Executive Summaries from the NIST OWM Analysis of the 2022 NCWM Specifications and Tolerances (S&T) Annual 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 **http://www.nist.gov/pml/weights-and-measures/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-22.1 V G.A.1. Commercial and Law-Enforcement Equipment.

OWM Executive Summary for GEN-22.1 – G.A.1. Commercial and Law-Enforcement Equipment

OWM Recommendation: OWM believes GEN-22.1 is fully developed and recommends its' adoption along with the two companion L&R items.

- This item is intended to eliminate all ambiguity concerning the issue of whether or not NIST Handbook 44 is intended to apply to weighing and measuring equipment used solely for the purpose of charging a fee for the service of providing a weight or measure.
- This item is somewhat related to the two remaining S&T scale items in Block 6, from which this item was removed by the Committee during the 2022 NCWM Interim Meeting and made a stand-a-lone voting item. The remaining two scale items are currently developing items.
- There are also two companion items on L&R's agenda related to S&T GEN-22.1, both of which are also voting items. The L&R items are B2: WAM-22.1 and NTP-22.1. These two L&R items were developed by OWM to harmonize the language associated with the terms "commercial" and "law enforcement" in NIST Handbook 44 and NIST Handbook 130.

SCL – SCALES

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

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

OWM Recommendation: No recommendation. This item was withdrawn at the 2022 Interim Meeting.

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

OWM Recommendation: For these reasons, OWM recommends this item be withdrawn. A much-preferred approach would be to develop a guidance document, taking into account all scale suitability factors thereby continuing to provide officials the discretion they currently possess to making final scale suitability determinations based on the results of their inspection.

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

- Suitability requirements should be applied independent of the product being weighed. It raises the question, "Why only cannabis and not other products?"
- There are many significant factors that need to be considered when determining whether or not a particular scale is suitable for its intended application. For example, the smallest, largest, and average loads to be weighed on the scale; the scale's minimum division value; the various unit prices of commodities weighed and whether or not the scale has tare deduction and/or computing capability; the environment in which the scale will be used; and other factors (not mentioned) should all be a part of that decision making process.
  - Because maximum scale division is only one such factor, establishing maximum scale division values in HB 44 may have the unintentional effect of restricting an official's ability to take enforcement action on a scale.
- Unit prices of commodities change over time and new products are continually being brought to market, some of which may have a much higher or lower unit price than products currently offered. For this reason, it is not possible to specify an acceptable maximum scale division value that will render the application of a scale suitable over time.
- NIST HB 44 already provides the necessary resources (in the way of General Code paragraph G-UR.1. Suitability of Equipment and Scales Code paragraph UR.1. Selection Requirements) for officials to be able to enforce scale suitability based on the many factors that need to be considered at time of inspection.
- Although the "Old" NIST HB 44 Scales code (i.e., pre-1986) provided maximum scale division values based on scale type or design per Table 7b, Applicable to Devices Not Marked with a Class Designation, the concept of specifying maximum scale division values for different commodities to be weighed on a scale was abolished with the adoption of a new Scales Code in 1986, which bases scale selection on a scale's accuracy class designation.

LMD – LIQUID MEASURING DEVICES

LMD-21.1 V Table S.2.2. Categories of Device and Method of Sealing

OWM Executive Summary for LMD-21.1 – Table S.2.2. Categories of Device and Method of Sealing

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

- ***Event Log Information Accessible During the Inspection.*** Inspectors need this information in order to assess the disposition of a device during the inspection process, not at a later point in time.

OWM Executive Summary for LMD-21.1 – Table S.2.2. Categories of Device and Method of Sealing

- ***IT Security Concerns with Connection Method.*** Options suggesting use of a memory stick or wired interface with a mobile device may pose a deterrent since many jurisdictions' IT security policies would not permit this method of accessing information on a jurisdiction-owned mobile device.

- ***Availability of Mobile Devices.*** Not all inspectors are equipped with mobile devices for downloading and viewing information.

- ***(Larger) Electronic Display on Site***. Might another alternative be to provide an on-site, inspector-accessible display which meets minimum dimensions? This option might be considered a compromise in which the inspector could easily access and view the information, though it does create a potential problem and disadvantage in not facilitating the recording and retaining of the results as part of the inspection record.

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

- It is not clear that the current proposal has addressed all of these items. Should the proposal move forward as written, it will be important at minimum that these items be considered during type evaluation and followed up during field inspection to ensure that the above items are addressed.

- While the ultimate goal is to move in the direction of the electronic form, not all jurisdictions may have the capability of viewing an electronic version of the event log at the time of inspection. Most people seem to be supportive of the concept of electronic versions of the information and want to move in that direction; however, it is essential that inspectors be able to gain the information needed for an inspection in a form accessible at the time of the inspection. An inspector needs to have access to this information on site, for example if the information is transmitted, how will the inspector view the information on site if they do not have electronic capability to do so? The use of General Code requirement G-UR.2.3 Accessibility for Inspection, Testing, and Sealing Purposes and G-UR.4.4. Assistance in Testing Operations may be used but may not be apparent to all inspectors.

- Similar language was adopted into the Electric Vehicle Fueling Systems tentative code.

- As language is adopted in NIST HB 44 to accept an electronic copy of the sealing information, consideration should be given to making appropriate changes to the sealing requirements for other devices in NIST HB 44.

LMD-22.1 V Table T.2. Accuracy Classes and Tolerances for Liquid Measuring Devices Covered in NIST Handbook 44, Section 3.30

OWM Executive Summary for LMD-22.1 – Table T.2. Accuracy Classes and Tolerances for Liquid Measuring Devices Covered in NIST Handbook 44, Section 3.30

OWM Recommendation: OWM believes this item is ready for a vote as proposed.

- During a review of NTEP requirements related to DEF dispensing systems, the NTEP Measuring Sector observed an inconsistency between the application of NIST Handbook 44.tolerances for retail motor-fuel dispensers (RMFDs) and for small capacity DEF measuring systems.
- Smaller capacity DEF measuring systems use measuring equipment nearly identical to that used for RMFDs.
  - Though DEF is not a motor fuel, NCWM and NTEP have agreed in past discussions to treat these systems the same.
  - Most inspectors have treated them essentially the same for some years.
  - Given the properties of the product being measured and the capabilities of the dispensing equipment, OWM concurs with this approach.
- As presently written, Table T.2. specifies a different tolerance for special tests of DEF dispensers than would be used for RFMDs.
  - Without specific clarification in Table T.2, there is a potential for inconsistently applying tolerances to DEF dispensers.
- OWM concurs the proposed change to Footnote 1 will:
  - correct the oversight made when DEF dispensers were added to requirements;
  - will align the special test tolerances for DEF dispensers with that of RMFDs; and
  - will eliminate the potential which currently exists for inconsistent application of tolerances.
- Although this item was submitted too late for the regional associations to review in fall 2021, OWM concurs with the Measuring Sector's recommendation to designate this as a Voting item for 2022. This is based on:
  - the approach used by NTEP for many years to treat DEF and RMFDs consistently;
  - consistency among current requirements in NIST HB 44 for the two applications; and
  - feedback OWM has had over the years regarding how some weights and measures jurisdictions approach DEF systems relative to RMFDs.

OWM Executive Summary for LMD-22.1 – Table T.2. Accuracy Classes and Tolerances for Liquid Measuring Devices Covered in NIST Handbook 44, Section 3.30

- This is further supported by the support of the CWMA and NEWMA at their Spring 2022 annual meetings.

VTM – VEHICLE TANK METERS

VTM-18.1 V 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 <u>on a multiple-product, single discharge hose.</u>

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.
- 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.

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 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.

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.

LIQUIFIED PETROLEUM GAS AND ANHYDROUS LIQUID-MEASURING DEVICES

LPG-15.1 D N.3. Test Drafts.

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 Item 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."

- 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 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 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 LPG-15.1 unnecessary and confusing.

- Additionally, the Committee is aware that a new Form 15 has been submitted by Seraphin for the 2023 cycle proposing a new General Code paragraph which clearly references the Director's authority as outlined in the Fundamental Considerations.

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

- This 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.

- **G-N.3. Test Methods. – Permissible test methods for verifying compliance of weighing and measuring systems with the provisions of the General Code and Specific Codes include, but are not limited to, test methods and apparatus that have been approved by the State Director of weights and measures as outlined in Appendix A - Fundamental Considerations, Section 3. Testing Apparatus.**

LPG-22.2 W S.2.6. Zero-Set-Back Interlock, for Stationary Customer-Operated Retail Motor-Fuel Devices, Electronic.

OWM Executive Summary for LPG-22.2 – S.2.6. Zero-Set-Back Interlock, for Stationary Customer-Operated Retail Motor-Fuel Devices, Electronic.

OWM Recommendation: No recommendation. This item was withdrawn following the 2022 Interim Meeting.

LPG-22.3 D S.2.5. Zero-Set-Back Interlock, Stationary ~~and Vehicle Mounted~~ Meters, Electronic., S.2.6. Zero-Set-Back Interlock, Vehicle Mounted Meters, Electronic., and S.2.~~6~~7. Zero-Set-Back Interlock for Stationary Self-Operated Retail Motor-Fuel Devices.

OWM Executive Summary for LPG-22.3 – S.2.5. Zero-Set-Back Interlock, Stationary and Vehicle Mounted Meters, Electronic., S.2.6. Zero-Set-Back Interlock, Vehicle Mounted Meters, Electronic., and S.2.67. Zero-Set-Back Interlock for Stationary Self-Operated Retail Motor-Fuel Devices.

OWM Recommendation: 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 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.

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 Item 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.

- 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.

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

- 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 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 Block 8.

- Additionally, the Committee is aware that a new Form 15 has been submitted by Seraphin for the 2023 cycle proposing a new General Code paragraph which clearly references the Director's authority as outlined in the Fundamental Considerations.
    - This 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.

- **G-N.3. Test Methods. – Permissible test methods for verifying compliance of weighing and measuring systems with the provisions of the General Code and Specific Codes include, but are not limited to, test methods and apparatus that have been approved by the State Director of weights and measures as outlined in Appendix A - Fundamental Considerations, Section 3. Testing Apparatus.**

MFM-22.1 V Table T.2. Accuracy Classes and Tolerances for Mass Flow Meters.

OWM Executive Summary for MFM-22.1 Table T.2. Accuracy Classes and Tolerances for Mass Flow Meters.

OWM Recommendation: OWM believes this item is fully developed and ready for a vote.

- This is a housekeeping item that clarifies the original tolerances (i.e., 2.0 percent and 1.0 percent) intended to apply in the dynamic measurement of hydrocarbon (HC) vapor products.

- Hydrocarbon vapor products application which has been recognized and remains unchanged in Application Section paragraph A.2. Vapor (Gases) of the MFM Code since the code was first adopted in 1991.

- The proposal places the family of HC vapor products under an accuracy class designation (i.e., 2.0) which is required marking information specified in paragraph S.5.(e) Markings since January 1, 1995.

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 requires further development. Rather than proposing an exemption for all requirements in Section 3.40, OWM recommends the submitters propose modifications to specific requirements to provide for alternative means of compliance. OWM acknowledges the submitters have been diligently working with the NIST USNWG EVFE Subgroup to identify possible alternatives for the submitters to present to the community for review.

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

- The submitters made alternate proposals available to the EVFE Subgroup 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 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-20.1 V S.1.3.2. EVSE Value of the Smallest Unit.

OWM Executive Summary for EVF-20.1 – S.1.3.2. EVSE Value of the Smallest Unit.

OWM Recommendation: OWM believes the USNWG EVFE Subgoup's "Option 3" alternative to the Item under Consideration as outlined in this analysis provides for a more appropriate resolution for AC and DC systems and will help lessen rounding errors and confusion about the transaction.

- Based on findings over the past six years on the actual power capacity ranges EVSEs operate at and other standard practices in fueling EVs the EVFE Subgroups has deliberated to arrive at an alternate proposal to replace the current Item under Consideration in EVF-20.1.

- At minimum the May-June 2022 EVFE Subgroup's proposed modifications that further refine paragraph S.1.3.2. EVSE Value of Smallest Unit should be adopted in July 2022. The Committee is also requested to consider proposed modifications to seven additional paragraphs for inclusion in EVF-20.1.

- These latest proposed modifications to paragraph S.1.3.2. are similar to a suggested alternative proposal the NCWM S&T Committee reviewed in January 2022. This alternate rework of paragraph S.1.3.2. more appropriately recognizes the differences in AC and DC systems such as power levels.

    - The EVFE Subgroup's alternate reworked proposal (OPTION 3 below) includes a higher resolution for the AC system's displayed kWh (0.0001) but maintains the current handbook kWh (0.001) display resolution for a DC system;

    - further refines requirements for the expression of the kWh (as a value of 1) to lessen rounding errors and confusion about the transaction; and

    - The U.S. standard will follow the SI practice of recognizing only the kWh for electrical energy in EV charging, so the megajoule will be no longer recognized in the EVFS Tentative Code.

- NIST OWM concurs with the EVFE SG's findings and its rework of paragraph S.1.3.2. EVSE Value of Smallest Unit (OPTION 3 below) and seven additional EVFS - Tentative Code requirements. NIST OWM supports the EVFE SG proposed modifications to paragraphs: S.1.3.1. EVSE Units of Measurement; S.2.5.1. Money-Value Divisions Digital; S.8. Minimum Measured Quantity (MMQ); and removing unwarranted paragraphs N.1. No Load Test; N.2. Starting Load Test; T.5. No Load Test; and T.6. Starting Load.

- These latest proposed modifications to paragraph S.1.3.2. are similar to a suggested alternate proposal the NCWM S&T Committee reviewed in January 2022. This January version of paragraph S.1.3.2. was a preview of a requirement that more appropriately recognized the differences in AC and DC systems such as power levels. The EVFE Subgroup's alternate reworked proposal (OPTION 3 below) includes a higher resolution for the AC system's displayed kWh but maintains the current handbook kWh display resolution for DC system and further refines requirements for the expression of the kWh to lessen rounding errors and confusion about the transaction.

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

OWM Executive Summary for T.2. Load Test Tolerances

OWM Recommendation: OWM believes this item requires further development. OWM acknowledges the submitters have been diligently working with the NIST USNWG EVFE Subgroup to identify possible alternatives for the submitters to present to the community for review.

- The EVFE Subgroup's discussions have been ongoing in their review of alternate proposals reworked by the submitters for expanding tolerances to 5 % for DC charging equipment manufactured prior to a specific date and maintaining the 1 % acceptance and 2 % maintenance tolerances for equipment manufactured after that date.
    - Proposals discussed recommend these changes be accompanied by a new marking requirement for those devices not capable of meeting the 1 % acceptance and 2 % maintenance tolerances to alert consumers of the difference in performance levels.
- The EVFE Subgroup was balloted June 17, 2022 on a proposed new 5 % tolerance for DC EVSEs installed prior to 2024 and a corresponding new requirement for marking the accuracy of pre-2024 equipment.
    - The results of this ballot will be provided to the submitters 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.

OWM Executive Summary for T.2. Load Test Tolerances

- 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.

TXI – TAXIMETERS

TXI-22.1 V Table S.5. Categories of Device and Methods of Sealing

OWM Executive Summary for TXI-22.1 – Table S.5. Categories of Device and Methods of Sealing

OWM Recommendation: OWM believes this item is fully developed and ready for a vote. This change will provide the specificity needed for audit trail criteria for taximeters and will allow this method of security for these devices.

- The proposal recognizes other approved means of security, an audit trail for electronically securing taximeter sealable parameters given the limited size of the taximeter and multiple options for electronically adjustable taximeter components.

  Use of an "electronic link" has been recognized since 2000 and remains a means to ensure the taximeter in operation is calibrated to the vehicle. Paragraph S.5.2. Taximeters Calibrated to Specific Vehicles adequately addresses the requirement for this security feature and does not need to remain in Table S.5.

GMA – GRAIN MOISTURE METERS 5.56 (A)

GMA-19.1 D Table T.2.1. Acceptance and Maintenance Tolerances Air Oven Method <u>for All Grains and Oil Seeds.</u>

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 support 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.

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

MDM – 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) on or before the 2022 NCWM Annual Meeting, 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.
- 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: OWM recommends this item be retained on the Committee's agenda as a Developing item while the USNWG EVF&S EWH Subgroup finalizes a draft code for submission in the 2023 standards development cycle.

- The USNWG on Electric Vehicle Fueling & Submetering Electric Watthour Meter Subgroup (EWH SG) is charged with developing standards and test procedures utility-type watt hour meters.

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

- The SG has been developing a draft code for inclusion in NIST Handbook 44 and submitted an early draft in September 2021.
    - The draft was posted on the S&T Committee's web site for review and comment with a request for comments by March 2022 to allow the SG to address concerns prior to finalizing the code for submission.
- The SG only received comments from CA DMS at the Fall 2021 WWMA meeting and again from the 2022 NCWM Interim Meeting supporting further development of this item. California concerns include:
    - identity marking requirements being on a separate document to satisfy model and serial number prefixes;
    - the current lack of clarification on what constitutes a separate document;
    - electronic versions of this information do not originate from the system;
    - testing capabilities should be easily and readily achievable before and after the installation to facilitate the resolution of accuracy complaints;
    - An additional observation is that the method of sealing for category II and III devices requires a hard copy of audit trail and event logger information whereas codes are considering the allowance of electronic forms of this information.
- The S&T Committee agreed to include this item as a Developing Item on its agenda to keep the weights and measures community informed of progress and facilitate participation by interested parties.
    - Mrs. Tina Butcher (NIST OWM) has provided regular updates to the NCWM and regional weights and measures association S&T Committees on this work. Details are found in past Committee reports.
- In the Fall 2021 and Spring 2022 all of the regional weights and measures associations have recommended maintaining this item as a Developing item on the Committee's agenda as the SG finalizes its draft.
- The SG continues work on the draft; it held eighteen meetings in 2021 and seven meetings thus far in 2022.
- The SG still hopes to resolve the remaining issues regarding the draft code and submit a draft to the NCWM S&T for consideration in the 2022-2023 NCWM cycle under this agenda item, and asks the Committee to maintain this item as Developing on its agenda to facilitate this submission.

OTH-22.2 V Appendix D – Definitions: face

OWM Executive Summary for Appendix D – Definitions: face
OWM Recommendation: OWM believes this item is fully developed and ready for a vote. This item corrects an oversight that was made when the term was originally added to NIST Handbook 44 and helps ensure consistency in the application of the term across multiple codes. • This proposal corrects the inadvertent omission of multiple numerical code designations from the definition of "face" where this unique term is cited in those code's design and user requirements. • Including the added reference in the definition to the missing three codes sections ensures the manufacturers of these devices has information for the proper placement of transaction information in use by both the buyer and seller and necessary to the regulatory official. • The current definition of "face" remains broad enough to recognize both customary transaction information as well as the more recent use of nontraditional application-specific information.

ITEM BLOCK 1 (B1) TERMINOLOGY FOR TESTING STANDARDS

B1: SCL-18.1	W	N.2. Verification (Testing) Standards
B1: ABW-18.1	W	N.2. Verification (Testing) Standards
B1: AWS-18.1	W	N.1.3. Verification (Testing) Standards, N.3.1. Official Tests, UR.4. Testing Standards
B1: CLM-18.1	W	N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards
B1: CDL-18.1	W	N.3.2. Transfer Standard Test, T.3. On Tests Using Transfer Standards
B1: HGM-18.1	W	N.4.1. Master Meter (Transfer) Standard Test, T.4. Tolerance Application on Test Using Transfer Standard Test Method
B1: GMM-18.1	W	5.56(a): N.1.1. Air Oven Reference Method Transfer Standards, N.1.3. Meter to Like-Type Meter Method Transfer Standards and 5.56(b): N.1.1. Transfer Standards, T. Tolerances[1]
B1: LVS-18.1	W	N.2. Testing Standards
B1: OTH-18.1	W	Appendix A: Fundamental Considerations, 3.2. Tolerances for Standards, 3.3. Accuracy of Standards
B1: OTH-18.2	W	Appendix D – Definitions: fifth-wheel, official grain samples, transfer standard and Standard, Field

OWM Executive Summary for Item Block 1 (B1) Terminology for Testing Standards
OWM Recommendation: The submitter, NIST OWM withdrew this item at the 2022 Interim Meeting. NIST OWM worked with Seraphin on Block 8 items which includes proposed definitions for Standards in NIST HB 44 and these terms and definitions are proposed and being considered.

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

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

OWM Recommendation: OWM awaits the further revision of various items in this block by the TG assigned.

- The items in this block 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, however, but this has not yet been the case.
- OWM disagrees with several of the changes proposed by the different items in this block as shown in the Committee's current agenda.
- The proposals in the Committee's current agenda were never updated, however, to reflect changes that members of the NCWM's Verification Scale Division (e) Task Group (TG) had agreed upon and included in TG's second report to the Committee.
- There seemed to be a misunderstanding between the TG and Committee on who would update the different items in this block to reflect the TG's second report and this effort was never completed.
- It was decided during the 2022 NCWM Interim Meeting that the Block 2 items would be reassigned to the TG for updating to reflect changes decided upon by the TG as indicated in its second report.
- OWM has been asked to continue its participation on the TG following the unexpected passing of Mr. John Barton, who had been serving as OWM's Technical Advisor to the group. Mr. Rick Harshman and Mr. Jan Konijnenburg plan to provide assistance in this regard.
- OWM looks forward to reviewing the updated versions of the different proposals in this block once they are made available by the TG.

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

OWM Recommendation: OWM concurs with the three regional weights and measures associations that recommended additional development on this item. OWM continues to encourage the submitter to work

with the USNWG and others to ensure that the modified proposal fully considers the technology used in TNMS as noted in the summary below.

- The submitters' March 2022 alternate proposal would permit a dual tolerance structure for vehicles within a single company or operating in the same geographic area.
- Work 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 (B4)ELECTRONICALLY CAPTURED TICKETS OR RECEIPTS

B4: GEN-21.2	D	G-S.5.6. Recorded Representations.
B4: LMD-21.2	D	S.1.6.5. Money Value Computations., UR.3. Use of a Device.
B4: VTM-21.1	D	S.1.1. Primary Elements., UR.2. User Requirements
B4: LPG-21.1	D	S.1.1. Primary Elements., UR.2. User Requirements
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 believes a Developing status is appropriate so that changes to the B4 specific codes are carefully reviewed to ensure the proposed changes do not change the original intent of the specific section before moving these items forward for a vote.

- 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.

ITEM BLOCK 5 (B5) DEFINE "FIELD REFERENCE STANDARD"

B5: CLM-18.2 W N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards
B5: CDL-18.2 W N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards
B5: HGM-18.2 W N.4.1. Master Meter (Transfer) Standard Test and T.4. Tolerance Application on Test Using Transfer Standard Test Method
B5: OTH-18.3 W Appendix D – Definitions: field reference standard meter ~~and transfer standard~~

OWM Executive Summary for Item Block 5 (B5) Define "Field Reference Standard"
OWM Recommendation: No Recommendation. This item was withdrawn at the 2022 Interim Meeting.

ITEM BLOCK 6 (B6) COMMERCIAL AND LAW ENFORCEMENT, AXLE AND AXLE GROUP WEIGHTS

B6: SCL-22.1 D S.1.14. Recorded Representation of Axle or Axle Group Weights
B6: SCL-22.3 D 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: The items in this block are in a Developing status. OWM is most interested at this time in receiving additional feedback from the community on each of these items in the block.

- When item SCL-22.1 of this block 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 has been updated below to S.1.15.

- SCL-22.1 adds two new HB 44 Scales Code specification requirements to address how weight information generated from multi-independent platform vehicle scale systems is to be identified on a weigh ticket.

- 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 transactions.

- SCL-22.3 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

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

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.

- Since the 2022 NCWM Interim Meeting, OWM has amended the proposal in SCL-22.3. and recommends it replace the current proposal for this item. An electronic copy of the revised proposal has been provided to the S&T Committee and has also been posted on NCWM's website.

ITEM BLOCK 7 (B7) TOLERANCES ON TESTS USING TRANSFER STANDARDS

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: STANDADS, FIELD., ~~TRANSFER STANDARD.~~ AND STANDARD, TRANSFER. APPENDIX A: FUNDAMENTAL CONSIDERATIONS, 3. TESTING APPARATUS

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.

- In addition to the changes in Block 8, a new form 15 for the 2023 cycle, which is not included in the 2022 Publication 16 and has not been addressed separately in the 2022 NIST OWM Technical Analysis, has been circulated to the Spring 2022 Regional Associations (NEWMA and CWMA)

- This new Form 15 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. The proposal is as follows:

  G-N.3. Test Methods. – <u>Permissible test methods for verifying compliance of weighing and measuring systems with the provisions of the General Code and Specific Codes include, but are not limited to, test methods and apparatus that have been approved by the State Director of weights and measures as outlined in Appendix A - Fundamental Considerations, Section 3. Testing Apparatus.</u>

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