OWM Technical Analysis

NIST | OFFICE OF WEIGHTS AND MEASURES

Specifications and Tolerances (S&T) Committee Agenda Items:

Executive Summary

In preparation for the 2024 Annual Meeting of the National Conference on Weights and Measures (NCWM) on July 14 – 18, 2024

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Executive Summaries from the NIST OWM Analysis of the 2024 NCWM Specifications and Tolerances (S&T) Annual Meeting Agenda

The NIST OWM Executive Summary is extracted from the NIST OWM Analysis. This provides the NIST 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**. NIST 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***.

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SCL – Scales

NIST OWM Executive Summary for SCL-24.1 – S.1.7. Capacity Indication, Weight Ranges, and Unit Weights

NIST OWM Recommendation: Withdraw

- It is unclear what problem the submitter is trying to solve. It appears that the submitter misinterpreted the term "computing scale". A computing scale is defined as: "One that indicates the money values of amounts of commodity weighed, at predetermined unit prices, throughout all or part of the weighing range of the scale."
- The term "electronic" was included to differentiate between analog computing scales, e.g., drum or fan type scales, from scales that display weight values in an electronic digital format.
- OWM believes the proposed change is ambiguous and would cause more confusion than the terms used in the current language

NIST OWM Executive Summary for SCL-24.2. − Multiple Sections Regarding Tare

NIST OWM Recommendation: Assigned

- NIST OWM recognizes the issues raised by the submitter. The error introduced to the measurement under the current tare requirements can be as much as the acceptance tolerance for single interval scales, and a multiple of the acceptance tolerance for multi-interval scales.
- NIST OWM believes that the proposed amendments help solve these issues. However, as the submitter already indicated, the item is not yet fully developed. NIST OWM supports further development of the item, preferably by a task group.
- Some of the points identified by NIST OWM that may add clarification to the item:
  - Although the explanation of the issues in the justification is correct, the justification seems hard to understand and does not clearly convey the necessity of the item.
  - The nine definitions of the different types of weight, load, and indication seem unnecessary. These terms can be correctly applied in the code without the need to define each one of them.
  - The proposal may need to emphasize that a preset tare value is any tare value that is not being determined by the scale during the current weighing operation (e.g., keyboard tare or stored tare).
  - The proposal may need to emphasize that mathematical agreement can only be obtained in case of a preset tare (e.g., keyboard tare or stored tare) or a net calculation based on two previous weighments (e.g., weigh-in-weigh-out systems). Mathematical agreement is impossible using a push button tare without introducing an error in either the gross, tare or net weight..

NIST OWM Executive Summary for SCL-22.3 – UR.3.3. Single-Draft Vehicle Weighing and UR.3.4. Axle and Axle Group Weight Values

NIST OWM Recommendation: Voting with recommended edits

- This proposal was necessitated by the adoption of GEN-22.1 in 2022, which amended paragraph G-A.1. Commercial and Law-Enforcement Equipment of NIST Handbook 44 clarifying that weighing and measuring equipment used for the purpose of providing a weight or measure for a fee constitutes commercial use of that equipment.
- There were concerns expressed during the WWMA and NEWMA regional meetings and the 2024 NCWM Interim meeting regarding "split-weighing".
- To be clear, this item will not allow "split-weighing" when weight values will be used in commerce.
- SCL-22.1 was adopted at the 2023 NCWM Annual Meeting and added paragraph S.1.15. to NIST Handbook 44 requiring the recorded value be identified as "Not-Legal-For-Trade" when weights values were not determined simultaneously (split-weighed).
- For the weight to be used in commerce the values must be obtained in compliance with paragraph UR.3.3. Single Draft Vehicle Weighing which requires a vehicle or vehicle combination to be weighed as a single draft.
- The "Note" in UR.3.3. currently exempts highway-law-enforcement scales and scales used for the collection of statistical data from having to weigh in single drafts. This item would add another exemption to this paragraph for scales used to weigh axle loads, axle-group loads, and the gross weight of vehicles and coupled-vehicle combinations **for a fee** when those values are **only** used "to determine compliance with highway legal load limits and safe distribution of the load".
- Item SCL-22.3 also adds a new paragraph, UR.3.4. Weighing of Axle Loads and Axle Group Loads which clarifies that it is acceptable to use multi-platform vehicle scale systems to charge a fee for the commercial service of providing customers (usually truckers) axle weights, axle group weights, and the gross weight of their vehicles to enable them to determine compliance with state and federal legal load limits.
- In addition, this proposed new UR.3.4. paragraph clarifies how these weights must be obtained to be used as commercial values, i.e., the summed total of a vehicle that is "split-weighed" cannot be used as the basis for a commercial transaction.
- OWM proposed amendments to this item in May 2023 based on feedback received from the SMA during and after the 2023 NCWM Interim Meeting and requested that the Committee replace the current proposal in SCL-22.3. The Item Under Consideration reflects these amendments.
- To reinforce that "split-weighing" is not allowed when weight values will be used in commerce, OWM requests that the Committee add the following to the end of the last paragraph in proposed new UR.3.4. Weighing of Axle Loads and Axle-Group Loads:
- (Also see S.1.15. paragraph Recorded Representations, Multi-Independent Platform Vehicle Scale Systems.)

NIST OWM Executive Summary SCL-23.3 – Verification Scale Division e: Multiple Sections Including, T.N.1., 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., S.1.2., T.N.1.2., Table S.6.3.a., Table S.3.6.b., Appendix D – Definitions (8), S.1.2.2., S.1.2.2.2., S.1.2.2.3.,Table 3., S.5.4., UR.3., Table 8.

NIST OWM Recommendation: The proposed changes to Table 8 should be separated and given an Informational status to allow additional consideration. OWM supports a Voting status for the remaining items.

- OWM recommends separating the amendments proposed to Table 8 and making it an Informational Item.
- The loads specified in Table 8 are meant to reduce the relative error due to the rounding that is inherent to each weighment.
- While the changes proposed to Table 8 would clarify its application, it would not be a technically correct application of the requirement.
- NIST OWM is of the opinion that the remaining items in this proposal are fully developed and support adoption of this group of items. NIST OWM would like to stress the importance of this item.
- The current scale code in Handbook 44 contains several contradictions and inconsistencies with respect to the use of the terms "scale division", and "verification scale division". This leads to confusion and non-uniformity in the application of the code.
- The proposal presented by the task group is meant to clean up the code and bring clarification of the requirements with respect to e and d.

NIST OWM Executive Summary for SCL-24.3 – Table 6. Maintenance Tolerances

NIST OWM Recommendation: Voting

- OWM supports the effort to provide additional clarity to Table 6, specifically clarification of the size and application of Class III L tolerances when stated in table format

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

[1]**NIST OWM Recommendation:** Assigned

- The proposed amendments to Table 7a are ambiguous. The weighing of all cannabis products is assigned to accuracy classes I, II, and III, which will lead to confusion in the field.
- OWM has multiple concerns about the proposed note in Table 8. These concerns are mainly regarding the note's location, the requirement of NTEP certification, and its unintended side effects. By including the note in Table 8, it's unclear if the intent is to make the amount

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

specified in the note, 3 oz (≈ 85 g), a recommended minimum load, a minimum net load, or a minimum load. Or whether the note is meant to limit the price increment per scale division.

- For this reason, OWM recommends this item remains assigned to the Task Group. OWM offers to assist the Cannabis Task Group in developing a technically sound proposal.

[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 legalization of 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.

AWS – Automatic Weighing Systems Code

OWM Executive Summary for AWS-24.1 – N.1.5. Test Loads

NIST OWM Recommendation: Voting with recommended changes

- OWM agrees with the submitter that the language in paragraph N.1.5. can be interpreted in different ways and needs clarification.
- Paragraph N.1.5. Test Loads and Table N.1.5. Test Loads apply to all Automatic Weighing Systems.
- The subsequent paragraphs, N.2. Test Procedures – Weigh-Labelers & N.3. Test Procedures – Automatic Checkweighers apply to Weigh-Labelers and Automatic Checkweighers, respectively.
- Paragraph N.1.5. is intended to specify what amount of test load is applied to all devices covered by this code.
- Paragraph N.2. currently specifies how test loads are applied to Weigh-Labelers
- Paragraph N.3. currently specifies how test loads are applied to Checkweighers.
- Because the application of test loads is specified in paragraphs N.2. & N.3., OWM initially supported the proposed Item Under Consideration as the language provided greater clarity regarding the test loads required.
    - Further analysis revealed several issues.
    - Paragraph N.1.5, which refers to Table N.1.5, specifies 4 different test loads which is in conflict with paragraph N.3.2. Automatic Tests, which specifies "Test runs shall be conducted using two test loads." There is also a potential for misinterpretation with paragraph N.2.2.2. Automatic Tests which specifies "Test runs should be conducted using at least two test loads."
    - There were other gaps in the language proposed in this item and the language currently in NIST Handbook 44.

OWM Executive Summary for AWS-24.1 – N.1.5. Test Loads

- OWM, with the submitter's support and input, is suggesting that the Item Under Consideration be replaced with the language included in the Detailed Analysis of this item.
- If these changes are accepted, the S&T Committee might consider changing the title of this item to better reflect the paragraphs that are included in the proposal

NIST OWM Executive Summary for AWS-24.2 – N.1.6. Influence Factor Testing

NIST OWM Recommendation: Voting

- The effect of influence factors is evaluated under controlled conditions, typically only during NTEP evaluation.
- As identified by the submitter, NCWM Publication 14 has procedures for evaluating influence factors when testing AWS either statically or dynamically, depending on the system's capabilities
- This note requires all influence factor testing for AWS to be conducted statically which is incorrect as these systems often only operate dynamically and cannot be tested statically.
- A search of NIST Handbook 44 shows that only one other code section, 5.58. Multiple Dimension Measuring Devices (MDMD), has a note that mentions influence factors (i.e., paragraph N.1.4.1. Test Objects), and that reference relates to the calibration of a test object when used near the limits of the influence factors. It does not require influence factor testing of the MDMD.
- Typically, NIST HB 44 specifies tolerances associated with influence factors but does not specify a test (N. paragraph or test note).

NIST OWM Executive Summary for AWS-24.3 – N.2.2.3. Shift Test (Dynamic)

NIST OWM Recommendation: Voting

- NIST HB 44 currently has no shift test specified for weigh-labelers that operate in the automatic mode only. Devices operating non-automatically are tested for eccentricity with a test load equal to ½ capacity. OIML R-51 specifies conducting this test at 1/3 system's capacity.
- Adoption of this item would align NIST Handbook 44 with OIML R-51, not only with the type of test but the test load required (1/3 the system's capacity)
- Adding this will facilitate field testing of these devices to ensure accuracy when off-center loading occurs.

WIM – Weigh-in-Motion Systems – Tentative Code

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

NIST OWM Recommendation: Voting with recommended edits

- NIST OWM applauds the submitter's efforts to address the concerns raised and incorporate the feedback received from the community into the Item Under Consideration. Our office supports this most recent version of the item and is of the opinion that all concerns identified by our office have been sufficiently addressed by the submitters.
- We agree that the best approach is to separate Section 2.25, which applies to WIM Systems used to screen and is a tentative code, from this new proposed Section 2.26, which will apply to WIM Systems used to enforce highway load limits.
- The proposed tolerance and test procedures are in line with internationally recognized documentary standards for WIM systems, such as OIML R 134 and ASTM E1318.
- Recommended Edits:
- Edit A.2. Exceptions as follows:
- A.2. Exception. – This code does not apply to weighing systems intended for the collection of statistical traffic data and weighing systems used for vehicle enforcement screening for the purpose of screening and sorting the vehicles based on the vehicle weight to determine if a static weighment is necessary. (Also see Section 2.25. Weigh-In-Motion Systems Used for Vehicle Enforcement Screening – Tentative Code)
- In the definition of WIM System, the term "estimate" should be replaced with "determine".
- In the definition of weigh-in-motion (WIM), the term "estimating" should be replaced with "determining"
- These systems are required to operate within the tolerances specified in Table T.2.3. and the weight values obtained from them are not an estimate.
- In paragraph S.5.2. (a) there is a reference to paragraph S.5.4. Vehicle Recognition/Presence Device. This reference should be to paragraph S.5.3. Vehicle Recognition/Presence Device.
- In paragraph S.5.3. the second instance of the term "WIM systems" is missing the "s" at the end of the word "system". Paragraph S.6. has this same issue.
- With these edits, NIST OWM is of the opinion that this item is fully developed and is ready to be voted upon.

LMD – Liquid Measuring Devices

NIST OWM Executive Summary for LMD-24.2 – N.4. Normal Tests

NIST OWM Recommendation: Withdraw

- Although examples can be helpful, OWM believes NIST HB 44 is not the correct place for them and discourages their use in the handbook for a number of reasons:
  - There are only two examples in NIST HB 44. In Section 2.21.Belt-Conveyor Scale Systems paragraph N.2.2. Subsequent Verification and Section 3.30. Liquid-Measuring Devices, paragraph S.4.4. Discharge Rates
  - The handbook is adopted as law and any additional information must be carefully considered as it can affect the application of the paragraph
  - Paragraphs that include unclear language should be amended to provide clarification to allow for uniform interpretation without the inclusion of this type of information
  - Additional guidance regarding the interpretation and application of the handbook is typically provided in documents such as Examination Procedure Outlines, training materials, etc.
  - Tina Butcher is currently updating NIST Handbook 112, Examination Procedures Outlines, and OWM intends to have the updated version available soon
  - If the weights & measures community chooses to move forward with this item, to be consistent with other examples currently in NIST Handbook 44 and to be more relevant to the devices to which the formula is typically applied, OWM suggests the following format and values for the example proposed by the submitter::

Example: If, under the conditions of installation, a device has a maximum discharge flow rate of 60 gpm and a rated minimum discharge flow rate of 20 gpm, using the above formula the minimum flow rate for additional normal tests is calculated as follows:

$$\frac{\mathbf{60\ gpm + 20\ gpm}}{\mathbf{2}} = \mathbf{40\ gpm}$$

For this device, any test conducted at a flow rate of 60 gpm down to and including 40 gpm is considered a normal test.

Any tests conducted below the calculated minimum discharge flow rate for normal tests of the device as specified in N.4.1. Normal Tests and not below the rated minimum discharge flow rate are considered "special" tests and shall be conducted as prescribed in paragraph N.4.2. Special Tests.

LPG – Liquified Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices

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

NIST OWM Recommendation: Withdraw

- Zero set-back interlock ensures that a device is returned to zero before another customer or services person uses the device for another transaction thus preventing the facilitation of fraud per G-S.2. Facilitation of Fraud.
- 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 an electronic stationary device than it does for a 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 if they are used more frequently for use in fueling vehicles?
- According to the requirements both electronic stationary and stationary retail motor fuel dispensers must have a zero-setback interlock.
- If this proposal is adopted "***Devices Used Exclusively as"*** would be added to both S.2.5.1. and S.2.5.2. to exempt stationary retail motor-fuel devices that are used for purposes other than dispensing retail motor-fuel from having a zero-set-back interlock and a note would be added to S.2.5.1. that would exempt Analog devices used for purposes other than dispensing retail motor-fuel from having a zero-set-back interlock.
- Is this equitable to other products dispensed, such as gasoline or diesel. The devices that dispense these products are required to have a zero-setback interlock and are sometimes used to fill containers used for filling gasoline or diesel-powered equipment. Granted, the majority of these 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? 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?

HGM – Hydrogen Gas-Measuring Devices

NIST OWM Executive Summary for NIST HGM-23.1 – UR.3.8. Safety Requirement

NIST OWM Recommendation: OWM has no recommendation until additional data is submitted.

- 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 the scope of the weights and measures authority.
- Groundwork is not outlined in the proposal detailing key elements that must be established for an SAE J2601 verification program and what standards if any apply to equipment in operation before the effective date.
- NIST OWM looks forward to the reporting from CA DMS and CARB as well as any updates from the submitter to clarify the types of test data available that are the result of compliance testing to the SAE J2601 standard.

EVF – Electric Vehicle Fueling Systems

NIST OWM Executive Summary for EVF-24.1 – S.1.3. Mobile Device as Indicating Element for AC Chargers

NIST OWM Recommendation: Withdraw. The EVSE primary display must meet a more comprehensive set of requirements in multiple codes to provide clear, legible, and verifiable transaction information and other metrological data in an appropriate manner.

- NIST OWM does not believe the proposed exceptions are appropriate without more detailed work to fully vet the permissible metrological features and functions for the wide range of software based remote devices to be recognized as the primary indicating elements for these commercial electrical energy measuring systems.
- The list of requirements referenced in the proposal (S.1.1., S.1.2., S.2.4.1, S.2.6, S.2.7, UR.1.1., and UR.3.1.) is not all inclusive of the paragraphs in NIST HB 44 applicable to indicating elements. There are additional requirements in Sections 1.10. General Code, 3.40. Electric Vehicle Fueling Systems and 5.55 Timing Devices that apply to an EVSE display that is an integral part of the electrical energy dispensing system or when a single display is used by multiple EVSEs. Therefore, additional accompanying requirements need to be developed for clarity and to fully recognize the proposed options for primary displays.

NIST OWM Executive Summary for EVF-24.1 – S.1.3. Mobile Device as Indicating Element for AC Chargers

- It was suggested prior to the code's adoption in 2015, to identify those paragraphs which are posing difficulties for some manufacturers to meet and possibly making those paragraphs non-retroactive, with an eventual sunset date, rather than proposing an exception to the entire code.
- Likewise, OWM also suggested that exceptions are sometimes made for certain applications which are able to meet a requirement in a different way through other mechanisms such as a contract or other price agreement or fleet sales.
- An additional concern, with regard to equity, is that companies have spent money to comply with display requirements and after 2024 would be competing with a population of existing noncompliant equipment and new equipment which will not have to be equipped in the same manner with a primary display.
- The proposal is unclear if the devices running those apps are a necessity for the operation of the charging equipment although the proposal specifies the location of the handheld device or vehicle as "being in the immediate vicinity of the EVSE" and yet there is no mention of their availability over the entire course of the transaction given a session can take twenty minutes or multiple hours to complete.
- The open-ended nature of the types of devices that fall under this category means a wide variety of handheld devices or vehicles would be part of the type evaluation process where their accuracy and clarity become more critical to the measurement transaction.
- If they are the only EVSE primary display these newly recognized devices will be the means for accessing the device/system metrological security information which can be sizable, and used for determining fuel quantity totals.
- With some further work "Apps" installed on a mobile device might provide the best opportunity for allowing for innovation since there is a mechanism for reviewing the display provided by the app and ensuring its operation provides the necessary information.
- The vehicle user interface, on the other hand, is somewhat problematic. They can vary from manufacturer to manufacturer and will undoubtedly change from year to year. How will the operator or regulatory official verify transaction information if vehicle user interface is the only means available for verification of this information? Will drivers be asked to voluntarily assist in inspections and complaint investigations, or will a car be provided as part of the official's tool kit? The code will need to address this, and it will be necessary to ensure type evaluation can adequately address this.
- How would the overall provisions of the General Code regarding legibility, clarity, and appropriateness of indications be applied when there is no display unique to a given EVSE on-site? The code addresses the EVSE as the intended point at which commercial measurements of electrical energy and related time fees are being made rather than the handheld device or EV.
- Will there be unique or common vulnerabilities to factors such as levels of service, temperature, connectivity, etc. For traditional vehicle fuel dispensers and other alternative vehicle fuel dispensers weather and normal wear issues are managed through equipment and station design and maintenance programs.

NIST OWM Executive Summary for EVF-24.1 – S.1.3. Mobile Device as Indicating Element for AC Chargers

- The submitter cites the concept of "Plug and Charge" that is part of ISO 15118 but has not provided information on the exact relevance/application to legal metrology requirements that apply.
- Currently EVF-24.1 is a proposal for a new requirement but the letter-number paragraph designation of S.1.3. is already part of the existing code and is titled EVSE Units. Does the submitter intend the proposal to replace existing code; be part of indicating element requirements already included in the code; or have a new letter-number designation?

NIST OWM Executive Summary for EVF–24.2 – S.2.7. Indication of Delivery, N.3.2. Accuracy Testing, and T.2.1. EVSE Load Test Tolerances

NIST OWM Recommendation: Withdraw, as the item does not address the lack of fundamental requirements for essential elements such as accuracy to be met uniformly across the marketplace.

- The 2028 enforcement dates were introduced late into the voting process reportedly in response to a lack of available test equipment and subsequently adopted July 2022 as part of an emergency agenda item to make the NIST HB 44 EVFS Tentative Code permanent. Stakeholders should be mindful that the formatting of the 2028 enforcement date language applicable to existing HB requirements and marketplace devices does not represent the typical precise HB code language with respect to the retroactive and nonretroactive application of these requirements. The lack of access until 2028 to fundamental requirements, such as these for indications, accuracy tests, and tolerances, increases the likelihood of nonuniformity in the application of those three sections of the EVFS code.
- We encourage a return to that original proposal for EVF-24.2 rather than the newly proposed exemption for all DC systems placed in service prior to 2025 from the tolerance and test procedures to read: All DC EVSE are exempt from this requirement until January 1, 20282025.
- The sunset provision expires while the requirements in these paragraphs do not cease to be a part of the code, they do however, become applicable to DC EVSE systems on January 1, 2028. The sunset provision as adopted into the code in July 2022 and as currently worded limits the scope of paragraphs S.2.7., N.3.2., and T.2.1.; however, it did not permanently exempt DC systems from these design features, official tests, and performance requirements. Whereas the amendments to the code in the Item Under Consideration to be voted on for adoption will make these paragraphs "Nonretroactive as of January 1, 2025," for all DC systems manufactured, warehoused, placed in service prior to January 1, 2025 (see HB 44, General Code 1.10 paragraph G-A.6. Nonretroactive Requirements.)
- Paragraph G A.3. Special and Unclassified Equipment exists for use by jurisdictions wishing to inspect and test existing DC systems in order to approve this equipment for commercial use and will remain the case should the 2028 retroactive enforcement date not change or if the 2028 date be modified as shown in the Item Under Consideration to become nonretroactive and therefore not enforceable for all DC systems placed into service prior to January 1, 2025.

NIST OWM Executive Summary for EVF–24.2 – S.2.7. Indication of Delivery, N.3.2. Accuracy Testing, and T.2.1. EVSE Load Test Tolerances

- Multiple EVFS Code requirements apply to the EVSE's primary indications for the display of the electrical energy measured, total sale, and unit price by this computing type device and the system's return to zero indications. (See paragraphs S.1.1 EVSE; Primary Indicating Element, S.1.2. EVSE Indicating Elements, S.1.2.1. Multiple EVSEs Associated with a Single Indicating Element, and S.2.1. EVSE Return to Zero.
- The electrical energy vehicle fueling application is a relatively new discipline in the weights and measures infrastructure where all the tools necessary for its implementation and the protection of all stakeholders in the marketplace are needed now.
- The delay in the application of these paragraphs encourages nonuniformity (from state to state) which can be disruptive and impact the level of confidence in the marketplace. The proposal expanding the exemption for DC systems further widens the gap in time delays in the application of tolerances which could result in what will be either a marketplace with multiple or no tolerances being applied to DC systems by manufacturers, regulators, and the service industry.
- Making the requirements in the paragraphs nonretroactive extends the exemption indefinitely to DC systems regardless of the life cycle for these systems. To further extend the exemption creates an unfair competitive advantage as there are manufacturers who have been working since 2015 to meet the code's performance and transaction information display requirements. The initial justification given for including the 2028 sunset provision was to address the delay in the supply of suitable DC EVSE test standards, however this no longer appears to be the case with test equipment.
- Should the community find the existing tolerances of a ± 1 percent acceptance tolerance and ± 2 maintenance tolerance too stringent for legacy DC systems it should be noted that if adopted Agenda Item EVF 23.6 would recognize a new wider tolerance (± 5 percent acceptance/maintenance) through January 2034 applicable to DC systems placed in service before January 1, 2024. Although the community would need to further modify Item EVF-23.6: (1) so that it is transparent to the customer and from a competitive standpoint that dual tolerances exist as a condition of sale under which electrical energy transfers will occur from DC systems and (2) to eliminate the code's exemption of applicable tolerances which is the result of the 2028 enforcement date.

NIST OWM Executive Summary for EVF-23.4 – S.5. 2. EVSE Identification and Markings Requirements, S.5.3. Abbreviations and Symbols, and N.3. Test of an EVSE System

NIST OWM Recommendation: Voting after resolving the ambiguity of the language that prescribes the conditions for performing the test and addresses the suitability of test equipment..

- For clarity and to fully define the electrical energy values where the EVSE delivers the maximum current the system is designed to deliver under the manufacturer's intended installation conditions and that corresponds to EVSE marking information, OWM recommends striking the proposed new definition in the Item Under Consideration shown as "maximum current deliverable - The maximum current that the EVSE can deliver as installed under optimum conditions" and adopting an alternate proposed new definition for the maximum current deliverable to read:

NIST OWM Executive Summary for EVF-23.4 – S.5. 2. EVSE Identification and Markings Requirements, S.5.3. Abbreviations and Symbols, and N.3. Test of an EVSE System

maximum current deliverable - The highest current rating the EVSE is designed to deliver when properly installed.

- Modify the definition of the newly proposed term "maximum deliverable amperage" to distinguish that the current delivered from the EVSE and used to establish the EVSE's maximum deliverable amperage for the purpose of accuracy testing is determined by a calibrated test standard apparatus. Additionally, an EV may not always be used as the test load so the vehicle providing the current level information is not always applicable for all DC systems' tests. Therefore, modify the proposed definition of the maximum deliverable amperage to read:

  maximum deliverable amperage - The maximum current available from the EVSE at the time of the test as determined by the Control Pilot Pulse Width Modulation signal or via digital communication between the test standard and EVSE and where applicable the EV orused as a test load. [3.40]
  (Added 202X)

- For consistency with the terminology in the HB used to address flow rates and that is in use for the electrical energy values monitored and measured over the course of the test, NIST OWM recommends alternate designations for the terms maximum current deliverable to become maximum rated current and maximum deliverable amperage to become maximum deliverable current. This would be a nonretroactive requirement which would require including enforcement dates in paragraphs S.5.2. EVSE Identification and Marking Requirements and S.5.3. Abbreviations and Symbols before application to various generations of EVSEs in service, warehouse, and stages of production.

- Under the intended conditions of installation and typical levels of operation, a test load is placed, on commercial weighing and measuring instruments to demonstrate the device or systems compliance over its entire operating range and when that range is narrow the handbook should specify the test conditions across that limited operating range of commercial use.

- Recommend the Handbook test criteria in proposed new paragraph N.3.3.(b) and its Note be modified to: (1) clearly specify that the test point at the" maximum power level" is instead at the "maximum rate of energy transfer (maximum power (kW))", (2) adhere to the Fundamental Considerations on the suitability and capability of the "test standard" apparatus used for the official test rather than the "test equipment available," and (3) specify the minimum range between the test points for: (a) the light load and (b) midrange to full load for a valid test as outlined below.

  N.3.3. Performance Verification in the Field of a DC EVSE - Accuracy tests shall be performed at any voltage and the following current levels:

  (a) A point between 10 % and 20 % of the MDA, but not less than 30 A; and

  (b) A point between 25 % and 100 % of the MDA, with the ~~recommendation to~~ test at the point resulting in the maximum rate of energy transfer (i.e., maximum power ~~level~~(kW)) within that range that ~~is possible~~ using the test ~~equipment~~ standard ~~available~~.

NIST OWM Executive Summary for EVF-23.4 – S.5. 2. EVSE Identification and Markings Requirements, S.5.3. Abbreviations and Symbols, and N.3. Test of an EVSE System

Note: The test points (a) and (b) above must not be at the same current level. ~~It is recomm±ended that the current levels should be separated to the extent that the test equipment will allow.~~ At minimum test points (a) and (b) must fall within the specified ranges and the difference between the two test points must be greater than 35 %.

OR

Note: The test points (a) and (b) above must not be at the same current level. ~~It is recommended that the current levels should be separated to the extent that the test equipment will allow~~. The MDA percentage values for test points (a) and (b) shall be within the specified MDA percentage ranges and the absolute value of the difference between those test points expressed in MDA percentages shall be greater than 35 (± 5 %).

For DC systems it is anticipated that an electric vehicle may be used as the test load. ~~Under that circumstance,~~ When an electric vehicle is used to simulate the test load, testing at the load presented by the vehicle shall be sufficient for field verification provided that it is greater than 40 % of the MDA and no less than 30 A.

For DC systems it is anticipated that an electric vehicle may be used as the test load. ~~Under that circumstance,~~ When an electric vehicle is used to simulate the test load, testing at the load presented by the vehicle shall be sufficient for field verification provided that it is greater than 40 % of the MDA and no less than 30 A.

- This 2023 proposal updated the test procedures for AC and DC systems but separated the DC systems' test procedure into a field test and laboratory test. The proposed new laboratory test is now specified as a type evaluation test. Due to the format style of the DC systems' test procedures paragraphs, it is unclear whether the existing 2028 enforcement date for testing of DC systems applies only to the field test or is also intended to apply to the newly proposed type evaluation test.
- OWM notes that because of the 2028 enforcement date applicable to the DC test procedure paragraph the NIST Handbook 44 General Code will continue to apply to existing equipment, including paragraph G A.3. Special and Unclassified Equipment. Jurisdictions wishing to inspect and test existing equipment in order to approve it for commercial use would be left to use this provision. The use of paragraph G A.3 may result in the application of tolerances present in various other metering devices' codes which would result in non-uniform regulation of these devices across the country.
- Type evaluation test criteria are not published in HB 44. The HB accuracy tolerances for a device under test apply when testing is conducted in either a laboratory or field environment. Although some tests were designed to be conducted in a laboratory, the HB codes do not specify that each individual test requirement applies specifically to tests performed in a field and/or laboratory environment. NTEP test procedures are developed within the NTEP technical sectors or workgroups. The NTEP Electric Vehicle Supply Equipment (EVSE) Work Group was established in 2017 by NCWM and remains active.
- In May 2023 the EVFE Subgroup tasked its Test Procedure Subcommittee (TPS) to undertake the project of combining S&T Items EVF-23.4 and EVF-23.7 into a single proposal. After input from

NIST OWM Executive Summary for EVF-23.4 – S.5. 2. EVSE Identification and Markings Requirements, S.5.3. Abbreviations and Symbols, and N.3. Test of an EVSE System

the submitters of both proposals and other U.S. stakeholders, and multiple meeting deliberations (June through December 2023) the TPS after conducting a straw poll arrived at a draft that combines elements of both proposals under Item EVF-23.4 that it will send to the EVFE Subgroup for its consideration.

- A slight change is recommended for the agenda item's title to include missing proposed new definitions for the terms "maximum current deliverable" and "maximum deliverable amperage" to clarify these EVSE related terms are a part of this proposal. This would also assist the community in distinguishing this item from multiple other proposals that address other types of EVFS marking requirements.

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

NIST OWM Recommendation: Developing to allow for deliberations on the enforcement dates, transparency for all stakeholders and fair competition is ensured in a dual tolerance marketplace, and establishing parameters for use of an electronic display for marking information.

- Having well-defined tolerances with clear and understandable effective dates is essential.
- Defining tolerances that are enforceable 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.
- Proposals have been developed to include a wider tolerance of 5 % for DC systems installed before 2024 when accuracy is marked, which several OEMs identified as achievable. However, an exemption for DC systems from the application of tolerance requirements through 2028 to sunset in 2034 is confusing from a testing/regulatory enforcement standpoint.
- Where commercial equipment is known to operate at dual tolerances the proposed marking and performance requirements should be retroactive.
- Should the community agree to the numerical designation of an Accuracy Class for DC systems which meet the wider tolerance, then additional requirements should be developed to include: (1) a standardized handbook accuracy class table for Section 3.40; (2) requirements specifying the appropriate "Accuracy Class" identifier; and (3) requiring the accuracy classification and accuracy statement be marked on the EVSE. The NIST OWM suggested format and wording for these proposed new HB requirements is shown in this document under the heading NIST OWM Detailed Technical Analysis.
- Accuracy markings and notices to consumers will need to be clearly viewable from the customer position prior to start of the transaction and provide adequate information to ensure the buyer is aware that accuracy varies from one site to another.
- The community should revisit past national discussions on the electronic formatting of required marking information and also consider April 2023 comments raised in the EVFE Subgroup ballot for specifying a minimum time for the duration of the display of information related to the level of accuracy maintained by the EVSE, especially since this could potentially create a new dual tolerance marketplace which is new to vehicle refueling applications.
- There are several dates referenced proposed EVF-23.6 paragraph T.2.2. Tolerances that conflict and OWM believes will create confusion for those implementing the proposed requirements.
- The prior item adopted by the NCWM in July 2022 making the code permanent also included an exemption for DC devices from any tolerance requirements until 2028 which remains in this 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: (1) widens the gap in time delays in the application of tolerances in what will be a dual tolerance marketplace for DC systems, (2) encourages nonuniformity in equipment performance, and (3) prevents the timely marking of information for consumer awareness.
    - 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 establishing a sunset date of 2034 for the entire country could be questioned, given the pace at which technology has already advanced, is nineteen years after the tentative code was first adopted by the NCWM.

- 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:
  - ensure stakeholders have the appropriate tools (well developed documentary standards, suitable test standards, and test procedures) needed for this new device application; and
  - discourage nonuniformity which can have a disruptive influence on the marketplace.
- The components of the weights and measures infrastructure help to ensure the accuracy and validity of commercial transactions based upon weight, measure, or count and to ensure in other cases that the product meets required quality standards. Another purpose of these components is to ensure consumers are informed so that they can make value comparisons. A robust infrastructure ensures equity in the marketplace, meaning that consumers receive the correct quantity and quality of products and services for which they pay, and businesses receive fair payment for the products and services that they deliver. By ensuring that they operate according to a consistent set of weights and measures standards and practices, businesses are also protected from unfair competition.
- The EVFE SG met in March 2023 to address proposed modifications to NIST HB 44 Section 3.40 EVSE test procedures and has not had the opportunity to review this agenda item's latest alternate proposal for modifications of existing marking requirements that will recognize a new accuracy class designation rather than a statement notifying the customer when systems are capable of a ± 5 percent tolerance instead of the ± 1 percent and ± 2 percent tolerances specified since 2015. The Technical Advisor anticipates the SG will meet to discuss the alternate proposal before July 2024.

NIST 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: Definitions– maximum deliverable ampere

NIST OWM Recommendation: Withdraw due to work in progress nearing completion to incorporate this proposal into EVF-23.7.

- 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

NIST 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: Definitions– maximum deliverable ampere

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 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? Please be advised that as a result of actions which occurred during the 31JUL2023-03AUG2023 NCWM Annual Meeting modifications to NIST HB 44 3.40 were adopted and resulted in the renumbering of the test notes (N.), the N.5 test procedure paragraphs were renumbered to become N.3. Additionally, that action by the NCWM deleted and no longer recognizes paragraphs N.1. No Load Test and N.2 Starting Load Test as part of the minimum test procedures for EVSEs.
- 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.
- 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.
- In May 2023 the EVFE Subgroup's Test Procedures Subcommittee (TPS) was tasked with working through a May 2023 version of the test procedures addressed in Item EVF 23.4. This latest modified version of the test procedures is the result of the collaborative effort of the submitters of both test procedure proposals in Items EVF 23.4 and EVF-23.7. TPS discussions about modifications of the test procedures and defining new terms having special and open-ended meaning were focused on, input from stakeholders (type and routine field testing), the NCWM, regional weights and measures associations, and NIST OWM. Based on the TPS's May through December 2023 deliberations and after a strawpoll taken of members and nonmembers attending the December 8, 2023 meeting, the TPS has agreed to forward a combined proposal derived from both EVF-23.4 and EVF-23.7 for the EVFE Subgroup's consideration.

GMA – Grain Moisture Meters 5.56 (a)

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

NIST OWM Recommendation: NIST OWM supports the Grain Analyzer Sector and the S&T Committee's decision to withdraw this item. OWM recognizes that if additional data is received, the proposed tolerance changes may be resubmitted for consideration.

- 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 weights and measures agencies. 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 meeting more stringent tolerances on both UGMA and Non-UGMA meter types.
- The Grain Analyzer Sector has not received additional data needed to further assess their proposed modifications to the tolerances values in NIST HB 44, Section 5.56(a). The GA Sector will keep this as an open item on their Sector agenda, but as the submitter of this item, the GA Sector recommends that this item be withdrawn. If or when additional data is received, the Grain Analyzer Sector may resubmit the item.

OTH – Other Items

NIST OWM Executive Summary for OTH-16.1 – Non-Utility Electricity-Measuring Systems (NUEMS) – Tentative Code

NIST OWM Recommendation: Voting.

- NIST OWM is in agreement with assigning a voting status to Item OTH-16.1 due to the extensive work to address the 30 points identified by the regulatory community and after stakeholders and the Committee consider and then provide input on these points:
  - NIST wishes to confirm there a consensus between industry and regulatory officials on the latest alternate modifications to proposed new paragraph S.1.3.2 Test Output to clarify three possible formats to be recognized for the test output indications.

NIST OWM Executive Summary for OTH-16.1 – Non-Utility Electricity-Measuring Systems (NUEMS) – Tentative Code

- Is the community clear on the specific conditions that dictate when it is not "feasible" to perform a test by injecting a primary current as the test load as described in paragraph N.4.(b) NUEMS Test Loads in the case of External Sensor NUEMS.

- The maximum value of quantity-value division is not defined in this proposed new code as it is in all other Section 3 Measuring Device Code Sections of HB 44. The kilowatt-hour is the prescribed measurement unit in the HB 130 MOS for these electrical energy devices. Is there agreement for having removed from the proposed NUEMS code a design requirement that applies to these systems which read: **S.1.1.X. Maximum Value of Quantity-Value Divisions. – The maximum value of the quantity-value division shall not be greater than one kilowatt hour?** Stakeholder will rely solely on the proposed paragraph UR.1.3.2. which reads: UR.1.3.2. Quantity-Value Division. - The configured quantity-value division shall not exceed the minimum increment to be used in billing" to establish the increment size for the kWh indicated and recorded by these systems.

- The paragraph UR.1.3.1. Service Application Note was amended to clarify the term Current Class is analogous to the term "Sensor Primary Current Rating" for meters with external sensors.

  - Should the term "Sensor Primary Current Rating" also be defined and included in the NUEMS Appendix D definitions section or at minimum be expanded further in the Table(s) or a Note to clarify one term is applicable to traditional socket type meters and the other applies to meters with external sensors?

  - An explanatory sentence or text should be included after paragraph UR.1.3.1. as leading text to explain the equation for calculating "Annual Max" that follows UR.1.3.1. as well as a legend placed after the equation to explain all variables in the equation, clarify abbreviated terms, and the relationship of the equation to its corresponding HB requirement.

- NIST OWM recommends the abbreviations for the term "Current Class" also be recognized in the tables for paragraph S.3.5. Abbreviations and Symbols and that abbreviation be expressed in all capital letters so rather than read "Cl Class" the table reads either:

Symbol	Description
CL	Class
CL	Current Class

OR

Symbol	Description
CL	Class or Current Class

- The use of the term "primary" in reference to an indicating element is understood and included as part of the handbook's definitions. There are multiple instances where the terms "primary" and "secondary" are used to qualify or identity amperage, current, and voltage in the proposed NUEMS Tentative Code where there is no further elaboration on what the use of those qualifying terms mean for those electrical energy units (i.e., Table S.3.3.b. Descriptors for Table S.3.3.a. Device Identification and Marking Requirements - External Sensors See Number 6 and Table S.3.2.2.b. Descriptors for Table S.3.2.2.a. Device Identification and Markings Requirements of– External Sensor (ES) NUEMS See Number 12).

NIST OWM Executive Summary for OTH-16.1 – Non-Utility Electricity-Measuring Systems (NUEMS) – Tentative Code

- Include a legend in the code's proposed new Appendix D definition of "active energy" to explain all variables in the Equation 1 shown below:

$$\underline{\boldsymbol{E(T) = \int_0^T v(t) \cdot i(t) \cdot dt}} \qquad \underline{\textbf{\textit{Eq. 1}}}$$

- In the proposed new code's Appendix D definitions for the terms "line service," "load service," and "master meter, electric"; keep the acronym NUEMS in parentheses but also spell out each word in the acronym and place that text just prior to the acronym.

- To require a NUEMS be provided with test features used by the "electrical submetering industry" may not be suitable for legal metrology verification therefore NIST OWM recommends a reference to HB 44 Section 1.10 General Code paragraph G-UR.4.4. Assistance in Testing Operations be included in proposed new paragraph UR.2.4.2. NUEMS Test Features to read:

  UR.2.4.2. NUEMS Test Features. – All NUEMS shall be provided with test features to facilitate common tests methods used in the electrical submetering industry and in accordance with General Code paragraph G-UR.4.4. Assistance in Testing Operations.

- Is it the intention of the code developers that the definition for the term "creep" which would read: "A continuous apparent measurement of energy indicated by a system with operating voltage applied and no power consumed (load terminals open circuited). [3.40, 3.XX] (Added 2022) not be included in the Appendix D for the NUEMS – Tentative Code.

NIST OWM Executive Summary for OTH-24.2 – Appendix D, Definitions: National Type Evaluation Program (NTEP) and Certificate of Conformance (CC)

NIST OWM Recommendation: Informational to allow for more time to review consistency in definitions across various publications.

- The definitions of "Active Certificate of Conformance" and "National Type Evaluation Program" in NIST Handbook 130 and the definitions of "National Type Evaluation Program" and "Certificate of Conformance" in NCWM Publication 14, Administrative Policy, should be reviewed for consistency.

ITEM BLOCK 1 (B1) TRANSFER STANDARD

NIST OWM Executive Summary for Item Block 1 (B1) – Transfer Standard

NIST OWM Recommendation: Voting

NIST OWM Executive Summary for Item Block 1 (B1) – Transfer Standard
• OWM supports amending these items to replace the term "Field" with "Transfer" as Transfer Standard is now a defined term in NIST Handbook 44 and amending the language to be consistent with similar paragraphs in other sections. • The Items Under Consideration in this block are not properly formatted to indicate the text being added, the text being deleted, and the current text that will remain. • The correct formatting is provided in the detailed analysis of these items.

ITEM BLOCK 2 (B2) LPG TERMS & DEFINITION

NIST OWM Executive Summary for B2-LPG-24.1 – S.1.5.7. Totalizers for ~~Retail Motor-Fuel Dispenser~~ Liquefied Petroleum Gas Retail Motor-Fuel Device, S.2.6.1. Electronic Stationary (Other than Stationary Retail ~~Motor-Fuel Dispensers~~ Liquefied Petroleum Gas Retail Motor-Fuel Device), S..2.6.2. Automatic Timeout Pay-at-Pump ~~Retail Motor-Fuel Devices~~ Liquefied Petroleum Gas Retail Motor-Fuel Device, and S.4.3. Location of Marking Information: ~~Retail Motor-Fuel Dispensers~~ Liquefied Petroleum Gas Retail Motor-Fuel Device
NIST OWM Recommendation: Withdraw • OWM sees no technical reason to replace the terms "Retail Motor-Fuel Dispenser" and "Retail Motor Fuels Devices" with "Liquefied Petroleum Gas Retail Motor-Fuel Device". • As defined, Liquefied Petroleum Gas Retail Motor-Fuel Device" includes both the terms "Retail Motor-Fuel Dispensers" and "Retail Motor Fuels Devices" so they mean the same thing. • Replacing these terms has no impact on the application of these paragraphs.

NIST OWM Executive Summary for B2- LPG-24.2 – S.2.5. Zero-Set-Back Interlock
NIST OWM Recommendation: Withdraw • OWM sees no technical reason to replace the term "Retail Motor-Fuel Dispensers" with "Liquefied Petroleum Gas Retail Motor-Fuel Device". • As defined, Liquefied Petroleum Gas Retail Motor-Fuel Device" includes the term "Retail Motor-Fuel Dispensers" so they mean the same thing. • Replacing this term has no impact on the application of these paragraphs.

NIST OWM Executive Summary for B2-OTH-24.1 – Appendix D, Definitions: liquefied petroleum gas retail motor-fuel device

NIST OWM Recommendation: Withdrawn

- OWM opposes the adoption of this item as the implications of the proposed changes are unclear.
- The Item Under Consideration includes a note which indicates "These devices are required to be listed to UL 495 Power-Operated Dispensing Devices for LP-Gas and equipped with a Type K15 nozzle in accordance with ISO/DIS 19825, Road vehicles- Liquefied petroleum gas refueling connector". This note could either limit this definition to include only devices with a K15 nozzle and that are UL listed or require all devices used to fill vehicles to be retrofitted to include the K15 nozzle and be UL listed.
- Devices which are not UL listed and do not have a K15 nozzle would no longer meet this definition, which could include devices that are NTEP approved as Retail Motor-Fuel Dispensers to deliver LPG. These devices may also need to be retrofitted to continue to be used to fill vehicles.
- In the justification for this item the submitter states, "These devices [K15 nozzles] are required by NFPA 58 for all LP-gas dispensers" Per the NFPA website, NFPA 58, Liquefied Petroleum Gas Code, provides the requirements for safeguarding all LP-Gas (propane) installations in homes, businesses, and industrial settings. Important updates to the code help designers, health and safety managers, authorities having jurisdiction (AHJs), and insurance professionals prepare for the challenges of modern LP-Gas hazards.
- NIST Handbook 44 includes requirements which apply to commercials devices that when properly enforced result in accurate measurements. Requirements related to safety are not codified in NIST Handbook 44.
- Per NFPA 58, 6.28.5.2, the K15 nozzle is only required on "self-service engine fuel dispensers" and would not be required on devices that dispense LPG as a motor fuel at locations that do not allow customers to fuel their own vehicles (full-service). NIST Handbook 44 does not distinguish between full-service and self-service dispensers.
- This item was proposed in combination with LPG-24.1 & LPG 24.2 as an alternative to LPG-23.1. which proposed to limit the application of S.2.5. Zero-Set-Back Interlock. The zero-set-back interlock feature functions to prevent the facilitation of fraud in accordance with G-S.2. Facilitation of Fraud by ensuring a dispenser returns to zero before the next transaction can be initiated, whether the transaction is initiated by trained service personnel or a customer filling their own vehicle.
- In the justification for OTH-24.1. the submitter acknowledges that not all propane-powered vehicles have the K15 connection.
- Per the U.S. Department of Energy's website "The National Fire Protection Association (NFPA) Code 58 (beginning with the 2017 version) requires all new vehicles to be equipped with the quick-release "Type K15" connector as of January 1, 2020 but does not require older vehicle to be retrofitted to accept a K15 connection
- The U.S. Department of Energy's website also states that "the ACME QCC screw-on connector has been used since 1994 for both vehicles and bottle filling."

NIST OWM Executive Summary for B2-OTH-24.1 – Appendix D, Definitions: liquefied petroleum gas retail motor-fuel device

- If this item is adopted as proposed along with LPG-24.2, vehicles with the older-style ACME QCC connection may have no choice but to fill at a station with a device that has no zero-setback interlock or, depending on the interpretation of this definition, may not be able to be fill at all if all devices are retrofitted with a K15 connector.
- Currently, all dispensers used to deliver LPG as a motor vehicle fuel installed after January 1, 2017, are required to have a zero-setback interlock as required on devices that dispense other types of fuels into motor vehicles.
- A search of the NCWM website indicates that there are various retail motor-fuel dispensers designed to dispense LPG, which have an NTEP CC and are suitable for this purpose. Those installed after January 1, 2017, are currently required to have a zero-setback-interlock regardless of whether they are self-service or not.

ITEM BLOCK 3 (B3) MILK METER TOLERANCES

NIST OWM Executive Summary for B3-VTM-20.2 – Table T.2. Tolerances for Vehicle Mounted Milk Meters

NIST OWM Recommendation: The Milk Meter Task group met to discuss these items and per the S&T committee's recommendations the task group will present updates at the 2024 annual meeting and the feasibility of establishing a new section in Handbook 44 for Milk Measuring Devices. NIST OWM agrees with an Assigned status for these items.

- The S&T committee at the 2024 Interim Meeting agreed to combine VTM-20.2 and MLK -23.1. Aaron Yankers (Colorado) held a task group meeting March 6 and April 24, 2024 to discuss the proposal. The Task group is reviewing and discussing various tolerances used for Milk meters and Aaron continues to collect feedback from the task group concerning the proposed changes.
- The task group held two meetings to discuss the direction for the milk meters items. The task group discussed combining the milk meter requirements from all other codes in NIST Handbook 44 into a new Code section and is also reaching out to the original submitters of B3 items for clarity.
- The codes in NIST HB 44 that address the measurement of milk are NIST HB 44 sections 3.31, .3.35, 3.37, and 4.42.
- Sections 3.31 Vehicle Tank Meters and 3.35 Milk Meters currently have the same tolerances. Section 3.37 Mass Flow Meters has a different tolerance. Section 4.42 Farm Milk Tank code applies to farm milk tanks that are used for the commercial measurement of milk. The farm milk tank tolerances are different than the meter tolerances.

NIST OWM Executive Summary for B3-VTM-20.2 – Table T.2. Tolerances for Vehicle Mounted Milk Meters

- NIST OWM supports the update of milk meter tolerances in NIST HB 44 for clarity. If OIML tolerances are adopted care should be taken to adopt those tolerances that are appropriate for this application where the U.S. only tests the complete system.
- If the task group plans to combine all milk measuring codes the group should consider:
  - For a VTM milk meter the product depletion test is considered as part of the official test of this meter type
  - The tolerances for a farm milk tank are different than tolerances for the milk meter Codes.

NIST OWM Executive Summary for B3-VTM-20.2 – Table T.2. Tolerances for Vehicle Mounted Milk Meters

NIST OWM Recommendation: The Milk Meter Task group met to discuss these items and per the S&T committee's recommendations the task group will present updates at the 2024 annual meeting and the feasibility of establishing a new section in Handbook 44 for Milk Measuring Devices. NIST OWM agrees with an Assigned status for these items.

- The S&T committee at the 2024 Interim Meeting agreed to combine VTM-20.2 and MLK -23.1. Aaron Yankers (Colorado) held a task group meeting March 6 and April 24, 2024 to discuss the proposal. The Task group is reviewing and discussing various tolerances used for Milk meters and Aaron continues to collect feedback from the task group concerning the proposed changes.
- The Milk Meter Task group also met on June 11, 2024 prior to the 2024 Annual Meeting.
- The task group discussion during its three meetings included the direction for the milk meters items, combining the milk meter requirements from all other codes in NIST Handbook 44 into a new Code section, reaching out to the original submitters of B3 items for clarity, and discussed direction for the block 3 items for discussion at the 2024 Annual meeting.
- The codes in NIST HB 44 that address the measurement of milk are NIST HB 44 sections 3.31, .3.35, 3.37, and 4.42.
- Sections 3.31 Vehicle Tank Meters and 3.35 Milk Meters currently have the same tolerances. Section 3.37 Mass Flow Meters has a different tolerance. Section 4.42 Farm Milk Tank code applies to farm milk tanks that are used for the commercial measurement of milk. The farm milk tank tolerances are different than the meter tolerances.
- NIST OWM supports the update of milk meter tolerances in NIST HB 44 for clarity. If OIML tolerances are adopted care should be taken to adopt those tolerances that are appropriate for this application where the U.S. only tests the complete system.
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○ The tolerances for a farm milk tank are different than tolerances for the milk meter Codes..