

California Agricultural Commissioners and Sealers Association



Jason Glass
Director, Kentucky Department of Agriculture
Chair, NCWM Specifications & Tolerances Committee

Dear Director Glass,

This letter is submitted to bring concerns to the attention of the National Conference on Weights and Measures (NCWM) regarding perceived deficiencies in the proposed draft HB 44 code (OTH-16.1) for Non-Utility Electricity Measuring Systems (NUEMS) as identified by the California Agricultural Commissioners and Sealers Association (CACASA) from reviews by regulators with knowledge and experience in this field.

The attached document lists and describes specific sections of major/moderate/minor concern:

- "Major" items are those which we feel are deleterious as written and would either hamper the efforts of regulators or undermine the integrity of the code.
- "Moderate" items are significant problems for which there are, in our view, better approaches, but may be appropriate or applicable as proposed.
- "Minor" problems are editorial issues or congruency issues within the code itself that we feel should be addressed.

For each of the concerns listed, we offer some background and provide what we feel to be constructive recommendations to resolve the issue.

We also suggest, respectfully, that you give consideration to the fact that the regional working group for this project consisted of a majority of industry representatives and only a very few regulators. It has been indicated that, in recent votes of the working group, where opinions were split, the regulatory representatives were simply outvoted.

It is important to bear in mind that this draft code is designed to address two categories of meters:

- First is what has been termed Internal Sensor (IS) Meters
- Second is termed External Sensor (ES) Meters.

Generally speaking, IS Meters encompass the traditional design of utility meter with which most people are familiar, sometimes called a socket meter. ES Meters are a modern design being manufactured by all the industry representatives in the work group. These ES meters have an



IS Meter
"Socket Meter"



ES Meter

external sensor that detects a primary electrical current (the electricity going to the customer) and sends a secondary signal in response to the primary current. An internet search for "current transformer meter" will yield some images, but there are a variety of configurations which makes it difficult to provide one example that represents the entire category. In general, there are two

main components of an ES meter, the main body and external sensors connected to the main body by wires (see photo). The sensors detect electricity usage and send a signal to the main body, which calculates the amount of electricity used.

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While both categories of meters perform the same basic function, the implementation is quite different. Many of the concerns pertain to ES Meters, which present unique challenges. It should be noted that the workgroup has continued to meet in attempts to resolve some of the concerns. Therefore, the final submission to the NCWM Annual Meeting may have already addressed some of the items, although most of the items addressed in the work group's discussions have been minor ones.

We also urge your recognition that, while this proposed draft may appear to have gained approval of the entire Working Group, including multiple California Weights and Measures Officials who were members thereof, significant concerns remain, many of which were discussed during CACASA's Specifications and Tolerances Committee on May 23, 2023. From those discussions, we felt compelled to share these concerns via written correspondence to you, Director Glass, with hopes that they be noted and discussed at the July 2023 NCWM Annual Meeting.

Please do reply with any thoughts or ideas you have regarding these concerns presented. Members of CACASA plan to attend the NCWM Annual Conference and will be prepared to present these concerns to the attendees.

In consideration of the concerns noted, we respectfully recommend that these proposed NUEMS code sections (OTH-16.1) be removed from "Voting" status at the upcoming 2023 NCWM Annual Conference, returned to "Developing" status, and allowed to be further developed and refined by the working group in a more balanced collaborative setting. We do support and encourage continued work to develop appropriate, comprehensive, and reliable standards for these devices before returning as a voting item in the future.

Sincerely,

Joe Deviney,
California Agricultural Commissioners and Sealers Association CACASA
CACASA Specifications and Tolerances Committee - Chair
Santa Clara County Sealer of Weights and Measures

CC:

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This document is intended to accompany the letter from the California Agricultural Commissioners and Sealers Association and to present specific concerns to the NCWM's attention regarding perceived deficiencies in the proposed draft HB 44 code for Non-Utility Electricity Measuring Systems (NUEMS), as seen by the California regulators with knowledge and experience in this field.

Major Concerns

S.1.3.2. Test Output – This code section relates to the mechanisms that allow a regulator to test the accuracy of the device. The current version of this section allows for methodologies (options 1 and 3 in the proposal) that are not currently, and have never been, allowed by any legal metrology jurisdiction. Specifications have not been established for options 1 and 3 and have not been tested by W&M officials.

Recommendation:

- Allow only a pulse output.
- If other methodologies are allowed, specifications must be developed, and device evaluation and type approval must be required.

Table S.3.2.3.a. Electronic Display – The draft code makes an allowance for a display to be connected via the internet as opposed to a direct connection between the device and the display. As an example, one could use a smartphone to go to a web address that connects the smartphone with the NUEMS. This would be a novel inclusion in HB44 and brings up security and fraud concerns from potential digital manipulation. This method seems, in theory, acceptable but appropriate security provisions should be included as well.

Recommendation:

Continue development to establish security, reliability, connectivity, and alternate display provisions.

Table S.3.2.3.a. 7.-11. – This table contains marking requirements for the main body of an ES Meter. The concern is that there are no standardized abbreviations. While not every marking requirement in HB44 has a standard abbreviation, most do. Those that do have standard abbreviations lend themselves to being easily understood without needing to have extensive expertise in a specific field. Deciphering the various markings on these devices without standard abbreviations requires a level of familiarity that most W&M officials may not have.

Recommendation:

Establish standardized abbreviations for uniformity, ready identification, and safety for testing officials.

Table S.3.2.3.b. 6 – An idea presented early in the development of this code was to create parameters to type approve the NUEMS body and the external sensors separately. While the regulators are supportive of this idea, it never materialized and the marking requirement number 6, in Table S.3.2.3.b., is a reference to that idea. Thus, including this note as currently worded causes confusion and may lead one to believe independent type approval is an option.

Recommendation:

Develop specifications and tolerances for external sensors to enable type approval. Until that is accomplished, remove all other references to external sensors type approval in the proposed code.

Table S.3.3.a. Separate Document – An early idea for providing flexibility in marking requirements was to allow a separate document to satisfy the marking requirements. This idea was explored and deemed infeasible. It was eliminated from Table S.3.2.3.a. but still remains in Table S.3.3.a. For uniformity, the column for a “Separate Document” should be eliminated.

Recommendation:

Delete the “Separate Document” column from Table S.3.3.a.

Table S.3.3.a. Polarity (11) – This marking informs both the installer and regulator of the direction current must flow through an external sensor, due to some sensors being directionally sensitive. The current table allows this marking to be not a physical marking, but an electronic indication on a display, and as such would only be visible post-installation. Physical marking on the sensor is necessary to ensure proper installation.

Recommendation:

Physical marking of current flow must be marked on the sensors.

Table S.3.3.a ‡ - This requirement allows for external sensors to omit a serial number in certain circumstances. This makes it exceedingly difficult to maintain traceability of a component and should not be allowed.

Recommendation:

Serial Numbers need to be marked on sensors.

Table S.3.3.a. † - This requirement entails a separate type approval as described in the comment for Table S.3.2.3.b. 6. Having separate type approvals should not be part of the draft code until such standards are developed.

Recommendation:

Delete references to separate type approvals.

Table S.3.3.b. 6. – This follows the same logic as the previous comment for Table S.3.3.a.†. It is recommended that this read the same as requirement 5 in Table S.3.3.b.

Recommendation:

Requirement should read as follows: NTEP Certificate of Conformance Prefix and Number. Also see General Code paragraph G-S.1. Identification.

S.3.4. Abbreviations and Symbols – Similar to comment for Table S.3.2.3. 7.-11.

Recommendation:

Standardized and uniform abbreviations should be placed in this section.

T.2. No-Load Test – This section includes tolerance based upon a testing methodology allowed in S.1.3.2. Test Output, the first item addressed in this letter. Specifications for these methods have not been developed and thus, the related tolerances should not be included.

Recommendation:

The language referring to “NUEMS without a pulse output” should be eliminated.

T.3. NUEMS Starting Load Test – As with the comment for T.2., the references to register indication should be eliminated.

Recommendation:

Delete “or register indication”.

Moderate Concerns

General Comment – There is inconsistent terminology when referring to the main body of an ES Meter. The terms “meter,” “meter body,” and “NUEMS electronics” are used throughout the document to refer to the same piece of the NUEMS. A single term should be agreed upon and used throughout.

Table S.3.2.3.b. 2. & 4. – These prefix marking requirements were separated from their corresponding items to allow for space saving on the device. The table allows for the prefix to appear on a display if omitted from the physical device. While this is still acceptable to the regulators in the group, a small but important amendment is needed to avoid implying the prefix could be omitted entirely. The final portion of Table S.3.2.3.b. 2. should read, “...the associated NUEMS is not required to be physically marked per General Code paragraph G-S.1. Identification (b)(1).” Table S.3.2.3.b. 4. would reference (c)(1).

Table S.3.2.3.b. 7. – The wording of this requirement is not clear. Confusion has occurred when this marking was thought to be the voltage that powers the device or the voltage that the sensor is designed to measure, while it may be discernable, it should be reworded with greater clarity. The lack of clarity could cause errors in the review of the device as well as safety hazards for regulators.

Table S.3.2.3.b. 10. – This requirement is titled “NUEMS Current Input,” but the explanation refers to current and voltage, which is not consistent with the title. It is suggested to title this requirement, and the corresponding section in Table S.3.2.3.a., uniformly with “NUEMS Input” to avoid confusion. The second sentence also only refers to “current” and requires clarification to avoid misinterpretations.

S.3.3. Device Identification and Marking Requirement – External Sensors – This section states that sensors “...shall have the following... indelibly marked on a permanent identification label...” The specific reference to a permanent label is overly prescriptive. Some manufacturers have used laser etching to mark the device. Specific requirements for “a label” is unnecessary if other means provide equal same permanence.

N.3. Minimum Test Duration – Before codifying a minimum test duration, the regulators would like to see data that supports the one-minute test versus other test durations, such as 10 watt-hour test constants for full load tests and 1 watt-hour test constants for light load tests. A preset quantity of

watthour test constants, rather than a test duration based on time, would be easier to track and sufficient to determine accuracy.

N.5. Test of a NUEMS (a) – Subsection (a) would be better placed in “User Requirements” to enable enforcement in the field. For clarity, the “User Requirement” should read, “Each NUEMS submitted for testing shall have all necessary components assembled, connected, and configured as intended for use. Components may include, but are not limited to, meter, sensor(s), indicator(s), etc.”

UR.1.2. Submeter Required – The title of this section is not applicable to all installation and use scenarios. While the majority of watthour meters subject to W&M regulation are submeters, there are installations that vary from this, such as a HOA that generates its own power independently from a public utility and distributes electricity to its members. What is described in the body of the UR.1.2 is not necessarily a submeter. Thus, it would be more accurate to title this code “NUEMS Required”.

UR.2.4.1. Certification – This code section may invite inconsistent interpretations. It begins with a vague requirement for “written certification... from the appropriate regulatory agency.” It then lists some very specific requirements that must be present on the certification. As an example of an issue this could present is the case of the NTEP certificate. All devices used under W&M authority are required to have an NTEP certification, but the NTEP certificate does not list the majority of the information required by this section. If the intent of this section is to ensure the user obtains the necessary building permits and other authorizations, then the type of certification should be more specific. Another approach would be to describe the list of required information more broadly, pointing to their purpose instead of the specific information. It may also be possible to say that the listed information must be present in aggregate amongst all the applicable certifications acquired by the user.

Minor Concerns

S.3.2.1. Device Identification and Marking Requirements of Meter with External Sensors – The order of this and the two following sections (S.3.2.2. and S.3.2.3.) is incongruent and confusing. It goes from ES to IS and back to ES. For clarity, marking requirement should be included in Table S.3.2.3.a.

S.3.2.3.(a) – “(a) service type or service configuration” -- This requirement would be best placed in Table S.3.2.3.a. It avoids the potential confusion of having a section titled S.3.2.3.(a) and a titled Table S.3.2.3.a.

S.3.2.3.b. 13. Bi-Directional – This requirement refers to the use of a “Separate Document.” The option for a “separate document” had been eliminated from Table S.3.2.3.a. by the working group and should similarly be eliminated here. This requirement should be amended to define “Bi-Directional.”

UR.1.1. Customer Indicating Element, Accessibility – The words “such as” after the comma should be deleted. Also, in (c), the “through” should be deleted after the comma.

UR.1.3.1. Service Applications – The equation in the box in this code has the term “Current Class.” That is a term that is used in reference to traditional socket-style meters. In this draft code, the analogous term for meters with external sensors would be “Sensor Primary Current Rating” (Found in Table S.3.2.3.a. (11)). Either a note connecting the two terms or the inclusion of the term in the equation

should be added to avoid confusion when applying this to the two categories of NUEMS described in this draft code (ES and IS).

UR.1.3.2. Maximum Quantity-Value Division – The goal of this section is to limit the quantity-value division to a scale that does not exceed the minimum increment used in billing. For example, it would not be advisable to allow a NUEMS to advance in 10 kWh increments if the bill showed 1 kWh increments. But the use of the term “Maximum” in this section may be misconstrued to limit the capability of a device as opposed to the programmed setting for a given installation. It would be inappropriate to disqualify a given NUEMS merely because it had the maximum capability to show 10 kWh increments, as long as it could be programmed for 1 kWh increments and was so programmed upon installation. It is recommended that the term “Maximum” be replaced with “Programmed” or “Configured” to indicate the used setting is what is being limited, not the capability. (See also S.1.1.1.)

UR.1.4. Current Sensor – It has been mentioned in other areas of the draft code that there are two types of sensors that can be utilized, current sensors and voltage sensors. If that is the case, the title and text of this section should be changed to refer to “sensors” or “Current/Voltage sensors”. There is also the reference at the end of the sentence to “current input” which should be changed accordingly.

UR.2.2. Load Range – The second sentence ends with “if necessary.” It is recommended to put that phrase at the beginning of the second sentence to clarify to the reader that the subsequent requirement is conditional.