Executive Summaries from the NIST Office of Weights and Measures (OWM) Analysis Specifications and Tolerances (S&T) 2023 NCWM Interim Meeting Agenda

The NIST OWM Executive Summary is extracted from the NIST OWM Analysis. This provides the OWM community with high level points that summarize the technical aspects and recommendations for the Item Under Consideration. The full NIST OWM Analysis can be viewed at **https://www.nist.gov/pml/owm/publications/owm-technical-analysis.** OWM offers these comments and recommendations based upon information and input available as of the date of this report.

Language shown in bold face print by **~~striking out~~** information to be deleted and **<u>underlining</u>** information to be added. Requirements that are proposed to be nonretroactive are printed in ***bold faced italics***.

For additional information or assistance please contact an OWM Technical Advisor:

Mrs. Tina Butcher, S&T Committee, **tina.butcher@nist.gov** or (301) 975-2196
Mr. Rick Harshman, S&T Committee, **richard.harshman@nist.gov** or (301) 975-8107
Mr. Jan Konijnenburg, NIST Associate, **jan.konijnenburg@nist.gov**
Ms. Diane Lee, S&T Committee, **diane.lee@nist.gov** or (301) 975-4405
Ms. Juana Williams, S&T Committee, **juana.williams@nist.gov** or (301) 975-3989

Table A
Table of Contents

Details of All Items
(In order by Reference Key)

GEN – General Code

GEN-23.1 G-N.3. Test Methods

OWM Executive Summary for GEN-23.1 – G-N.3. Test Methods

OWM Recommendation: We recognize that GEN-23.1 could be used as a roadmap to what is being proposed in Block 8 to support those States needing a specific requirement in the handbook that address the use of Standards within a Jurisdiction. NIST OWM supports this as a Voting item along with the changes where it ensures continuity in terms, as described in the detailed technical analysis section.

- Some States have argued the need for specific requirements in NIST HB44 for specific standards that can be used for testing commercial devices and this new proposal would address that concern.
- Item GEN-23-1 provides requirements in NIST HB 44 General Code for all standards to meet the guidance as specified in the fundamental considerations thereby eliminating the need for specific guidance for each type of standard used to test commercial devices.
- Block 8 is a proposal to clarify the fundamental considerations concerning all standards use to test commercial devices.
- With both GEN-23.1 and the Block 8 items, weights and measures Jurisdictions will have the necessary tools to determine the appropriate Standards for use when testing commercial devices and these proposed items eliminate the need for specific changes to NIST HB 44 Test Draft Sections as proposed in S&T Item LPG-15.1, MFM-15.1, and Block 1, and the technical problems associated with these proposed changes to NIST HB 44. See NIST OWM comments in this analysis concerning items LPG-15.1, MFM-15.1 and Block 1.

SCL – SCALES

SCL-22.2 A UR.1. Selection Requirements, UR.1.X. Cannabis

OWM Executive Summary for SCL-22.2 – UR.1. Selection Requirements, UR.1.X. Cannabis

[1]**OWM Recommendation:**

Additional consideration and development of this item by the Cannabis Task Group and/or its Scales Focus Subgroup is needed. For this reason, OWM recommends this item remain assigned to the Task Group

Note: The original proposal associated with this item has been replaced by the Scales Subgroup of the NCWM Cannabis Task Group (CTG) with the proposal shown in the Item Under Consideration. It is important to note, however, that when the revised proposal was submitted to the NCWM, just prior to the November 15, 2022 deadline, proposed new paragraph UR.3.1.2. Required Minimum Loads

OWM Executive Summary for SCL-22.2 – UR.1. Selection Requirements, UR.1.X. Cannabis

for Cannabis products was unintentionally omitted. The CTG plans to request the paragraph be included as part of the proposal during the 2023 NCWM Interim Meeting.

No longer are maximum scale division values proposed for the weighing of cannabis products as was the case with the original proposal. Consequently, no longer do the comments and recommendations that OWM developed previously for this item apply.

The following represents OWM's executive summary for the current proposal and provides justification for the "Assigned" status recommendation:

- Although OWM doesn't believe it was the intent of the CTG Scales Focus Group, adding the terminology, "and weighing of all Cannabis products," to each of the three accuracy class classifications in Table 7a (i.e., Class I, Class II, and Class III) leads one to believe that a scale of any one of those three accuracy classes would be permissible for use to weigh all cannabis products.

- It is OWM's understanding that some participants of the CTG believe NIST HB 44 requirements cannot be applied to scales used commercially to weigh cannabis products unless Table 7a explicitly indicates such use. We do not share this opinion and note that the description in Table 7a for Class III scales specifies "All commercial weighing not otherwise specified…," which would include scales used to weigh cannabis products. That is, the description of "Weighing Application or Scale Type" in HB 44 Scales Code Table 7a for Class III scales adequately captures scales used to weigh cannabis products.

- There are several commercial uses of scales excluded from Table 7a in which jurisdictions continually regulate those scales without concern. For example, scales used in a grocery store to weigh bakery items, meat products, delicatessen products, and produce are not explicitly identified in the existing table; yet these scales are regularly regulated by weights and measures officials throughout the US. The different uses of these scales are encompassed in the terminology, "All commercial weighing not otherwise specified…" as would be the case for scales used to weigh cannabis products.

- We take no position, however, on adding an additional example device type to HB 44 Scales Code Table 7a if others believe it is essential, since the title of the table specifies that the different device types listed are only "typical." Yet, because the "Note" included at the bottom of Table 7a specifies a scale with a higher accuracy class than that specified as "typical" may be used, it is unnecessary to add the additional device type to more than one accuracy class classification in the table. Adding it to the Class III description alone would suffice given that Class I and Class II scales are of higher accuracy class. Additionally, we believe adding the additional device type description to the Accuracy Class I and Class II classifications would cause unnecessary confusion due to the Note explaining that a higher accuracy class may be used.

- OWM currently participates on the Scales Focus Subgroup of the NCWM Cannabis Task group. Most recently, several members of the subgroup have voiced support for the development of a scale suitability guidance document that could not only be used by the Cannabis industry, but other industries as well. We too would be in favor of developing such a document and believe it would be helpful in selecting a suitable scale.

OWM Executive Summary for SCL-22.2 – UR.1. Selection Requirements, UR.1.X. Cannabis

---

[1] In contrast to hemp, marijuana remains a Schedule I substance under the Controlled Substances Act. NIST does not have a policy role related to the production, sale, distribution, or use of cannabis (including hemp and marijuana). NIST participates in the National Conference of Weights and Measures (NCWM) as part of NIST's statutory mission to promote uniformity in state laws, regulations, and testing procedures.

SCL-23.1 S.1.12. Manual Weight Entries

OWM Executive Summary for SCL-23.1 – S.1.12. Manual Weight Entries

OWM Recommendation: NIST OWM is of the opinion that the current proposal incorporates user requirements in a specification which should be avoided. Therefore, NIST OWM recommends this item to be Developing.

- In the proposal, the restrictions laid down in UR.3.9 are implemented as requirements in S.1.12. However, they remain requirements on the application of the device which do not belong in the specifications of the scales code.
- Furthermore, the condition "*When being used in a direct sale application*" is contradicting requirement (c) in the proposal. Generating labels for standard weight packages is in general not a direct sales application.
- NIST OWM suggest to refer to UR.3.9 as a condition for specification S.1.12.
  e.g., ***"S.1.12. Manual Weight Entries.*** *– A device when being used* ~~*for direct sale*~~ ***in an application mentioned in UR.3.9*** *shall accept …"*

SCL-23.2 Table S.6.3.a. Marking Requirements, and Table S.6.3.b. Notes for Table S.6.3.a. Marking Requirements

OWM Executive Summary for SCL-23.2 – Table S.6.3.a. Marking Requirements, and Table S.6.3.b. Notes for Table S.6.3.a. Marking Requirements

OWM Recommendation: The analysis is based on the revised proposal that was posted on the NCWM website on 12/19/2022. NIST OWM is of the opinion that the item is fully developed. Therefore, NIST OWM recommends making it a Voting item.

SCL-23.3 Verification Scale Division e: Multiple Sections Including, T.N.1.3., Table 6., T.N.3., T.N.4., T.N.6., T.N.8., T.N.9., T.1., T.2., S.1.1.1., T.N.1.2., Table S.6.3.a., Table S.3.6.b., Appendix D, S.1.2.2., Table 3., S.5.4., UR.3., Table 8.

OWM Executive Summary for SCL-23.3 – Verification Scale Division e: Multiple Sections Including, T.N.1.3., Table 6., T.N.3., T.N.4., T.N.6., T.N.8., T.N.9., T.1., T.2., S.1.1.1., T.N.1.2., Table S.6.3.a., Table S.3.6.b., Appendix D, S.1.2.2., Table 3., S.5.4., UR.3., Table 8.

OWM Recommendation: This item is new and incorporates the NCWM's Verification Scale Division (e) Task Group's recommendations from its July 21, 2021 into the Committee's 2023 agenda (NCWM Publication 15). Since the changes proposed by this item represent the TG's most recent recommendations, OWM recommends the committee reconcile the changes proposed by this item with those in the Block 2 items and then withdraw Block 2 from its agenda.

- We are pleased that the TG has recommended the Committee assign this item to the TG for further development. OWM looks forward to participating on the TG and sharing its perspective of the proposed changes with its members.

WIM – Weigh-in-Motion Systems – Tentative Code

WIM-23.1 Remove Tentative Status and Amend Numerous Sections Throughout

OWM Executive Summary for WIM-23.1 – Remove Tentative Status and Amend Numerous Sections Throughout

OWM Recommendation: The analysis is based on the revised proposal that was posted on the NCWM website on 12/1/2022. NIST OWM is of the opinion that the item currently has merit, but that it is not yet fully developed. NIST OWM recommends making this item Developing to give the submitters the opportunity to address raised concerns.

- The submitter has demonstrated there is a need for permanent and direct enforcement. The proposed code is intended to address this need.

- The proposed tolerances and test procedures are comparable to the OIML recommendation R 134 which is used in multiple countries as the standard for weighing road vehicles in motion (for both direct enforcement and other applications).

However, there are several issues that need to be addressed:

- Since the proposal has a significant impact on the enforcement of vehicle weight limits, it is important that all stakeholders be involved in the development of the code. Not only should be the technical requirements of the system be taken into consideration, but also the practical implementation of field testing after installation. (See the Detailed Technical Analysis below for a list of possible stakeholders).

- Due to the large tolerance of WIM systems, the measured weight value must be corrected for the uncertainty of the measurement, so it is guaranteed that the weight used for the citation never exceeds the actual weight of the vehicle. Although the submitters state that the measured weight

OWM Executive Summary for WIM-23.1 – Remove Tentative Status and Amend Numerous Sections Throughout

value should be corrected, the language in the proposal does not clearly elaborate how or when the measurement value is to be corrected.

- The proposed methods for weighing axle loads are in general considered unsuitable. However, due to the large tolerance, it may be possible that these methods do meet the fundamental considerations. The submitters should investigate whether the proposed methods for determining the axle load, axle-group load and gross vehicle weight of the reference vehicles, are indeed suitable.

- The proposal should contain provisions to support unattended operation in order to prevent any reasonable doubt about the measurement. The different stakeholders involved in the future development of the proposal should decide on the different provisions that need to be part of the code (e.g., pictures of the vehicle, license plate and its position on the road, and other registrations of the circumstances).

- The submitters should provide justification for the proposed vehicle types to be used as reference vehicle. The selected reference vehicles must be representative to the traffic that can be expected traveling over the WIM installation. E.g., vehicles carrying fluids or vehicles with a steel leaf spring suspension. The ultimate criteria for the selection of the reference vehicles must be agreed upon by all stakeholders.

- The submitters should demonstrate the acceptable level of performance and reliability of these WIM systems. And demonstrate that the proposed test procedures are effective and sufficient. Any data presented should be complete and traceable to the national standards.

LMD – Liquid Measuring Devices

LMD-23.3 Automatic Temperature Compensation Task Group

OWM Executive Summary for LMD-23.1 – Automatic Temperature Compensation Task Group

OWM Recommendation: This item was withdrawn by all 2023 Fall Regional Weights and Measures Associations prior to the 2023 Interim Meeting as such the item does not appear on the Interim Meeting Agenda.

LMD-23.4 N.3.5. Wholesale Devices.

OWM Executive Summary for LMD-23.4 – N.3.5. Wholesale Devices.

OWM Recommendation: NIST supports these proposed changes to N.3.5 because it helps to broaden the original intent of the paragraph. We believe the requirements for test drafts were written around the most common test methods at that time. Future requirements for test drafts may be better addressed in the General Code with additional guidance in the Fundamental Considerations or another guidance document.

OWM Executive Summary for LMD-23.4 – N.3.5. Wholesale Devices.

- There are several items on the 2023 Interim Meeting agenda that propose changes to Test Draft paragraphs in NIST HB 44.

- The test draft items included on the 2023 Interim Meeting Agenda are LMD 23.4, LPG-15.1, MFM-15.1, Block 1, and Block 5.

- The purpose stated for Items LPG-15.1, MFM-15.1 and Block 1, "…to allow field standard meters to be used to test and place into service dispensers and delivery system flow meters.." is already addressed in the fundamental considerations section of NIST HB 44, that states the director has the authority to select the standard used to test commercial devices and we believe Item GEN-23.1 and Block 8 on the 2023 Interim Meeting Agenda adds clarity to how the standard should be selected. The Item Under Consideration for these items adds a test draft paragraph that is specific to the use of field standard meters. The paragraph is problematic for some types of test because the language prevents conducting a complete test of a device. See NIST Technical Analysis for these three separate items.

- NIST HB 44 was written to be non-technology specific, but test draft criteria were written around the current technology most common at that time. When testing a positive displacement meter using an open neck prover there are ramp-up and ramp-down errors that are associated with the test. As such, the test draft has to contain enough volume so that these errors do not contribute greatly to the test of the meter. With the use of different test standards, the ramp-up and ramp-down errors may not be factors that will affect the test but there may be other factors that contribute to error in the test that would affect the test draft.

- LMD-23.4 and Block 5 seek to keep the existing N.3.5. paragraph and make it broader to encompass other field standards.

- Over the years some changes have been made to the Test Draft criteria so that the requirement is more inclusive of other technology such as the change that was made to N.3.5 in 1996 to remove "test draft" and replace it with "delivered quantity" to be more inclusive of SVPs for those states using this technology.

- Technology will continue to change and evolve, and we will need to respond to the number of changes, such as the different standards that will be in use, and the factors associated with different technologies. We will need to ensure an appropriate test draft is selected so that the errors of test method and device under test do not contribute greatly to the test of the device. Coupled with what is already in the fundamental considerations for responsibility for selecting a test standard and what is being proposed in Items Gen-23.1 and Block 8, we believe a solution may be to add a general code requirement with additional guidance in the fundamental consideration for Test draft and consider removing Test Draft from the individual codes and addressing it in the general code in test notes as a suitability requirement. Currently with no alternate proposal in place for Test Draft, the changes in both LMD-23.4 and Block 5 would assist with recognizing the test draft of other standards in use.

- We encourage the submitters of these item, LMD-23.4 and Block 5 to work together to combine the changes that are being proposed to the same paragraph, N.3.5. Wholesale Devices. If the submitters are in agreement with combining these changes a proposed change for the combined items LMD-23.4 and B5: LMD lock 5 is provided below:

OWM Executive Summary for LMD-23.4 – N.3.5. Wholesale Devices.

N.3.5. Wholesale Devices – The **total** delivered quantity **for any required accuracy test** ~~should~~ **shall** be equal to**, or is recognized as being representative of, a volume equivalent to** at least the amount delivered by the device in one minute at ~~**its**~~ **the meter's** maximum discharge rate ~~**and shall in no case be less than 200 L (50 gal)**~~.

(Amended 1987**,** ~~and~~ 1996**, and 2023**)

VTM – Vehicle Tank Meters

VTM-18.1 S.3.1 Diversion of Measured Liquid and S.3.1.1. Means for Clearing the Discharge Hose and UR.2.6. Clearing the Discharge on a multiple-product, single discharge hose.

(**Note:** At the 2020 Interim Meeting the Committee agreed to combine both VTM-18.1 and VTM-20.1. Both items are now one item under VTM-18.1.)

(**Note:** At the 2022 Annual Meeting, this item did not receive sufficient votes to pass or to fail and was returned to the Committee.)

OWM Executive Summary for VTM-18.1 – S.3.1 Diversion of Measured Liquid and S.3.1.1. Means for Clearing the Discharge Hose and UR.2.6. Clearing the Discharge on a multiple-product, single discharge hose.

OWM Recommendation: OWM believes the proposed changes represent a reasonable solution that will help minimize the potential for fraud with the use of manifold flush systems while allowing companies access to the safety-related benefits from the use of such systems in distributing products on VTMs. With the most recent version of the Item Under Consideration, OWM believes this item is ready for vote.

- 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.
- NIST Handbook 44 already includes provisions allowing the use of manifold flush systems.
  - However, without appropriate safeguards, these systems represent a significant potential for fraud.
  - OWM believes the current Item Under Consideration offers additional safeguards that are not present in the current NIST HB 44 language.
  - These changes will reduce the potential for facilitation of fraud with the design and use of these devices.
- When presented for a vote in 2019, this item (though revised multiple times in response to comments) failed to obtain sufficient votes to "pass" or "fail" and was returned to Committee.
  - Several additional variations to address comments and concerns were subsequently considered.

OWM Executive Summary for VTM-18.1 – S.3.1 Diversion of Measured Liquid and S.3.1.1. Means for Clearing the Discharge Hose and UR.2.6. Clearing the Discharge on a multiple-product, single discharge hose.

- In January 2020, this item was combined with a related Item VTM-20.1 (which proposed limits on the use of these systems with specific product types) with the goal of having the submitters of both items work together to reach a reasonable compromise between the two proposals.
- Since January 2020, the submitters of both items have worked to find a compromise that best meets the needs of the community.
- In developing the current proposal, the submitters considered concerns raised regarding the use of these systems, including:
  - the potential for facilitation of fraud with the use of these systems;
  - the potential for cross contamination of products in different tank compartments; and
  - the suitability of using a single meter for multiple product types.
- These concerns were balanced against comments indicating:
  - these same product handling practices have occurred for many years without the use of such systems; and
  - manifold flush systems can offer distinct safety advantages for drivers when flushing product.
- 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)
  - However, OWM recognizes this is already a widespread practice in the industry and placing a blanket limitation in NIST Handbook 44 may not best serve the community.
- OWM acknowledges the safety advantages of such a systems to the drivers since the drivers do not have to climb on top of the VTM truck to flush product from the line before delivering another product.
- OWM notes that such changes do not preclude a jurisdiction from implementing policies regarding the use of a single meter to dispense multiple different product types.

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

(**Note:** This item was revised based on changes that were made by the Committee at the 2021 Interim Meeting.)

(**Note:** The Item Under Consideration was removed from the voting consent calendar at the 2021 Annual Meeting and the S&T Committee made this a Developing Item.)

OWM Executive Summary for VTM-20.2 – Table T.2. Tolerances for Vehicle Mounted Milk Meters.

OWM Recommendation: OWM supports the Assigned status for this item and encourages the task group to continue its review of the proposed OIML tolerances for Vehicle Tank Milk Meters.

- One of the questions raised concerning the current proposal that includes the OIML tolerances is that the proposal includes tolerances for the system and a separate tolerance for the meter.
- NIST OWM observed that a separate tolerance for the meter would apply during OIML type evaluation. However, NIST HB 44 only includes requirements for the entire measurement system and not separate main elements nor does it have separate tolerances for main elements known to be metrologically significant.
- NIST OWM will look forward to more discussion of this item during task group meetings.

LPG – Liquified Petroleum Gas and Anhydrous Liquid-Measuring Devices

LPG-15.1 D N.3. Test Drafts.

(Note: Previously LPG-4**)**

(**Note:** In 2019 this item was combined with Block 1 "Terminology For Testing Standards" and other items that addressed terminology for standards and the use of "master meters." Based on comments heard during the 2021 Annual Meeting, the S&T Committee recommended that all items that were combined with Block 1 "Terminology For Testing Standards" that originally appeared as a separate item or a separate block of items on the S&T agenda prior to 2019, be removed from Block 1 "Terminology For Testing Standards" and appear as originally presented.

Item LPG-15.1 was removed from Block 1 "Terminology For Testing Standards" and now appears as a separate item on the 2022 Interim Meeting agenda.)

OWM Executive Summary for LPG-15.1 – N.3. Test Drafts.

OWM Recommendation: OWM believes that the purpose for this item, as specified by the submitter, is better addressed from a technical standpoint in Items GEN-23.1 and Block 8.

- State and industry have a need to use various types of field test standards to evaluate commercial devices installed in the marketplace. NIST OWM recognizes the need to use various standards to test commercial devices and support the use of these standards when test data supports its use.
- NIST OWM is also supporting the use of various types of field test standards through the purchase of several meters and the collection of data throughout the U.S.
- The purpose statement for Items LPG-15.1 (LPG & Anhydrous Ammonia Liquid-Measuring Devices Code) indicates the goal of this items is:

  "to amend Handbook 44 to allow field reference standard meters to be used to test and place into service dispensers and delivery system flow meters."

OWM Executive Summary for LPG-15.1 – N.3. Test Drafts.

- The proposed changes in Items LPG-15.1 suggest changes to the *test draft criteria* for devices covered under this code, which is not necessary to allow field reference standard meters to be used to test and place into service dispensers and delivery system flow meters.
- Amongst the concerns raised to the S&T Committee over the proposed changes for LPG-15.1 is that it conflicts with existing test draft criteria and confusion over the application of the proposed requirement.
- As such, given the long debate over multiple iterations of the proposals, OWM proposes that since the purpose of the proposal is to allow field reference standard meters to be used to test and place into service dispensers and delivery system, and the responsibility for allowance of these field test standards are already addressed in the NIST Handbook 44 Fundamental Considerations and Items GEN-23.1 and Block 8 clarifies these responsibilities, that Consideration be given to the proposal in Items GEN-23.1 and Block 8 which clearly states the responsibility for allowance of field standards.
- Block 8 clarifies what has long been recognized in NIST HB 44 concerning the responsibility for acceptance of a standard, making changes to specific codes such as those references in LPG-15.1 unnecessary and confusing.
  - GEN-23.1 provides a requirement for all devices to avoid the need to specifically reference individual test methods in each specific code, it avoids the potential of implying that test methods not specifically referenced in a code would not be appropriate.

LPG-22.3 W *S.2.5. Zero-Set-Back Interlock., S.2.5.2. Zero -Set-Back Interlock for Stationary Customer -Operated Electronic Retail Motor-Fuel Devices.*

(**Note:** The Item Under Consideration has been updated since the 2022 Interim Meeting. The current item is a combined effort of the National Propane Gas Association and U-Haul International, Inc.

Note: At the 2022 Annual Meeting this item was designated as Developing. During the 2022 Fall Regional Meetings, the submitter requested that this item be Withdrawn and that consideration be given to Item LPG-23.)

OWM Executive Summary for LPG-22.3 – *S.2.5. Zero-Set-Back Interlock., S.2.5.2. Zero -Set-Back Interlock for Stationary Customer -Operated Electronic Retail Motor-Fuel Devices.*

OWM Recommendation: This item was withdrawn by the submitter and all regions supported the withdraw of this item. The original OWM comments are maintained in this analysis.

NIST OWM is not in support of this proposal to change S.2.5.2 requirements in the LPG Code and feel that this creates different requirements for retail motor fuel devices used for other products. Also, a proposal is needed for consideration of changes to timeout for LPG. The submitter requested that this

item be withdrawn during the 2022 Regional Meetings, and that consideration be given to Item, LPG-23.1. NIST Supports the submitters decision to withdraw this item.

- The submitters explained in their justification that only trained operators can dispense propane into a vehicle and that these propane retail motor fuel dispensers do not meet the requirements for Zero-Set Back Interlock for Stationary Retail Motor-Fuel Devices. As such, the submitters are proposing that since these are not customer operated dispensers, and that the dispensers are operated by trained staff, the requirements in S.2.5.2 Zero-Set-Back Interlock for Stationary Retail Motor Fuel Devices should be revised to only apply to Customer Operated Electronic Retail Motor Fuel Devices. The following are NIST OWM comments to this proposed change.

- If a dispenser is operating as a retail motor fuel device the current requirements for zero-set-back interlock apply whether or not it is operated by the customer or trained staff.

- The purpose of the Zero-Set-back Interlock is to ensure that an automatic interlock prevents subsequent delivery until the indicating element is returned to zero.

- With the changes proposed, any propane retail motor fuel device that is operated by trained staff could possibly not be returned to zero at the start the next transaction.

- Propane retail motor fuel devices, that are not customer operated, would not be required to meet S. 2.5.2. in the LPG Code.

LPG-23.1 S.2.5. Zero-Set-Back Interlock

OWM Executive Summary for LPG-23.1 – S.2.5. Zero-Set-Back Interlock

OWM Recommendation: NIST OWM believes additional discussion is need concerning this item and how it will be enforced when other LPG devices are in use that require zero-setback interlock and also the impact of the proposed requirement on other retail motor fuel devices of other products used to fuel vehicles.

- Zero set-back interlock ensures that a device is returned to zero before another customer or services person uses the device for another transaction (to ensure that an automatic interlock prevents subsequent delivery until the indicating element is returned to zero).

- The LPG Code paragraphs S.2.5.1 and S.2.5.2 address electronic stationary and other stationary devices because the process for zero-set-back interlock operates differently for electronic stationary than stationary retail motor fuel device as described in S.2.5.2. but both devices are required to return to zero before another transaction is made.

- The submitter states that only a few transactions for LPG dispenser are for fueling vehicles and they are limited to use by trained staff. Paragraphs S.2.5.1 and S.2.5.2 are not dependent on who is dispensing the product or how often the device is used as a retail motor dispenser; the paragraphs are intended to ensure that the device is so designed that each new transaction starts at zero. What happens when they are used more frequently for use in fueling vehicles?

OWM Executive Summary for LPG-23.1 – S.2.5. Zero-Set-Back Interlock

- Both electronic stationary and stationary retail motor fuel dispensers according to the current requirements must have a zero-setback interlock.
- The proposed language added to both S.1.5.1 and S.1.5.2 is "***Devices Used Exclusively as"*** Stationary Retail Motor-Fuel Devices. As such, the zero-setback interlock requirement would only applies to those devices that are used exclusively to fueling vehicles.
- Is this equitable to other products dispensed, such as gasoline dispensers. Gasoline dispensers are required to have a zero-setback interlock, and some are used to fill containers used for gasoline-powered equipment. Granted, the majority of gasoline dispensers are used to fill vehicles; but does this create an unfair market situation where some fueling dispensers are required to have zero set-back interlock and others are not?
- The submitter also stated that proposed changes were introduced for consideration in 2023 to allow public refueling of LP Gas with safety precautions and with these new requirements zero-setback interlock is needed. How will LPG devices with and without zero-setback interlock be fairly-regulated?

LPG-23.2 S.2.6. Automatic Timeout.

OWM Executive Summary for LPG-23.2 – S.2.6. Automatic Timeout.

OWM Recommendation: Different device types may require varying timeouts; as such, if 5 minutes is deemed appropriate for electronic vehicle tank meters NIST OWM supports this change.

- The Automatic time-out feature helps to prevents the use the device by another customer when the preceding customer completes the transaction. This is achieved by requiring that the device automatically time-out after a specified time.
- The submitter is requesting that the automatic time out that is currently specified as 3 minutes for electronic vehicle mounted meters in the LPG code be removed from S.2.6.1 in the LPG code and another paragraph be created, S.2.6.3 for electronic vehicle tank meters and,
- The submitter is requesting that the automatic time out be extended to 5 minutes for electronic vehicle tank meters to account for the initiation time at the truck and moving the discharge hose to the customer tank which can exceed 150 feet.
- Discussion may be needed to determine how this will impact the VTM code requirements with Timeout requirements of three-minutes.
- Different device types will require varying timeout. As such, if the 5 minutes suggested is the appropriate industry standard for this device, NIST OWM supports this change.

MLK – Milk Meters

MLK-23.2 Table T.1. Tolerances for Milk Meters

OWM Executive Summary for MLK-23.2 – Table T.1. Tolerances for Milk Meters

OWM Recommendation: A review of this item by the Milk Meter Task Group when a new chair is appointed may be useful. We agree with other regionals that this item be assigned to the Milk Meter Task Group.

- The Milk Meter Task Group reviewed all the varying tolerances in HB 44 for Milk meters. Instead of keeping a decreasing tolerance as the test draft increases, as the tolerance in the Milk meters code, the Task Group is proposing that the tolerances as included in the 2023 interim Meeting Agenda for VTM-20.2 for milk meter also be adopted in the Milk Meter code.

- With the Task Group Chair currently not assigned since Mr. Charlie Stutesman no longer works with Kansas Weights and Measures and is no longer Chair of the Milk Meter Task Group, a review of the item by the Task Group when a new chair is appointed may be useful. We agree with other regionals that this item be assigned to the Milk Meter Task Group when a new task group chair is assigned.

MFM – Mass Flow Meters

MFM-15.1 D N.3. Test Drafts.

OWM Executive Summary for MFM-15.1 – N.3. Test Drafts.

OWM Recommendation: OWM believes that the purpose for this item, as specified by the submitter, is better addressed from a technical standpoint in Items GEN-23.1 and Block 8.

- State and industry have a need to use various types of field test standards to evaluate commercial devices installed in the marketplace. NIST OWM recognizes the need to use various standards to test commercial devices and support the use of these standards when test data supports its use.

- The NIST OWM is also supporting the use of field test standards through the purchase of several meters and the collection of data throughout the U.S.

- The purpose statement for Item MFM-15.1 (Mass Flow Meters Code) indicates the goal of this item is:

  "to amend Handbook 44 to allow field reference standard meters to be used to test and place into service dispensers and delivery system flow meters."

- The proposed changes in Items MFM-15.1 suggest changes to the *test draft criteria* for devices covered under this code, which is not necessary to allow field reference standard meters to be used to test and place into service dispensers and delivery system flow meters.

OWM Executive Summary for MFM-15.1 – N.3. Test Drafts.

- Amongst the concerns raised to the S&T Committee over the proposed changes for MFM-15.1, is the inability for an inspector or service company to test devices under their conditions of use and as required elsewhere in the MFM code.
  - Specifically, with the proposed addition of a paragraph N.3.2. Field Reference Standard Meter Test., no information or data has been provided to justify that:
    - a different test draft size than that specified in N.3.1. or the current Mass Flow Meter, NIST HB 44 paragraph N.3 Test Draft is necessary in order to use a "Field Reference Standard Meter."
    - the current requirements for test draft "one test draft at the maximum flow rate of the installation and one test draft at the minimum flow rate" is appropriate for use when testing with a meter or volume prover.
  - This proposal creates two test draft paragraphs in NIST HB 44. It retains the existing criteria for the test draft and adds a proposal for a second test draft paragraph that states "the test draft shall be equal to or greater than the amount delivered in one minute"
    - It has been observed when testing CNG that some draft will take far less time than one minute. If the proposed test draft paragraph is added the test draft will not be achievable and as stated unable to test under conditions of use.
    - Since this proposal adds another test draft paragraph with the existing paragraph for test draft it also creates confusion as to what paragraph the inspector should apply.

    As such, given the long debate over multiple iterations of the proposals, OWM proposes that since the purpose of the proposal is to allow field reference standard meters to be used to test and place into service dispensers and delivery system, and the responsibility for allowance of these field test standards are already addressed in the NIST Handbook 44 Fundamental Considerations and Item Block 8 clarifies these responsibilities, that Consideration be given to the proposal in Item Block 8 which clearly states the responsibility for allowance of field standards along with a new proposal to add a general code requirement.
- Note that GEN-23.1 and Block 8 items clarify what has long been recognized in NIST HB 44 concerning the responsibility for acceptance of a standard making changes to specific codes such as those references in MFM-15.1 and is better addressed in GEN-23.1 and Block 8.
- GEN-23.1 not only avoids the need to specifically reference individual test methods in each specific code, it avoids the potential of implying that test methods not specifically referenced in a code would not be appropriate.

HGM – Hydrogen Gas-Measuring Devices

HGM-23.1 UR.3.8. Safety Requirement

OWM Executive Summary for HGM-23.1 – UR.3.8. Safety Requirement
OWM Recommendation: • It has not been part of the weights and measures standards development process to include prescriptive safety requirements into handbook legal metrology standards. • The dispenser's design features regardless of their function should not affect the metrological integrity of the equipment. • Traditional fueling applications have established mechanisms to address the safety features of dispenser installations not typically within in the scope of the weights and measures authority. • Groundwork not outlined in the proposal must be laid to establish an SAE J2601 verification program.

EVF – Electric Vehicle Fueling Systems

EVF-21.1 D A.1. General

OWM Executive Summary for EVF-21.1 – A.1. General
OWM Recommendation: • OWM believes this item should not be revisited because as written in the Item Under Consideration it requires considerable further development. Rather than proposing an exemption from all requirements in Section 3.40, OWM recommends the submitters not revisit this proposal and for those problematic areas of compliance they should propose modifications to specific requirements that result in a suitable alternative means to achieve conformity. • OWM acknowledges the submitters have been diligently working with the NIST USNWG EVFE Subgroup. The EVFE Subgroup has held 16 meetings since 2020 where the submitters presented possible alternatives for the group to review prior to presenting those alternatives to the community for consideration. The EVFE Subgroup only reached a consensus in June 2022 for a proposal that does not delay fundamental requirements for accuracy of commercial systems. The EVFE Subgroup's proposal recommends a wider DC tolerance (5 percent) for EVSEs installed prior to 2024 and specifies that must include accuracy markings for transparency to the EV driver about the conditions for the sale of electrical energy and in fairness to competing businesses. The EVFE Subgroup offers that proposal for consideration as an alternative to Agenda Items EVF-23.5 and EVF-23.6 with notable differences. • NIST OWM is aware of the submitters' November 15, 2022 email sent to the Committee where the submitters recommend withdrawing EVF 21.1 and EVF-21.5 given new proposal EVF-23.6 reflects feedback on these 2021 proposals and the significant changes to the proposals since August 2020

OWM Executive Summary for EVF-21.1 – A.1. General

(as well as the EVSE code becoming permanent). The submitters are also supportive of designating EVF-23.6 as a Voting Item.

- The proposal, if adopted as written, 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.

- 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 or EVSE manufacturers who are spending money to comply with current requirements. The fairness issue has surfaced in several 2023 proposals.

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

- The submitters made alternate proposals available to the EVFE Subgroup for their review in January 2022 and April 2022. These alternate proposals do not include any modifications to paragraph A.1. General as shown in the Item Under Consideration.

- The EVFE Subgroup's discussions have been ongoing in their review of the submitters latest proposals which are intended to replace S&T Agenda Items EVF-21.1 and EVF-21.5. The EVFE Subgroup has not reached a consensus on the submitters' latest proposals which were revised to address specific features such as the indicating element, identification/marking information, as well as general and type evaluation tolerances.

EVF-21.5 D T.2. Load Test Tolerances.

OWM Executive Summary for EVF-21.5 – T.2. Load Test Tolerances

OWM Recommendation: OWM believes this item requires further development.

- The submitters made alternate proposals available to the EVFE Subgroup for their review in January 2022 and April 2022. These alternate proposals did include modifications to paragraph T.2. Load Test Tolerance to become a nonretroactive requirement enforceable in 2024 initially with a 4 percent overregistration/6 percent underregistration tolerance which then became 5 percent for DC systems that would also require accuracy markings if the device "is not subject to 1 percent Acceptance/2 percent Maintenance tolerance."

- The EVFE Subgroup's discussions have been ongoing in their review of the submitters 2022 proposals which are intended to replace S&T Agenda Items EVF-21.1 and EVF-21.5. The EVFE Subgroup did not reach a consensus on the submitters' latest proposals which were revised to address specific features such as the indicating element, identification/marking information, as well as general and type evaluation tolerances.

OWM Executive Summary for EVF-21.5 – T.2. Load Test Tolerances

- The EVFE Subgroup was balloted June 17, 2022 on its proposal to recognize a separate new 5 % tolerance for DC EVSEs installed prior to 2024 and a corresponding new requirement for marking the accuracy of pre-2024 equipment.
  - The final outcome of this ballot resulted in the EVFE Subgroup being in favor of the proposal. The results were provided to the submitters in October 2022 to enable them to assess how and if to modify their original proposal to the S&T Committee.
- OWM notes that a sunset date (retroactive enforcement date) ending a dual tolerance structure would encourage uniformity in equipment performance in the marketplace; facilitate value comparisons by consumers; and phase out less accurate equipment.
- According to information provided to the USNWG by the submitters, not all DC chargers (including those manufactured in recent years) manufactured prior to 2024 can be readily or inexpensively upgraded to meet the existing (1 % and 2 %) tolerances.
  - Of the DC chargers manufactured prior to 2024, including those manufactured in recent years, some are capable of being upgraded to meet the existing (1 % and 2 % tolerances) and some are not.
  - Of those DC chargers that can be upgraded, the cost for such upgrades can vary across a rather wide spectrum.
  - While some estimates of impact have been provided, the details seem to represent the broad spectrum of capabilities and cost, making it difficult to assess the impact on manufacturers, businesses, and consumers as a whole.
  - Details regarding the percentage of equipment that falls into these categories would be helpful to the community in assessing the need for a sunset date and, if a sunset date is deemed appropriate, what represents a reasonable time frame for phasing out the less accurate equipment.
  - Information has also been provided to suggest that newer DC devices being manufactured (including those manufactured today) are more robust than older equipment, extending the lifespan beyond that originally reported in past discussions.
- OWM acknowledges the submitters have been diligently working with the NIST USNWG EVFE Subgroup. The EVFE Subgroup has held 16 meetings since 2020 where the submitters presented possible alternatives for the group to review prior to presenting those alternatives to the community for consideration. The EVFE Subgroup reached a consensus the group's June 2022 proposal. The EVFE Subgroup proposal does not delay fundamental requirements for accuracy of commercial systems. The EVFE Subgroup's proposal recommends a wider DC tolerance (5 percent) for EVSEs installed prior to 2024 and specifies that must include accuracy markings for transparency to the EV driver about the conditions for the sale of electrical energy and in fairness to competing businesses. NIST OWM notes that the group's proposal does require additional editing for clarity about the application of the marking requirement. The EVFE Subgroup offers that proposal for consideration as an alternative to Agenda Items EVF-23.5 and EVF-23.6. NIST OWM finds there are notable differences in the EVFE Subgroup proposal and EVF-23.6 proposal for DC systems installed prior

OWM Executive Summary for EVF-21.5 – T.2. Load Test Tolerances

to 2024 when bearing accuracy markings are permitted a 5 percent tolerance which sunsets in 2034 although all DC tolerances don't apply until 2028.

- NIST OWM is aware of the submitters' November 15, 2022 email sent to the Committee where the submitters recommend withdrawing EVF 21.1 and EVF-21.5 given new proposal EVF-23.6 reflects feedback on these 2021 proposals and the significant changes to the proposals since August 2020 (as well as the EVSE code becoming permanent). The submitters also indicated they are supportive of designating EVF-23.6 as a Voting Item.

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

EVF-23.1 S.2.5.1. Money-Value Divisions Digital, S.8.(a) Minimum Measured Quantity, S.5.3.(d) Abbreviations and Symbols; Joule, N.1. No Load Test, T.5. No Load Test, N.2. Starting Load Test, T.6. Starting Load, Appendix D–megajoule

OWM Executive Summary for EVF-23.1 – S.2.5.1., S.8., S.5.3.(d), N.1., T.5., N.2., T.6., Appendix D – Definitions; megajoule (MJ)

OWM Recommendation:

- NIST OWM agrees with this EVFE Subgroup's proposal that further refines the electrical vehicle fueling systems code requirements in NIST HB 44.

- NIST OWM also notes there is a related method of sale proposal on the L&R Committee Agenda (MOS-23.4) that updates the unit of measurement terminology for the EVSE application in NIST HB 130.

- NIST OWM concurs with the EVFE Subgroup's late fall 2022 proposed changes to the EVFS Code in S&T Agenda Item 23.1 to include:

  - further modification to paragraph S.2.5.1. Money-Value Divisions Digital to clarify that it is at the "end of the transaction when mathematical agreement shall occur.

  - proposed new modifications to:

    - paragraph S.5.2. EVSE Identification and Marking Information to ensure continuity across the EVFS Code in all references to the EVSE's current level; and

    - further amending paragraph S.5.3. Abbreviations and Symbols to recognize the term "kilowatt-hour"

  The additional modifications would read:

  S.2.5.1. Money-Value Divisions Digital. – An EVSE with digital indications shall comply with the requirements of paragraph G-S.5.5. Money-Values, Mathematical

OWM Executive Summary for EVF-23.1 – S.2.5.1., S.8., S.5.3.(d), N.1., T.5., N.2., T.6., Appendix D – Definitions; megajoule (MJ)

Agreement, and the total price computation **at the end of a transaction** shall be based on quantities not exceeding ~~**0.5 MJ or**~~ 0.**0**1 kWh."

S.5.2. EVSE Identification and Marking Information.

(b) maximum ~~**current**~~ deliverable **amperes**;

S.5.3. Abbreviations and Symbols.

(d) ~~**J**~~**kWh** = ~~**joule**~~**kilowatt hour**.

EVF-23.2 S.2.7. Indication of Delivery

OWM Executive Summary for EVF-23.2 – S.2.7. Indication of Delivery

OWM Recommendation:

- The effective date was placed under this specific paragraph that addresses indications and therefore applies only to this paragraph while there are multiple other code paragraphs that include requirements for indication of that same transaction information throughout the charging session.
- An important question for the community is that as the enforcement date draws closer will compliance be delayed further by extending the effective date or granting a permanent exemption to equipment.
- An EVFS may have its own integral display indication or multiple devices being interfaced to a single display capable of clearly providing each device's associated information. NIST Handbook 44 Section 1.10 General Code requirements under G.S.5. Indicating and Recording Elements and where applicable Section 5.55 Timing Devices Code also include indication requirements that apply to EVFSs.
- The proposal should be analyzed from the standpoint of its effect on the consumer, operator, competing businesses, and regulatory authority. One thing that is missing from that part of the argument is that simply eliminating the indications requirement doesn't ensure that all vehicle displays provide the same clear and understandable alternative in the vehicle, nor explain how W&M officials will regulate/ensure that clear and legible indication for all vehicle types.
- The State of California has type approved AC systems based on their meeting indication requirement in the Electric Vehicle Fueling Systems Code.
- This is a continuance of the case where consideration has not been given to similar work by multiple stakeholders from the weights and measures and electrical energy community on the USNWG EVFE SG over the past three years to reach a consensus that is clear, comprehensive, fair from a competitive standpoint, and takes place before submitting a proposal that effects the fundamental weights and measures component of transparency.

EVF-23.3 S.2.7. Indication of Delivery

OWM Executive Summary for EVF-23.3 – S.2.7. Indication of Delivery

OWM Recommendation:

- The effective date was placed under this specific paragraph that addresses indications and therefore applies only to this paragraph while there are multiple other code paragraphs that include requirements for indication of that same transaction information throughout the charging session.
- An important question for the community is that as the enforcement date draws closer will compliance be delayed further by extending the effective date or granting a permanent exemption to equipment.
- An EVFS may have its own integral display indication or multiple devices being interfaced to a single display capable of clearly providing each device's associated information. NIST Handbook 44 Section 1.10 General Code requirements under G.S.5. Indicating and Recording Elements and where applicable Section 5.55. Timing Devices Code also include indication requirements that apply to EVFSs.
- The proposal should be analyzed from the standpoint of its effect on the equipment manufacturer, consumer, operator, competing businesses, and regulatory authority as to how it will be interpreted, applied, and enforced because of other indication requirements across the codes.
- The State of California has type approved AC systems based on their meeting indication requirement in the Electric Vehicle Fueling Systems Code.

EVF-23.4 S.5. Markings, and N.5. Test of an EVSE System.

OWM Executive Summary for EVF-23.4 S.5. – Markings and N.5. Test of an EVSE System.

OWM Recommendation:

- The proposed modifications to subparagraph S.5.2. (b) to specify EVSEs must be marked with the "maximum deliverable amperes" will clarify the appropriate terminology for specifying the amperage load rating for the equipment's operation and to be marked on the device.
- At this time the "joule" unit of measurement is not used for expressing electrical energy quantity values in commercial EVSE applications. For continuity across EVSE NIST Handbook codes and regulations the term and its abbreviation (J) should also be removed from subparagraph S.5.3.(d). The kilowatt-hour unit of measurement and its corresponding abbreviation should be recognized in the EVFS Code.
- There does not seem to be a general consensus on the minimum test criteria to apply to AC and DC systems. There may be test criteria that cannot be applied in both the laboratory and in the field because there are factors the examiner cannot control or adequately correct for. Tests should be conducted over the range of operating conditions for which the device is designed.

OWM Executive Summary for EVF-23.4 S.5. – Markings and N.5. Test of an EVSE System.

- The 2023 proposal creates a new separate test requirement specifically for laboratory evaluations; therefore a 2028 exemption would also be new text that requires being underscored to clearly designate the 2028 effective date as new language.

- The 2028 effective date is confusing, is the intent that no testing at an approved brick and motor facility nor type evaluations can be carried out until January 1, 2028?

- A slight change is recommended for the agenda item's title to include missing paragraphs S.5.2.(b) EVSE Identification and Marking Requirements and S.5.3.(d) Abbreviations and Symbols; joule and striking ~~S.5. Markings~~ to clarify these units of measurement are a part of this proposal. This would also assist the community in distinguishing this item from multiple others 2023 proposals that address EVFS marking requirements.

EVF-23.5 S.5.2. EVSE Identifications and Marking Requirements and T.2. Load Accuracy Test tolerances

OWM Executive Summary for EVF-23.5 – S.5.2. EVSE Identifications and Marking Requirements and T.2. Load Accuracy Test Tolerances

OWM Recommendation:

- Items EVF-23.5 and EVF-23.6 both propose changes to marking and accuracy requirements in NIST Handbook 44.

- OWM has given thought to how we might assist the Committee and the Community in addressing these items and arriving at a single proposal that would meet the needs of the submitters of both items and other stakeholders.

- OWM believes this proposal (Item EVF-23.5) and the alternative recommended in Item EVF 23.6 both require more work and vetting as suggested by two of the four regional associations.

    - We believe this work would most appropriately be done in the USNWG SG as recommended during the WWMA meeting and recommend the Committee designate these items as Developing and ask the SG for assistance in vetting the proposals.

- Should the Committee believe there is an urgent need to move one of these proposals forward, we encourage the Committee to use the proposed language in Item EVF-23.5 as a starting point to ensure clarity and understanding of the final language.

    - Having well-defined tolerances with clear and understandable effective dates is essential.

    - Defining tolerances in the specific device codes is also preferable to the alternative of having jurisdictions use the provisions of the General Code to implement tolerances suitable for the application since this has the potential for non-uniform application across the country.

- OWM has included comments on Item EVF-23.6 as part of its analysis of that item.

OWM Executive Summary for EVF-23.5 – S.5.2. EVSE Identifications and Marking Requirements and T.2. Load Accuracy Test Tolerances

- Regarding Item EVF-23.5, OWM is mindful of the comments made in some of the regions and by other stakeholders through written comments submitted to the Committee that the specifics of this proposal (Item EVF-23.5) may not meet the needs of all stakeholders.
    - See the letter on the Committee's website in opposition to EVF-23.5 (Colorado, Michigan, Florida, Vermont and Electrify America, Tesla, and EVGo) and recommends the community work to modify the code to appropriately address the marketplace and provide a comprehensive uniform set of requirements needed by regulators and equipment manufacturers (EVSE and test apparatus). What has been done in the development stage and over the last seven years to verify EVSEs in commercial (for fee) applications.
- However, the proposed changes in Item EVF-23.5 are much clearer in language, format, and application and are closer to language agreed to by the USNWG SG in June 2022 than are the proposed changes in Item EVF-23.6.
    - The NIST USNWG EVFE Subgroup reached a consensus through a June 2022 ballot in which the group agreed to move forward to recommend a wider tolerance of 5 percent only for DC systems installed before 2024 that must bear accuracy markings while maintaining for AC systems a 1 percent Acceptance Tolerance/2 percent Maintenance Tolerance and the tighter tolerance would also apply to post 2024 DC systems.
    - The language from that June 2022 ballot is included in OWM's detailed analysis below and in Item EVF-23.6.
    - OWM has included specific comments regarding changes needed to the proposed language in Item EVF-23.6 as part of OWM's analysis of that item.
- Below are some additional comments for the Committee and other stakeholders to consider in reviewing Items EVF-23.5 and EVF-23.6.
- Proposed accuracy markings need to be separate from the markings of electrical energy levels and required temperature ranges, therefore OWM recommends the "Notice" be included as a separate, new subparagraph S.5.2.1.
- Adoption should occur only after fully vetting proposals to modify fundamental requirements such as those that impact accuracy, transparency, or that ensure fair competition to:
    - avoid unforeseen consequences;
    - ensure stakeholders have the tools needed for this new device application;
    - discourage nonuniformity which can have a disruptive impact on the marketplace; and
    - take corrective action on discovering any gaps/oversight in modifications to the seven-year-old legal metrology requirements.
- NIST OWM encourages the community's participation in the USNWG EVFE Subgroup which began its work in 2012 and whose work resulted in NIST HB 44 3.40. EVFS Code's adoption in

OWM Executive Summary for EVF-23.5 – S.5.2. EVSE Identifications and Marking Requirements and T.2. Load Accuracy Test Tolerances

2015. The Subgroup is reviewing the four paragraphs that appear in multiple 2023 proposals that address: (1) dual EVSE tolerances (2.0 percent or 5.0 percent [DC EVSEs]); (2) new EVSE markings required for the wider tolerance in the marketplace; and (3) corresponding accuracy test procedures.

- The EVFE Subgroup last met on December 8, 2022, to address proposals under consideration for the 2023 cycle and will provide a clear statement in writing of its exact position on agenda items.

EVF-23.6 S.5.2. EVSE Identification and Marking Requirements and T.2. Tolerances

OWM Executive Summary for EVF-23.6 – S.5.2. EVSE Identification and Marking Requirements., and T.2. Tolerances.

OWM Recommendation:

- Items EVF-23.5 and EVF-23.6 both propose changes to marking and accuracy requirements in NIST Handbook 44.
- OWM has given thought to how we might assist the Committee and the Community in addressing these items and arriving at a single proposal that would meet the needs of the submitters of both items and other stakeholders.
- OWM believes this proposal (Item EVF-23.6) and the alternative recommended in Item EVF 23.5 both require more work and vetting as suggested by two of the four regional associations.
- We believe this work would most appropriately be done in the USNWG SG as recommended during the WWMA meeting and recommend the Committee designate these items as Developing and ask the SG for assistance in vetting the proposals.
- Should the Committee believe there is an urgent need to move one of these proposals forward, OWM encourages the Committee to use the proposed language in Item EVF-23.5 as a starting point to ensure clarity and understanding of the final language.
    - Having well-defined tolerances with clear and understandable effective dates is essential.
    - Defining tolerances in the specific device codes is also preferable to the alternative of having jurisdictions use the provisions of the General Code to implement tolerances suitable for the application since this has the potential for non-uniform application across the country.
- Regarding Item EVF-23.6, OWM offers the following specific technical concerns and comments.
- OWM questions the reference to the phrase “certified to….” In the proposed EVF-23.6 paragraph S.2.5.1. Marking.

OWM Executive Summary for EVF-23.6 – S.5.2. EVSE Identification and Marking Requirements., and T.2. Tolerances.

  - If the intent is to note the marking is not required for devices capable of meeting the 1 % Acceptance and 2% Maintenance tolerance, then the language should clearly state this.

- OWM concurs that the markings need to be "conspicuously and legibly displayed." Prior versions of similar language considered by the EVFE Subgroup also included the term "indelible" in recognition that the General Code requires all markings to be of a permanent nature. OWM recommends including the term "permanent" to align with the language used in the General Code.

- There are several dates referenced in proposed EVF-23.6 paragraph T.2.2. Tolerances that conflict and OWM believes will create confusion for those implementing the proposed requirements.

- The statement adopted by the NCWM in July 2022 exempting DC devices from any tolerance requirements until 2028 remains in the proposal, yet there is a date of 2024 in both the proposed paragraph T.2.2.(a) and paragraph T.2.2.(b) which specifies requirements for DC devices installed prior to 2024. This is confusing.

- Proposed paragraph T.2.2.(a) references a sunset date of 2034, yet there is still a statement referring to a 2028 date, creating a conflict. Additionally, the 2034 date is 6 years after the 2028 date that was adopted by the NCWM in July 2022. The rationale for extending the sunset date is not clear. OWM also notes that a date of 2034 is eighteen years after the tentative code was first adopted by the NCWM.

- The rationale for the following statement in paragraph T.2.2.(b) is not clear and OWM believes this statement needs to be struck from the proposed new paragraph T.2.2.(b):

  - "or that do not bear the notice specified in paragraph S.5.2.1. Marking of Accuracy Limits, DC EVSEs Installed Prior to 2024 tolerances are"

- Proposed accuracy markings need to be separate from the markings of electrical energy levels and required temperature ranges, therefore OWM agrees the "Notice" be included as a separate, new subparagraph S.5.2.1.

- As shared in its comments in Item EVF-23.5, OWM believes the proposed changes in Item EVF-23.5 are much clearer in language, format, and application and are closer to language agreed to by the USNWG SG in June 2022 than are the proposed changes in Item EVF-23.6.

  - The NIST USNWG EVFE Subgroup reached a consensus through a June 2022 ballot in which the group agreed to move forward to recommend a wider tolerance of 5 percent only for DC systems installed before 2024 that must bear accuracy markings while maintaining for AC systems a 1 percent Acceptance Tolerance/2 percent Maintenance Tolerance and the tighter tolerance would also apply to post 2024 DC systems.

  - The language from the June 2022 ballot is included in OWM's detailed analysis below and in Item EVF-23.5.

OWM Executive Summary for EVF-23.6 – S.5.2. EVSE Identification and Marking Requirements., and T.2. Tolerances.

  - As noted in its comments on Item EVF-23.5, OWM is aware of comments indicating EVF-23.5 may not meet the needs of all stakeholders as presently written and OWM believes additional changes would be needed to that item. However, the proposed changes in Item EVF-23.5 are much clearer in language, format, and application and are closer to language previously agreed to by the USNWG SG in June 2022 than are the proposed changes in Item EVF-23.6.

- There are differences between the language recommended in that June 2022 SG ballot and that proposed in Item EVF-23.6. The language adopted in the June 2022 ballot:

  - Permits DC devices installed before 2024 to have a wider tolerance if they were clearly marked to designate their accuracy.

  - Includes a wider tolerance of 5 % for DC systems installed before 2024 when accuracy is marked, which several OEMs identified as achievable. Note: The SG's language does not include an exemption for DC systems from accuracy tolerances up through 2028 to sunset in 2034.

  - Acknowledges the less-than-ideal existence of dual tolerances in the marketplace would be addressed by marking systems to indicate when 5 percent is their achievable accuracy; and

  - Recognizes the EVFE Subgroup would further refine the requirement's text.

- OWM is also aware of a Florida, Electrify America, Tesla, EVGo, and Siemens' October 15, 2022, letter sent to the S&T Committee regarding EVF-23.6 and a June balloted proposal of the USNWG EVFE Subgroup (SG). OWM submitted the following clarifications regarding this letter to the S&T Committee.

  - NIST OWM, as convenors of the EVFE SG, sent a response to the Committee indicating that although the results of the Subgroup's June 2022 ballot indicate the group's support for modifications to tolerances and marking requirements this should not be construed as supporting the specific changes proposed in EVF-23.6.

  - There are some key differences between the Subgroup's June balloted proposal and EVF-23.6. Specifically, the Subgroup's proposal does not include two different retroactive dates and differs in the magnitude of the tolerances and specific conditions under which they would apply, the permissible format required for markings (which are not indelible, do the submitters have a label or electronic only in mind?) and reference to certification. The convenors of the Subgroup will continue to provide written and verbal input as explicitly directed by the group.

- Below are some additional comments for the Committee and other stakeholders to consider in reviewing Items EVF-23.5 and EVF-23.6.

- Adoption should occur only after fully vetting proposals to modify fundamental requirements such as those that impact accuracy, transparency, or that ensure fair competition to:

OWM Executive Summary for EVF-23.6 – S.5.2. EVSE Identification and Marking Requirements., and T.2. Tolerances.

- avoid unforeseen consequences;
- ensure stakeholders have the tools needed for this new device application;
- discourage nonuniformity which can have a disruptive influence on the marketplace; and
- take corrective action on discovering any gaps/oversight in modifications to the seven-year-old legal metrology requirements.

- NIST OWM encourages the community's participation in the USNWG EVFE Subgroup which began its work in 2012 and whose work resulted in NIST HB 44 3.40. EVFS Code's adoption in 2015. The Subgroup is reviewing the four paragraphs that appear in multiple 2023 proposals that address: (1) dual EVSE tolerances (2.0 percent or 5.0 percent [DC EVSEs]); (2) new EVSE markings required for the wider tolerance in the marketplace; and (3) corresponding accuracy test procedures.

- The EVFE Subgroup last met on December 8, 2022, to address proposals under consideration for the 2023 cycle and will provide a clear statement in writing of its exact position on agenda items.

EVF-23.7 N.1. No Load Test, N.2. Starting Load Test, N.5.2. Accuracy Testing, and Appendix D: maximum deliverable amperes

OWM Executive Summary for EVF-23.7 – N.1. No Load Test, N.2. Starting Load Test N.5.2. Accuracy Testing, and Appendix D: maximum deliverable amperes

OWM Recommendation:

- Test procedures are not solely written to the operational characteristics or particular design of one test apparatus. Test procedures should encompass operational conditions over the course of the entire transactions in the marketplace. Test points should fall within the rated minimum up through the maximum operational ranges specified by the manufacturer for the EVFS under normal conditions of commercial use.

- Observe this proposal removes any reference to the feature used to determine the MDA percentage level achieved during accuracy tests and establishes a new MDA range for performing the light load test and when a vehicle is the test load for verifying EVFSs; whereas other proposals recommend the establishment of a new laboratory test in addition to field test procedures.

- The EVFS test standard must be fit for purpose or appropriate and suitable (this might be demonstrated by data) in its design, capacity, and accuracy; and would allow for replication of the manner in which the EVSE is used in commerce. The test standard used to verify an EVSE must also meet the NIST HB 44 Appendix A Fundamental Considerations for a test apparatus.

- Therefore, with a decade of experience with EVFSs having gone through type evaluation (i.e., CADMS) and test equipment designed to verify both AC and DC systems and the laboratory

OWM Executive Summary for EVF-23.7 – N.1. No Load Test, N.2. Starting Load Test N.5.2. Accuracy Testing, and Appendix D: maximum deliverable amperes

community closing in on filling the last gaps in the weights and measures infrastructure for EVFSs; it is important and necessary that all stakeholders (EVSE/test equipment manufacturers, type examiners, and regulators) reach a consensus on test procedures.

- Is this a proposal to renumber paragraph N.5. Accuracy Testing to become N.5.2.1.? The proposal does not show paragraph N.5.2 in entirety, is the submitter proposing to remove the 2028 enforcement date?

- For clarity the "meaning portion" of a definition should not include the term or parts of the term it is defining nor cite one of the many code paragraphs where the term is used because the appearance can be the term is unique to that sole paragraph. Therefore, the term's definition should include reference to the EVFS Code in brackets (i.e., [3.40] at the end of the definition rather cite a single code requirement or paragraph. The EVFS is a permanent code and definitions applicable to the code should be included in Appendix D—Definitions.

- The proposal removes the No Load Test and Starting Load Test but does not do the same for the tolerances applicable to these tests in paragraphs T.5. and T.6, respectively.

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.

OWM Executive Summary for GMA-19.1 – Table T.2.1. Acceptance and Maintenance Tolerances Air Oven Method for All Grains and Oil Seeds.

OWM Recommendation: NIST OWM supports the collection of data to verify that the proposed reduction in tolerances is appropriate for all grains.

- 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 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.

- North Carolina submitted the requested grain data for review. Field meter inspection data from the state of North Carolina for years 2017 to 2019 was examined and comprised over 3300 records each usually averaged 3 commodity drops on UGMA and Non-UGMA meter types. While only one state's data cannot be considered representative of all the other states, the results provide indications of trouble with decreased tolerances on both UGMA and Non-UGMA meter types.

OWM Executive Summary for GMA-19.1 – Table T.2.1. Acceptance and Maintenance Tolerances Air Oven Method for All Grains and Oil Seeds.

- Additional data is expected from other States participating in the grain data submission.

GMA-23.1 N.1.3. Meter to Like-Type Meter Method Transfer Standards and Table T.2.2. Acceptance and Maintenance Tolerances Meter to Like-Type Meter Method

OWM Executive Summary for GMA-23.1 – N.1.3. Meter to Like-Type Meter Method Transfer Standards and Table T.2.2. Acceptance and Maintenance Tolerances Meter to Like-Type Meter Method

OWM Recommendation: NIST supports with the proposed changes with suggestions for editorial changes to the proposal.

- The title of the item should include the word "type" to be consistent with the term used in NIST HB 44. Thus, the title and references in the item should include the phrase "Meter to Like-Type Meter" rather than "Meter to Like-Meter." The title in our technical analysis and references in the body of the proposed item have been corrected to include the term "Like-Type."

- We suggest modifications to the changes made to the note in T.2.2. as follows:

NOTE: Like-type as described in paragraph N.1.3. ~~See definition for like-type meter in N.1.3.~~ (Added 20XX)

MULTIPLE DIMENSION MEASURING DEVICES

MDM-22.1 D S.1.7. Minimum Measurement.

OWM Executive Summary for MDM-22.1 – S.1.7. Minimum Measurement.

OWM Recommendation: Unless additional information to justify the proposed changes to the MDMD Code is provided to the Committee by the submitter (or submitter's consultant), OWM recommends this item be withdrawn.

- This is the identical proposal that appeared in the S&T Committee's 2019 agenda (as S&T Item MDM-2) and was withdrawn by the Committee in 2019.

- The NCWM MDMD Work Group also reviewed the MDM-2 proposal during its spring 2019 meeting and recommended the item be withdrawn.

- We have reviewed our comments and recommendations provided to the 2019 S&T Committee for S&T Item MDM-2 and still find them relevant today. Consequently, we provide them again with only few minor changes in our detailed analysis of this item included below.

OWM Executive Summary for MDM-22.1 – S.1.7. Minimum Measurement.

- There is no additional information provided in the justification section of this item in the Committee's current agenda to explain the reason for resubmission or why the Committee should reconsider its earlier action to withdraw the item in 2019.

- We raised all of the above points during the 2022 NCWM Interim Meeting and recommended the Committee withdraw this item. During that same meeting, however, Mr. Darrell Flocken (NCWM) requested the Committee maintain a Developing status based upon a request he had received from the submitter's consultant who indicated the submitter wished to resurrect the item.

OTH – Other Items

OTH-16.1 D Electric Watthour Meters Code under Development

OWM Executive Summary for OTH-16.1 – Electric Watthour Meters Code Under Development

OWM Recommendation: Although, the EWG SG is open to discussion on points addressed in the OWM detailed technical analysis we agree with a Voting status for this item.

- Over the past several years, has been developing a proposed NIST Handbook 44 code for EWH-type meters.
    - The SG held eighteen meetings in 2021 and twelve meetings in 2022 in addition to meetings of small Task Groups focused on specific issues.
- This item has been on the S&T Committee's agenda since 2016 as a Developing Item to allow the USNWG to inform the weights and measures community of progress on the draft code.
- The EWH SG appreciates the Committee's willingness to maintain the item on the agenda as a mechanism for and to encouraging input and participation from those interested in the draft code and associated work.
- The EWH SG is pleased to submit a draft NIST HB44 code for "Non-Utility Electricity Measuring Systems" for consideration at the 2023 NCWM Interim Meeting.
- The EWH SG submitted a draft code to the S&T Committee Chair on November 12, 2022, and this draft appears in the Committee's 2023 NCWM Publication 15 agenda.
- The EWH SG believes the draft code is ready for consideration as a voting item and asks the Committee to consider assigning this item Voting status.
- As noted in OWM's more detailed analysis below, there are several areas of the code in which the Subgroup is continuing to develop some additional language; however, this work need not delay consideration of the Code. These areas include the following paragraphs:
    - S.1.4.2. Test Output

OWM Executive Summary for OTH-16.1 – Electric Watthour Meters Code Under Development

- The Subgroup would particularly like input on this paragraph. Though the majority of members supported the proposed language, regulatory members of the subgroup disagreed with the proposed language.

- Table S.3.2.3.b., Note 7
  - The work group is considering a future proposal to add a corresponding User Requirement.
- N.3. Minimum Test Duration
  - The subgroup is considering alternative language to describe full and light load tests.
- N.5.(a) Test of NUEMS
  - The subgroup is considering moving this paragraph from the Notes section and placing it into the User Requirement section.

- Although the most recent draft of the code was not available until after the Fall 2022 regional meetings, the regions and others will have adequate opportunity to review and comment on the draft in the period between the Interim and Annual Meetings.
- Thus, the EWH SG believes that designating this item with a Voting status is still an appropriate course of action.

Block 1 Items (B1) Minimum Draft Size When Using a Field Standard Meter

B1: LMD-23.1 N.3.5. Wholesale Devices
B1: VTM-23.1 N.3. Test Drafts
B1: MLK-23.1 N.3. Test Drafts

Source: Endress+Hauser Flow USA, Inc.

OWM Executive Summary for Block 1 Items (B1) – Minimum Draft Size When Using a Field Standard Meter

OWM Recommendation: NIST OWM believes that test draft criteria should be non-technology specific when addressed in NIST HB44. It is suggested that other proposal on the agenda may be a better approach for current changes to the test draft sections in Handbook 44. We encourage that future consideration be given to removing the test draft sections from the individual codes and placing them in the General Code as a suitability requirement with further guidance on selecting an appropriate test draft maybe in the Fundamental Considerations and/or EPOs.

- The submitter of this item is the same submitter of Items LPG-15.1 and MFM-15.1 which are changes to the test draft paragraphs in the LPG and MFM Codes.

OWM Executive Summary for Block 1 Items (B1) – Minimum Draft Size When Using a Field Standard Meter

- The items in Block 1 are the same proposal made in Items LPG-15.1 and MFM-15.1, but the proposals are for the test draft paragraphs in different sections of the Handbook (LMD-23.1 N.3.5. Wholesale Device, VTM-23.1 N.3. Test Draft, MLK-23.1 N.3.Test Draft).

- The purpose statement for Block 1 items which is "to define the minimum test draft size when using a field standard meter" are different than LPG-15.1 and MFM-15.1 likely due to comments received concerning these items.

- The test draft items on the 2022 Interim agenda are seeking to establish test draft criteria for various test methods in use for testing commercial devices. The Test draft items on the 2022 Interim Agenda are LMD-23.4, LPG-15.1, MFM-15.1, Block 1, and Block 5.

- LPG-15.1, MFM-15.1, and Block 1 items are proposals to add a separate paragraph to the code to address the test method using field standard meters. As noted in other comments to these item, NIST HB 44 was written to be non-technology specific so that requirements in the handbook would apply to any device or method used to test a device. This prevents separate code requirements for the different test methods or devices under test.

- There are three items on the 2022 Interim agenda that are proposals to change the same LMD paragraph N.3.5 Wholesale Devices which are:

  - LMD-23.4 N.3.5. Wholesale Devices,
  - B1: LMD-23.1 N.3.5 Wholesale Devices, and
  - B5: N.3.5. LMD-23.2 Wholesale Devices.

Since two of the above items are not proposal to add another paragraph to N.3.5.and are in-line with creating requirements that are non-technology specific by editing the existing paragraph such that the paragraph is more encompassing of other test methods, we encourage that the submitters of these items, LMD-23.4 N.3.5.and B5: LMD-23.2 N.3.5. work together to combine the changes that are being proposed to the same paragraph, N.3.5. Wholesale Devices. If the submitters are in agreement with combining these changes a proposed change for the combined items LMD-23.4 N.3.5 Wholesale Device and B5: N.3.5. LMD-23.2 Wholesale Device is provided for consideration:

N.3.5. Wholesale Devices – The **total** delivered quantity **for any required accuracy test** ~~should~~ **shall** be equal to**, or is recognized as being representative of, a volume equivalent to** at least the amount delivered by the device in one minute at ~~**its**~~ **the meter's** maximum discharge rate ~~**and shall in no case be less than 200 L (50 gal)**~~.

(Amended 1987**,** ~~and~~ 1996**, and 2023**)

- There are two items on the 2022 Interim Meeting Agenda that are proposals for changes to the same paragraph, VTM code N.3. Test draft which are:

  - B1: VTM-23.1 N.3. Test Drafts
  - B5: VTM-23.2 N.3. Test Draft

Since B5 VTM-23.2. N.3. Test Drafts adds clarification to the existing paragraph we encourage the committee to look at the proposed change in B5: VTM-23.2. N.3. Test Draft

OWM Executive Summary for Block 1 Items (B1) – Minimum Draft Size When Using a Field Standard Meter

- NIST OWM has similar comments for Block 1 items as is provided for LPG-15.1, MFM-15.1 since the proposals in Block 1 are the same proposals in LPG-15.1 and MFM-15.1, that add a separate paragraph for N.3 Test Drafts. As mentioned, in other comment although the purpose statement has changed for Block 1 items there are still concerns with providing different requirements for test draft based on different test method and confusion this may cause and number of paragraphs that will be added based on different technology.

- Technology will continue to change and evolve, and we will need to respond to the number of changes, such as the different standards that will be in use, and the factors associated with different technologies. We will need to ensure an appropriate test draft is selected so that the errors of test method and device under test do not contribute greatly to the test of the device. Coupled with what is already in the fundamental considerations for responsibility for selecting a test standard and what is being proposed in Items Gen-23.1 and Block 8, we believe a solution may be to add a general code requirement with additional guidance in the fundamental consideration or EPOs for Test draft and consider removing Test Draft from the individual codes and addressing it in the general code in test notes as a suitability requirement.

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

B2: A SCL-20.3	A	S.5.4. Relationship of Minimum Load Cell Verification Interval to the Scale Division
B2: A SCL-20.4	A	Table 3. Parameters of Accuracy Classes.
B2: A SCL-20.5	A	Table S.6.3.a. Marking Requirements, Note 3.
B2: A SCL-20.6	A	T.N.1.2. Accuracy Classes and T.N.1.3. Scale Division.
B2: A SCL-20.7	A	Table 7. Maintenance Tolerances
B2: A SCL-20.8	A	Table 8. Recommended Minimum Load

NOTES:

1. 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.

2. While this item was carried over from the 2020 Interim Meeting, it was not a Voting Item and therefore not discussed during the continuation of the 2020 Annual Meeting. Instead, it was placed on the 2021 Interim Meeting's agenda and was discussed during that meeting.

OWM Executive Summary for Item Block 2 (B2) – Define True Value for Use in Error Calculations

OWM Recommendation: That the Committee reconcile the entries proposed in new item SCL-23.3 with those in this block and then withdraw this block of items from its agenda to be replaced by new item SCL-23.3 (additional details included in the paragraph below).

- The different proposals in this block of items were recently amended, reorganized, and resubmitted to the NCWM by the NCWM's Verification Scale Division (e) Task Group (TG) to reflect changes agreed to by members of the TG and included in its 2nd Final report. The NCWM agreed to

OWM Executive Summary for Item Block 2 (B2) – Define True Value for Use in Error Calculations

consolidate these proposals into a single new item (i.e., Item SCL-23.3) on the Committee's 2023 Interim Meeting agenda. The NCWM also agreed to maintain the Block 2 items on the Committee's 2023 Interim Meeting agenda so that the Committee could reconcile the entries during the upcoming 2023 NCWM Interim Meeting.

- The items in this block and the proposals included in new Item SCL-23.3 represent very significant changes to the Scales Code of NIST HB 44 in that they are an attempt to clarify which value: the value of the scale division (d) or verification scale division (e), are the paragraph requirements to be based. It is important that everyone agree with the changes proposed.

- OWM participates on the TG and looks forward to sharing its perspective with its members on the proposed changes.

Item Block 3 (B3) Tolerances for Distance Testing in Taximeters and Transportation Network Systems

B3: TXI-20.1 D T. Tolerances
B3: TNS-20.1 D T. Tolerances

OWM Executive Summary for Item Block 3 (B3) – Tolerances for Distance Testing in Taximeters and Transportation Network Systems TXI-20.1 T. Tolerances and TNS-20.1 T. Tolerances

OWM Recommendation:

- OWM concurs with the submitter's recommendation during NEWMA October 25-26, 2022 Interim Meeting to withdraw the proposal. OWM continues to encourage stakeholders to work with the USNWG to ensure that future modifications to the NIST HB 44 Taximeters and TNMS Codes fully consider the technology used in both applications.

- The work to update the taximeters and TNMS codes may need to be stepped up to address issues identified in the areas of design and function of indicating elements, provisions for sealing, and location services signal loss so that these provisions are in the code for properly operating this newer technology in taxis.

Item Block 4 (B4) Electronically Captured Tickets or Receipts

(**Note:** The Item Under Consideration reflects changes that were received by the committee from the submitter of the item and that the Committee agreed to during its 2021 Interim Meeting work session. The changes are highlighted.)

B4: CLM-21.1 D S.1.4.1. ~~**Printed Ticket**~~ Recorded Representation., UR.2.6.3. ~~**Printed Ticket**~~ Recorded Representation.

B4: MLK-XX-X D S.1.4.2 ~~**Printed Ticket**~~ Recorded **Representation**., UR.2.2. ~~**Printed Ticket**~~, Recorded **Representation**.

B4: MFM-21.2	D	S.6. ~~**Printer**~~ Recorded Representations., UR.2.6. ~~**Ticket Printer**~~, Customer Ticket, Recorded Representation., UR.3.4. ~~**Printed Ticket**~~. Recorded Representation.
B4: CDL-21.1	D	S.1.4.1. ~~**Printed Ticket**~~ Recorded Representations., UR.2.4.2. ~~**Tickets or Invoices.**~~ Recorded Representation.
B4: HGM-21.1	D	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	D	Appendix D - Definitions.: recorded representations, recording element.

OWM Executive Summary for Item Block 4 (B4) – Electronically Captured Tickets or Receipts

OWM Recommendation: Although NIST OWM feels that all proposed changes would benefit from additional review, NIST OWM believes that the additional changes made to G-S.5.6 provides clarity. NIST OWM supported a Developing status so that changes to the B4 specific codes are carefully reviewed to ensure the proposed changes did not change the original intent of the specific section. Barring no additional specific changes to Block 4 items NIST OWM supports this item moving forward with a Voting status with the suggested change below.

- Most of the changes proposed by NIST OWM are included in the proposal, except for the recommendation that "However" be removed from the General Code requirement in this proposal. We recommend that "However" be removed.

Block 5 Items (B5) Test Drafts

B5: LMD-23.2	N.3.5. Wholesale Devices
B5: VTM-23.2	N.3. Test Drafts

OWM Executive Summary for Block 5 Items (B5) – Test Drafts

OWM Recommendation: NIST OWM Supports this proposed change to remove "should" and replace it with "shall' in the N.3.5. and N.3 paragraphs of the LMD Code. We also suggest that the submitters work together to develop one proposal for changes to LMD N.3.5.

- To ensure that an inspector is required to use the correct size test draft, the submitter is recommending that "should" in LMD-23.2 N.3.5. Wholesale Devices and VTM-23.2 N.3. Test Drafts be changed to "shall"

- Item LMD-23.4 on the 2022 Interim Meeting agenda is another proposal for changes to the LMD N.3.5 paragraph. These changes are to ensure that the paragraph is more encompassing of other test methods, specifically when testing SVPs.

- We encourage the submitters of LMD-23.4 and Block 5 to work together to combine the changes that are being proposed to the same paragraph, N.3.5. Wholesale Devices. If the submitters are in agreement with combining these changes a proposed change for the combined items LMD-23.4 and B5: LMD N.3.5 is provided below:

  N.3.5. Wholesale Devices.– The **total** delivered quantity **for any required accuracy test** ~~should~~ **shall** be equal to**, or is recognized as being representative of, a volume equivalent to**

OWM Executive Summary for Block 5 Items (B5) – Test Drafts

at least the amount delivered by the device in one minute at ~~its~~ **the meter's** maximum discharge rate ~~**and shall in no case be less than 200 L (50 gal)**~~.

(Amended 1987~~,and~~ 1996**, and 2023**)

Item Block 6 (B6) Commercial and Law Enforcement, Axle and Axle Group Weights

B6: SCL-22.1 S.1.14. Recorded Representation of Axle or Axle Group Weights
B6: SCL-22.3 UR.3.3. Single-Draft Vehicle Weighing., and UR.3.4. Axle and Axle Group Weight Values.

OWM Executive Summary for Item Block 6 (B6) – Commercial and Law Enforcement, Axle and Axle Group Weights

OWM Recommendation: That the Committee maintain the current Developing status of these items on its agenda.

Reason: The SMA, during its Fall 2022 meeting, proposed additional changes to paragraph S.1.15.1. Axle and Axle Group Loads in item B6:22.1 and also indicated additional work is needed to the B6:SCL-22.3 item.

- When item SCL-22.1 was originally proposed there was a lag in the publication process for 2020 and 2021; so, the numbering of the paragraph in the Item Under Consideration in this document has been updated to S.1.15. Not so, however, in the Committee's 2023 NCWM Interim Agenda (i.e., NCWM 2023 Publication 15) where it is still appears today as paragraph S.1.14. Consequently, OWM requests the Committee change the paragraph references S.1.14., S.1.14.1., and S.1.14.2. in SCL-22.1 to S.1.15., S.1.15.1., and S.1.15.2., respectively, when completing its Interim Meeting Report (2023 NCWM Publication 16.)

- The first proposed sub-paragraph of SCL-22.1 (i.e., S.1.15.1) requires the ticket to clearly identify the particular independent scale platform associated with each printed weight value.

  The second proposed sub-paragraph of SCL-22.1 (i.e., S.1.15.2.) requires the summed total of all platforms to be identified as the vehicle's total weight in instances where all axle and axle groups of the vehicle being weighed fit onto a live portion of the scale system and are weighed simultaneously as a single draft. In instances where the vehicle being weighed cannot be weighed as a single draft (e.g., oversized vehicles that do not fit onto the scale) thus necessitating weighing the vehicle in two drafts, the ticket must provide clear indication that the total weight is "not legal-for-trade" or similar text to make known the gross vehicle weight is not valid for use in commercial sales transactions.

- SCL-22.3 proposes amending the text in the "Note" of existing HB-44 Scales Code paragraph UR.3.3. Single-Draft Vehicle Weighing and removing the "Note" reference. These proposed changes are needed because in 2022 the NCWM agreed to amend paragraph G-A.1. Commercial and Law-Enforcement Equipment of NIST Handbook 44 to explicitly make clear weighing and measuring equipment used for the purpose of providing a weight or measure for a fee constitutes commercial use of that equipment. Paragraph UR.3.3. currently requires a vehicle or vehicle combination to be weighed "commercially" on a vehicle scale only as a single draft except as noted

OWM Executive Summary for Item Block 6 (B6) – Commercial and Law Enforcement, Axle and Axle Group Weights

in subparts (a) and (b) of the paragraph. The "Note" in UR.3.3. currently exempts highway-law-enforcement scales and scales used for the collection of statistical data from having to comply. Multi-independent platform vehicle scale systems typically weigh vehicles and vehicle combinations in multiple drafts yet comply with paragraph UR.3.3. because subpart (b) makes this permissible. When installed at a truck stop, the predominant commercial use of these vehicle scale systems is to weigh vehicles and vehicle combinations for a fee. All axles and axle groups of some oversized vehicles, however, are not able to fit onto one of the live platforms of a vehicle scale system and be weighed simultaneously. This necessitates the weighing of the portion of the vehicle that doesn't fit separately from the rest of the vehicle (i.e., split weighing). Weights and Measures officials have typically allowed this practice when the only use of those weight determinations is to verify compliance with highway legal load limits. Because a fee is charged, this too constitutes commercial use of the scale systems, but violates current paragraph UR.3.3. It is for this reason OWM is proposing the change to paragraph UR.3.3.

- SCL-22.3 also adds a new HB 44 Scales Code user requirement to make clear the acceptable use of multi-platform vehicle scale systems to charge a fee for the commercial service of providing customers (usually truckers) axle weights, axle group weights, and total weight of their vehicles to enable them to determine compliance with state and federal legal load limits.

- OWM amended the proposal in SCL-22.3. prior to the 2022 NCWM Annual Meeting and recommended during S&T open hearings that the Committee update the proposal to the revised version. The Committee, in consideration of the comments received during open hearings, agreed to replace the Block 6 SCL-22.1 proposal in its Interim Meeting agenda (2022 NCWM Publication 15) with the updated version provided by OWM. Unfortunately, the National S&T Committee neglected to update the proposal in its addendum sheets for the 2022 NCWM Annual Meeting and the version of the proposal appearing on the 2023 regional S&T Committee agendas wasn't the updated version. OWM recently resubmitted the updated version to the National S&T Committee so the version now appearing in the Committee's current agenda is correct.

- OWM can support the changes recommended by the SMA during its Fall 2022 meeting to the first sentence of proposed new paragraph S.1.14.1. as shown in shaded text below:

  S.1.14.1. Axle and Axle Group Loads. – All recorded representations of the different axle and axle group loads of a vehicle when weighed in a single draft on a multi-independent platform vehicle scale system shall be identified by providing indication of either:

  As noted earlier, however, this proposed paragraph should be referenced S.1.15.1 in the Committee's current agenda.

- With respect to the SMA's Fall 2022 position statement for item B6: SCL-22.3, OWM is very interested in learning more specifically the additional work SMA believes is necessary.

Item Block 7 (B7) Tolerances on Tests Using Transfer Standards

B7: CLM-22.1 D T.3. On Tests Using Type 2 Transfer Standards
B7: CDL-22.1 D T.3. On Tests Using Type 2 Transfer Standards
B7: HGM-22.1 D T.4. Tolerance Application on Tests Using Type 2 Transfer Standard Test Method

(Note: The Item Under Consideration was revised by the submitter based on comments from the 2022 Interim Meeting.)

OWM Executive Summary for Item Block 7 (B7) – Tolerances on Tests Using Transfer Standards

OWM Recommendation: When the S&T Committee presents Block 8 for a vote, OWM agrees that Block 7 should also go forward for a vote.

- Block 7 Items are proposed changes to NIST HB 44 Codes that have transfer standard tolerance requirements.
- Because of the larger uncertainties associate with the use of transfer standards, the current Code requirement increases the tolerance to account for the uncertainties in the tolerance.
- The proposal is to revise the transfer standard tolerance requirements with an equation to calculate the tolerances for Type 2 Transfer standards and to clarify that these standards are considered Type 2 standards.
- The equation places an upper limit on how large the uncertainty associated with the transfer standard can be.

Item Block 8 (B8) G-T.5. Tolerances on Tests When Transfer Standards are Used., Appendix A, Section 3.2. Tolerances for Standards., and Appendix D – Definitions: standards, field., ~~transfer standard.~~ and standard, transfer. Appendix A: Fundamental Considerations, 3. Testing Apparatus

B8: GEN-19.1 D G-T.5. Tolerances on Tests When Transfer Standards are Used., **Appendix A, Section 3.2. Tolerances for Standards., and** Appendix D – Definitions: **standards, field., ~~transfer standard.~~** and **standard, transfer.**

B8: OTH-22.1 D Appendix A: Fundamental Considerations, 3. Testing Apparatus

(Note: These proposals are a combined modification of the 2021 S&T Agenda Block 1 Items GEN-19.1 and OTH-22.1. Since the S&T Committee has changed item GEN-19.1 from "assigned" to "developing," the submitter has worked with NIST OWM to revise and combine the original proposals of GEN-19.1 and OTH-22.1 to address discussions within the NCWM Field Standards Task Group and other comments received at the regional weights and measures meetings on the proposals. These items are related, so they are presented together. These OWM and Seraphin proposals were submitted to the S&T Committee just before the 2022 Interim Meeting.

Note: The joint OWM and Seraphin proposals submitted to the S&T Committee just before the 2022 Interim Meeting were updated with two changes at the request of the Submitters following the 2022 Interim Meeting. The first change is in the definition of "Standard, Field." The words "(typically one year)" were replaced with "(as determined by the Director)". The second change was to add the words "to the International System of Units (SI)" in the section 3.1.3. of the Fundamental Considerations. These two changes are reflected in the items below.)

Note: The current Item Under Consideration represents additional changes made by the submitters in November 2022 based on comments received from the regional meetings in 2022.

OWM Executive Summary for Item Block 8 (B8) – G-T.5. Tolerances on Tests When Transfer Standards Are Used, Appendix A, Section 3.2. Tolerances for Standards., and Appendix D – Definitions: Standards, Field., and Standard, Transfer. Appendix A: Fundamental Considerations, 3. Testing Apparatus

OWM Recommendation: The submitters agree that these items, GEN-19.1 and OTH-22.1 are fully developed and requested that this S&T committee consider that Block 8 item be a Voting Item in 2023.

- State and industry have a need to use various types of test standards to evaluate commercial devices installed in the marketplace. NIST OWM recognizes the need to use various standards to test commercial devices and support the use of these standards when test data supports its use.

- Block 8 clarifies the use and definition of three types of standards to be included in NIST HB 44: (1) Fields Standards, (2) Type 1 Transfer Standards and (3) Type 2 Transfer Standards; it provides an equation that should be used to calculate the tolerances when Type 2 transfer standards are used; provides definitions for Field Standards, Type 1 Transfer Standards and Type 2 Transfer Standards, and provides clarification that the State Director has the authority to approve the use of standard and that specific requirements in NIST HB 44 code are not necessary to approve a standard for use.

- Two items, LPG-15.1 and MFM-15.1 in the Interim Meeting Report (Publication 16), include a purpose statement that the proposals are added to allow field standard meters to be used to test and place into service dispensers and delivery system flow meters. Block 8 items clarify what has always been recognized in NIST HB 44 concerning the responsibility for acceptance of a standard and notes that specific code changes are not necessary for a field standard to be adequate for use. If Block 8 is adopted it accomplishes the same goal as LPG-15.1 and MFM-15.1. and the objectives of Micheal Keilty are met with Block 8. The adoption of Block 8 would not only accomplish the same goal it also provides for a broad criteria and provide for the acceptance of other standards.

- In addition to the changes in Block 8, GEN-23.1 adds a General Code requirement so that rather than revising a specific code in Handbook 44 every time a new field or transfer standard is proposed or developed, an overall statement in the General Code recognizes the use of other field and transfer standards that meet the requirements for use as field or transfer standards.

- NIST OWM also observed that the definitions in Block 8 should include appropriate references to the NIST HB 44 codes.

- It was noted that the term “Standard, Field” has a different definition in NIST HB 130. It appears that the definition in NIST HB 130 describes the standard from a laboratory perspective and hierarchy of testing. As such, some future effort may be needed to harmonize the terms across all NIST handbooks.