status provided that the time period stated in the proposal as 180 seconds should be stated as "three minutes" and that the "(or five minutes where conditions warrant)" be deleted from the proposal as shown.

> ***S.1.6.10. Automatic Timeout – Pay-At-Pump Retail Motor-Fuel Devices.*** *– Once a device has been authorized, it must de-authorize within* ~~***two minutes 180 seconds***~~ ***three minutes*** ~~***(or five minutes where conditions warrant)***~~ *if not activated. Re-authorization of the device must be performed before any product can be dispensed. If the time limit to de-authorize the device is programmable, it shall not accept an entry greater than* ~~***two minutes 180 seconds***~~ ***three minutes*** ~~***(or five minutes where conditions warrant)***~~*.*
>
> *[Nonretroactive as of January 1, 2017]*
>
> (Added 2016)

During the open hearing session the Committee heard comments from Mr. Kurt Floren (LA County, CA), Mr. Brent Price (Gilbarco), Clark Cooney (CA DMS), Cadence Matijevich (NV) stating their support of the proposal but recommending a change to the stated five minute time period in that it was excessive.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard comments from Brent Price (Gilbarco) who stated that S.1.6.10 is confusing where it states "(or five minutes where conditions warrant)". He would like to see that statement removed. After consideration of this item the Committee agrees with Brent Price's comment and has modified the amendment as recommended. The Committee recommends this item as a Voting Item with the modified language. Automatic Timeout – Pay-At-Pump Retail Motor-Fuel Devices. – Once a device has been authorized, it must de-authorize within two minutes 180 seconds (or five minutes where conditions warrant) if not activated. Re-authorization of the device must be performed before any product can be dispensed. If the time limit to deauthorize the device is programmable, it shall not accept an entry greater than two minutes 180 seconds (or five minutes where conditions warrant). [Nonretroactive as of January 1, 2017]

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item be moved to a voting status but with a change in language. The Committee believes 3-5 minutes is ambiguous and feels a specific timeout be used. The suggested language is as follows:

> ***S.1.6.10. Automatic Timeout – Pay-At-Pump Retail Motor-Fuel Devices.*** *– Once a device has been authorized, it must de-authorize within* ~~***two minutes 180 seconds***~~ ***three minutes*** ~~***(or five minutes where conditions warrant)***~~ *if not activated. Re-authorization of the device must be performed before any product can be dispensed. If the time limit to de-authorize the device is programmable, it shall*

not accept an entry greater than ~~***two minutes 180 seconds***~~ ***three minutes*** ~~***(or five minutes where conditions warrant)***~~.

[Nonretroactive as of January 1, 2017]

(Added 2016)

During open hearings, Mr. John McGuire (NJ) and Mr. Frank Greene (CT) stated that he was unsure of what circumstances would lead to a need for a 5-minute timeout. Mr. Jason Flint (NJ) advised the group that the submitter was concerned about ADA compliance and other issues.

CWMA: - 2019 Interim Meeting. Charlie Stutesman, KS, commented that he supports the item if the 180 seconds is changed to 3 minutes and is concerned with the phrase "where conditions warrant" in relation to the 5-minute timeout and would support the item as voting with this removed. Ivan Hankins, IA, also supports these changes. We recommend this item move forward as a voting item with the above amendments

2020 Interim Meeting. The S&T committee heard comments in support of this item from NIST OWM and state regulatory officials. We feel this item is fully developed and recommend this item move forward as a voting item.

LMD-20.3 W UR.1.1. Discharge Hose.

Organization (*) not submitted (**) no meeting (***) no recommendation	LMD-20.3 – UR.1.1. Discharge Hose. – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
*WWMA							
*SWMA							
*CWMA Interim (2019 Fall)							
**CWMA Annual (2020 Spring)							
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim			✔				

NIST OWM: NIST understands the submitter's concerns regarding a retail motor fuel dispenser (RMFD) with a hose configuration in which the hose may inadvertently bump the customer fuel selection buttons and inadvertently change the customer's selection from one fuel type to another. For example, a customer selects regular fuel at the start of the transaction, and the angle of the hose is such that the hose inadvertently bumps the fuel selection button and changes the selection to a premium grade before the customer begins to dispense the fuel without the customer noticing. This would potentially result in increased cost to the customer for the transaction. It could also potentially create a situation in which a fuel with incompatible or undesirable properties for a particular design of vehicle is dispensed into that vehicle. Such scenarios would likely result in consumer frustration and increased complaints as has already been noted in discussions on the proposal.

NIST notes that General Code paragraph G-UR.2.1. already includes a provision that equipment must be installed so that neither its operation or performance is adversely affected by any details of the installation. This paragraph would seem to be sufficient to address a scenario such as that outlined by the submitter if the configuration is affected by how the user installs the equipment. If that is the source of the problems encountered by the submitter, OWM questions whether or not the addition of specific language in the LMD Code is necessary and suggests the Committee consider whether or not this General Code paragraph may be adequate to address the submitter's concerns.

If, however, the scenario posed by the submitter is the result of the basic design and configuration of the dispenser, then OWM believes the addition of a "specification" to the specific LMD Code would be a more appropriate solution to address the issue than would a "user requirement" in either the General Code or LMD Code. Addressing the concern through a specification may help manufacturers prevent costly redesigns by increasing their awareness of such scenarios and enable them to consider solutions early in the design process. Additionally, this would also help to

ensure that such an issue is adequately addressed and corrected during type evaluation since user requirements are not generally applied during type evaluation. Should such a specification be considered, it may be necessary to include a nonretroactive date, recognizing the potential impact of the requirement.

Given the questions that have been raised in the discussions of the proposal, OWM believes it is appropriate to designate this item as a Developing Item to allow the submitter to further consider the most appropriate solution and to solicit input from manufacturers, users, and regulators.

However, should the Committee decide to proceed with the proposed User Requirement, the language in new subparagraph (d) should be modified to clarify that the "inadvertent selection" is "by action of the hose."

Note: *This Item was not submitted to the WWMA, SWMA, or the CWMA.*

NEWMA: - 2019 Interim Meeting. This proposal was a late submission to NEWMA and was accepted by the Committee to be included in our agenda. The Committee and the body agree that this item has merit and be given a developing status. During open hearings, submitter Mr. Frank Greene (CT) stated that the basis of this item has roots in a consumer complaint that his office had investigated and asked if anyone had similar experiences. Mr. Ethan Bogren (Westchester County, NY) stated that he has investigated about a dozen complaints of this nature and indicated that there is a software upgrade available from the manufacturer that will solve the issue. Mr. John McGuire (NJ) stated that moving the position of the hose, where it is attached to the pump, may also be a viable solution. The Committee also encourages the submitter to contact the manufacturer.

Block 5 items (B5) Category 3 Methods of Sealing

B5: LMD-20.1 D Table S.2.2. Categories of Device and Methods of Sealing.

B5: LMD-21.1 Table S.2.2. Categories of Device and Methods of Sealing.

Organization (*) not submitted (**) no meeting (***) no recommendation	Block 5 items (B5) – Category 3 Method of Sealing (2 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA		✔					
SWMA	✔						
CWMA Interim (2020 Fall)		✔					
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)	✔						
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM: This block includes two items LMD 20.1 and LMD 21.1 that address the allowance of an electronic log in lieu of a printed copy of an audit trail for category three method of sealing in the liquid measuring devices code. NIST provided comments to LMD 20.1 and now reiterate some of those comments in consideration of both items LMD 20.1 and LMD 21.1.

- OWM recognizes the desire to move forward with electronic forms of required information and believes this is an appropriate direction in which to head. A key question the Committee must consider is what alternatives may need to be offered as we move in this direction to ensure that officials have adequate information to make enforcement decisions at the time of an inspection.

- OWM offers no opposition to the proposal but suggests the community revisit past discussions to ensure that the issues raise during those discussions are no longer of concern.

- In assessing this item, although G-S.5.6. refers to printed receipts and tickets, the Committee will want to consider some of the rationale and discussion surrounding the changes made to G-S.5.6. Recorded Representations in 2014 (also referenced by the submitter) to determine whether or not the points raised in the past with regard to providing required information to the official in only an electronic form will meet the needs of the regulators.

- During discussions of G-S.5.6. concerns raised within the regulatory community included the inspector's lack of access to the internet (e.g., when no internet service available in a given area or the inspector has no means to access the internet or is not permitted to insert digital media from an external source into his or her computer. Some comments heard by the Committee during these discussions indicated that inspectors sometimes don't have email or have access to it on site and the information from an event logger is typically needed at the time of inspection in order to make an enforcement decision.

- While the ultimate goal is to move in the direction of the electronic form, not all jurisdictions may have the capability of viewing an electronic version of the event log at the time of inspection. Most people seem to be supportive of the concept of electronic versions of the information and want to move in that direction; however, it is essential that inspectors be able to gain the information needed for an inspection in a form accessible at the time of the inspection. An inspector needs to have access to this information on site.

- Initially, the submitter of the item, Randy Moses, Wayne Fueling Systems, LLC requested this item be withdrawn based on concerns raised during discussions at the 2019 NTEP Measuring Sector Meeting. In January 2020, however, Mr. Moses retracted that request.

- At the 2020 Interim Meeting, Mr. Brent Price (Gilbarco) recommended a Voting or Developing status for this item and offered to work with the submitter. Mr. Price noted that the Category 3 devices coming into the market are able to print an event log, but the font is quite small.

- Given the requirement for ensuring event logger information is readable and readily understandable, OWM notes suggestions to use a narrow receipt (such as is provided with "Card Readers in Dispensers") as the means for printing an event log may not meet requirements for clarity and legibility if printed in an extremely small font.

- Some members of industry (LC, FMC) and the regulatory community (AK, OR, CA, NY) support the concept of an electronic version of the required event log on a Category 3 device, but noted the proposal requires additional work.

- Jim Pettinato, Technip FMC, noted the Software Sector also supports an electronic log and suggested a user requirement may also be warranted.

- OWM concurs with the direction toward permitting an electronic form of the event log, provided the following key issues that have been raised in discussions are addressed:

    - ***Event Log Information Accessible During the Inspection.*** Inspectors need this information in order to assess the disposition of a device during the inspection process, not at a later point in time.
    - ***IT Security Concerns with Connection Method.*** Options suggesting use of a memory stick or wired interface with a mobile device may pose a deterrent since many jurisdictions' IT security policies would not permit this method of accessing information on a jurisdiction-owned mobile device.
    - ***Availability of Mobile Devices.*** Not all inspectors are equipped with mobile devices for downloading and viewing information.
    - ***(Larger) Electronic Display on Site***. Might another alternative be to provide an on-site, inspector-accessible display which meets minimum dimensions? This option might be considered a compromise in which the inspector could easily access and view the information, though it does create a potential problem and disadvantage in not facilitating the recording and retaining of the results as part of the inspection record.

- ***Security of Event Logger Data.*** A point raised in discussions of this issue was how an inspector can determine if information downloaded electronically is connected with the specific device under inspection. Revisions to the current requirements need to consider including information with any remotely-downloaded log that would enable the inspector to link the log to the specific device.

- OWM also concurs with the Committee's suggestion for the submitter to focus on the format of an electronic display of the event log and any barriers to its access (as noted above).

- OWM further asks jurisdictions to consider whether they are actively inspecting and viewing event counter and event logger information. Experience reviewing event counter and logger information will help regulators make a better-informed decision on any alternatives proposed.

- OWM notes that device types that are activated and/or operated using mobile applications may already be providing some flexibility in this regard (see 5.60 TNMS Code S.2.3. Change Tracking, p.5-104).

- OWM also notes that there is a similar proposal for S&T agenda item EVF-21.4 and the committee may wish to compare the language and align the language as appropriate.

- OWM agrees a Developing status is appropriate to allow for further development by the submitters and others who may be able to provide suggestions and input to assist in the process and looks forward to reviewing any proposed revisions. Since regulatory official will most be impacted by this change, OWM would suggest that the S&T committee consider the status of this item based on the input from regulatory officials.

WWMA: LMD-21-1 CATEGORIES OF DEVICE AND METHODS OF SEALING - Brent Price (Gilbarco) commented this is a little different than other proposals. Gas pumps have limited printing capabilities on receipts so they would like the option for electronic printing. Suggests combining into one proposal with Wayne Pump. Steven Harrington (Oregon) commented he was concerned about how this will affect device testing efficiency by adding additional testing steps in the field. He is also concerned about time and structure of how this information is received in the field. Committee recommends this to be assigned developing status. The Committee recommends that the submitter work with other stakeholders and vets this through the other regions for further development.

SWMA: During Open Hearings the Committee heard from Brent Price (Gilbarco), the submitter, who stated that he wants to have the option of an Electronic Event Log, and for the item to be considered as fully developed. The Committee also heard from Tina Butcher (OWM) who stated she would like to have consistent language in the Handbook for LMD, EVSE, and Taximeters. The committee notes that it prefers the language in this item rather than a similar item submitted by Wayne last year. After considering this item the Committee recommends the item as a Voting Item.

NEWMA: B5 – LMD-21.1 The Committee agrees with the bodies recommendation that this item move forward with a Voting designation. During open hearings, the Committee heard from the submitter that the intent was not to have multiple proposals, but that there was support from the submitter of the developing, grouped item that this item move forward. There was no discussion heard against this proposal. There is another item proposed EVF 21.4 that has a similar purpose and should have matching language.

CWMA: G. Diane Lee (NIST OWM) advised the S&T committee that the developers of both of these items are working together to present one item in the future. We recommend this item remain developing and look forward to collaborative results to come.

VTM – Vehicle Tank Meters

VTM-18.1 D S.3.1.1. Means for Clearing the Discharge Hose and UR.2.6. Clearing the Discharge Hose.

(This item was returned to committee at the 2019 Annual Meeting)

Organization (*) not submitted (**) no meeting (***) no recommendation	(Previously VTM - 1 – Means for Clearing the Discharge Hose and UR.2.6 Clearing the Discharge Hose) VTM-18.1 same title - **Initial Status – New Item (1 Items), 2020 S&T Recommendations**						
	V	**D**	**W**	**A**	**I**	**Opposed**	**Support**
OWM		✔					
WWMA		✔					
SWMA		✔					
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
MMA (Industry)							
NCWM S&T Committee Interim		✔					

NIST OWM:

- Both Item VTM-18.1 (S.3.1.1 Means for Clearing the Discharge Hose) and Item VTM-20.1 (S.3.1. Diversion of Measured Liquid) address issues with the operation of the "manifold flush systems." OWM's comments address both items.

- Some in support of Item 18.1 oppose modifications that will restrict the use of manifold flush systems with only certain products. Some in support of Item 20.1 oppose use of manifold flush systems unless there is a restriction placed on the products with which the system can be used.

- Particularly given the diametrically opposing views, OWM appreciates the Committee's decision at the 2020 NCWM Interim Meeting to combine Items VTM-18.1 and VTM-20.1 to allow submitters of both items to work toward a unified proposal.

- As of the date of this analysis, the submitters have not yet met to continue this work. However, NIST hopes to collaborate with the other submitters in the coming months and looks forward to working with the submitters to further develop these items.

- For reference, OWM has retained the technical comments offered in its original analysis below.

- ***Background to Consider:***

    - Based on comments at the 2019 NCWM Annual Meeting from the submitters of Item VTM-18.1 (NY & NIST OWM) and with support from the Meter Manufacturers Association, the Committee agreed to modify items (f) and (g) in the proposal and to designate part (g) as nonretroactive as of January 2022 to become retroactive January 2025.

    - At the July 2019 meeting, comments from Murray Equipment noted significant problems with fraud in Europe where they are permitted, suggesting the item be withdrawn.

    - Comments from FL at the July 2019 meeting suggested limiting the application to only certain products. This issue is addressed in the new Item 20.1 from Murray Equipment.

    - When presented for a vote, the revised item failed to obtain sufficient votes to "pass" or "fail" and was returned to Committee.

- In reviewing the proposals in Items VTM 18.1 and VTM 20.1, one needs to recall that a manifold flush system allows liquid to be diverted from the discharge line on single hose multi-product VTMs so that liquid of one product is not mixed with liquid of another in the discharge line.

- OWM acknowledges the safety advantages of such a system since the operator does not have to climb on top of the VTM truck to flush product from the line before delivering another product.

- However, without appropriate safeguards, these systems represent a significant potential for fraud. Concerns have been voiced over this potential at multiple national and regional meetings.

- ***OWM offers the following comments on Item 18.1:***

  - At its Fall 2019 meeting, NEWMA recommended changes to extend the *nonretroactive* date. OWM recognizes this extension may help move the item forward and, thus, help reduce the potential for fraud when using these systems. OWM would also like to hear from the Meter Manufacturers Association regarding the difficulty designing communications between the metering system and the flushing system and the feasibility of an earlier nonretroactive date.

  - At its Fall 2019 meeting, NEWMA also recommended eliminating the *retroactive* date. Given the potential to facilitate fraud and a number of comments received to that effect over the past several years, OWM is concerned with the proposed elimination of the retroactive date. However, if this will allow the item to progress it may represent a viable solution. OWM heard from NY regarding the extensive number of systems already in the field, particularly mechanical ones which may not lend themselves to modification. OWM is also interested in how others view the proposal to eliminate the retroactive date.

  - The remaining regional associations recommended the item be given Developing status to permit the submitters to address concerns raised during the Annual Meeting.

  - Comments from the SWMA voice serious concern about the potential for cross contamination of products. The proposal in Item 20.1 may help to address this by including limitations on the type of products with which these systems can be used.

  - OWM believes the term "operational" should be deleted from proposed paragraph UR.2.6.1. since the key point is that the system not be *used* when a commercial transaction is in progress.

- ***OWM offers the following comments on Item 20.1:***

  - OWM notes that one jurisdiction (NY) in NEWMA specifically opposes the limitation of product types. The S&T Committee will have to consider how to address this.

  - After discussing the proposed limitation of using manifold flush systems to only products other than engine fuels with NY W&M, OWM recognizes there may be instances where a VTM is used to transport only engine fuels of different types and grades. OWM recognizes that a blanket limitation may unintentionally impact applications that may not have been considered under Item 20.1.

  - While OWM continues to have concerns regarding the safety of delivering products such as gasoline and home heating oil through the same meter (and questions whether a single meter is suitable for such purposes), OWM recognizes this is already a widespread practice in the industry and placing a blanket limitation may not best serve the community. OWM suggests working with the submitter of 20.1 to see if there are ways to resolve specific concerns without impacting other applications.

  - In its review of these issues, OWM also noted the need to clarify when paragraph S.3.1.1. applies and suggests the addition of the terms "multiple-product, single discharge hose" to both the title and preamble.

- While OWM recommends additional work prior to including product limitations, OWM offers the following points to consider should the Committee decide to move forward with a limitation as proposed in 20.1.

  - OWM concurs with the comments from the SWMA suggesting the use of the term "engine" rather than "vehicle." However, OWM finds the use of the term "non-engine fuels" to be cumbersome. Consequently, OWM recommends use of the phrase "used to dispense product(s) other than engine fuels" instead.

  - Just as the development of S.3.1.1. was prompted by concerns over safety, some have questioned the safety and potential for fraud with using a single metering system to measure and delivery products of a significantly different nature.

  - While the concept of changes to the specification paragraphs (along with modifications to the terminology) seem appropriate, OWM believes that a change to the "user requirements" corresponding to this specification are even more important. Thus, OWM recommends the submitter consider the addition of the statement "Such flushing systems are not to be installed on delivery vehicles with metering systems used to dispense engine fuels." Following the first sentence in the proposed UR.2.6.1. OWM also suggests the elimination of the term "operational" since this speaks more to design criteria than a user requirement. OWM also has additional editorial suggestions for this paragraph.

- ***Proposed Revisions to Item Under Consideration:***

  - As noted earlier, OWM believes more work is needed to address Items 18.1 and 20.1 and the items should be combined and addressed together and appreciates the Committee's decision in January 2020 to do so. OWM believes a Developing status is appropriate for the combined item.

  - Given the collective recommendations in both Items 18.1 and 20.1 and given OWM's specific suggestions for changes to the items, OWM offers the following suggestion to replace the Items Under Consideration in both Items 18.1 and 20.1. Given comments at the January 2020 NCWM Interim Meeting, OWM is aware that not all submitters may support these recommendations and looks forward to continued work with the submitters to refine the proposal.

S.3.1. Diversion of Measured Liquid. – No means shall be provided by which any measured liquid can be diverted from the measuring chamber of the meter or the discharge line thereof. However, two or more delivery outlets may be installed if means are provided to ensure that:

(a) liquid can flow from only one such outlet at one time; and

(b) the direction of flow for which the mechanism may be set at any time is definitely and conspicuously indicated.

This paragraph does not apply to the following:

(1) Equipment used exclusively for fueling aircraft.

(2) Multiple-product, single-discharge hose metering systems that are equipped with systems designed to flush the discharge hose, provided the flushing system complies with the provisions of paragraph S.3.1.1.

Means for Clearing the Discharge Hose**, Multiple-Product, Single-Discharge Hose Metering Systems.** (Amended 2018 **and 20XX**)

S.3.1.1. Means for Clearing the Discharge Hose, Multiple-Product, Single-Discharge Hose Metering Systems. - Multiple-product, single-discharge hose ~~M~~metering systems may be equipped with systems specifically designed to facilitate clearing of the discharge hose prior to delivery to avoid product contamination. In such systems. a valve to temporarily divert product from the measuring chamber of the meter to a storage tank, shall be installed only if all the following are met:

(a) the discharge hose remains of the wet-hose type;

(b) the valve and associated piping are approved by the weights and measures authority having jurisdiction over the device prior to commercial use;

(c) the valve is permanently marked with its purpose (e.g. flush valve);

(d) the valve is installed in a conspicuous manner and as far from the hose reel as practical;

(e) the system clearly and automatically indicates the direction of product flow during operation of the flush system; and

(f) clear means, such as an indicator light or audible alarm, is used to identify when the valve is in *use **on both quantity indications and any associated recorded representations (e.g., using such terms as "flushing mode" or "not for commercial use")**;*
[nonretroactive as of January 1, 2024.]

(g) effective, automatic means shall be provided to prevent passage of liquid through any such flush system during normal operation of the measuring system; and
[nonretroactive as of January 1, 2024.]

(h) no hoses or piping are connected to the inlet when it is not in use.

(Added 2018)**(Amended 20XX)**

UR.2.6. Clearing the Discharge Hose.

UR.2.6.1. Clearing the Discharge Hose, General. – A manifold flush or similar system designed to accommodate the flushing of product on single-hose, multiple-product systems is not to be used during a commercial transaction. The following restrictions apply:

a) The inlet valves for the system are not to be connected to any hose or piping (dust covers are permitted) when not in use.

b) <u>When the flushing system is in operation, the discharge hose is only to be connected to the port for the product type being flushed from the discharge line.</u>

c) <u>Following the flushing process, indications and recording elements must be reset to zero prior to beginning a commercial delivery.</u>

<u>(Added 20XX)</u>

<u>UR.2.6.2.</u> Records. Whenever, prior to delivery, a different product is pumped through the discharge hose to avoid contamination, a record including the date, time, original product, new product, and gallons pumped shall be maintained. These records shall be kept for a period of 12 months and available for inspection by the weights and measures authority.

(Added 2018)

WWMA: - 2019 Annual Meeting. The Committee agrees that the item has merit and this item failed to be adopted when voted on during the 2019 NCWM Annual Meeting. The Committee agreed that the item should be given a Developing status and that the submitters work together to further develop the proposal considering the statements made by NIST OWM during the 2019 NCWM Annual Meeting open hearing and the amendments that were presented at that time. There were no comments heard during the open hearing session on this item.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Hal Prince (Florida) who stated that this item muddies the waters, and that this item will cause the unacceptable cross contamination of engine fuels. After consideration of this item the Committee recommends that this item move forward as a Developing Item, as long as the developers of VTM 18.1 and VTM 20.1 can combine their language to include an exception specifically for "Engine Fuels."

NEWMA:

2019 Fall Interim Meeting. The Committee and the body agree that this item be moved to voting status, but with some changes to language. The Committee believes that the item in its current form will place undue burden on the industry as it already uses manifold flush systems and retrofitting them will be costly. The following language is proposed:

(a) clear means, such as an indicator light or audible alarm, is used to identify when the valve is in use ***<u>on both quantity indications and any associated recorded representations (e.g., using such terms as "flushing mode" or "not for commercial use");</u>***

<u>[nonretroactive as of January 1, ~~2022~~ 2024 ~~to become retroactive January 1, 2025~~]</u>

<u>(b) effective, automatic means shall be provided to prevent passage of liquid through any such flush system during normal operation of the measuring system; and</u>

<u>[nonretroactive as of January 1, ~~2022~~ 2024 ~~to become retroactive January 1, 2025~~]</u>

During open hearings, submitters Mr. Jim Willis (NY) and Mr. Steve Timar (NY) recommended removing retroactive dates and extend non-retroactive to 2024.

CWMA:

2019 Interim Meeting. Charlie Stutesman, KS, commented that he supports the item with a developing status but is not sure about the requirements being retroactive and isn't sure this will prevent fraud. We recommend developing status.

2020 Interim Meeting. Tina Butcher (NIST OWM) requested that the committee recommend this item remain a developing item.

VTM-20.1 D S.3.1. Diversion of Measured Liquid.

Organization (*) not submitted (**) no meeting (***) no recommendation	VTM-20.1 – S.3.1. Diversion of Measured Liquid - Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
WWMA		✔					
SWMA		✔					
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
NEWMA Interim (2019 Fall)			✔				
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim		✔					

NIST OWM:
See Comments in VTM 18.1

WWMA: - 2019 Annual Meeting. The Committee recommends the item be given a Developing status and that the submitter of this proposal work with the submitters of item VTM-18.1 to coordinate the changes being recommended and to avoid conflicting requirements.
During the open hearing session, Mr. Steve Harrington (OR) stated that he see potential issues with aviation fueling systems equipped with more than one hose.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard comments from Hal Prince (Florida) who stated that he would like the term "non-Vehicle Motor Fuels" changed to "non-Engine Fuels" to protect non-vehicle engines such as boats, generators, and construction equipment from potential cross contamination of gasoline and diesel. After consideration of this item the Committee recommends this item move forward as a Developing Item, as long as the developers of VTM 18.1 and VTM 20.1 can combine their language to include an exception specifically for "Engine Fuels"

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item be withdrawn due to its possible redundancy with VTM-18.1. During open hearings, Mr. John McGuire (NJ) stated he believes VTM-18.1 and VTM-20.1 are almost the same and suggested that the submitter speak with the submitter of VTM-18.1. Mr. Steve Timar (NY) commented that NY has issues with having a carve out just for home heating fuel.

CWMA: - 2019 Interim Meeting. Charlie Stutesman, KS, commented that he supports the item as voting, Dick Suiter, Richard Suiter Consulting, relayed that the SWMA suggested removing the term vehicle. Loren Minnich, KS, asked whether it was appropriate to exempt trucks carrying other fuels. We believe that it is unclear what fuels are being targeted by this item and recommend the item move forward as developing.

2020 Interim Meeting. Tina Butcher (NIST OWM) requested that the committee recommend this item remain a developing item.

VTM-20.2 A Table T.2. Tolerances for Vehicle Mounted Milk Meters.

Organization (*) not submitted (**) no meeting (***) no recommendation	VTM-20.2 – Table T.2. Tolerances for Vehicle Mounted Milk Meters. – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM				✔			
*WWMA							
*SWMA							
CWMA Interim (2019 Fall)							
**CWMA Annual (2020 Spring)							
CWMA Interim Meeting (2020 Fall)				✔			
NEWMA Interim (2019 Fall)							
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim				✔			

NIST OWM: This is a proposal to increase the tolerances for vehicle mounted pump metering systems that measure milk.

The submitter (Poul Tarp) explained that use of vehicle mounted pump metering systems to measure milk reduces the amount of time needed to collect and process the milk which reduces the cost and loss of product that would occur with a slower measurement process. But, with the use of vehicle mounted pump measuring systems, entrained air is produced that cannot be removed and this air is measured as product. As such, with the use of a pump metering system there is an inherit loss to the buyer. Although the system has means for air elimination, not all entrained air can be removed and this is the submitter's reason for requesting that the tolerances currently in the HB be increased.

Poul Tarp also noted that it is recognized by the European Standardization Agencies: Measuring Instrument Directive (MID) and Organization of Legal Metrology (OIML) Recommendation (R) 117 *Dynamic measuring systems for liquids other than water* and the dairy industry in general that it is not possible to remove all the air from milk before measuring it. Poul Tarp notes that the MID and OIML (R) 117 standards specify that measurements of a vehicle mounted milk metering system must not result in inaccuracy of more than 0.5% at any given amount being collected from a minimum of 50 gallons and up to +500 gallons. NIST HB 44 Section 3.31.has a designated tolerance table in volume for vehicle-mounted milk meters that was added to the code in 1989 with an acceptance tolerance of 0.3 and

Collected volume	Proposed Tolerance Maintenance		Current NIST Tolerance Maintenance		Proposed Tolerance Acceptance		Current NIST Tolerance Acceptance	
	Gallon	Percent %	Gallon	Percent %	Gallon	Percent %	Gallon	Percent %
50 Gallon	0.25	0.5%			0.25	0.5%		
100 Gallon	0.5	0.5%	0.5	0.50%	0.5	0.5%	0.3	0.30%
200 Gallon	1	0.5%	0.7	0.35%	1	0.5%	0.4	0.20%
300 Gallon	1.5	0.5%	0.9	0.30%	1.5	0.5%	0.5	0.17%
400 Gallon	2	0.5%	1.1	0.275%	2	0.5%	0.6	0.15%
500 Gallon	2.5	0.5%	1.3	0.26%	2.5	0.5%	0.7	0.14%

maintenance tolerance of 0.5 gallons for the first 100 gals and these tolerances decrease in percent tolerance as the indicated volume increases, as was reported in a presentation from Poultarp:

NIST OWM's initial points to consider as the Committee began to deliberate on the proposal were:

- Are there other methods that can be employed to remove entrained air from the milk?
- Can the amount of error introduced from entrained air be determined?
- Should NIST HB 44 tolerances be aligned with OIML R 117 less stringent tolerances, as recommended by the submitter.
- Should there be a separate tolerance table to address vehicle mounted pump metering systems?

During the 2019 interim meeting another company stated that they met the current tolerances in HB 44 and were issued an NTEP certificate and believe that the current tolerances are appropriate. Other State regulators commented that the current certificate was limited to testing up to 300 gallons. At that time the S&T committee assigned a task group to this item and NIST OWM expressed interest in working with the task group.

Charlie Stutesman, KS, and chair of the task group sent an email to the Milk Meter Tolerance Task Group (TG) providing a list of the TG members and the TG's mission. Mr. Stutesman also informed the task group that most communication will be conducted via e-mail and that face to face meetings will be planned at Interim and Annual Meetings.

The following list contains the names of members on the Milk Meter Tolerance TG:
Chair-Charlie Stutesman (KS)
NEWMA Representative-Jim Willis (NY)
SWMA Representative-TBD
WWMA Representative-Jeff Cambies (CA)
NTEP Technical Advisor-Mike Manheim
NIST Technical Advisor- Diane Lee
Measurement Canada Technical Advisor-Luciano Burtini
Industry Representative- Carey McMahon (Poul Tarp)
Industry Representative-Leigh Hamilton (Piper Systems)
Industry Representative-Brandon Meiwes (Dairy Farmers of America)
Industry Representative-Bob Fradette (Agri-Mark)
Mitch Marsalis (LA) has agreed to be the SWMA representative. I am just waiting on formal assignment by the NCWM chair for Mitch.

Milk Meter TG Mission:
The mission of the task group is to review and possibly recommend changes to the tolerances that apply to milk meters, which may include milk measuring systems, in Sections 3.31. Vehicle Tank Meters, Section 3.35. Milk Meters, Section 3.37. Mass Flow Meters, and Section 4.42. Farm Milk Tanks. This TG will consider the tolerances proposed in S & T item VTM-20.2 and the tolerances in OIML R 117-2 " Dynamic measuring systems for liquids other than water" in their discussion."

Mr. Stutesmann provided the task group with milk meter tolerances and requirements from OIML-R117-2: 2007, NIST HB 44 Tolerances for Milk Meters that are located in the VTM Code Section 3.31, the Mass Flow Meter Code Section 3.37, and the Farm Milk Code Section 4.42 and Measurement Canada's tolerances for milk meters and requested feedback from the task group on appropriate tolerances to apply. A task group member from Poul Tarp, the original submitter of the item recommended that the proposal be changed to align NIST HB 44 with the tolerances for milk meters in OIML R-117-2. Mr. Stutesman circulated a proposal for consideration by the task group that would aligns the tolerances in NIST HB 44 Section 3.31 Table 2 with OIML to tolerances. OIML Tolerances seem to apply two different tolerances. 0.5% tolerance for milk meters in a system and 0.3% tolerance for a meter outside of a system that is used to measure milk. The proposed tolerances and changes to NIST HB 44 are provided below:

Proposed change to Handbook 44- Simple rewrite of table 2 and paragraph T.4. in 3.31 VTM Code and Table 1 in 3.35 Milk Meter Code.

3.31 Vehicle Tank Meters

T.2. Tolerance Values. – Tolerances shall be as shown in Table 1. Accuracy Classes and Tolerances for Vehicle-Tank Meters Other Than Vehicle-Mounted Milk Meters and Table 2. Tolerances for Vehicle-Mounted Milk Meters. (Amended 1995, 20XX)

Table 2. Tolerances for Vehicle-Mounted Milk Meters		
~~**Indication (gallons)**~~	~~**Maintenance Tolerance (gallons)**~~	~~**Acceptance Tolerance (gallons)**~~
~~100~~	~~0.5~~	~~0.3~~
~~200~~	~~0.7~~	~~0.4~~
~~300~~	~~0.9~~	~~0.5~~
~~400~~	~~1.1~~	~~0.6~~
~~500~~	~~1.3~~	~~0.7~~
~~Over 500~~	~~Add 0.002 gallon per indicated gallon over 500~~	~~Add 0.001 gallon per indicated gallon over 500~~

Table 2. Tolerances for Vehicle-Mounted Milk Meters		
Indication (gallons)	**Acceptance Tolerance**	**Maintenance Tolerance**
Complete Measuring System	0.5%	0.5%
Meter Only	0.3%	0.3%

If changes to the product depletion test tolerances in Handbook 44 are made to match OIML R117-1 paragraph 2.10.1:

T.4. Product Depletion Test. – The difference between the test result for any normal test and the product depletion test shall not exceed 0.5 % of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated higher than 380 Lpm (100 gpm) or 0.6 % of the volume delivered in one minute at the maximum flow rate marked on the meter for meters rated 380 Lpm (100 gpm) or lower. Test drafts shall be of the same size and run at approximately the same flow rate. **For vehicle tank meter measuring systems used to measure milk, the effect due to the influence of the air or gases on the measuring result shall not exceed 1.0% of the quantity measured.**

Charlie Stutesman also asked the task group if consideration should be given to updating all of the codes pertaining to milk metering devices in NIST HB 44 and if all milk metering requirements should be included in a single code.

The NCWM Milk Meter Tolerance Task Group met virtually on January 7, 2020. During this meeting the task group discussed:

- the system of milk collection from farm to processer (seller to buyer),
- the operation of metering systems that measure milk to include discussion of air elimination systems,
- review of the milk measuring tolerances in NIST HB 44 from 1919 to 2020,
- review of the proposal to harmonize the NIST HB 44 VTM code milk metering tolerances with OIML tolerances for single milk meters and milk meter measuring systems, and

- whether or not the task group wanted to consider expanding its scope to include combining all milk metering requirements in NIST HB 44 to a single code.

By consensus the task group agreed with harmonizing the VTM milk metering tolerance with OIML R 117 tolerances and that those tolerance be presented during the NCWM 2021 interim meeting for discussion. The task group also agreed that a request should be made to the S&T committee to expand the scope of the task group to include combining milk meter requirements in NIST HB 44 to a single code.

CWMA 2020 Interim Meeting. Charlie Stutesman (KS & Chair of Milk Meter Tolerance Task Group) updated the committee that the task group was hard at work on this item.

LPG – LPG AND ANHYDROUS ammonia liquid-measuring devices

LPG-20.1 V S.2.5. Zero-Set-Back Interlock and S.2.6. Automatic Timeout.

Organization (*) not submitted (**) no meeting (***) no recommendation	LPG-20.1 – S.2.5 Zero-set-back Interlock and S.2.6 Auto Timeout Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM (w/comments)	✔						
WWMA	✔						
SWMA	✔						
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim	✔						

NIST OWM: This item is a follow-up to the changes that were made to the LPG Code in 2019. The current proposed changes are to separate the S.2.5. "Zero-Set-Back Interlock and Automatic Timeout" requirements in the LPG Code into two paragraphs which would align that requirement's format/structure with similar requirements in both Section 3.30 LMD Code and Section 3.31 VTM Codes.

If the proposed change is adopted in S&T Item, LMD-20.2 to the Automatic Timeout Paragraph to adjust the time a system must deactivate when not in use, consideration should be made to change the Automatic Timeout paragraphs in other measuring codes.

Also see OWM's comments to LMD-20.2. S.1.6.10 Automatic Timeout – Pay-at-pump Retail Motor-Fuel Devices. The current proposal for voting item number LMD-20.2 includes a automatic time out of 3-minutes. The current proposal for LPG-20.1 paragraph S.2.6.2 Automatic pay-at-pump includes a 2-minute timeout. For uniformity between codes OWM agrees with the CWMA that the committee may want to consider changing the time-out in LPG-20.1 to three minutes in paragraph S.2.6.2. prior to voting on this item.

WWMA: - 2019 Annual Meeting. The Committee agrees with the proposal and recommends a Voting status. Mr. John Barton stated that this item is a follow-up item to changes that were adopted in the NCWM Annual Meeting in July 2019. It is intended to reformat requirements for zero-set back interlock in the LPG Code to align with requirements in the LMD and VTM Codes.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Diane Lee (NIST) who recommended the Committee harmonize the language in this item to align with the LMD Code in the handbook. After consideration of this item the Committee recommends this item be made a Voting Item with the term "two minutes" changed to "180 seconds" on lines 46 and 48 on page S&T 49.

NEWMA:

2019 Interim Meeting. The Committee and the body agree that this item should be listed as voting but with a language change. The Committee believes that to be consistent with other timeout requirements, the term "two minutes" shall be changed to "180 seconds) on lines 46 and 48 on page S&T 50. During open hearings, Mr. Dick Suiter (Richard Suiter Consulting) commented that he would recommend a language change to 3 minutes. Mr. John McGuire (NJ) and Mr. Jim Willis (NY) agreed with Mr. Suiter's comments.

CWMA:

2019 Interim Meeting. Charlie Stutesman, KS, commented that he would like this item separated and that S.2.5. move forward as voting and S.2.6. move forward as developing until the length of the time out is sorted out. We recommend the item be separated and that S.2.5. move forward as voting and S.2.6. move forward as developing for these reasons.

2020 Interim Meeting. The only comments the S&T committee heard during open hearings were an interest to keep language uniform in Handbook 44. The CWMA S&T committee recommends this item be amended as follows:

S.2.6.2. Automatic Timeout Pay-at-Pump Retail Motor-Fuel Devices. – Once a device has been authorized, it must de-authorize within ~~two~~ three minutes if not activated. Re-authorization of the device must be performed before any product can be dispensed. If the time limit to de-authorize the device is programmable, it shall not accept an entry greater than ~~two~~ three minutes.
[Nonretroactive as of 2021]
(Added 2020)

We believe this item, as amended, is fully developed and recommend this item move forward as voting.

WTR – Water Meters

WTR-20.1 V S.3.2. Meter size and Directional Flow Marking Information.

Organization (*) not submitted (**) no meeting (***) no recommendation	WTR-20.1–S.3.2 Meter Size and Dir Flow Marking Info.- Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA	✔						
***SWMA							
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim	✔						

NIST OWM:

- OWM concurs with the submitter that marking of meter size and flow direction will assist in assessing compliance with suitability and installation requirements.

- Meter size is used along with rate of flow to determine test draft size. The marking of meter size will greatly assist in properly applying test criteria.

- OWM concurs with the modification to broaden the requirement to mark the direction of water flow by eliminating the reference to stamping the information on the body of the meter.

- OWM continues to recommend additional edits to the wording as follows:

(1) deleting the word "information" in the preamble following the phrase "indelibly marked with the following"

The modified proposal would read as shown below:

> **S.3.2. Meter Size and Directional Flow Marking Information.** A water meter shall be clearly and indelibly marked with the following:
>
> (a) meter size on the indicator face plate; and
> (b) water flow direction.

- OWM notes that paragraph S.3.1. that applies to all markings for utility type meters is nonretroactive. This may create confusion in the application of S.3.2. consequently, the Committee may wish to consider a modification to paragraph S.3.1. as follows or make S.3.2. nonretroactive.

> ***S.3.1. Location of Marking Information; Utility Type Meters.*** *– **Except for the markings specified in S.3.2. Meter Size and Directional Flow Marking Information**, all required markings, including those required by G-S.1. Identification, shall be either on the meter body or primary indicator.*
>
> *[Nonretroactive as of January 1, 2013]*
>
> (Added 2012)

- Given the submitter indicated an openness to make this requirement nonretroactive should manufacturers need additional time to comply, OWM would like to hear input from water meter manufacturers regarding compliance with the proposal. Making the proposal nonretroactive would also eliminate the need to modify S.3.1. as noted above.
- In the process of reviewing this item, OWM noted there is another paragraph S.2.3. Multi-jet Meter Identification that also includes marking requirements. OWM recommends a future proposal be submitted which would reorganize all marking requirements into a single section

WWMA: - 2019 Annual Meeting. The Committee agrees this item has merit and that it should be given a Voting status. During open hearing session, Mr. Clark Cooney (CA DMS) stated his support for the item.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard no comments on this item. After consideration of this item the Committee decided to make No Recommendation on this item.

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item should be moved to voting status. No comments were heard regarding negative aspects to the proposal.

CWMA: - 2019 Interim Meeting. Rachelle Miller, WI, supports this as a voting item. We recommend the item move forward as voting.

2020 Interim Meeting. The S&T committee heard no comments during open hearings on this item. We feel this item is fully developed and recommend this item move forward as a voting item.

WTR-20.2 V S.1.1.4. Advancement of Indicating and Recording Elements.

Organization (*) not submitted (**) no meeting (***) no recommendation	WTR-20.2–S.1.1.4. Adv of Indicating & Record Ele. - Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA		✔					
***SWMA							
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim	✔						

NIST OWM:

- OWM appreciates and understands the perspective of the submitter in view of the variety of meter types in the marketplace and the trend for equipment to be largely electronic in operation. OWM believes the use of the term "mechanical" was not intended to refer to metering systems with "mechanical" indications, but rather refer to the operation of the metering system itself. The intent was to ensure a device is designed such that it will prevent interference with or manipulating of the indicating and recording elements in such a way that the measurement operation or end result is affected. In particular, it was intended to ensure that the indications and recording elements cannot be manipulated to provide a measurement indication greater than the quantity actually measured.

- OWM notes that General Code paragraphs G-S.2. Facilitation of Fraud and G-UR.1.1. Suitability of Equipment can be used to provide additional assurance to ensure that equipment is of a design such that its indications and recording elements are not susceptible to tampering or alteration.

- OWM believes the language, as modified by the S&T Committee based on input received at the January 2020 Interim Meeting offers additional clarity to the language.

- OWM continues to note a number of other codes in NIST Handbook 44 (particularly many measuring device codes) include similar language to that currently in Water Meters Code paragraph S.1.1.3. Advancement of Indicating and Recording Elements. Should the Committee decide to proceed with changes to paragraph S.1.1.3., the Committee may wish to introduce a future item proposing the **modification** of corresponding paragraphs in other codes to align with the final language in paragraph S.1.1.3.

- OWM also notes the terms "mechanical (analog)" and "electronic (digital)" are used in Water Meters Code paragraph S.1.1.5. Proving Indicator. As part of such a future item, the Committee may wish to consider striking the terms "mechanical" and "electronic" from that paragraph so that the paragraph and retaining the terms in the parentheses instead.

S.1.1.6. Proving indicator. – Utility-type meters shall be equipped with a proving indicator. The individual graduations on a**n** ~~**mechanical (analog)**~~ proving indicator shall indicate volumes no larger than $^1/_{100}$ of the value of the smallest unit of indicated delivery required in S.1.1.3. Value of Smallest Unit. For ~~**electronic (digital)**~~ proving indications, the smallest unit of volume displayed shall be no larger than $^1/_{1000}$ of the value of the smallest unit of indicated delivery required in S.1.1.3.

(Added 2009)

WWMA: - 2019 Annual Meeting. The Committee agreed that the item has merit however, there were some concerns about the use of the word "normal" in the proposal in reference to the operation of the device. The Committee agree this proposal should be assigned a Developing status. The Committee also recommends the submitter work with CA DMS and LA County to wordsmith the terminology used in the proposal.
During open hearing session, the Committee heard comments from Mr. Garrett Cooper (San Diego County, CA) stating that there are many non-mechanical meters in use that incorporate non-invasive technology and that the proposal should be expanded to include all meters. Mr. Kurt Floren (LA County, CA) stated that he is not comfortable with the use of the term "normal" operation and suggests that there is a better means to define this. Mr. Floren suggests the description "as intended by the manufacturer" as a replacement. Mr. Clark Cooney (CA DMS) agrees and recommends a change to the use of "normal" operation.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard no comments on this item. After consideration of this item the Committee decided to make No Recommendation on this item

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item be moved to a voting status, but with a language change. The Committee is concerned with the use of the term "normal". The language change suggested is "as intended by the manufacturer". During open hearings, Mr. Frank Greene (CT) suggested replacing "normal" with another term as it is ambiguous. Mr. Jason Flint (NJ) presented the language change offered by the Western Weights and Measures Association report.
CWMA: - 2019 Interim Meeting. Charlie Stutesman, KS, commented that he supports this item as voting if the phrase "be susceptible to" is removed and the word "advancement" is changed to "advance" as shown above. We recommend this item as a voting item with these changes.

2020 Interim Meeting. The only comments heard during open hearings were from Charlie Stutesman (KS) who supported the item as amended. The committee recommends the item moving forward as a voting item with the proposed amendments by the NCWM S&T Committee.

MFM – Mass Flow Meters

MFM-20.1 V S.1.3.3. Maximum Value of Quantity Divisions.

Organization (*) not submitted (**) no meeting (***) no recommendation	MFM-20.1-S.1.3.3. Maximum Value Quantity Division .- Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
***SWMA							
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim	✔						

NIST OWM: In 2019, NIST developed a proposal designated S&T Agenda Item MFM-2 proposing changes to MFM Code paragraph S.1.3.3. to address the omission of requirements for the maximum value for the quantity-value division "d" for LNG applications.

As part of this work, NIST noticed a second omission in paragraph S.1.3.3. That is, there was no specification for the maximum value of "d" for products that fall under the category of "all gases other than CNG." NIST indicated it would delay proposing a substantive change to Item MFM-2 at that time and revisit paragraph S.1.3.3. in 2020 with a proposal to include a new subparagraph that establishes a maximum value for the quantity-value division for all gases

other than CNG. The maximum value of d for other gases was not specified in paragraph A.2 Vapor (Gases) when the MFM Code was first modified in 1994 to recognize the CNG retail motor-fuel application.

A specification for the maximum size of the unit measure is:

(1) Consistently included in most weighing and measuring device codes in NIST Handbook 44;
(2) essential for facilitating the selection of suitable dispensing equipment for product applications; and
(3) necessary to facilitate transparency in sales transactions and for making comparisons in fuel pricing.

The purpose section of Agenda Item MFM-20.1 is incorrect. It should read as follows:

Specify the maximum permissible quantity value of "d" for mass flow meters designed to dynamically measure gases other than CNG. This is currently a missing component of paragraph S.1.3.3.

WWMA: - 2019 Annual Meeting. The Committee agrees that the item should have a Voting status.
Mr. John Barton (NIST) commented that there was a gap noted in the changes adopted to S.1.3.3. during the 2019 NCWM Annual Meeting where gasses other than compressed natural gas were not addressed. This proposal amends the paragraph to address that issue.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard no comments on this item. After consideration of this item the Committee decided to make No Recommendation on this item.

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item be moved to voting status as there is no negative aspects to the proposal. During open hearings, Mr. James Cassidy (MA), Mr. Steve Timar (NY) and Mr. Jim Willis (NY), NY voiced support.

CWMA: - 2019 Interim Meeting. Charlie Stutesman, KS, commented that he supports this item as voting. We recommend this item as a voting item.

2020 Interim Meeting. The S&T committee heard no comments during open hearings on this item. We feel this item is fully developed and recommend this item move forward as a voting item.

MFM-21.1 UR.3.3. Ticket Printer: Customer Ticket

Organization (*) not submitted (**) no meeting (***) no recommendation	MFM-21.1 - UR.3.3. Ticket Printer: Customer Ticket (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA		✔					
SWMA							
CWMA Interim (2020 Fall)		✔					
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)			✔				
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

- This Agenda item is a proposal to make changes to the same paragraph that is included in Agenda item Block 4: MFM 21.2 UR.3.3. of the 2021 Interim Agenda. (Note: the proposal Block 4 MFM 21.2 references an incorrect paragraph number UR.2.6., the correct paragraph number is UR.3.3.)

- Both proposals have a similar purpose which is to allow the option for receiving electronically captured tickets.

- The proposal in Block 4 provides changes to all appropriate sections in NIST Handbook 44 to address the issue of allowing an option for electronic forms of recorded representation by removing the term "printed ticket," and replacing it with "recorded representation' for uniformity across all codes.

- The proposal MFM-21.1 retains the term "printed ticket".

- NIST OWM agrees with both NEWMA and the CWMA and encourages the submitter of this item to work with the submitter of Block 4 items to ensure uniformity. The submitter may also want to consider withdrawing this item if there is agreement with the proposed changes to MFM-21.2 UR.3.3 in block 4.

WWMA: Matthew Douglas (CA DMS) believes the paragraph needs to be "Wordsmithed". Committee agrees to recommend the item be given a developing status. Recommendations to the submitter to further define the intent of the item and continued vetted through the regions.

SWMA: Decision and comments not recorded in the SWMA report.

NEWMA: The Committee agrees with the body that this proposal does not have merit, is redundant and should be considered as a Withdrawn Item. During open hearings, the Committee received comments from multiple agencies that the general code already provides for the intent of the submitted item.

CWMA: The S&T committee heard a number of comments from regulatory officials about the merits of this item. We recommend this item move forward as a developing item and suggest that the developer of this item and the Block 4 items work together on this issue.

EVF – Electric Vehicle Fueling Systems

EVF-19.1 V S.3.5. Temperature Range for System Components. and S.5.2. EVSE Identification and Marking Requirements.

Originally EVF-3

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF – 19-1 – S.3.5, S.5.2 - Initial Status – D (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
***SWMA							
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF – 19-1 – S.3.5, S.5.2 - Initial Status – D (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
**NEWMA Annual (2020 Spring)							
NCWM S&T Committee Interim	✔						

NIST OWM: NIST originally introduced this proposal in 2019 to eliminate inconsistencies between the references to temperature limits in:

(1) paragraph S.3.5. Temperature Range for System Components (which currently specifies a range of - 40 °C to + 85 °C [− 40 °F to 185 °F]; and
(2) paragraph S.5.2. EVSE Identification and Marking Requirements (which currently specifies a range of – 20 °C to + 50 °C [− 4 °F to 122 °F].

NIST proposes modifying the marking requirements in paragraph S.5.2. to specify a temperature range of – 40 °C to + 85 °C [− 40 °F to 185 °F] to align the limits in paragraph S.5.2. with those specified in paragraph S.3.5.

The NIST USNWG on EVF&S's Electric Vehicle Fueling Equipment Subgroup held web meetings on January 7, 2020 and January 13, 2020 to discuss this proposal (along with other EVFS-related items on the Committee's Agenda) and comments received thus far. At the January 7 meeting, the Subgroup voted and agreed to recommend to the NCWM S&T Committee that this item be designated as a Voting Item and the proposed changes shown in the Item Under Consideration be recommended for adoption at the July 2020 NCWM Annual Meeting.

NIST believes this proposal is fully developed based on the following points.

- Clarification of this requirement is needed for this rapidly emerging technology that is already making inquiries about type evaluation and subsequent commercial service.
- Equipment only capable of operating within a narrower range complies when it is marked with the appropriate temperature limits.
- Proposals under consideration by California for its EVSE requirements indicate California Division of Measurement Standards will pursue similar modifications to corresponding code sections.
- The proposal has been circulating for over a year as part of the 2018-2019 NCWM cycle and no opposition to expanding only the range for the marked temperature limits has been expressed nor have alternate suggestions for the range been submitted during that time.

NIST concurs with the Committee's decision to upgrade this item from a Developing Item to a Voting Item.

It should be noted that the USNWG EVF&S Electric Vehicle Fueling Equipment Subgroup agreed in January 2020 to recommend this proposal for adoption during the Spring 2020 regional associations meetings and July 2020 NCWM Annual Meeting to eliminate any conflict in the temperature range for operation and required marking information.

Additionally, the following text at the beginning of Publication 16 Appendix for this item needs to be deleted as shown below:

~~This item has been assigned to the submitter for further development. For more information or to provide comment please contact:~~

~~Ms. Juana Williams, NIST Office of Weights and Measures~~
~~100 Bureau Drive, M/S 2600~~
~~Gaithersburg, MD 20899-2600~~
~~(301) 975-3989, juana.williams@nist.gov~~

WWMA: - 2019 Annual Meeting. The Committee agrees that the item is fully developed and should be given a Voting status. Mr. Clark Cooney (CA DMS) stated his support for this item.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard no comments on this item. After consideration of this item the Committee decided to make No Recommendation on this item.

NEWMA: 2019 Interim Meeting. The Committee and the body agree that this item be moved to voting status. During open hearings, Mr. Jim Willis (NY) commented that the markings on EVSE are currently widely varied and supports the changes. Mr. James Cassidy (MA) and Mr. John McGuire (NJ) voiced support.

CWMA: 2019 Interim Meeting. We recommend this item as a voting item

2020 Interim Meeting. The S&T committee heard no comments during open hearings on this item. We feel this item is fully developed and recommend this item move forward as a voting item.

EVF-20.1 D S.1.3.2. EVSE Value of the Smallest Unit.

Organization (*) not submitted (**) no meeting (xxx) no recommendation	EVF-20.1 - S.1.3.2. EVSE Value of the Smallest Unit - Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
WWMA	✔						
***SWMA							
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim		✔					

NIST OWM: This recommendation was developed by NIST to modify the current maximum value for the quantity-value division "d" specified for the electrical energy unit of measurement (kilowatt-hour) for EVSEs. The proposal would require a value of "d" with a higher resolution that is suitable for all commercial transactions, but, in particular, does not significantly lengthen the time to conduct an accuracy test of an EVSE. The present requirement would lengthen the time of the test by a factor of 25.

Therefore, NIST proposes the maximum permissible value of the indicated and/or recorded electrical energy unit by an EVSE be specified as 0.0005 megajoule (MJ) or 0.0001 kilowatt-hour (kWh)) rather than the current value of 0.005 MJ or 0.001 kWh. Measurements in either unit can be supported through calibrations by an accredited (or recognized) laboratory. During the 2014 EVFS USNWG deliberations on the draft code, industry representatives indicated that the value of d or unit of measurement could be inexpensively modified.

To provide adequate resolution (i.e., value of the kWh unit) in the displayed electrical energy transaction information and to facilitate accuracy testing of the system two alternate proposals were originally developed that recommended somewhat different modifications of paragraph S.1.3.2., including an option that would allow for a higher resolution display as part of a test mode. However, this option did not receive full support of the EVFE Subgroup and was subsequently abandoned.

A corresponding recommendation has been submitted to modify the corresponding EVFE requirement in NIST Handbook 44 Section 5.55. Timing Devices paragraph S.1.1.3. Value of the Smallest Unit to specify the maximum permissible value of the time unit for these systems.

With regard to the proposal under this item, NIST asks that the Committee consider additional modifications to the language. The language currently shown in the "Item Under Consideration" includes the phrase "shall not be greater than." After further review and discussion, NIST recommends that phrase be eliminated. NIST OWM also observed that the format of the proposal does not follow guidelines for strike through and underscore of text. As the proposal appears in Pub 16 on page S&T-230 it gives the appearance the kilowatt-hour unit as being newly added to the EVSE

design specification in paragraph S.1.3.2. EVSEs. This gives the appearance that electrical energy charging in the kWh began in 2020. Consequently, NIST recommends the proposal that currently appears in the Item Under Consideration in NCWM Publication 15 be replaced with the following.

S.1.3. EVSE Units.

S.1.3.2. EVSE Value of Smallest Unit. – The value of the smallest unit of indicated delivery by an EVSE, and recorded delivery if the EVSE is equipped to record, shall be 0.0005 MJ or 0.0001 kWh.
(Amended 2020)

NIST believes this modification would help avoid any unintentional implication that increments in units such as 0.003 or 0.00007 MJ or kWh (i.e., increment other than 1,2, or 5) would be appropriate.

It should be noted that the USNWG EVF&S Electric Vehicle Fueling Equipment Subgroup discussed the proposal in January 2020 but has not yet reached a consensus on the proposed or alternate language for this agenda item. The Subgroup will continue its deliberations and recommends the proposal be given "Developing" status. On July 7, 2020 the subgroup assigned the proposal to a new subcommittee chaired by Dr. William Hardy to fully address the effect of the EVSE's display resolution and MMQ size on the testing time for AC and DC systems. The EVFE Subgroup asks for input from all sectors (OEMs, Regulators, Consumer Associations, Operators) on their perspective from an ease of testing standpoint, transparency, and for easy comparison to other traditional and alternative vehicle fueling applications, what should the maximum or fixed increment size be for sales of electrical energy vehicle fuel (in the XXXX.X kWh)?

Consequently NIST, OWM agrees that the status should remain developing.

WWMA: - 2019 Annual Meeting. The Committee agrees that the item is fully developed and should be given a Voting status. Mr. Clark Cooney (CA DMS) stated his support for this item.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard no comments on this item. After consideration of this item the Committee decided to make No Recommendation on this item.

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item be moved to a developing status as it has merit. During open hearings, Mr. Steve Timar (NY) questioned if MMQ should also be changed. Mr. Jim Willis (NY) stated that moving the resolution to 1/10,000th may be a little extreme and recommends changing the resolution to 1/1000th. He also questions whether changing the resolution effects the time to conduct a test.

CWMA: - 2019 Interim Meeting. We recommend this item as a voting item.

2020 Interim Meeting. The only comments heard on this item by the S&T committee were from Tina Butcher (NIST OWM) giving an update from the USNWG on EVFS for this item have yet to reach a consensus on the proposed or alternate language and asked the committee to recommend a developing status for this item. The committee concurs with her recommendation.

EVF-20.2 V Definitions: submeter (Previously numbered OTH-20.1

See comments below. This item was renumbered as EVF-20.2 and is now a voting item as EVF-20.2)

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF – 20.2 – Definitions: Submeter - Initial Status – D (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
*SWMA							

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF – 20.2 – Definitions: Submeter - Initial Status – D (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
*CWMA Interim (2019 Fall)							
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
*NEWMA Interim (2020 Fall)							
**NEWMA Annual (2021 Spring)							
NCWM S&T Committee Interim	✔						

NIST OWM:

- NIST OWM notes this item was incorrectly numbered as OTH-20.1. We recommend that this item be moved and renumbered as EVF-20.1. and add the following statement to each section:

  Statement under OTH-20.1
  This item has been renumbered to EVF-20.2. See that item for details.

  Statement under EVF-20.2
  This proposal first appeared on the Committee's 2020 Agenda as "Item OTH-20.1" and was designated as a Voting Item. During review of this item in preparation for the 2021 NCWM cycle, the Committee recognized this item was placed in the incorrect section of the Committee's agenda in its 2020 Agenda. The definition of "submeter" as referenced in the proposal has been part of the "Definitions" which are located in Section 3.40 Electric Vehicle Fueling Systems tentative code (EVF) in NIST Handbook 44 since the addition of that code in 2015. Therefore, the Committee relocated and renumbered the proposal to become agenda item EVF-20.2 and maintained its status as a Voting Item

- NIST is the submitter of this proposal. An EVSE supplies and assesses charges (in units of the kilowatt-hour) for electrical energy that is used to fuel a vehicle. An EVSE may also have the capability to separately assess fees for time-based and other services. Applicable EVSE handbook (44 [2015] and 130 [2013]) requirements for both electricity and time have been available for over four years.

- An EVSE is unlike other traditional vehicle refueling equipment that must comply with legal metrology requirements. Any terminology that further clarifies what constitutes a commercial EVSE and any accessories subject to weights and measures' jurisdiction is helpful to the equipment designer, installer, and regulator. Clearly distinguishing where the responsibility for such equipment begins and ends is essential. Being able to make this distinction may also be useful to ensure installations are not interfaced with other equipment that might have a detrimental effect on the normal operation of an EVSE or it's metrological integrity. At some point jurisdictions may also deem it necessary to establish policy to clarify for staff, industry, and the public, weights and measures' role and relationship to the service utility, station owner/operator, and end user. Because there are multiple jurisdictions (i.e., 34 states) where legislative bodies are making decisions about which entity has legal authority over the sale of electricity as a vehicle fuel, this proposal should be considered on a national basis.

- NIST continues to encourage jurisdictions that actively regulate submetering equipment to study the proposed modification to the definition of "submeter" as it relates to current local requirements and provide input to the S&T Committee on Agenda Item OTH-20.1.

- The NIST USNWG on EVF&S's Electric Vehicle Fueling Equipment Subgroup held web meetings on January 7, 2020 and January 13, 2020 to discuss this proposal (along with other EVFS-related items on the Committee's Agenda) and comments received thus far. At the January 7 meeting, the Subgroup voted and agreed to recommend to the NCWM S&T Committee that this item be designated as a Voting Item and the proposed changes shown in the Item Under Consideration be recommended for adoption at the July 2020 NCWM Annual Meeting.

- NIST agrees the proposed modification of the "submeter" definition to recognize commercial electrical equipment that is a *meter* or is designed to operate as a system is a more accurate description of the possible configurations of key components in an *electric* submeter device application. While there was no intent to limit the definition to those devices, OWM concurs with the designation at the 2020 NCWM Interim Meeting to limit the definition to Code 3.40 given comments received.

- OWM continues to note there are other instances where what are generally referred to as "submeters" are in use to supply and bill end users for utility-type commodities other than electricity; for example, commercial equipment addressed in NIST Handbook 44 Section 3.33 Hydrocarbon Gas Vapor-Measuring Devices and Section 3.36 Water Meters. A definition for submeter, even if different than that developed for Code 3.40, may be needed as a future proposal to help make any distinctions among terminology used in the different submeter industries.

- OWM agrees with 2020 NCWM Interim Meeting comments from Kurt Floren, L.A. County, CA noting the need for a definition of "master meter" in NIST Handbook 44 or perhaps an alternate term. OWM acknowledges the term as used in this definition has a specific meaning for the electric metering industry. Since the Committee agreed to present this as a Voting item, OWM suggests that the term be further discussed in concurrent discussions within the Electric Watthour Subgroup to determine if alternatives might be identified. No meetings of that Subgroup have been held since Fall 2019 and no immediate meetings are scheduled; however, OWM will certainly include this issue on the agenda of a future meeting if scheduled. In the meantime, OWM encourages individual members of the Subgroup to individually provide any input as they feel appropriate.

- OWM also notes the term "master meter" is one of several terms being discussed within the S&T-assigned group to address "terminology" regarding standards used in inspecting and testing of commercial weighing and measuring equipment. Perhaps there will be some suggested alternatives coming out of that work that could be considered.

- The proposal should correctly reflect changes to the definition of submeters that is currently in NIST HB 44 Section 3.40 as follows:

  submeter. – A meter or meter system downstream of ~~furnished, owned, installed, and maintained by the customer who is served through a utility owned~~ the master meter. [3.40]

WWMA: - 2019 Annual Meeting. The Committee agrees this proposal has merit and that it is fully developed and should be given a Voting status. The Committee also recognizes that the stated Purpose should be amended to state the change would affect to EVSE Code paragraph 3.40., Appendix D, Definitions as shown.

~~**submeter.** – A system furnished, owned, installed, and maintained by the customer who is served through a utility owned master meter. [3.40]~~

Submeter - a meter or meter system downstream of the master meter. [3.40]
(Added 20XX)

During open hearings the Committee heard comments from Ms. Lisa Warfield (NIST) stated that this item is fully developed and ready for a Voting status. Mr. Kevin Merrit (ID) asked the question would this language apply to a LPG meter? Ms. Warfield responded that this does not apply to a LPG meter and that the definition for "submeter" referred to in this proposal should not be confused with the use of "master meter" as used when referring to calibrations. Mr. Kurt Floren (LA County, CA) asked the question "is the term master meter defined?" Ms. Warfield responded that the term "master meter" is defined and that the definition was derived from that definition from Measurement Canada.

CWMA: The only comments the S&T committee heard, from both NIST OWM and state regulatory officials, expressed a concern with the use of the word "master meter." Tina Butcher (NIST OWM) explained that the term

"master meter" has a widely accepted definition in the electric vehicle and watt hour industry. We feel this item is fully developed and recommend this item move forward as a voting item.

EVF-21.1 A.1. General

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF-21.1 – A.1. General (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA		✔					
SWMA		✔					
CWMA Interim (2020 Fall)		✔					
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)			✔				
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

- As worded the proposal is: (1) unclear on the exact type of use that entitles an EVSE to an exemption from all code requirements and (2) in conflict with General Code paragraph G-A.6. Nonretroactive Requirements. The proposal wording states "EVSE used for commercial purposes and put into service" on or before January 1, 2022 (AC systems) and January 1, 2023 (DC systems). The commerce and service use aspects of a device are one in the same. Does the submitter mean to use the word "or" rather than "and?" The General Code specifies nonretroactive requirements are enforceable on or after the effective date for devices used in noncommercial applications which are then placed into commercial use after the effective date.
  - If the intent is to make these requirements retroactive after some date, this needs to be clearly stated as such.

- The proposal, if adopted, would mean an entire generation of devices will be permitted to operate for a ***10-year period*** without having to comply with ***any*** HB 44 Section 3.40 requirements for indications, receipts, accuracy, security for metrological features, specific code markings, etc. for what may well be the lifetime of the device.

  - If the intent is to provide relief to devices that have already been installed and are in use, the effective date of such exemptions ***should only apply to those devices already in service***, not to devices installed between now and the effective date of any proposed exemption. A concern is that companies will continue to install noncompliant devices, fully knowing they are not capable of meeting existing requirements to take advantage of the extended window of time

  - For jurisdictions that don't automatically adopt the current version of NIST Handbook 44, this window of time during which noncompliant devices can continue to be installed will be even longer.

  - To allow such a blanket exemption does a disservice to the electric vehicle refueling industry and would be viewed as competitively unfair to traditional and other alternative vehicle fueling applications which are required to comply with similar requirements.

  - A related concern is that some competing companies are spending money to comply with current requirements, yet competing with a population of existing equipment to which no requirements would apply.

  - At least one EVFS company has stated their equipment is currently able to comply with the existing requirements. Delaying the effective date of the entire code may negatively impact that company's ability to request approval by a weights and measures jurisdiction for equipment that is currently installed.

- The USNWG EVF&S has been widely advertised and all stakeholders (including EVFS OEMs) encouraged to join. Many companies have been an integral part of the development of these requirements and have expended considerable funds to bring their equipment into compliance; these companies would be placed at a competitive disadvantage if a large group of competing devices were to be exempted from the requirements. Inconsistent marketing practices can frustrate value comparisons among competing devices, creating confusion on the part of consumers and affecting their acceptance of products/services offered through those devices.

- There will be no notice to consumers that purchasing electricity from one site does not provide the same assurance of accuracy that is provided at another site. Some dispensing systems in operation will be tested and verified to a stated accuracy and some dispensing systems in operation will be subjected to no accuracy requirements even though both are selling to the same customer base and application

- If there are concerns about specific provisions in the code, these need to be addressed by making specific sections "nonretroactive," not by exempting the device from the requirements of the specific code in entirety. Such paragraphs could then include specific enforcement dates to allow a phasing-in period over which the device would be brought into compliance.

- Should specific timelines be established for given requirements, the fact that the EVFS codes have been available for five years (and was under development by regulators and industry for three years prior to that) should be factored into any timeline and justification for enforcement dates.

- OWM continues to believe that, should individual requirements in the code be creating compliance issues, these requirements should be addressed by adding nonretroactive/retroactive dates to those specific requirements individually rather than apply such dates to the code in its entirety. There is less reluctance to adopting a phase-in date that includes an accompanying sunset date. Providing the statistics on the population of devices that will exist with no requirements will be important.

- The submitter needs to consider that, even if an effective date is added to an entire device-specific code, Section 1.10 General Code requirements will still apply.

- To counter opposing arguments the community typically asks for updated statistics, in this case what is the ratio of AC and DC EVSEs and average costs to retrofit them; however, the combined effect of all four industry proposals addressed in this set of OWM comments will result in multiple new designations and classes of EVSEs permitted an exemption from handbook requirements. It may be difficult to determine how large the population of exempted devices will be compared to those that must comply.

- Are the "existing installed devices" representative of multiple generations of equipment and remanufactured EVSEs in commercial service?

- The description of the marketplace as having "existing stations that often do not include an integrated meter" might be an indication that available EVSEs placed into commercial use before the enforcement date will have limited or no legal metrology components. This calls into question the level of accuracy for commercial transactions conducted with these devices and any assurances to consumers of such accuracy.

WWMA: Tesla, EV Connect, EV Go – Francesca Wahl – presentation: Sec 3.4 charging evolves and technology changes. They are trying to address the tentative code CA is now using. Charging involves many different speeds and levels. Trying to fit charging into what consumers are doing rather than making it a separate event (based on convenience). Metering technology is now becoming more commercial. Retro-fit costs are excessive. Add the 10 year phase-in that CA currently recognizes. Copy of the presentation that was provided is available on the WWMA website.

Kevin Schnepp (CA DMS) commented that the 10- year extension was political in CA and may not be necessary at the national level. He believes the indicator should not be solely tied to a mobile device. The extension of the

accuracy may not be necessary for the national level. Note that some areas have sub-meters at residential units that fall under commercial device applications. CA-DMS would ask the committees look at the concessions that CA made as to whether or not this should be applied to HB 44.

Mahesh Albuquerque (CO) supports all of the proposals to move on to a voting item. He agrees with the comments made but wants to keep the process moving forward. Perhaps change the exception time to say "up to 10 years" allowing jurisdictions to make their own determination.

Juana Williams (NIST OWM) submitted written comment after open hearings and will be posted on the WWMA website.

The Committee agrees to recommend this item be assigned a developing status. The Committee also recommends the submitter continue to work with their stakeholders and jurisdictions to develop the item and consider language with regards to the 10-year period.

SWMA: During the Open Hearing the Committee heard from Francesca Wahl who gave a presentation on the industry's support of these items, and willingness to develop them. The Committee also heard from Tina Butcher (OWM) who stated that the item needs terminology work, and that she had concerns about a 10-year blanket exemption for these devices. She also noted that some of these devices do not currently contain a meter. The Committee also heard from Ken Ramsburg (Maryland) who stated that he did not agree with a blanket exemption. After consideration of this item the Committee recommends that this item be given Developing Status, and assigned to the national work group.

NEWMA: The Committee agrees with comments heard from the body that this proposal is unclear and a blanket exemption for certain devices in the same category would be contrary to the NCWM mandate to create equity in the market place and could create a competitive edge against other fuels or competing devices. Additionally, the ten year exemption in an evolving technological field is not appropriate. Some suggestions were heard that the proposal could conflict with User Requirements and allow a generation of devices to be used for ten years without compliance. Therefore, the Committee recommends this proposal be Withdrawn.

CWMA: The S&T committee heard numerous comments of concern from regulatory officials on this item. The key issues addressed were the 10-year exemption, the blanket exemption from the EVFS codes, and the competitive advantage this item may present to the industry. We feel this item has merit and feel a more appropriate course of action would be to request exemptions from specific requirements vs. a blanket exemption. We recommend this item move forward as a developing item.

EVF-21.2 A.2. Exceptions

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF-21.2 – A.2. Exceptions (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA		✔					
SWMA			✔				
CWMA Interim (2020 Fall)			✔				
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)			✔				
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

- All commercial measurement transactions are subject to weights and measures regulations.

- That is, if a charge is being assessed for goods or service, the devices used to determine that charge are considered "commercial" in most states and are not exempt from weights and measures regulations. This applies whether the station is open to the general public or only available to certain customers. The key is whether there is money changing hands for the measured product or services.

- If there are no charges assessed for goods or services, for example, a company uses an EVSE to fuel its own fleet of vehicles, then these devices do not fall under the scope of NIST Handbook 44. This is already addressed in the Application section of Section 1.10. General Code and in the weights and measures laws or regulations of most states; thus, if the proposal is intended to exempt devices which are not used to make a measurement on which a charge will be based, the language is unnecessary.

- The USNWG that developed the EVFS code was asked, at the time the current tentative code was proposed for adoption, to consider whether or not there was a need to propose exemptions for specific provisions in the code for "contract" sales such as fleet sales. However, exempting commercial applications from the entire the code is inappropriate. Note also that no suggestions were made for exceptions at that time.

- Jurisdictions that adopt NIST Handbook 130 require kWh as the method of sale.

- Even exceptions to select paragraphs in NIST HB 44 for applications such as "contract sales" or "fleet sales" must still comply with method-of-sale requirements.

    - "Contract" sales or sales between two parties are still commercial transactions and, in most W&M jurisdictions, are subject to W&M regulation. This is true even if a weights and measures jurisdiction chooses not to routinely regulate a particular type of device or application.

    - Some misconstrue the reference to "contract sales" as allowing a blanket exemption from weights and measures requirements.

    - Most states would require a contract (even if just between two people and even if it's just one single transaction) to comply with legal requirements; and this is the case, whether or not the regulatory agency chooses to routinely regulate the individual device or application. Thus, a contract can't be used to avoid compliance with legal metrology requirements (such as method of sale, device requirements, transaction and pricing transparency and accuracy, etc.). Sometimes this is stated as "a contract can't be used to circumvent the law." While this sounds a little austere, it's designed to ensure that not only are both the buyer and the seller protected, but also that companies are given a level playing field and can fairly compete.

- Rather than proposing a blanket exemption to an entire code, it is preferable to identify specific paragraphs for which an exception is needed. Justification will still be needed to support the argument for why a specific exception or phase-in period is needed, particularly given the statements made by at least one company (at the July 7, 2020 EVFE Subgroup meeting) indicating their own equipment is able to meet the existing requirements.

    - Note when "exceptions" have been permitted for categories of devices such as "contract sales" or "fleet sales," those exceptions still preserve the requirement for providing full and transparent information to buyer and seller, but allow for the requirement to be met in an alternate way.

    - To help illustrate how these kinds of exceptions might typically appear, in paragraph UR.3.3. Computing Device in Section 3.30 the Liquid-Measuring Devices Code includes multiple exceptions and conditions. There are a number of other paragraphs with "exceptions" in that code which are simple "exceptions" for fleet and contract sales, but this one provides an example of how exceptions are sometimes accompanied by conditions which help ensure transparency in the transaction.

- To summarize, there can be exceptions provided which allow for alternatives such as display of information, invoicing practices, etc. for "contract" sales. However, these exceptions simply allow the information required in a legal metrology transaction to be provided in a different fashion; the overall transaction still has to be transparent and accurate and ensure equity to buyer and seller. And these exclusions need to be added to specific sections of the code and the argument made for satisfying the requirements of the measurement transaction in an alternate way.

- It's important to keep in mind that these requirements are designed to help ensure a level playing field and create an environment for fair competition. While the companies "at the table" discussing these requirements are striving to ensure accurate and equitable transactions, these provisions have to ensure that those not at the table or devices yet to be developed are held to the same standard and provide the same accurate and transparent transaction.

WWMA: Kurt Floren (LA County) commented his concerns regarding exceptions when charges are being imposed when private installations are later opening up to the general public. Initially they may fall under the exception but if they change their position from a private to a public site, how would this be addressed? Suggests the proposal needs to be clarified. A blanket exemption is not sufficient. Thought needs to be given to devices falling under the exception may not be appropriate nationwide.

Jeremy Whaling (EVgo) commented in response to Kurt Floren (LA) that if a business went from private to public their devices would have to comply.

Brad Juhasz (EVConnect) commented that most charging ports are level 2 charging sites. The goal is to avoid unnecessary costs to participants in controlled applications. Fleet sales and contract sales are common in private work and living spaces and the interest to the general public is not in play.

Matthew Douglas (CA DMS) concurred with Kurt Floren's concerns. Also added 21.2, A.2.(e), should be amended to stay under jurisdictional regulation.

Tina Butcher (NIST OWM) commented, if the device is being used commercially, NIST handbook 44 applications will apply. The general approach to HB 44; consumers and businesses expect to see the amount, cost and final amount the device charges. Fleet and contract sales are common exceptions throughout HB 44. The current proposal is an exception to all the requirements. A better method is to identify solutions where they may not comply with current code. Rather than allow a blanket exception it may be better to pinpoint areas where exceptions need to be addressed.

She also commented that the US national working group on EVF fueling discussed these items and did not reach a consensus. Lots of debate. If a device is not being used commercially it's not covered by HB 44. Comment on exceptions: consumers and businesses expect to determine how much they receive and pay. The transactional info still needs to be provided but how it is provided may be different. Fleet sales for example do not need to show pricing because that has already been agreed upon maybe through a contract. Maybe identify those code sections where compliance needs to be met. Rather than give a blanket exceptions, consider whether specific points can be given exceptions.

Kevin Schnepp (CA DMS) Fleet sale accuracy needs to be clarified noncommercial and non-public can easily become public. Concerned to the blanket exclusion regarding multiunit residences.

Mahesh Albuquerque (CO) added all comments are good but still recommends moving forward. Additionally, he would like to harmonize all the dates.

Francesca Wahl (Tesla) clarified the blanket exception was chosen because it was straight forward but realizes it may need to be more specific. They are open to working on this moving forward.

The Committee agrees, and recommends this item be assigned a developing status. The Committee also recommends the submitter continue to work with their stakeholders and jurisdictions to develop the item.

SWMA: During the Open Hearings the Committee heard from Ken Ramsburg (Maryland) who stated that D and E needed further development. He stated that he had no issue with home chargers being considered non-commercial, but not the entire designation of "non-public" stations, such as those at workplaces. Ken also stated that he does not support the exception for stations used in contract sales, as that exemption does not exist for petroleum fueling stations. The Committee also heard from Tina Butcher (OWM) who stated that she agrees with Ken. Tina also stated that if these devices are not commercial, then this statement is not needed, as Handbook 44 is for the regulation of commercial devices. Tina also clarified that although exceptions can exist, such as those for fleet sales, the device is still considered commercial. After consideration of this item the Committee recommends that it be withdrawn.

NEWMA: The Committee agrees with the body that this proposal has no merit and should be considered a Withdrawn Item. During the open hearings, the Committee heard multiple comments that the proposal was too vague and allowed for instances where devices used in commerce would be exempted from testing. All commercial weighing and measuring devices are subject to NIST HB44 regulations and non-public devices can still be used commercially. The national work group could not come to a consensus on this item.

CWMA: The S&T committee heard a number of concerns from regulatory officials about a blanket exemption from the EVFS code for EVSE devices located at a multi-unit residence, workplace, or other locations not open to the public. Concerns were also heard from regulatory officials about a blanket exemption for EVSE devices used exclusively for fleet sales and other price contract sales. We feel this issue is likely already covered by G-A.1. paragraph (a). We recommend this item be withdrawn.

EVF-21.3 S.1.2. EVSE Indicating Elements, S.2.4.1. Unit Price, S.2.5. EVSE Money-Value Computations., S.2.7. Indication of Delivery

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF-21.3 – S.1.2. EVSE Indicating Elements, S.2.4.1. Unit Price, S.2.5. EVSE Money-Value Computations., S.2.7. Indication of Delivery (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA		✔					
SWMA		✔					
CWMA Interim (2020 Fall)		✔					
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)		✔					
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

- The proposal includes text that will recognize personal remote/mobile devices which reads "*but are not limited to*, smartphones, tablets, or laptop computer equipped with digital display." This is a concern since laundry lists are not the norm in code requirements. The proposal could be interpreted as recognizing an endless list of auxiliary devices for use as the primary indications. Currently there are vehicles with computer monitor-sized laptops mounted to the dashboard (aka vehicle user interface or VUI) that perform a multitude of software-based functions to include communicating with the EVSE during charging.

- There is concern with measuring devices and other vehicle technology that erroneously provide the official with data not in compliance.

- For those EVSEs that take a longer period of time to deliver a charge, providing for a customer display that can be viewed remotely from the device is a definite benefit. However, that doesn't argue for eliminating the primary display from the device or an adjacent display terminal.

- The fact that these proposed new options for displays become the primary displays means their accuracy and clarity become even more critical to the measurement transaction.

- The EVSE must be capable of properly communicating the information to these alternative display mechanisms.

- If transaction information is provided in more than one location be aware that there are General Code requirements specifying that indications of like value must agree. (see paragraph G S.5.2.2.)

- "Mobile display apps" may provide the best opportunity for allowing the referenced desire for innovation since there is a mechanism for reviewing the display provided by the app and ensuring its operation provides the necessary information. The vehicle user interface, on the other hand, is problematic. They can vary from manufacturer to manufacturer and will undoubtedly change from year to year. They are not included in type evaluations nor are they realistic for regulatory officials to control to ensure clarity, accuracy, and transparency in the measurement transaction. The vehicle interface should not be provided as an option to satisfy the requirements for the primary display.

OWM Comments on Proposed Changes to S.1.2. EVSE Indicating Elements:

- California DMS considered and rejected the possibility of exempting EVSEs from having a primary indicating element in a November 2019 "Final Statement of Reasons." Among other points made, CA noted "it is impractical, unfeasible, and uneconomical for EVSE manufacturers or owners/operators to require the purchaser to provide the primary indicating element to initiate a transaction and view the required indicating information." CA also noted the manufacturer would be required to submit on-dash displays for type evaluation, which OWM believes would be impractical.

- OWM agrees with the CA assessment and conclusion, including the point that this would not preclude the consideration of other options in the future.

- Other options such as those noted in the proposed "exception" are already permitted as "supplemental" displays.

- If the laptop option would include the "vehicle user interface" display on the dashboard of the vehicle being fueled, OWM has the following concerns regarding this proposed approach.

    - If no primary display is provided on or adjacent to the EVSE, what means will officials use to conduct inspections? For example, if the dashboard of a vehicle is used to display transaction information.

    - How will the visibility and clarity of the primary display be verified since this can vary from vehicle manufacturer to vehicle manufacturer?

    - How would the overall provisions of the General Code regarding legibility, clarity, appropriateness of indications be applied when there is no display unique to a given EVSE on-site?

- "Mobile display applications" have been permitted in the Transportation Network Measuring Systems Code and are considered in that code as equivalent to the primary display. However, in that application, the measurement is not taking place in a device on site. In this case, the measuring device, the EVSE, is on site and there needs to be a primary display that will provide clear, legible, and verifiable transaction information in an appropriate format. Additionally, how would a customer verify that the measurement information shown in a mobile display represents the specific EVSE being used to fuel the vehicle?

-

OWM Comments on Proposed Changes to S.2.4.1. Unit Price:

- Also see OWM's comments under the proposed changes to S.1.2. EVSE Indicating Elements regarding concerns over the use of electronic remote displays such as a vehicle user interface or mobile display application.

- OWM questions if the submitters might be attempting to address concerns about the need to display a single unit price in the case of fleet or contract sales which may set the pricing conditions as part of the contract. If this is the source of the concern, an alternative might be to propose an exemption to this specific requirement for "dispensers used exclusively for fleet sales, other price contract sales…" where requirements would be met in an alternate way.

OWM Comments on Proposed Changes to S.2.5. EVSE Money-Value Computations:

- Also see OWM's comments under the proposed changes to S.1.2. EVSE Indicating Elements regarding concerns over the use of electronic remote displays such as vehicle user interface or mobile display application.

OWM Comments on S.2.7. Indication of Delivery:

- Also see OWM's comments under the proposed changes to S.1.2. EVSE Indicating Elements regarding concerns over the use of electronic remote displays such as a vehicle user interface or mobile display application.

- CA DMS suggested changing the term "show" to "display." OWM believes this is an appropriate change.

- If clarifying language is needed, OWM would propose the following:

S.2.7. Indication of Delivery. - The EVSE shall automatically ~~show~~ display on its face the initial zero condition and the quantity delivered (up to the capacity of the indicating elements).

WWMA: Francesca Wahl (Tesla), Jeremy Whaling (EVgo) and Brad Juhasz (EVConnect) commented that there is confusion as to where the primary indicator should be located. Technology is rapidly changing and the movement is towards different formats. This addresses the ability to have the display on mobile devices. Looking at this issue as a global issue rather than US transportation companies. Most customers exit the vehicle while charging and want to be informed real time as to the charging process.

Matthew Douglas (CA DMS) stated the indicator should not be a burden to the consumer. The indicating element should be part of the device. If they want additional displays that are appropriate, that's okay, but the primary indicator should be part of the device.

Juana Williams (NIST OWM) submitted written comment after open hearings and will be posted on the WWMA website.

The Committee agrees, and recommends this item be assigned a developing status. The Committee also recommends the submitter continue to work with their stakeholders and jurisdictions to develop the item. The Committee further recommends the submitter revise the item to make the primary indicating element be an integral part of the device with any other indicating elements being secondary.

SWMA: During the Open Hearings the Committee heard from Francesca Wahl, who stated that the car dash screen or customer's device would be used as the indicator. The Committee has concerns about relying on the customer's device as the only indicator, and issues that could present for the inspection procedure. After considering this item the Committee recommends that it be given Developing Status and developed further by the national work group.

NEWMA: The Committee agrees with the body that this item has merit, but due to the emerging technology, more analysis is needed. There are also concerns that charging stations do not have indicators and different vehicle indicators or apps may not be equally effective as measuring tools. Therefore the Committee recommends this proposal to be considered a Developing Item. A comment was heard that the national work group anticipates the display will be app based but has concerns with specific language of open ended device/display types, such as vehicle user interfaces which may not be as well developed.

CWMA: The S&T committee heard several concerns on this item from regulatory officials. Some of the concerns dealt with the availability of access to the apps/integrated vehicle display at the time of inspection or following up on a consumer complaint. Another concern is the security of the communication between the device and the display. These devices may need to be submitted to NTEP for type evaluation similar to POS systems and software used to generate scale tickets even if they are not the primary indicating element. We feel this item has merit and recommend this item move forward as a developing item.

EVF-21.4 S.3.3. Provision for Sealing

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF-21.4 – EVF-21.4 S.3.3. Provision for Sealing (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
SWMA	✔						
CWMA Interim (2020 Fall)	✔						
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)	✔						
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

- To date, these discussions (as recently as Fall 2019) have been met with resistance from officials who have limited or no access to reliably being able to obtain electronic forms of audit trail information. However, this proposal may have addressed past concerns expressed by officials since the modification to the sealing requirement specify both the printed and/or electronic audit trail record(s) will be easily accessible and in a usable format *at the time of inspection*.

- There are *already* requirements in place that require the audit trail has to be decipherable and readable and readily understandable, so that information is usable by the inspector. These current requirements also apply to the size of the display, accessibility, and readability of electronic versions of an audit trail record provided through a device.

- Additionally, an inspector can use the provisions of General Code paragraph G-UR.4.4. Assistance in Testing Operations to require assistance from the device owner/operator in obtaining the needed information during an inspection.

- NIST OWM acknowledges there are two similar proposals to recognize an electronic format for audit trail information being considered for Category 3 liquid measuring devices (LMD-20.1 and LMD-21.1). The proposed changes were developed after giving consideration to past concern expressed about the visibility, accessibility, and legibility of an electronic display/record, current applicable handbook requirements for the design of system components and accessibility in testing, along with the capabilities of technology.

USNWG'S EVFE SUBGROUP:

At the conclusion of its August 10, 2020 meeting deliberations the EVSE Subgroup agreed to a reworked industry proposal that modifies Table S.3.3. sealing requirements for Category 2 and Category 3 EVFSs to recognize the required audit trail record for these systems may be provided electronically in lieu (place) of or in addition to a hard copy at the time of the official's inspection. The Subgroup agreed the proposed modifications to Table S.3.3. should be part of the EVFS Code and recommends that the U.S. Regional and NCWM S&T Committees support this proposal move forward as a Voting Item for adoption at the July 2021 NCWM Annual Meeting.

WWMA: Kevin Schnepp (CA DMS) commented that CA is in support of this item. It recognizes the changes of tech and will not have to add any costs of having a physical printer on the device.

Tina Butcher (NIST OWM) commented that this item originated from the national working subgroup. This is a desire to move to alternative formats. The group recognizes this is the way of the future. It also recognizes these types of installations do not have people on site. W&M inspectors may be impeded during their inspection. The General Code allows the owner to provide assistance.

Mahesh Albuquerque (CO) supports this item.

The Committee agrees the item is fully developed and recommends assigning this item a voting status.

SWMA: During Open Hearings the Committee heard from Alan Walker (Florida) who asked for clarification on sealing these devices. The Committee also heard from Dianne Lee (OWM) who stated that NIST supported moving this forward as a Voting Item. She also stated that the Subgroup consensus was to permit an electronic event log. After considering this item the Committee recommends the item move forward as a Voting Item.

NEWMA: The Committee agrees with the body that this proposal be considered a Voting Item. This item was submitted by NIST on behalf of the national work group, which believed it was fully developed and ready to be voted on. There is some concern that the electronic logger may provide an imposition for W&M inspectors that do not have a smart phone/laptop/internet service, but the User Requirement of assistance from the device owner should resolve any concerns. LMD 21.1 has a similar proposal and should have language aligned for the sake of consistency.

CWMA: The only comments heard by the S&T committee on this item were from Tina Butcher (NIST OWM). She advised that this item has come out of the work of the USNWG EVF&S and is fully developed and recommended this item for voting status. The committee agrees.

EVF-21.5 T.2. Load Test Tolerances.

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF-21.5 – T.2 Load Test Tolerance (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA		✔					
SWMA		✔					
CWMA Interim (2020 Fall)		✔					
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)			✔				
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

- Are there existing devices that can meet the current requirements? If so, what are the justifications for proposing the relaxing of the tolerances, particularly without a sunset date (i.e., a retroactive date)?

- From a technical perspective, OWM would be less reluctant to seeing the adoption of a phase-in date that includes an accompanying sunset date (i.e., a retroactive date). OWM asks what concrete issues can be cited to counter opposing arguments for a window for phasing in DC systems? Again, providing the statistics on the population of devices that exist while not in compliance with requirements will be important.

- This is not a typical practice to be done on an unlimited basis. This would be more palatable from both a competitive and enforcement standpoint If there are specific technical issues, etc. that necessitate and justify this on an industrywide basis.

- Are the "existing installed devices" representative of multiple generations of equipment and remanufactured EVSEs in commercial service?

- There will be concerns about a dual tolerance structure. Of particular concern is there is no proposed marking or other information to alert consumers that purchasing electricity from one fueling device does not provide the same accuracy assurance that it does from another fueling device. Multiple tolerance tiers frustrate value comparisons. Consequently, what provisions will be in place to identify a system's accuracy?

    - If these proposed changes are to be pursued, an accompanying proposal requiring the marking of accuracy level must be included to alert consumers to the difference in accuracy levels.

- How many devices are out there that would be put into use and competing with AC devices, thus creating a competitive advantage for DC devices?

- An additional concern is that companies are spending money to comply with the existing NIST HB Section 3.40 tentative code, yet competing with a population of existing equipment. An additional question is: How big is that population exactly?

WWMA: During the open hearings for these items a presentation by Tesla, EVConnect and EVgo was given in which a slide spoke to this item stating the need to separate the requirements for AC and DC systems. Extending the tolerances based on the extension of time allowing time for higher accuracy phase in.
Kevin Schnepp (CA DMS) believes the phase in for tighter tolerances may be too long. Accuracy will become a greater issue as this becomes more prevalent. Clarification needs to be made; the submitter references public access,

we deal with commercial use. The term public access should be changed to commercial use. Also, with technology changing so rapidly, 13-year phase in period is too long. Kurt Floren (LA County) agrees with Kevin's comments. Tina Butcher (NIST OWM) agrees with Kevin and consumers generally expect the tolerances be the same. Look at a shorter period of time to avoid consumer confusion.

The Committee agrees, and recommends this item be assigned a developing status. The Committee also recommends the submitter continue to work with their stakeholders and jurisdictions to develop the item. The Committee further recommends the submitter provides additional data beyond their original justification to support the necessity for two separate tolerances.

SWMA: During the Open Hearing the Committee heard from Ken Ramsburg (Maryland) who stated that he would like real world data before determining the tolerances. He also stated that the proposed tolerance is more than double the current tolerance. After considering this item the Committee recommends this item be given Developing Status, and be developed further by the national work group.

NEWMA: The Committee agrees with the body that this item has no merit as there is lack of sufficient data. The committee recommends that the proposal be Withdrawn. During open hearings, the Committee heard comments that the national work group could not come to a consensus on this item. There are concerns that consumers would be unaware of different devices in the same category operating on different tolerances. More data needs to be offered to show accuracy capabilities. Tolerance parameters set until 2033 is too distant for this fast paced technological field that is rapidly changing.

CWMA: The S&T committee heard concerns from regulatory officials that this item does not have a sunset date, so devices installed prior to January 1, 2033 would be allowed a higher tolerance for the life of those devices. The committee also heard comments that a limited amount of data was available to support the higher tolerances. We feel that this item has merit and recommend it move forward with a developing status.

EVF-21.6 Definitions: minimum measured quantity (MMQ)

Organization (*) not submitted (**) no meeting (***) no recommendation	EVF-21.6 – Definitions: minimum measured quantity (MMQ) (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
SWMA		✔					
CWMA Interim (2020 Fall)	✔						
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)	✔						
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

- The reference to amending the Handbook's Appendix D in the "Item Under Consideration" is incorrect. The proposal recommends the term MMQ be included only in the device-specific code's definitions section in the last portion of Code Section 3.40 Electric Vehicle Fueling Systems –Tentative Code Definitions (i.e., page 3-165), not Appendix D, Definitions (i.e., page D-18) intended for codes that have permanent status. The text should read: "Item Under Consideration: Amend NIST Handbook 44, **Electric Vehicle Fueling Systems-Tentative Code** Appendix D. Definitions as follows:"

- In 2014 the USNWG on EVF&S developing HB 44 Section 3.40 EVFS-Tentative Code inadvertently omitted the term MMQ from the device-specific code's Definitions. The term is applicable to these systems because it is a unique marking requirement and its value is used in the determination of test loads and tolerances.

- In an anticipation of upcoming EVSE type evaluations and field enforcement action by U.S. officials, the term MMQ needs to be defined since it is currently cited in the EVFS design, test notes, and tolerance requirements in the NIST Handbook 44 Section 3.40 EVFS Tentative Code.

- NIST OWM believes the omission could best be remedied by a vote at the July 2021 NCWM Annual Meeting to adopt the proposal for including the term MMQ in the Definitions section of NIST HB 44 Section 3.40 EVFS - Tentative Code.

EVFE SUBGROUP:

At the conclusion of its August 10, 2020 meeting the Subgroup acknowledged the oversight on omitting the definition of "minimum measured quantity (MMQ)" from the EVFS Code. The Subgroup agreed the definition should be part of the EVFS Code and recommends the U.S. Regional and NCWM S&T Committees that this item be designated as a Voting Item for adoption at the July 2021 NCWM Annual Meeting.

WWMA: Tina Butcher (NIST OWM) commented, they think it's a housekeeping item, not technically substantial. There has been some discussion in the national working group as to whether the MMQ is relevant. But this is only dealing with the definition.

The Committee agrees this item is fully developed and recommends a voting status. The Committee noted that an editorial correction needs to be made removing the word "to".
SWMA: During the Open Hearing the Committee heard from Dianne Lee who stated that NIST supported moving this item forward as a Voting Item. After considering this item the Committee recommends that it be given Developing Status and be developed further by the national work group.

NEWMA: The Committee agrees with the body that this proposal should be considered a Voting Item. This item was submitted by NIST and supported by the national work group. There is an error in the agenda and the item under consideration should read section 3.40, not Appendix D. This item duplicates the definition in Appendix D and provides a needed definition for a term being used (MMQ) within the tentative code. The item received no opposition during the open hearing.

CWMA 2020 Interim: The only comments received by the S&T committee were from Tina Butcher (NIST OWM). She explained that this item is to correct an inadvertent omission to the EVFS code. She also advised that the submitted item should be changed as follows to add this definition to the EVFS code and not Appendix D.

Item Under Consideration:
Amend NIST Handbook 44 NIST, Section 3.40. Definitions as follows**:**
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, 3.40]

We feel that this item is fully developed with the change made above and recommend this item move forward as a voting item.

TXI – Taximeters

See Block 3 Items: Tolerances for Distance Testing.

TIM – Timing Devices Code

TIM-20.1 V S.1.1.3. Value of Smallest Unit.

Organization (*) not submitted (**) no meeting (***) no recommendation	TIM-20.1 – S.1.1.1. Value of Smallest Unit - Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
***SWMA							
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim	✔						

NIST OWM: In the 2015 updates to the Timing Devices Code to addresses the EVSE application specific requirements were inadvertently omitted for a suitable maximum value of the quantity-division for EVSE time-based indications. Specifying the maximum size of the measurement unit is consistent across the handbook codes, essential for the selection and set-up of suitable dispensing equipment, and necessary to facilitate transparency in sales transactions. EVSE time-based services are recognized along with electrical energy fees and must be clearly indicated and recorded and can vary because they:

- range in length over the course of a charging session which can be 20 minutes to 12 hours
- can include additional time-based fees (such as idling after a full charge) or
- might be assessed in conjunction with the electrical energy delivery.

An EVFS is also required to make available, in either printed or electronic format, complete and clearly defined transaction information about the start and stop time of a service, power loss event, or rate change.

Consequently, NIST proposes reorganizing and modifying current paragraph S.1.1.3 Value of Smallest Unit to specify the maximum unit of time for an EVSE equipped with an integral time measuring feature. In response to CWMA's recommendation the proposal be assigned developing status as it is unclear when to apply (b) and (c); each commercial timing device type is addressed in separate subparagraphs (i.e., (a) parking meters, (b) EVSEs, and (c) for all other timing devices such as air dispensers, laundromat dryers, etc.).

A corresponding recommendation has been submitted to modify the corresponding EVFE requirement in NIST Handbook 44 Section 3.40. EVFS-Tentative Code to specify the maximum permissible value of the electrical energy unit for systems.

The NIST USNWG on EVF&S's Electric Vehicle Fueling Equipment Subgroup held web meetings on January 7, 2020 and January 13, 2020 to discuss this proposal (along with other EVFS-related items on the Committee's Agenda) and comments received thus far. At the January 7th meeting, the Subgroup voted and agreed to recommend to the NCWM S&T Committee that this item be designated as a Voting Item and the proposed changes shown in the Item Under Consideration be recommended for adoption during the Spring 2020 regional associations meetings and at the July 2020 NCWM Annual Meeting to clarify the appropriate increment value for the indicated and recorded time charges.

WWMA: - 2019 Annual Meeting. The Committee agrees that the item is fully developed and should be given a Voting status. There were no comments heard during the open hearing session on this item.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard no comments on this item. After consideration of this item the Committee decided to make No Recommendation on this item.

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item be moved to a voting status. Mr. James Cassidy (MA) and Mr. Jim Willis (NY) voiced support.

CWMA: - 2019 Interim Meeting. Doug Musick, KS, commented that it may not be clear when part (b) and (c) apply. We recommend this item move forward as a developing item

2020 Interim Meeting. The S&T committee heard no comments during open hearings on this item. We feel this item is fully developed and recommend this item move forward as a voting item.

GMA – Grain Moisture Meters 5.56 (a)

GMA-19.1 D Table T.2.1. Acceptance and Maintenance Tolerances Air Oven Method for All Grains and Oil Seeds.

Previously GMA-3

Organization (*) not submitted (**) no meeting (***) no recommendation	GMA – 19.1 – Table T.2.1 Accept. & Maint. Tol. Air Oven Meth for all grain and oil seeds- Initial Status – D (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
WWMA		✔					
SWMA		✔					
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
GA NTEP Sector		✔					
NCWM S&T Committee Interim		✔					

NIST OWM:

During the NTEP Grain Analyzer (GA) Sector 2019 meeting, the Sector reviewed data from Arkansas for Long Grain Rough Rice (LGRR) and other grains. The data showed that the proposal to tighten the acceptance and maintenance tolerance may not be appropriate for all grain types. The original data presented and which was used as a basis for the proposal applied to corn and soybeans. After reviewing the data, the Sector decided to collect inspection data from across the country. An industry representative offered to assist with data analysis and along with the NIST representative will work in producing the inspection data needed for the analysis. A request for State participation will be sent to State weight and measures. The Sector requests that this remain a developing item as they move forward in evaluating additional data.

At the 2020 Interim Meeting the S&T committee agreed to retain this item as developing in anticipation of additional data that is being collected to assess the proposed tolerances and the appropriateness of the change to tolerances for other grain types. The NIST Technical Advisor is working with the Grain Analyzer Sector and States to collect additional data on the proposed changes to the tolerances with plans to present data at the next NCWM meeting. NIST OWM agrees with the S&T committee that this item should be given a developing status until additional data is examined.

History

The GA Sector originally forwarded this proposal to the regional weights and measures associations with a proposed voting status. All regional weights and measures associations agreed to forward the proposal as a voting item on the 2019 NCWM Interim Agenda and the Sector appreciates their review and support. However, following the regional meetings additional data was submitted to the sector which indicates a need to consider developing different tolerance for some grain types. Through a subsequent ballot, and a majority vote, the sector agreed to recommend changing the status of the item to developing to provide the Sector time to consider additional data and changes to its original

proposal. OWM agrees with the Grain Analyzer (GA) Sector's revised decision to change the status of this item to "developing."

This proposal to change the air-oven method tolerances was developed during the 2018 GA Sector meeting. During the 2018 GA Sector Meeting, Dr. Charlie Hurburgh provided the Sector with an analysis of data for 2-corn and 1-soybeans samples which included the average error for UGMA grain moisture meter technology and the average error of 2 MHz grain moisture meter technology from Iowa State weights and measures inspection data for years 2014-2017. Based on the Sectors review of the data, discussion of new tolerances, and the ability of the technologies to meet the new tolerances the Sector agreed to change the tolerances based on the data provided.

During additional discussion of what tolerances to apply to other grains, it was proposed that the same tolerances could apply to all grains, because corn is one of the more difficult grains to test and would likely have one of the largest variations when testing. No objections from States or meter manufacturers were provided during the discussion and voting to forward the item to the State regional weights and measures associations. Following the Sector meeting one State noted that there may be an issue with applying the tolerance to some grain types, specifically long grain rough rice. The GA Sector's technical advisor requested that the State forward field data to review the grain moisture meter results for LGRR and other grains. After review of the data with the proposed tolerances it was determined that a high meter failure rate could result with a change to the tolerances for some grain types.

After the Sector's Technical Advisor discussed the findings with the NTEP laboratory and the Sector members that originally proposed the tolerance change and they agreed with proposing a developing status for this item, the Sector was officially balloted and also agreed to change the originally proposed voting status to Developing to allow the Sector time to review additional data and make changes to its original proposal.

WWMA: - 2019 Annual Meeting. The Committee agrees the item has merit however, based on input provided from the NTEP Grain Analyzer Sector there will be additional data provided to the Committee prior to the 2020 NCWM Interim Meeting. The Committee agrees the item should be designated as a Developing item.

During open hearings the Committee heard comments from Mr. Russ Vires (SMA) stating the SMA takes no position on this item and looks forward to additional analysis by the submitter.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Russ Vires (SMA) who had no position on this item. The Committee also heard comments from Diane Lee (NIST) who stated that nationwide testing on more grains would be taking place to aid in any tolerance change determinations. She recommended this item remain Developing. After consideration of this item the Committee recommends this item to remain a Developing Item so that more detailed tolerances can be determined.

NEWMA: -

2019 Interim Meeting. The Committee and the body agree that this item should continue as a developing item. No comments were heard during open hearings.

CWMA:

2019 Interim Meeting. Doug Musick, KS, commented that AR had concerns that meters may not be capable of operating within these tolerances for some grains. Ivan Hankins supports developing status until more data is received. We recommend this item move forward as a developing item.

2020 Interim Meeting. The S&T committee heard comments from G. Diane Lee (NIST OWM) giving an update from the NTEP Grain Analyzer Sector work on this item and requested this item remain developing so they can complete their work on this item. The committee recommends this item remain with a developing status.

SMA: - Spring 2019 Meeting. The SMA takes no position on this item at this time and looks forward to additional analysis performed by the submitter.

GMA-20.1 V S.2.5 Provision for Sealing

Organization (*) not submitted (**) no meeting (***) no recommendation	GMA–20.1: S.2.5 Provision for Sealing. New Item (1 Item) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
*WWMA							
*SWMA							
*CWMA Interim (2019 Fall)							
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
*NEWMA Interim (2019 Fall)							
**NEWMA Annual (2020 Spring)							
GA NTEP Sector	✔						
NCWM S&T Committee Interim 2020	✔						

NIST OWM: These proposed changes are to address errors that were adopted into the 2020 version of NIST HB 44 GMM Code, Table S.2.5 when language was added with the intent to specify that all grain analyzers have an event logger.

In the 2020 version of NIST HB 44, the sealing table in Section 5.56(a) was changed to (1) add a nonretroactive date of 2020 to the sealing table: (2) change Category 3, which uniformly across NIST HB 44 Codes applies to "remotely configurable devices" to "configuration capability access may be unlimited or controlled through a software s witch:" (3) removed Category 3a and 3b.: and (4) add footnotes to the table that specified when requirements would apply.

The errors that occurred with these changes are:

- the table only applies to devices placed into service after the nonretroactive date of 2020 and the table should apply to all devices placed into service after 1999
- changing the existing table for which older devices were approved may cause some older devices to no longer meet requirements for which they were previously approved; and
- Category 3 throughout NIST HB 44 applies to remotely configurable devices, although the Grain Moisture Meters Code 5.56(a) has a category 3a and 3b to apply to other forms of sealing that would need to have an event logger, a change to Category 3 creates nonuniformity across the codes.

The NIST OWM proposal provided at the 2020 Interim Meeting included a paragraph with dates stating when to apply the sealing requirements for the 2019 HB 44 version of GMM 5.54 (a) table S.2.5. and a paragraph with dates stating when to apply the new requirements for sealing. The format of this wording is consistent with convention used in NIST HB 44 Section 2.20. Scales Code, paragraph S.2.1.3. for expressing effective dates. Table S.2.5. will remain the same as the 2019 version of NIST HB 44, GMM 5.54 (a). The proposed language to correct the errors in the code were voted and approved by a majority vote of the Grain Analyzer Sector. NIST OWM agrees with the Sector that the proposed language provide a method of transitioning to new sealing requirements for grain analyzers without disruption to older devices already in use in the field.

At the 2020 Interim meeting comments were received in support of this item and the S&T Committee assigned a voting status to this item. It was also noted at the 2020 Interim Meeting that editorial changes may be needed to paragraph S.2.5.2. of the proposal which differs from other codes in HB 44. Paragraph S.2.5.2 requires the capacity of the event logger to retain records 25 times the number of sealable parameters but not more than 1000 records are required, and this has been in the sealing table since 1999. This differs from other codes that require 10 times the number of sealable parameters but not more than 1000 records are required NIST OWM suggest that any proposed change to record retention be forwarded to the GA Sector for a technical review, and if necessary, a proposal for changes be made.

OWM questioned whether the word "appropriate" used in S.2.5.1. is necessary, as other codes are not formatted in this manner. Additional feedback from the Sector will be solicited.

NIST OWM provides the following editorial changes to simply the proposed changes and keep similar language from the 2019 edition of NIST HB 44 GMM 5.54 (a). Below are suggested editorial changes to GMA-20.1.

GMA-20.1 V S.2.5. Provisions for Sealing.

Source:
NTEP Grain Analyzer Sector

Purpose:
Correct an error caused by a 2019 amendment that inadvertently removed applicability of the provisions in Table S.2.5. for any devices manufactured prior to 2020.

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

S.2.5. Provision for Sealing. – For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:

~~Provision shall be made for applying a~~ **An approved means of** security **shall be provided** ~~seal in a manner that requires the security seal to be broken, or for using other approved means of providing security (e.g., audit trail available at the time of inspection~~ as defined in ~~**paragraphs**~~**Table** ~~S.2.5.1~~ S.2.5.***Categories of Device and Methods of*** Sealing ~~**Requirements**~~ **for Devices Manufactured Between January 1, 1999 and January 1, 2020** ~~Categories of Device and Methods of~~ **and paragraph** ~~**S.2.5.2**~~ **S.2.5.1. Sealing Requirements for Devices Manufactured on or after January 1, 2020**) before any change that affects the metrological integrity of the device can be made to any mechanism.

(Amended 2019, **2020**~~**20**~~**21**)

~~**S.2.5.1. Sealing Requirements for Devices Manufactured Between January 1, 1999 and January 1, 2020**~~**21. The appropriate sealing requirements in Table S.2.5.1. shall apply.**~~

~~***Table S.2.5.1.***~~ **Table S.2.5**

Categories of Device and Methods of Sealing

For Devices Manufactured Between January 1, 1999 and January 1, 2020

Categories of Device	*Methods of Sealing*
Category 1[1]: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.*

~~Table S.2.5.1.~~ **Table S.2.5**

Categories of Device and Methods of Sealing

For Devices Manufactured Between January 1, 1999 and January 1, 2020

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

~~*Table S.2.5.1.*~~ **Table S.2.5** ***Categories of Device and Methods of Sealing*** ***For Devices Manufactured Between January 1, 1999 and January 1, 2020***	
Categories of Device	***Methods of Sealing***
Category 3b: No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password). ****When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.***	***Same as Category 3***
~~[1] Not allowed for devices manufactured on or after January 1, 2020~~ ~~[2] Required for all devices manufactured on or after January 1, 2020~~	

*[Nonretroactive as of January 1, ~~2020~~ **1999**]*
*[*Nonretroactive as of January 1, 2014]*

(Amended 1998, 2013, ~~and~~ 2019, **20~~20~~21**)

Note: Zero-setting and test point adjustments are considered to affect metrological characteristics and must be sealed.

(Added 1993) (Amended 1995 and 1997)

~~S.2.5.2.~~ S.2.5.1. Sealing Requirements for Devices Manufactured on or after January 1, 2020. - An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants.)

A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to 25 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

Background/Discussion: See Appendix A, Page S&T-A314.

Additional letters, presentations and data may have been part of the Committee's consideration. Please refer to https://www.ncwm.com/publication-16 to review these documents.

NIST OWM agrees with the Committee's decision to move this item forward for voting.

CWMA: The S&T committee heard no comments during open hearings on this item. The committee recommends the item moving forward as a voting item with the proposed amendments by the NCWM S&T Committee.

MDM – MULTIPLE DIMENSION MEASURING DEVICES

MDM-20.1 V S.1.3. Negative Values, S.1.6. Customer Indications and Recorded Representations, S.1.7. Minimum Measurement, S.1.8. Indications Below Minimum and Above Maximum, S.2. Design of Zero TareDimensional Offset and Appendix D – Definitions: dimensional offset

Organization (*) not submitted (**) no meeting (***) no recommendation	MDM-20.1 – S.1.3., S.1.6., S.1.7., S.1.8., S.2., App D - Initial Status – New Item (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
SWMA	✔						
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)	✔						
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)	✔						
NCWM S&T Committee Interim	✔						

NIST OWM: The changes proposed by this item better reflect how MDMD's separate and measure the volume of an item/load contained on a conveyance object (e.g., a pallet). According to the MDMD manufacturers in attendance at the May 2019 MDMD Work Group Meeting, MDMD's do not subtract "tare" (e.g., volume of a pallet) from "gross" (volume of a pallet plus the item/load to be measured) to determine a "net" measurement. There is no subtraction of tare taking place, but rather a cancelling effect of the conveyance object so that just the item/load contained on the pallet is measured. Consequently, we believe these changes as proposed by the Multiple Dimension Measuring Device Work Group are appropriate.

WWMA: - 2019 Annual Meeting. The Committee agrees the item has merit and should be assigned a Voting status. No comments were heard during the open hearing session.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard comments from Russ Vires (Mettler Toledo) who supports the item as written. The Committee also heard comments from Dick Suiter (Richard Suiter Consulting, MDM Work Group Member) who clarified that the goal of the work group is to change the term "Tare" to "multi-dimensional offset." After consideration of this item the Committee recommends this item move forward as a Voting Item.

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item should be moved to voting status. During open hearings, Mr. Dick Suiter (Richard Suiter Consulting), a MDMD WG member, commented that MDMD code was borrowed from Scale code using "tare" as a term. The MDMD doesn't use "tare" when determining measurements so the language change is a housekeeping item.

CWMA: - 2019 Interim Meeting. Dick Suiter, Richard Suiter Consulting, commented that this is a housekeeping item and it should move forward as voting. Doug Musick, KS, suggested that a definition of "Dimensional Offset" may need to be developed. We recommend this item as a voting item.

2020 Interim Meeting. The S&T committee heard comments in support of this item from both the SMA and NIST OWM. We feel this item is fully developed and recommend this item move forward as a voting item.

SMA: - 2019 Fall Meeting. The SMA supports and recommends this be a Voting item.

Block 3 items (B3) D Tolerances for Distance Testing in Taximeters and Transportation Network Systems

B3: TXI-20.1 T. Tolerances

B3: TNS-20.1 T. Tolerances

Organization (*) not submitted (**) no meeting (***) no recommendation	B3 Tol for Dist Test in Taxi Mtrs. & Tranp Netwk Sys. - Initial Status – New Item (2 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
WWMA		✔					
***SWMA							
CWMA Interim (2019 Fall)	✔						
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
NEWMA Interim (2019 Fall)	✔						
**NEWMA Annual (2020 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim		✔					

NIST OWM:

OWM appreciates the efforts of the submitter to harmonize the tolerance requirements in the Taximeters Code and the TNMS Code although, we do not believe it is necessary to increase the tolerance allowed since taximeters have been required to comply with the existing tolerances for decades.

OWM also notes that TNMS do not typically assess fare charges based on intervals as do taximeters. Taximeters will accumulate fare charges by summing the number of intervals comprising the trip's distance traveled and time elapsed and multiplying by the appropriate rate. In contrast, TNMS typically base the fare charges on the total distance (and time in some cases) for the trip. For this reason, we do not believe it is necessary to amend paragraphs T.1.1.(a) and (b) to refer to "interval under test" as is shown in the proposal. OWM recommends that this proposal be further developed (perhaps with the assistance of the NIST USNWG on Taximeters) during the upcoming cycle in such a way that will better align the HB 44 Taximeters and TNMS Codes.

The NIST led U.S. National Work Group (USNWG) on Taximeters has held several virtual meetings in 2020. The focus of these meetings was the merger of the existing HB 44 Taximeters Code and the tentative TNMS Code. Those members attending these meetings were in general agreement that this is the appropriate direction the work group should take. The USNWG also began discussions on some of the areas to be addressed in a unified "Transportation-for-Hire" Code that could present challenges in the development of appropriate requirements. Those areas included the design and function of indicating elements, provisions for sealing, and location services signal loss.

Also included as a topic in the meetings was this proposal submitted to the NCWM S&T Committee to amend the HB 44 Taximeters and TNMS Codes. The USNWG was briefed on comments heard at the 2020 NCWM Interim Meeting regarding this proposal and the fact that the S&T Committee decided to withdraw the item. This

action appeared to be a result of little support heard during the Interim Meeting for the item presumably due to the increase of tolerances in the Taximeters Code included in the proposal. The USNWG agreed that the two HB 44 Codes should be merged and that this could be accomplished by continuing its efforts in the future.

WWMA: - 2019 Annual Meeting. The Committee agrees that the item should be given a Developing status and that the submitter should work with the USNWG on Taximeters to incorporate the proposed changes into the appropriate HB 44 Codes.

During the open hearing session, the Committee heard comments from Mr. John Barton stating that the effort to align the TNMS Code with the Taximeters Code is appreciated and expressed the desire to merge the two codes in the future. Mr. Kurt Floren (LA County, CA) stated that he has concerns about the significant increase in the tolerance allowed for taximeters as proposed and that there is no data to support such a change. Mr. Clark Cooney (CA DMS) stated that he agrees with Mr. Floren and encourages further development of this proposal. Mr. Stan Toy (Santa Clara County, CA) stated that he agrees with the previous comments heard and does not believe the tolerances for taximeters should be increased.

SWMA: - 2019 Annual Meeting. During Open Hearings the Committee heard no comments on this item. After consideration of this block the Committee decided to make No Recommendation on this item.

NEWMA: - 2019 Interim Meeting. The Committee and the body agree that this item should be moved to voting status. During open hearings, Mr. Jim Willis (NY) indicated that taxi meters are currently being held to tighter standard as compared to TNS and this proposal will align the tolerances in both codes. Mr. John McGuire (NJ) and Mr. James Cassidy (MA), voiced support.

CWMA: - 2019 Interim Meeting. Loren Minnich, KS, commented that this would give taxi's the same tolerances as TNS. We recommend this item as a voting item.

2020 Interim Meeting. The only comments received by the committee were from Tina Butcher (NIST OWM). She gave an update of the work of the USNWG and requested these items remain as developing items. The committee agrees.

OTH – OTHER ITEMS

OTH-16.1 D Electric Watthour Meters Code under Development

Originally OTH-4

Organization (*) not submitted (**) no meeting (***) no recommendation	OTH – 16.1 – EWM Under Development - Initial Status – D (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM		✔					
WWMA		✔					
(***) SWMA							
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
CWMA Interim (2020 Fall)		✔					
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
NCWM S&T Committee Interim		✔					

NIST OWM:

- The USNWG on Electric Vehicle Fueling & Submetering is divided into two subgroups; one to address electric vehicle fueling and one to address utility-type watt hour meters.

- This item addresses work being done by the latter subgroup, the "Electric Watthour Meter Subgroup (EWH SG).
- The EWH SG met most recently in August 2019 in Sacramento, CA. Meetings have included web-conferencing to allow those not able to attend in person to participate.
- The SG developed a proposed addition to NIST Handbook 130's Uniform Regulation for the Method of Sale (MOS) of Commodities (see Item MOS-8 on the L&R Committee's 2019 Agenda) to specify a method of sale for electrical energy sold through these systems. This proposal, titled "Section 2.38. Non-Utility Transactions of Electrical Energy (Other than Vehicle Fueling Applications)" was adopted by the NCWM in July 2019.
- The SG continues work on a proposed NIST Handbook 44 code for EWH-type meters. The SG made significant progress on the preparation of the draft code at its August 2019 meeting and the draft is nearing completion.
- There are two remaining areas of the draft to be resolved, including requirements related to identification and markings. Two small task groups are actively working on these areas and will submit recommendations for the SG's review.
- The SG does not have an in-person meeting scheduled but expects to hold a web meeting in 2020 to review and discuss the recommendations of these task groups and, hopefully, finalize the draft code.
- OWM anticipates the SG will be ready to submit the draft to the NCWM S&T in 2020 for consideration and inclusion into the agenda in the 2020-2021 NCWM cycle.
- In Fall 2019, the SWMA took no position on this item. The remaining three regions indicated support for maintaining this as a Developing item on the Committee's agenda.
- OWM requests this item be maintained on the S&T Committee's agenda as a Developing Item while the SG finalizes its proposed HB 44 draft. OWM will continue to apprise the Committee of progress.
- Those interested in participating in this work please contact:
    - Subgroup Chairman, Ms. Lisa Warfield, (OWM)

      Email (lisa.warfield@nist.gov) or phone (301-975-3308)
    - Technical Advisor, Mrs. Tina Butcher, (OWM)

      Email (tbutcher@nist.gov) or phone (301-975-2196).

WWMA: - 2019 Annual Meeting. The Committee recommends that the submitter continue its efforts on the development of this item. Ms. Lisa Warfield (NIST) provided the Committee with an update on the work group's efforts. Mr. Clark Cooney (CA DMS) encouraged the support from WWMA for this proposal and appreciates the efforts of the work group developing the item.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard no comments on this item. After consideration of this item the Committee decided to make No Recommendation on this item.

NEWMA: - 2019 Spring Annual Meeting. Comments on this item were heard in the L&R open hearing under MOS-8. Please see the NEWMA L&R report for any comments. The committee recommends that this item remain developing on the NCWM S&T Committee agenda.

2019 Interim Meeting. The Committee and the body agree that this item should continue as a developing item. No comments were heard during open hearings.

CWMA: - 2019 Spring Annual Meeting: Charlie Stutesman, Kansas W&M, asked for an update from USNWG. Lisa Warfield, NIST OWM, commented that there should be an update available in the Fall.

2019 Interim Meeting. We support the work of the USNWG on Electric Vehicle Fueling and Submetering and we recommend this item remain developing

2020 Interim Meeting. The only comments received on this item were form Tina Butcher (NIST OWM). She requested this item remain developing as the USNWG continues its work. We recommend this item remain developing. OTH-18.4

W Appendix D – Definitions: batch (batching)

Originally OTH -5 was returned to committee

Organization (*) not submitted (**) no meeting (***) no recommendation	OTH – 18.4 – Appendix D – Batch (Batching) - Initial Status – D (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM			✔				
WWMA			✔				
SWMA			✔				
CWMA Interim (2019 Fall)		✔					
**CWMA Annual (2020 Spring)							
NEWMA Interim (2019 Fall)		✔					
**NEWMA Annual (2020 Spring)							
NCWM S&T Committee Interim			✔				
SMA (Industry)						✔	

NIST OWM: OWM reiterates its previous comments regarding this item and refers to the following points as justification for our recommendation that this item should not move forward.

- The term "batching" does not describe any particular device or type of device but instead is a type of process that can be accomplished through the use of various types of devices.
- OWM does not believe the stated purpose of this proposal will be fulfilled with the adoption of this item. It is not clear when (if ever) the process of batching can be considered a metrologically significant event.
- The two references of batching scales currently found in the HB 44 Scales Code that the submitter has cited apply to types of devices that are believed to be obsolete and not likely to be currently found in commercial service.
- There are no references included in the proposed definition to identify which specific HB 44 device code/sections this definition will apply.

WWMA: - 2019 Annual Meeting. The Committee agreed that this proposed change is unnecessary and that the item should be withdrawn. Mr. Russ Vires (SMA) stated that the SMA opposes this item because "batching" is a process and not a device. Mr. John Barton (NIST) commented that the stated purpose of this item has not been met by the proposed changes. Also, that the term batching is an application of devices used in a process and should not be used in the context of a device specification.

SWMA: – 2019 Annual Meeting. During Open Hearings the Committee heard comments from Russ Vires (SMA) who opposes this item. He stated that he feels batching is an application, not a device type. We also heard comments from Dick Suiter (Richard Suiter Consulting) who stated that Batching goes beyond just a method. After consideration of this item the Committee recommends this item be Withdrawn. Based on discussion, batching is a process or a system, not a device.

NEWMA: - 2019 Spring Annual Meeting. A single comment was heard from Mr. Russ Vires (representing the SMA) that the SMA opposes this item on the basis that batching is an application and not a device type. The committee recommends this as a Voting item on the NCWM S&T Committee agenda.

2019 Interim Meeting. The Committee and the body agree that this item should be moved to developing status as we do not deem item to be fully developed. During open hearings, Mr. John McGuire (NJ) raised the concern that this definition could possibly be used for blending at retail motor fuel devices.

CWMA: - 2019 Spring Annual Meeting: Russ Vires, SMA, stated that SMA opposes this item.

2019 Interim Meeting. Loren Minnich, KS, commented that he is working on changes and requested the item be given a developing status. We recommend a developing status.

SMA: 2019 Fall Meeting. The SMA opposes this item.

Rationale: The SMA feels that batching is an application, not a device type.

OTH-20.1 V Appendix D – Definitions: submeter

(See comments below. This item was renumbered as EVF-20.2 and is now a voting item as EVF-20.2)

Organization (*) not submitted (**) no meeting (***) no recommendation	OTH – 20.1 – Appendix D –Submeter - Initial Status – D (1 Items) 2020 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM	✔						
WWMA	✔						
*SWMA							
*CWMA Interim (2019 Fall)							
**CWMA Annual (2020 Spring)							
*NEWMA Interim (2019 Fall)							
**NEWMA Annual (2020 Spring)							
NCWM S&T Committee Interim	✔						

NIST OWM:

- NIST OWM notes this item was incorrectly numbered as OTH-20.1. We recommend that this item be moved and renumbered as EVF-20.1. and add the following statement to each section:

  Statement under OTH-20.1
  This item has been renumbered to EVF-20.2. See that item for details.

  Statement under EVF-20.2This proposal first appeared on the Committee's 2020 Agenda as "Item OTH-20.1" and was designated as a Voting Item. During review of this item in preparation for the 2021 NCWM cycle, the Committee recognized this item was placed in the incorrect section of the Committee's agenda in its 2020 Agenda. The definition of "submeter" as referenced in the proposal has been part of the "Definitions" which are located in Section 3.40 Electric Vehicle Fueling Systems tentative code (EVF) in NIST Handbook 44 since the addition of that code in 2015. Therefore, the Committee relocated and renumbered the proposal to become agenda item EVF-20.2 and maintained its status as a Voting Item

- NIST is the submitter of this proposal. An EVSE supplies and assesses charges (in units of the kilowatt-hour) for electrical energy that is used to fuel a vehicle. An EVSE may also have the capability to separately assess fees for time-based and other services. Applicable EVSE handbook (44 [2015] and 130 [2013]) requirements for both electricity and time have been available for over four years.

- An EVSE is unlike other traditional vehicle refueling equipment that must comply with legal metrology requirements. Any terminology that further clarifies what constitutes a commercial EVSE and any accessories subject to weights and measures' jurisdiction is helpful to the equipment designer, installer, and regulator. Clearly distinguishing where the responsibility for such equipment begins and ends is essential. Being able to make this distinction may also be useful to ensure installations are not interfaced with other equipment that might have a detrimental effect on the normal operation of an EVSE or it's metrological integrity. At some point jurisdictions may also deem it necessary to establish policy to clarify for staff, industry, and the public, weights and measures' role and relationship to the service utility, station owner/operator, and end user. Because there are multiple jurisdictions (i.e., 34 states) where legislative bodies are making decisions about which entity has legal authority over the sale of electricity as a vehicle fuel, this proposal should be considered on a national basis.

- NIST continues to encourage jurisdictions that actively regulate submetering equipment to study the proposed modification to the definition of "submeter" as it relates to current local requirements and provide input to the S&T Committee on Agenda Item OTH-20.1.

- The NIST USNWG on EVF&S's Electric Vehicle Fueling Equipment Subgroup held web meetings on January 7, 2020 and January 13, 2020 to discuss this proposal (along with other EVFS-related items on the Committee's Agenda) and comments received thus far. At the January 7 meeting, the Subgroup voted and agreed to recommend to the NCWM S&T Committee that this item be designated as a Voting Item and the proposed changes shown in the Item Under Consideration be recommended for adoption at the July 2020 NCWM Annual Meeting.

- NIST agrees the proposed modification of the "submeter" definition to recognize commercial electrical equipment that is a *meter* or is designed to operate as a system is a more accurate description of the possible configurations of key components in an *electric* submeter device application. While there was no intent to limit the definition to those devices, OWM concurs with the designation at the 2020 NCWM Interim Meeting to limit the definition to Code 3.40 given comments received.

- OWM continues to note there are other instances where what are generally referred to as "submeters" are in use to supply and bill end users for utility-type commodities other than electricity; for example, commercial equipment addressed in NIST Handbook 44 Section 3.33 Hydrocarbon Gas Vapor-Measuring Devices and Section 3.36 Water Meters. A definition for submeter, even if different than that developed for Code 3.40, may be needed as a future proposal to help make any distinctions among terminology used in the different submeter industries.

- OWM agrees with 2020 NCWM Interim Meeting comments from Kurt Floren, L.A. County, CA noting the need for a definition of "master meter" in NIST Handbook 44 or perhaps an alternate term. OWM acknowledges the term as used in this definition has a specific meaning for the electric metering industry. Since the Committee agreed to present this as a Voting item, OWM suggests that the term be further discussed in concurrent discussions within the Electric Watthour Subgroup to determine if alternatives might be identified. No meetings of that Subgroup have been held since Fall 2019 and no immediate meetings are scheduled; however, OWM will certainly include this issue on the agenda of a future meeting if scheduled. In the meantime, OWM encourages individual members of the Subgroup to individually provide any input as they feel appropriate.

- OWM also notes the term "master meter" is one of several terms being discussed within the S&T-assigned group to address "terminology" regarding standards used in inspecting and testing of commercial weighing and measuring equipment. Perhaps there will be some suggested alternatives coming out of that work that could be considered.

- The proposal should correctly reflect changes to the definition of submeters that is currently in NIST HB 44 Section 3.40 as follows:

  submeter. – A meter or meter system downstream of ~~furnished, owned, installed, and maintained by the customer who is served through a utility owned~~ the master meter. [3.40]

WWMA: - 2019 Annual Meeting. The Committee agrees this proposal has merit and that it is fully developed and should be given a Voting status. The Committee also recognizes that the stated Purpose should be amended to state the change would affect to EVSE Code paragraph 3.40., Appendix D, Definitions as shown.

~~**submeter.** A system furnished, owned, installed, and maintained by the customer who is served through a utility owned master meter. [3.40]~~

Submeter - a meter or meter system downstream of the master meter. [3.40]
(Added 20XX)

During open hearings the Committee heard comments from Ms. Lisa Warfield (NIST) stated that this item is fully developed and ready for a Voting status. Mr. Kevin Merrit (ID) asked the question would this language apply to a LPG meter? Ms. Warfield responded that this does not apply to a LPG meter and that the definition for "submeter" referred to in this proposal should not be confused with the use of "master meter" as used when referring to calibrations. Mr. Kurt Floren (LA County, CA) asked the question "is the term master meter defined?" Ms. Warfield responded that the term "master meter" is defined and that the definition was derived from that definition from Measurement Canada.

OTH-21.1 Appendix A – 2.1. Acceptance and Maintenance Tolerances.

Organization (*) not submitted (**) no meeting (***) no recommendation	OTH-21.1 – Appendix A-2.1 Acceptance and Maintenance Tolerances (1 Items) 2021 S&T Recommendations						
	V	D	W	A	I	Opposed	Support
OWM							
WWMA	✔						
SWMA	✔						
CWMA Interim (2020 Fall)	✔						
CWMA Annual (2021 Spring)							
NEWMA Interim (2020 Fall)		✔					
NEWMA Annual (2021 Spring)							
SMA (Industry)							
NCWM S&T Committee Interim							

NIST OWM:

OWM notes that the submitter drafted a previous proposal addressing the same issue using a different approach in changing requirements to address those concerns. In that previous proposal, the submitter recommended changes to HB 44 General Code requirement G-T.1. "Acceptance Tolerances." During the 2020 Interim Meeting, there were multiple comments heard opposing this proposal and the recommended changes during the open hearing session. The S&T Committee considered the initial proposal and determined that amendments offered by the submitter following the open hearing session to the proposal substantially changed the direction and scope of that initial proposal and therefore decided that the Item Under Consideration should be withdrawn.

The submitter is now offering a new proposal that does not address concerns by changing General Code requirements but instead is recommending changes to HB 44 Appendix A, Fundamental Considerations.

OWM recognizes that there are statements addressing the application of acceptance tolerances in different sections of NIST HB 44 that appear to be in conflict. As shown in the Item Under Consideration, the current General Code requirement G-T.1. states acceptance tolerances are applied to devices that:

- are being placed into commercial service for the first time;
- are being officially tested for the first time if placed into service within the preceding 30 days;
- are being returned to commercial service after rejection based on performance and have been repaired within the preceding 30 days;
- are being officially tested within 30 days following major reconditioning or overhaul; or
- undergoing type evaluation.

What is not explicitly stated in this General Code requirement is whether acceptance tolerances are to be applied within 30 days after any *routine* calibration adjustment(s) have been made to improve the device's performance. This type of adjustment would not be prefaced by an official rejection of the device. The absence of any statement addressing this specific circumstance has led to differences in interpretation regarding the appropriate application of acceptance tolerances. This difference of interpretation is more evident when the General Code requirement (G-T.1.) is compared to the statement found in HB 44 Appendix A - Fundamental Considerations, Section 2.1. Acceptance and

Maintenance Tolerances where acceptance tolerances are addressed. In Appendix A, acceptance tolerances are described as follows:

"Acceptance tolerances are applied to new or newly reconditioned ***or adjusted equipment*** and are smaller than (usually one-half of) the maintenance tolerances."

It should be recognized that some commercially used equipment is officially tested and not afforded the less stringent maintenance tolerances. In general, this includes volumetric equipment such as graduated glassware, dry measure apparatus. This is done with the understanding that accuracy for this type of apparatus does not significantly degrade over time. Thus, it would be reasonable to presume that only equipment whose performance is expected to deteriorate over periods of use should be afforded the application of maintenance tolerances. In other words, maintenance tolerances are applied to equipment that can reasonably be expected to gradually lose accuracy and performance over periods of time and use.

A strict interpretation of the statement in Section 2.1. of the Fundamental Considerations may prompt some to consider that since the device has undergone any adjustment within the preceding 30 days, that device should be capable of meeting acceptance tolerances. Therefore, some weights and measures officials have required devices that were recently adjusted (within 30 days) to comply with the more stringent tolerances whether or not that device had been officially rejected following an inspection and test within that 30-day period.

OWM notes that changes to G-T.1. were recommended in 1990 when a proposal was submitted that would have had acceptance tolerances apply whenever a security seal was broken. If the previously referred to "evidence" is to include a broken security seal on the device, it is conceivable that the seal could have been broken to make changes that did not affect the accuracy. This 1990 proposal was withdrawn following comments stating that the broken seal would not always positively indicate an adjustment affecting the device's accuracy.

This issue was also addressed during the 2009 NCWM Annual Meeting where comments were offered in opposition to the application of acceptance tolerances following "metrological adjustments." The proposal was not adopted for reasons related to some device owners entering into service contracts that could include routine adjustments. At that time, those opposing this change also pointed out that devices may not be capable of continuously operating within acceptance tolerances however, could be maintained to operate within maintenance tolerances. The proposed changes to G-T.1. at that time were withdrawn due to a lack of support from industry and weights and measures officials.

OWM recognizes two opposing perspectives for the resolution of this matter. There are those that will support the idea when adjustments to commercial weights and measures equipment are made within a reasonable period of time, that equipment should perform within acceptance tolerances. If this notion is supported, then the former proposal to recommend changes to G-T.1. appear to be appropriate. Alternatively, others may take the position that device owners who proactively have entered in a contract for periodic routine service on their equipment will be penalized when that equipment is consistently held to more stringent, acceptance tolerances.

When a device owner has entered into a contract with a service agency to provide routine inspection and maintenance on their equipment. The frequency of these service visits will vary; such as on an annual or semi-annual basis although some may occur as frequently as on a monthly basis. During those contractual inspections, well-intentioned service agents may make minor adjustments to a device to ensure the best accuracy and performance from that device. As stated in the General Code requirement G-UR.4.3., adjustments made to equipment shall be made to bring the performance errors to as close to zero as practicable. The equipment owners/operators who are paying for this proactive service do so with the expectation that their devices are operating consistently at peak efficiency and accuracy. According to General Code requirement G-UR.4.1. this is the owner/operator's responsibility. This practice may provide more equitable transactions based on the accuracy of measurements/weighments made by that equipment.

Considering potential consequences of having equipment held to more stringent performance requirements on a frequent basis, owners/operators may elect to not have any regular service done to maintain optimum performance of their devices. This could potentially lead to less accurate equipment and larger errors in measuring and weighing operations during the interim period between official examinations.

As found in HB 44 General Code G-UR.4.3. "Use of Adjustments," service agents are expected to make any adjustments to a device so as to bring its performance to as close as possible to zero error. This expectation would support the notion of maintaining all weights and measures commercial device in prime operating condition. Therefore, it would be reasonable to expect that devices covered under a regular, routine service contract would be capable of performing within acceptance tolerances.

OWM believes that if a change to the Fundamental Considerations would be adopted, additional clarity could be achieved if those changes were accompanied by a specific explanation including details for why acceptance tolerances are not to be applied to equipment that has undergone only routine adjustment. Therefore, if this proposal is supported OWM would recommend changes to G-T.1. be made to explicitly exclude the application of acceptance tolerances to equipment that has undergone routine adjustment not precipitated by an official rejection.

WWMA: Michelle Wilson (AZ), submitter of the item, gave some background; in AZ, they've had debate on acceptance tolerance after calibration. Last year we submitted to clarify that acceptance tolerance would be applied following adjustment. Majority felt that that was not appropriate. This is a form 15 to clarify appendix A, sect. 2.1. - currently says acceptance tolerance is applied to new or adjusted. This leaves it open to interpretation. Removing "or adjusted" and add language to match the appendix with General code. Recommend to move forward as a voting item. John Barton (NIST OWM) commented is not convinced this is the only change needed to be made. For example, G.T.1. needs clarification when and when not to apply. Brent Price (Gilbarco) agrees to remove "when adjusted". He supports this item. The Committee agrees the item is fully developed and recommends voting status.

SWMA: During Open Hearings the Committee heard from Tim Chesser (Arkansas) who stated that he supports the intent of the item but not the wording. Tim suggested amending the code instead. The Committee also heard from John Barton (OWM) who stated that this is a revision of a previous proposal, and that he agrees with the proposal. John also stated that enforcement of Acceptance Tolerance differs between some jurisdictions in regards to routine adjustments. The Committee also heard from Brent Price (Gilbarco) who stated that he supports the proposal. He stated that many devices are adjusted routinely, and shouldn't be considered like new. Tim Chesser also stated that the 30 day window for Acceptance Tolerance exists because a meter should hold that adjustment for at least 30 days. If it cannot hold that calibration, it may be a bad meter. The Committee also heard from Ken Ramsburg (Maryland) who stated that he agrees with Tim, and that this item would put us at the mercy of the service agency to do a good job. The Committee also heard from Hal Prince (Florida) who stated he sees both sides, and doesn't want to dissuade good maintenance practices, but knows some service agencies do poor work. After considering this item the Committee recommends the item as a Voting Item.

NEWMA: The Committee agrees with the body that this proposal has merit and recommends that it be considered a Developing Item. During the open hearings, the Committee heard comments that the submitter has been working on this item and removed a conflicting statement. There are still some questions on routine maintenance and what precisely qualifies as an adjustment. There are also concerns that a device owner who responsibly maintains their equipment may be held to higher tolerances than an individual that does not properly maintain their equipment.

CWMA: The committee heard from numerous regulatory officials that this item is a good addition to the handbook and recommended this item move forward as a voting item. We feel this item is fully developed and recommend this item as a voting item.