

Specifications and Tolerances (S&T) Committee 2020 Interim Meeting Report

Mr. Loren Minnich, Committee Chair
Kansas

INTRODUCTION

The S&T Committee (hereinafter referred to as the “Committee”) submits this Committee Interim Report for consideration by National Conference on Weights and Measures (NCWM). This report contains the items discussed and actions proposed by the Committee during its Interim Meeting in Riverside, California, January 26-29, 2020. The report will address the items in Table A during the Interim Meeting. Table A identifies the agenda items by reference key, title of item, page number and the appendices by appendix designations. The acronyms for organizations and technical terms used throughout the agenda are identified in Table B. The headings and subjects apply to NIST Handbook 44 *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices, 2020 Edition*. The first three letters of an item’s reference key are assigned from the Subject Series List. The first three letters of an item’s reference key are assigned from the Subject Series List. The status of each item contained in the report is designated as one of the following: **(V) Voting Item:** the committee is making recommendations requiring a vote by the active members of NCWM; **(I) Informational Item:** the item is under consideration by the Committee but not proposed for Voting; **(A) Assigned Item:** the committee has assigned development of the item to a recognized subcommittee or task group within NCWM; **(D) Developing Item:** the Committee determined the item has merit; however, the item was returned to the submitter or other designated party for further development before any action can be taken at the national level; **(W) Withdrawn Item:** the item has been removed from consideration by the Committee.

Some Voting Items are considered individually; others may be grouped in a consent calendar. Consent calendar items are Voting Items that the Committee has assembled as a single Voting Item during their deliberation after the Open Hearings on the assumption that the items are without opposition and will not require discussion. The Voting Items that have been grouped into consent calendar items will be listed on the addendum sheets. Prior to adoption of the consent calendar, the Committee will remove specific items from the consent calendar upon request to be discussed and voted upon individually.

Committees may change the status designation of agenda items (Developing, Informational, Assigned, Voting and Withdrawn) up until the report is adopted, except that items which are marked Developing, Informational, Assigned or Withdrawn cannot be changed to Voting Status. Any change from the Committee Interim Report (as contained in this publication) or from what appears on the addendum sheets will be explained to the attendees prior to a motion and will be acted upon by the active members of NCWM prior to calling for the vote.

An “Item under Consideration” is a statement of proposal and not necessarily a recommendation of the Committee. Suggested revisions are shown in **bold face print** by ~~striking out~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in **bold faced italics**. Please refer to <http://www.ncwm.com/publication-16> to review these documents.

All sessions are open to registered attendees of the conference. If the Committee must discuss any issue that involves proprietary information or other confidential material; that portion of the session dealing with the special issue may be closed if (1) the Chairman or, in his absence, the Chairman-Elect approves; (2) the Executive Director is notified; and (3) an announcement of the closed meeting is posted on or near the door to the meeting session and at the registration desk. If possible, the posting will be done at least a day prior to the planned closed session.

Note: It is policy to use metric units of measurement in publications; however, recommendations received by NCWM technical committees and regional weights and measures associations have been printed in this publication as submitted. Therefore, the report may contain references to inch-pound units.

Subject Series List

NIST Handbook 44 – General Code	GEN Series
Scales	SCL Series
Belt-Conveyor Scale Systems	BCS Series
Automatic Bulk Weighing Systems	ABW Series
Weights	WTS Series
Automatic Weighing Systems	AWS Series
Weigh-In-Motion Systems used for Vehicle Enforcement Screening	WIM Series
Liquid-Measuring Devices	LMD Series
Vehicle-Tank Meters	VTM Series
Liquefied Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices	LPG Series
Hydrocarbon Gas Vapor-Measuring Devices	HGV Series
Cryogenic Liquid-Measuring Devices	CLM Series
Milk Meters	MLK Series
Water Meters	WTR Series
Mass Flow Meters	MFM Series
Carbon Dioxide Liquid-Measuring Devices	CDL Series
Hydrogen Gas-Metering Devices	HGM Series
Electric Vehicle Refueling Systems	EVF Series
Vehicle Tanks Used as Measures	VTU Series
Liquid Measures	LQM Series
Farm Milk Tanks	FMT Series
Measure-Containers	MRC Series
Graduates	GDT Series
Dry Measures	DRY Series
Berry Baskets and Boxes	BBB Series
Fabric-Measuring Devices	FAB Series
Wire-and Cordage-Measuring Devices	WAC Series
Linear Measures	LIN Series
Odometers	ODO Series
Taximeters	TXI Series
Timing Devices	TIM Series
Grain Moisture Meters (a)	GMA Series
Grain Moisture Meters (b)	GMB Series
Near-Infrared Grain Analyzers	NIR Series
Multiple Dimension Measuring Devices	MDM Series
Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices	LVS Series
Transportation Network Measuring Systems	TNS Series
Other Items	OTH Series

Table A
Table of Contents

Reference Key	Title of Item	S&T Page
SCL – SCALES		79
SCL-17.1	V S.1.8.5. Recorded Representations, Point of Sale Systems	79
SCL-19.2	V UR.5. Coupled-in-Motion Railroad Weighing Systems	83
SCL-20.10	V S.1.2.2.2. Class I and II Scales Used in Direct Sale and S.1.2.2.3. Deviation of a “d” Resolution.	89
SCL-20.13	V N.1.5. Discrimination Test.	91
LMD – LIQUID MEASURING DEVICES		93
LMD-19.1	V UR.4.2. Security for Retail Motor-Fuel Devices.	93
LMD-20.2	V S.1.6.10. Automatic Timeout – Pay-at-pump Retail Motor-Fuel Devices.	96
LPG – LPG AND ANHYDROUS AMMONIA LIQUID-MEASURING DEVICES		99
LPG-20.1	V S.2.5. Zero-Set-Back Interlock and S.2.6. Automatic Timeout.	99
WTR – WATER METERS		101
WTR-20.1	V S.3.2. Meter size and Directional Flow Marking Information.	101
WTR-20.2	V S.1.1.4. Advancement of Indicating and Recording Elements.	103
MFM – MASS FLOW METERS		104
MFM-20.1	V S.1.3.3. Maximum Value of Quantity Divisions.	104
EVF – ELECTRIC VEHICLE FUELING SYSTEMS		106
EVF-19.1	V S.3.5. Temperature Range for System Components. and S.5.2. EVSE Identification and Marking Requirements.	106
EVF-20.2	V Definitions: submeter	108
TIM – TIMING DEVICES CODE		110
TIM-20.1	V S.1.1.3. Value of Smallest Unit.	110
GMA – GRAIN MOISTURE METERS 5.56 (A)		111
GMA-20.1	V S.2.5. Provisions for Sealing.	111
MDM – MULTIPLE DIMENSION MEASURING DEVICES		116
MDM-20.1	V S.1.3. Negative Values, S.1.6. Customer Indications and Recorded Representations, S.1.7. Minimum Measurement, S.1.8. Indications Below Minimum and Above Maximum, S.2. Design of Zero Tare Dimensional Offset and Appendix D – Definitions: dimensional offset	116
OTH – OTHER ITEMS		120
OTH-20.1	V Appendix D – Definitions: submeter	120

Table B
Glossary of Acronyms and Terms

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

Details of All Items
(In order by Reference Key)

1 **SCL – SCALES**2 **SCL-17.1 V S.1.8.5. Recorded Representations, Point of Sale Systems**3 **Source:**

4 Kansas and Minnesota

5 **Purpose:**

6 Provide consumers the same opportunity, to be able to easily verify whether or not tare is taken on items weighed at
7 a checkout stand using a POS system, as has currently afforded them when witnessing items being weighed and priced
8 in their presence using other scales in the store.

9 **Item Under Consideration:**

10 *NOTE: At the 2020 NCWM Interim Meeting the Committee supported the Non-retroactive version for changes to this*
11 *item.*

12 Amend NIST Handbook 44, Scales Code as follows:

13 **S.1.8.5. Recorded Representations, Point-of-Sale Systems.** – The sales information recorded by cash registers when
14 interfaced with a weighing element shall contain the following information for items weighed at the checkout stand¹:

15 (a) the net weight;¹16 (b) the unit price;^{1,2}17 (c) the total price; **and**18 (d) the product class or, in a system equipped with price look-up capability, the product name or code number; **and**

19 (e) the tare weight.

20 [Non-retroactive as of January 1, 20XX]

21 **(Amended 20XX)**

22 ¹Weight values shall be **adequately defined as gross, tare, and/or net upon any two or more of these**
23 **values appearing on the receipt. Acceptable abbreviations include, but are not limited to, G & GR**
24 **(gross), TA (tare), and N & NT (net). The unit of weight shall be identified by as kilograms, kg, grams,**
25 **g, ounces, oz, pounds, or lb. ~~The “#” symbol is not acceptable.~~**
26 **[Nonretroactive as of January 1, 2006]**

27
28 ²For devices interfaced with scales indicating in metric units, the unit price may be expressed in price per
29 100 grams.

30 (Amended 1995, **and** 2005, **and 20XX**)31 **Background/Discussion:**

32 This item has been assigned to the Point-of-Sale Tare Task Group (POST) for further development. For more
33 information or to provide comment, please contact:

1 Mr. Loren Minnich, Chair of the Point-of-Sale Tare Task Group
2 Kansas Department of Agriculture
3 785-564-6695, Loren.Minnich@ks.gov
4

5 The submitters of this proposal state that it will benefit consumers by enabling them to see at a glance that tare is being
6 taken on the commodities they purchase. It would also educate the public about tare and make them better and more
7 aware consumers.

8 Additionally, it is purported that retailers would benefit because this proposal would aid their quality control efforts
9 behind the counter and at the cash register. Retailers would be able to see that their employees are taking tare on
10 packages, and that the tare employees take is the appropriate tare.

11 Finally, this proposal would aid weights and measures officials investigating complaints about net contents of item by
12 creating written proof of how much tare was taken on a given package or transaction.

13 Scale manufacturers will need to modify software and label and receipt designs before the non-retroactive date.
14 Retailers with point of sale systems and packaging scales may feel pressured to update software or purchase new
15 devices in response to consumer demand for tare information on labels and receipts. The amount of paper needed to
16 print customer receipts may increase depending on the formatting of the information and the size of the paper being
17 used. Some retailers may not want consumers to have this information as it will allow consumers and weights and
18 measures officials to hold them accountable and would be written proof tare was not taken when, and if, that happens.

19 During the 2018 NCWM Interim Meeting, the Committee heard from Mr. Loren Minnich (KS) who commented that
20 the item will benefit consumers and asked the Committee to move the item forward as a voting item. Many comments
21 both in support of and in opposition to the proposal were heard. The Committee also received a written
22 recommendation asking the Committee to consider modifying the proposal to: (1) require the tare weight and/or the
23 gross weight be printed on the receipt; (2) clarify printed weight values must be clearly and definitely identified as
24 gross, tare, and/or net weights (as required by the General Code); and (3) move text currently in a footnote to the
25 paragraph into the body of the paragraph for ease of reference.

26 During the Committee's work session, the committee members reviewed all information received and agreed to move
27 the item forward as a "Voting" item without change.

28 During the 2018 NCWM Annual Meeting, the Committee agreed to assign the further development of this item to an
29 NCWM task group (TG) and established that the goal of this task group should be to determine how to provide
30 consumers (and operators) with the information necessary, whether on a receipt or displayed on the POS system itself,
31 to verify that charges for items weighed at checkout are based on net weight, similar to the opportunity provided them
32 by retail-computing scales used in direct sale applications.

33 The Committee also received several comments in opposition including a comment from Mr. Russ Vires (Mettler-
34 Toledo, LLC), speaking on behalf of the SMA, stating that the SMA opposes the agenda item and feels it would be
35 too costly to implement with little benefit. Additionally, the Committee received written comments including those
36 from Ms. Elizabeth K. Tansing, on behalf of the Food Marketing Institute, opposing the item and requesting that the
37 Committee withdraw the proposal. During the committee's work session, the proposal was amended to only include
38 changes to paragraph S.1.8.5. and to include a nonretroactive enforcement date of January 1, 2020.

39 The Committee received numerous comments on this item suggesting additional work is needed to further develop
40 the proposal and recommending a new task group made up of regulatory officials, food marketing representatives,
41 POS software programmers, NIST, and others. Two of the original submitters of the item, Ms. Julie Quinn (MN) and
42 Mr. Loren Minnich (KS) spoke in favor of assigning the item to a work group; one noting that the complexities of
43 packaging are more involved today than first realized indicating the need for this proposal to be looked at more in
44 depth.

45 The Committee also received numerous written letters from the grocery store industry opposing the item and
46 requesting that the Committee withdraw it to include: the NC Retail Merchants Association, FL Retail Federation, SC

1 Retail Association, Food Marketing Institute (FMI), and others. In consideration of the number of comments received
 2 on this item in support of its further development by a work group, the Committee agreed to recommend this item be
 3 assigned to an NCWM Task Group (TG).

4 At the 2019 NCWM Interim Meeting, the Chairman of the NCWM POS Tare Task Group, Mr. Loren Minnich (KS),
 5 provided an update of the Task Group's activities since it first formed following the 2018 NCWM Annual Meeting.
 6 He reported the main topics of discussion thus far have been:

- 7 • whether the addition of proposed part (e) to paragraph S.1.8.5., which adds “tare weight” to the list of required
 8 information printed on a receipt should remain non-retroactive, as submitted, or be changed, per NIST
 9 OWM's suggestion, to retroactive with an effective date ten years from the date of adoption; and
- 10 • which value should be added to the receipt, “tare” or “gross” weight?

11 Mr. Minnich recommended this item remain in an Assigned status given members of TG have been unable to reach a
 12 consensus on these issues. Cost of compliance is a concern. The Committee, in consideration of the comments
 13 received on this item, agreed with the recommendation of the POS Tare TG Chairman to maintain the Assigned status
 14 of the item to allow the TG more time for further discussion and development.

15 During the 2019 NCWM Annual Meeting, the POS Tare TG Chairman provided the Committee with an update on the
 16 TG's progress and presented two amended versions of S.1.8.5. and associated footnotes for the Committee to consider.
 17 Those two versions are shown under the Item Under Consideration.

18 The Chair of the assigned TG reported that members of the TG believe both versions of the amended S.1.8.5. are fully
 19 developed, but they were unable to agree on which version should be presented for final consideration. Both versions
 20 are being offered so that feedback can be solicited from the fall regional weights and measures associations. It is
 21 hoped this feedback will help the Committee to decide the most favorable version.

22 During the 2020 NCWM Interim Meeting, most comments received supported the non-retroactive version included
 23 in Pub 15 since it will allow the business affected to choose when to comply and would provide the consumer
 24 confirmation that tare was deducted. The Committee heard comments in opposition to the proposal from Mr. Russ
 25 Vires (SMA) believing the changes recommended will do little if anything to assist the consumer and that field
 26 officials are already performing inspections to verify that correct tare is taken in transactions where the item is sold
 27 by weight. Comments were also heard regarding the new abbreviations being proposed in this item. The concern was
 28 that they could be misinterpreted as something else (e.g., TA for taxable item). Mr. Tim Chesser (AR) added that he
 29 did not believe there was any significant benefit to the proposed changes but added that identifying “gross,” “net,” or
 30 “tare” on a receipt using (respectively) “g,” “n,” or “t” is not an acceptable means to identify these terms. Mr. Jim
 31 Willis (NY) stated his opposition to the proposal believing that adding tare to the customer's receipt wouldn't ensure
 32 that the tare deducted is correct if not verified.

33 During the 2020 Interim Meeting open hearings however, most comments received supported the non-retroactive
 34 version included in Pub 15 because it would allow the business affected to choose when to comply and would provide
 35 the consumer confirmation that tare was deducted.

36 NIST OWM did not state any preference as to whether the “nonretroactive” or “retroactive” version of the proposal
 37 should be favored but noted it is important that the consumer be given the opportunity to verify that items sold by
 38 weight are priced according to “net” weight. This would be easily done by including information on the receipt
 39 showing that tare has been deducted from the gross weight prior to calculating the total sale. We acknowledge that
 40 not all consumers will have this concern when purchasing items sold by weight however, those consumers that are
 41 interested in verifying the terms of sale must be afforded the information that will help them do that. OWM also notes
 42 that opposition to this proposal has cited costs involved with compliance to this proposal as one reason not to adopt it
 43 however, we are not aware of any cost analysis that has been done to verify this claim.

44 Mr. Chesser noted that receipts provided from sales in some retail locations are exceedingly long and include
 45 extraneous information not relevant to the sale. If placing all of this information on the receipt is being done, how
 46 much effort and cost could it be to simply add a value for the tare weight used during the sale? Mr. Charles Stutesman

1 (KS) stated his support for the nonretroactive version of the proposal and also questioned the claims of these changes
2 being too costly to implement.

3 Ms. Fran Elson-Houston (OH) commented that devices that already have been given a NTEP Certificate of
4 Conformance may need to undergo a subsequent evaluation since the changes in this proposal would be accomplished
5 through software changes in those devices. Mr. Darrell Flocken (NTEP) stated that if the device/system is already
6 calculating total sale prices, there would be no need to reevaluate the devices following the adoption of this proposal.
7 Mr. Steve Harrington (OR) stated his concern for small retail operations that do not have the resources of the big chain
8 stores to enable a quick change in their software. He would be more willing to support the proposal if there was
9 consideration given to allow a more gradual phase-in period for compliance by smaller businesses.

10 Other regulatory officials voiced their support for the nonretroactive version of the proposal noting that small
11 businesses would not immediately be affected. Mr. Loren Minnich (KS) stated that was the rationale behind the
12 development of a nonretroactive version. He also stated that if the Committee agrees to move the nonretroactive
13 version forward as a voting item, there will need to be an effective date assigned to the requirement.

14 During the Committee's work session, the Committee assigned a voting status to the non-retroactive version below:

15 **S.1.8.5. Recorded Representations, Point-of-Sale Systems.** – The sales information recorded by cash
16 registers when interfaced with a weighing element shall contain the following information for items
17 weighed at the checkout stand¹:

- 18 (a) the net weight;¹
- 19 (b) the unit price;^{1,2}
- 20 (c) the total price; ~~and~~
- 21 (d) the product class or, in a system equipped with price look-up capability, the product name or code
22 number; ~~and~~
- 23 (e) the tare weight.

24 [Non-retroactive as of January 1, 20XX]
25 (Amended 20XX)

26 **FOOTNOTES 1 AND 2 FOR EITHER VERSION (RETROACTIVE OR NONRETROACTIVE)**

27
28 ¹Weight values shall be adequately defined as gross, tare, and/or net upon any two or more of these
29 values appearing on the receipt. Acceptable abbreviations include, but are not limited to, G & GR
30 (gross), & TA (tare), and N & NT (net). The unit of weight shall be identified by as kilograms, kg,
31 grams, g, ounces, oz, pounds, or lb. ~~The "#" symbol is not acceptable.~~
32 [Nonretroactive as of January 1, 2006]
33

34 ²For devices interfaced with scales indicating in metric units, the unit price may be expressed in price per
35 100 grams.

36 (Amended 1995, ~~and~~ 2005, and 20XX)

37 **Regional Association Comments:**

38 WWMA 2018 Annual Meeting: Mr. Russ Vires (SMA) reported the SMA had provided a position from their 2019
39 April meeting stating that this proposal would provide little if any benefit to the consumer. Mr. John Barton (NIST
40 OWM) stated that to not provide some indication to the consumer that tare has been taken violates the principle behind
41 the General Code requirement G-S.5.1. That requirement states that weight indications for commercial transactions
42 be clear, definite, and easily read. The consumer deserves to be assured that the commodity is being sold by net weight
43 and that appropriate tare has been deducted. He also noted that the TG assigned to this item has offered two versions
44 of the proposal. One is non-retroactive version and the other is a retroactive version. The Committee is encouraged
45 to consider the implications of the status for the proposed requirement. The retroactive version will require that all
46 POS systems comply with the requirement, and the non-retroactive version would allow those systems that are
47 currently in service to be grandfathered. Mr. Kurt Floren (L.A. County, CA) stated he supports the retroactive version
48 of this proposal if it is not cost-prohibitive however, he does oppose the item even if the proposal was adopted as non-

1 retroactive. He also recommended that the term “defined” as it appears in both versions of this proposal should be
 2 replaced with “indicated” or “designated.” Mr. Steve Harrington (OR) stated he was concerned with the potential that
 3 smaller businesses will need to absorb the cost to comply with the requirement if the retroactive version was adopted.

4 The Committee agreed to support the non-retroactive version of this item as proposed in the item under consideration.
 5 The Committee also deliberated on the establishment of an effective date for the non-retroactive requirement. The
 6 Committee agreed to recommend that the effective date be January 1, 2024.

7 The Committee agrees that this item be given a voting status and recommends that additional input be solicited from
 8 the other regional associations and that input then be forwarded to the NCWM S&T Committee.

9 SWMA 2019 Annual Meeting: Mr. Russ Vires (SMA) opposed this item on the grounds that it provides no benefit to
 10 the consumer. The Committee recommends the non-retroactive version of this item be made a Voting Item.

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

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

19 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
 20 <https://www.ncwm.com/publication-16> to review these documents.

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

22 *NOTE: This item replaces the 2018 Items, Block 2 items: SCL-1 & SCL-2, and 2017 individual items 3200-4 and*
 23 *3200-8. and was further amended in 2019 to remove:*

- 24 • T.N.3.6. Couple in Motion Railroad Weighing Systems: a proposal to increase the tolerance for dynamic
 25 weighments of unit trains
- 26 • T.N.4.6. Time Dependence (Creep) and to provide an exception from “creep” tolerances for point based in
 27 motion railroad weighing systems.

28 **Source:**
 29 Meridian Engineers Pty., Ltd.

30 **Purpose:**
 31 Replace the 2018 Block 2 Items: SCL-1 and SCL-2 and now item number SCL-19.2 with new proposals to:
 32 a) Require the user of coupled-in-motion railroad weighing systems to provide a static scale in proximity for
 33 testing purposes, and
 34 b) Add a definition for Point-Based Railroad Weighing Systems to support those proposals.

35 **Item Under Consideration:**
 36 Amend NIST Handbook 44, Scales Code as follows:

37 **UR.5. Coupled-in-Motion Railroad Weighing Systems**

- 38 (a) A coupled-in-motion weighing system placed in service on or after January 1, 1991, should be tested in
 39 the manner in which it is operated, with the locomotive either pushing or pulling the cars at the designed
 40 speed and in the proper direction. The cars used in the test train should represent the range of gross

1 weights that will be used during the normal operation of the weighing system. Except as provided in
2 N.4.2. Weighing Systems Placed in Service Prior to January 1, 1991 and Used to Weigh Trains of Ten
3 or More Cars and N.4.3.(a) Weighing Systems Placed in Service on or After January 1, 1991, and Used
4 to Weigh Trains of Ten or More Cars, normal operating procedures should be simulated as nearly as
5 practical. Approach conditions for a train length in each direction of the scale site are more critical for
6 a weighing system used for individual car weights than for a unit-train-weights-only facility and should
7 be considered prior to installation.

8
9 **(b) For coupled-in-motion Point-based weighing systems used only for dynamic weighing, the user**
10 **shall provide an alternate certified scale to be used as a reference scale. The weights and measures**
11 **authority having jurisdiction over the weighing system shall determine if the reference scale**
12 **provided is suitable in terms of size, capacity, minimum division, performance requirements, and**
13 **the proximity to the weighing system under evaluation. The reference weight cars weighed on the**
14 **reference scale may then be used for calibration and annual inspection by the jurisdiction with**
15 **statutory authority for the system.**

16 (Added 1990) (Amended 1992 **and 20XX**)

17 And add the following definition to NIST Handbook 44 Appendix D – Definitions:

18 **point-based railroad weighing systems. – An In-Motion-Railroad Weighing System designed to weigh**
19 **wheel(s) of a railway car when centered on the load sensor within a weighing zone typically of 2 inches or**
20 **less. The weight of the wheels are added to obtain the total weight of the cars and train which are used for**
21 **any transaction.**

22 **Background/Discussion:**

23 In 2017 the submitter, Meridian Engineers Pty Ltd. submitted two proposals. The first of those proposals was to
24 amend the NIST Handbook 44 Scales Code, Table 3 “Parameters for Accuracy Classes” to reduce the required
25 minimum scale division value for coupled-in-motion railroad weighing systems that are not used for static reference
26 weighing. The second proposal sought to align the acceptance tolerance values and establish accuracy classes in NIST
27 Handbook 44 Scales Code for coupled-in-motion railroad weighing systems to harmonize with OIML R106
28 “Automatic rail-weighbridges.

29 At the 2017 NCWM Interim Meeting, the Committee grouped the two items in this proposal together and took
30 comments on these items simultaneously since they were related. The submitter explained that due to the design and
31 the technology used in their “point-based railroad weighing system” these systems would not comply with existing
32 HB 44 static scale tolerances. Meridian Engineers Pty Ltd. did maintain however, that these systems would be capable
33 of meeting HB44 Scales Code Class IIIIL tolerances applicable to coupled-in-motion (CIM) railroad weighing systems.

34 The submitter also stated, the “pseudo load cells” used in Meridian’s systems are significantly different than a typical
35 load cell used in many static and dynamic weighing systems in commercial service. For this reason, Meridian
36 Engineers Pty Ltd. believed it would be unfair to evaluate their systems based on requirements pertaining to load cells
37 already in the HB 44 Scales Code. The submitter therefore solicited the NCWM to adopt the changes recommended
38 in these proposals. Additionally, the proposed addition of multiple accuracy classes would align U.S. standards more
39 closely with those in OIML R106.

40 At the 2017 NCWM Annual Meeting open hearings, the Committee grouped Agenda Items 3200-4 and 3200-8
41 together and took comments on those two items at the same time. A presentation was given by the item’s submitter,
42 Mr. Anthony Pruiti (Meridian Engineers Pty Ltd.). The presentation provided an explanation for the changes being
43 proposed and Meridian’s perspective supporting those changes. The changes, if adopted, would align the performance
44 requirements corresponding to coupled-in-motion (CIM) railroad weighing systems in HB 44 with those in OIML R
45 106 Automatic rail-weighbridges. OIML R106 provides multiple accuracy classes for CIM railroad weighing,
46 whereas, HB 44 currently provides only a single accuracy class. A few questions were asked following Mr. Pruiti’s
47 presentation including:

- 1 • If this scale is not capable of meeting HB 44 (Table 3) Parameters for Accuracy Classes, what consequences
2 can be expected by expanding the existing tolerances?
- 3 • What, and who will these changes benefit?

4 The Committee agreed to maintain the Developing status of this item based on the questions raised.

5 At the 2018 NCWM Interim Meeting, the Committee heard from Mr. Richard Suiter (Richard Suiter Consulting)
6 representing Meridian Engineers Pty Ltd. (the submitter). Mr. Suiter asked that the item remain “Developing” because
7 the submitter is working on changes which they plan to submit later this year. The NIST Office of Weights and
8 Measures offered the Committee written comments related to these items. Those comments are as follows.

- 9 • This item proposes four different accuracy classes for CIM railroad weighing systems and therefore a choice
10 is necessary to determine a weighing system’s accuracy class that fits the intended application. The proposal,
11 however, doesn’t provide any guidance on how this selection is to be made nor does it specify whom is to
12 decide the appropriate accuracy class.
- 13 • This approach of specifying different accuracy classes in HB 44 is based on the intended use rather than the
14 scale’s level of precision and performance. That approach deviates significantly from how commercial and
15 law-enforcement scales in the U.S. are typically selected today. Without any guidance concerning acceptable
16 and unacceptable uses of the different accuracy classes specified, this proposal presents a potential conflict
17 when deciding what is an appropriate weighing system for a given installation.

18 OWM’s written comments to the Committee stated that OWM would need additional supporting data and information
19 from the submitter of this item to be able to offer constructive feedback on the two proposals in this group that
20 comprised the original proposal. OWM elaborated by providing the following list of information needed:

- 21 • Clarification on whether the proposal is intended to include “uncoupled-in-motion railroad weighing
22 systems.” Although the title of proposed paragraph T.N.3.6. is “Coupled-In-Motion Railroad Weighing
23 Systems,” proposed new paragraph T.N.3.6.3. Wagon Weighing references both uncoupled and coupled
24 “wagon” weighing. If the proposal is to include uncoupled wagon weighing, the title of T.N.3.6. would need
25 to be changed. If not, then the reference to “uncoupled wagon weighing” in T.N.3.6.3. would need to be
26 deleted. OWM notes that if the proposal is intended to apply to uncoupled-in-motion railroad systems, the
27 tolerances specified in the proposal far exceed the current HB 44 tolerances specified in paragraph T.N.3.7.
28 for this same application, which requires every weighment error to be within the static maintenance tolerance.
- 29 • Results of comparison tests (using reference cars weighed as a single draft on an accurate static railroad track
30 scale) that provide true indication of the accuracy of the Meridian system.
- 31 • The rationale for the changes proposed to footnote 3 of Table 3.
- 32 • Clarification of how the tolerance values in proposed Table T.N.3.6. are calculated for both wagon weighing
33 and train weighing on both initial and subsequent verifications based on the criteria specified in proposed
34 paragraph T.N.3.6.3. and T.N.3.6.4. Perhaps an example of the tolerance calculations for both wagon
35 weighing, and train weighing would be helpful to clarify the application of these tolerances.
- 36 • A list of the different qualifying applications in which the proposed four accuracy classes of a coupled-in-
37 motion railroad weighing system could be used.

38 OWM noted that while it is supportive of wanting to harmonize U.S. and international standards when it makes sense
39 to do so, it views this proposal as an attempt to increase the allowable tolerance on individual railcars weighed
40 coupled-in-motion to pave the way for the use of railroad weighing systems installed on continuous rail. We question
41 the reasonableness of increasing current HB 44 tolerances to allow for the use of less accurate commercial equipment
42 given that existing commercial equipment can perform to within the current tolerances specified.

43 At the 2018 NCWM Annual Meeting, the Committee did not take comments during open hearings on Developing
44 items except to grant the submitter of a Developing item (or block of Developing items) an opportunity to provide an
45 update on the progress made to further develop the item(s) since the 2018 NCWM Interim Meeting. Mr. Richard
46

1 Suiter (Suiter Consulting), serving as consultant to Meridian Engineers Pty Ltd., provided an update to the Committee
2 on this block of items. Mr. Suiter reported Meridian is still working on these items in hopes of having a proposal
3 developed for consideration at the 2019 NCWM Interim Meeting.

4 In written comments to the Committee, the SMA recommended the withdrawal of this proposal. The current standards
5 have been in effect for years, there are several devices that comply with the current standards, and the SMA does not
6 feel lowering the standard is in the best interest of the weights and measures community. In addition, the SMA feels
7 that adding additional classes with larger tolerances would cause confusion in the marketplace.

8 The Committee agreed to carryover this proposal on its 2019 agenda by assigning it a developing status to provide the
9 submitter additional time to develop the items.

10 During the 2019 NCWM Interim Meeting the Committee heard a presentation from Mr. Richard Suiter (Richard Suiter
11 Consulting) representing the submitter. The presentation provided an overview of the design and operation of an
12 in-motion railway track scale the presentation defined as a “Point Based System.” The presentation showed that the
13 system uses a strain gage-based sensing device that is mounted directly to the rail. At the conclusion, Mr. Suiter
14 suggested that the item was ready to be assigned a voting status.

15 The Committee also heard comments from the SMA opposing the item as it increases the current tolerance values
16 relative to similar types of devices as well as providing less stringent specification requirements. In view of these
17 changes, the SMA recommended the item be withdrawn. Representatives from Systems Associates, Inc. and Schenck
18 Process, LLC. voiced opposition to the proposal primarily due to the increase of the tolerance values. They
19 commented that there are current systems in use today that meet existing tolerances and for this reason do not feel it
20 is appropriate to increase tolerance values for one manufacturer.

21 During the committee’s work session, the committee members discussed the need to include a statement related to the
22 selection and requirements of a reference scale for use during the testing of an instrument that is only capable of
23 dynamic weighing. The Committee revised UR.5.(b) of the original proposal (revised version shown in the Item Under
24 Consideration) to state that the determination of the reference scale selection was within the authority of the
25 jurisdiction having statutory authority for the system. The revised version accepted by the Committee is as shown in
26 the Item Under Consideration. With the inclusion of these amendments to the proposal, the Committee designated
27 the item a voting status.

28 At the 2019 NCWM Annual Meeting, the Committee heard comments from Mr. Suiter representing the submitter.
29 Mr. Suiter requested the proposal be amended to delete the changes proposed to paragraphs TN.3.6., TN.3.6.1. and
30 TN.4.6. The amended proposal would then include only changes proposed to paragraph UR.5.(b). and the addition of
31 a new definition for “point-based railroad weighing systems” in HB 44 Appendix D. The Committee agreed to delete
32 changes proposed to TN.3.6. and TN.3.6.1. and TN.4.6. as requested by submitter. The Committee also decided to
33 change the status of the proposal from “Voting” to “Informational” and to seek input from the regional associations
34 on remaining portions (UR.5.b. and the definition for point-based railroad weighing systems) of this proposal.

35 At the 2020 NCWM Interim Meeting, several comments were heard during the open hearing session referring to the
36 title of the proposal as listed in the meeting agenda. Those comments noted that the current item under consideration
37 did not include all the listed requirements to be amended that are included in the meeting agenda.

38 Mr. Steve Beitzel (Systems Associates) noted that the submitter has stated these systems are for dynamic weighing
39 only and if this proposal goes forward, the user requirement as shown in the item under consideration must not be
40 misunderstood to apply to static weighing systems. He also felt the last sentence UR.5. (b) was poorly worded, that
41 the definition isn’t necessary but if it is put in that the 2-inch number may not be the right number, and that the last
42 sentence in the definition should be reworded.

43 NIST OWM commented that the most recent change to this proposal (made during the 2019 NCWM Annual Meeting)
44 does not add any new or significant information since the regulatory official has always been charged with making
45 the determination of whether a reference scale is suitable or not. The addition of the term “point-based railroad
46 weighing systems” gives the appearance of only providing a justification for including the proposed and recently

1 added definition to this item in HB 44. NIST OWM also questioned if these systems will be subject to Verified
 2 Conformity Assessment Program (VCAP) requirements through NTEP as are load cells. Since these systems can not
 3 technically be considered load cells since they are simply a strain gauge attached to existing railroad rail. Mr. Russ
 4 Vires (Mettler-Toledo) agreed with OWM's statements. Other commenters recommended this item move forward as
 5 a voting item.

6 Mr. Richard Suiter (representing the submitter) explained to the Committee the process that was followed to obtain a
 7 NTEP Certification for the "point-based railroad weighing systems." This process involved submitting the strain
 8 gauge components of this system mounted on sections of railroad rail that were tested in the labs environmental
 9 chambers. He reported that the system passed the tests performed and that the only step left before the system could
 10 be approved was a field test. Mr. Darrell Flocken (NTEP Administrator) confirmed this and added that this system is
 11 required to meet the same requirements as any load cell submitted for type approval. OWM's recommendation was
 12 that the Committee carefully consider these questions.

13 During its work session, the Committee agreed to amend the title of the proposal to reflect the withdrawal, by the
 14 submitter, of two sections of HB 44 Scales Code which were included in the initial proposal. The Committee also
 15 agreed to assign a Voting status to the item as amended.

16 The following is the item, as amended, included on the S & T Committee Agenda as SCL-19.2 for
 17 consideration during the 2020 Annual Meeting:

18 UR.5. Coupled-in-Motion Railroad Weighing Systems. –

19 **(a)** _____ A coupled-in-motion weighing system placed in service on or after January 1, 1991, should be tested
 20 in the manner in which it is operated, with the locomotive either pushing or pulling the cars at the designed
 21 speed and in the proper direction. The cars used in the test train should represent the range of gross weights
 22 that will be used during the normal operation of the weighing system. Except as provided in N.4.2. Weighing
 23 Systems Placed in Service Prior to January 1, 1991 and Used to Weigh Trains of Ten or More Cars and
 24 N.4.3.(a) Weighing Systems Placed in Service on or After January 1, 1991, and Used to Weigh Trains of Ten
 25 or More Cars, normal operating procedures should be simulated as nearly as practical. Approach conditions
 26 for a train length in each direction of the scale site are more critical for a weighing system used for individual
 27 car weights than for a unit-train-weights-only facility and should be considered prior to installation.

28

29 **(b) For coupled-in-motion Point-based weighing systems used only for dynamic weighing, the user**
 30 **shall provide an alternate certified scale to be used as a reference scale. The weights and measures**
 31 **authority having jurisdiction over the weighing system shall determine if the reference scale provided**
 32 **is suitable in terms of size, capacity, minimum division, performance requirements, and the proximity**
 33 **to the weighing system under evaluation. The reference weight cars weighed on the reference scale**
 34 **may then be used for calibration and annual inspection by the jurisdiction with statutory authority for**
 35 **the system.**

36 (Added 1990) (Amended 1992 and 20XX)

37 And add the following definition to NIST Handbook 44 Appendix D – Definitions:

38 **Point-based railroad weighing systems. – An In-Motion-Railroad Weighing System designed to weigh**
 39 **wheel(s) of a railway car when centered on the load sensor within a weighing zone typically of 2 inches**
 40 **or less. The weight of the wheels are added to obtain the total weight of the cars and train which are**
 41 **used for any transaction.**

42

1 Below is the item as presented during the S & T Committee open hearing at the 2020 Interim meeting:

2 UR.5. Coupled-in-Motion Railroad Weighing Systems. –

3 **(a)** A coupled-in-motion weighing system placed in service on or after January 1, 1991, should be tested
4 in the manner in which it is operated, with the locomotive either pushing or pulling the cars at the designed
5 speed and in the proper direction. The cars used in the test train should represent the range of gross weights
6 that will be used during the normal operation of the weighing system. Except as provided in N.4.2. Weighing
7 Systems Placed in Service Prior to January 1, 1991 and Used to Weigh Trains of Ten or More Cars and
8 N.4.3.(a) Weighing Systems Placed in Service on or After January 1, 1991, and Used to Weigh Trains of Ten
9 or More Cars, normal operating procedures should be simulated as nearly as practical. Approach conditions
10 for a train length in each direction of the scale site are more critical for a weighing system used for individual
11 car weights than for a unit-train-weights-only facility and should be considered prior to installation.

12 **(b) For coupled-in-motion weighing systems used only for dynamic weighing, the user shall**
13 **provide an alternate certified scale to be used as a reference scale. The weights and measures authority**
14 **having jurisdiction over the weighing system shall determine if the reference scale provided is suitable**
15 **in terms of size, capacity, minimum division, performance requirements, and the proximity to the**
16 **weighing system under evaluation. The reference weight cars weighed on the reference scale may then**
17 **be used for calibration and annual inspection by the jurisdiction with statutory authority for the**
18 **system.**

19 (Added 1990) (Amended 1992 **and 20XX**)

20 And add the following definition to NIST Handbook 44 Appendix D – Definitions:

21 **Point-based railroad weighing systems. – An In-Motion-Railroad Weighing System designed to weigh**
22 **wheel(s) of a railway car when centered on the load sensor within a weighing zone typically of 2 inches**
23 **or less. The weight of the wheels are added to obtain the total weight of the cars and train which are**
24 **used for any transaction.**

25 **Regional Association Comments:**

26 **WWMA 2019 Annual Meeting:** Prior to the 2019 WWMA Annual Meeting, the submitter provided a written
27 recommendation to amend the proposed new subparagraph, UR.5.b. by adding the terminology of “point-based
28 railroad weighing system” to that paragraph and to also include the definition in HB 44 Appendix D for “point-based
29 railroad weighing system.”

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

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

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

42 The Committee agreed this proposal as amended by the submitter has merit and to also recommend a Voting status
43 for the item. The Committee also recommends that this proposal’s purpose be modified to only include the changes

1 being suggested to add new subparagraph UR.5.b. and the definition for “point-based railroad weighing systems” in
2 HB 44 Appendix D.

3 SWMA 2019 Annual Meeting: Mr. Russ Vires (SMA) opposed the item because he believes the current standards
4 are fine. Mr. Dick Suiter (representing Meridian Engineering) stated that Meridian Engineering withdrew this item
5 in July and has since removed the Creep Test and Tolerance changes from the item. He also stated that he believes
6 the item should be made into a Voting Item with the term “Point-Based” added to UR.5.b., and also the following
7 definition of Point-Based to HB 44:

8
9 **UR.5. (b) For coupled-in-motion Point-Based weighing systems used only for dynamic weighing, the**
10 **user shall provide and alternate certified scale to be used as a reference scale. The weights and measures**
11 **authority having jurisdiction over the weighing system shall determine if the reference scale provided is**
12 **suitable in terms of size, capacity, minimum division, performance requirements, and the proximity to**
13 **the weighing system under evaluation. The reference weight cars weighed on the reference scale may then**
14 **be used for calibration and annual inspection by the jurisdiction with statutory authority for the system.**
15 (Added 1990) (Amended 1992 and 20XX)

16 Mr. Tim Chesser (AR) stated that he supports moving this forward as a Voting Item. Mr. Eric Golden (Cardinal Scale)
17 pointed out that the post-July changes that Mr. Suiter laid out were still included in our copy of the item on S&T p.20
18 Lines 4 and 5 and should have been removed.

19 The Committee recommends this item be moved forward as a Voting Item with the language corrected as described.

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

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

27 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
28 <https://www.ncwm.com/publication-16> to review these documents.

29 **SCL-20.10 V S.1.2.2.2. Class I and II Scales Used in Direct Sale and S.1.2.2.3. Deviation of a**
30 **“d” Resolution.**

31 **Source:**

32 New York Department of Agriculture and Markets

33 **Purpose:**

34 Remove the specification prohibiting the value of “d” from differing from the value of “e” for class I and II scales.

35 **Item Under Consideration:**

36 Amend NIST Handbook 44, Scales Code as follows:

37 ***S.1.2.2.2. Class I and II Scales Used in Direct Sales.—When accuracy Class I and II scales are used***
38 ***in direct sale applications the value of the displayed division “d” shall be equal to the value of the***
39 ***verification scale interval “e.”***

40 ***[Nonretroactive as of January 1, 2020; to become retroactive as of January 1, 2023]***

41 ***(Added 2017)***

42
43 ***S.1.2.2.3. Deactivation of a “d” Resolution.—It shall not be possible to deactivate the “d” resolution***
44 ***on a Class I or II scale equipped with a value of “d” that differs from “e” if such action affects the scale’s***

1 ~~ability to round digital values to the nearest minimum unit that can be indicated or recorded as required~~
2 ~~by paragraph C-S.5.2.2. Digital Indication and Representation.~~
3 ~~(Added 2018)~~
4

5 S.1.2.2.42. Class III and IIII Scales. The value of “e” is specified by the manufacturer as marked on
6 the device. Except for dynamic monorail scales, “e” must be less than or equal to “d”.

7 **Background/Discussion:**

8 In the opinion of the submitter, beginning January 1, 2020 this specification will require device owners to purchase
9 unnecessary class I or II scales and beginning January 1, 2023 it will require them to remove from use scales that are
10 perfectly acceptable for their purpose. This will result in the removal of a great number of good scales (thousands or more)
11 with a very high replacement value. Scales where “d” differs from “e” can be used accurately provided they are tested
12 with proper weights, using a tolerance based on “e” but using the value of “d” for tolerance application. When this is done
13 the value of “d” can be used in direct sales. I believe there is a misunderstanding regarding NTEP evaluation where it is
14 believed that the value of “d” is not used during the evaluation process. This is not correct, the value of “d” is used, and
15 devices will fail if the value of “d” is outside the applicable tolerance.

16 The submitter suggested that there was considerable concern that the value of “d” was being used in the direct sales of
17 cannabis and that the rounding would result in inaccurate values. These concerns could be addressed if NTEP/NIST
18 representatives assured those concerned that the value of “d” can be used during testing and that following successful
19 testing the value of “d” can be used in direct sales with confidence.

20 During open hearings session at the 2020 NCWM Interim Meeting, the Committee heard from Mr. Steven Harrington
21 (OR) who commented that when considering the three items on the Committee’s agenda related to this same issue
22 (SCL-20.2, SCL-20.10, and SCL-20.11) he would prefer to see S.1.2.2.2. deleted as proposed in this item, SCL-20.10
23 rather than to make exemptions as recommended in SCL-20.11. He also would support a change to make the current
24 specification requirement S.1.2.2.2. into a user requirement as proposed in B2: SCL-20.2. He recommends SCL-
25 20.10 as a Voting item.

26 Mr. Russ Vires (SMA) stated that the SMA supports this as a Voting item as submitted in their written comments to
27 the Committee.

28 Mr. John Barton (NIST OWM) commented that all three items should be addressed together for one solution and
29 referenced OWM’s written analysis that was submitted to the Committee. He also stated that proposals to add
30 exemptions is usually not a good practice. He recommends this continue as a Developing item.

31 Mr. Jim Willis (NY) commented that something needs to be done to rectify this section, as it stands now it is a hardship
32 on some industries. He asked that this item move forward as Voting and if not, that he would support SCL-20.11.

33 Mr. Ken Ramsburg (MD) commented that he recommends that this item be Withdrawn and Withdraw B2: SCL-20.2
34 and supports SCL-20.11 as Voting.

35 During their work session, the Committee agreed to assign this item a Voting status.

36 **Regional Association Comments:**

37 WWMA 2019 Annual Meeting: During the open hearing session, comments were taken as a group to include items
38 SCL-20.2, SCL-20.10, and SCL-20.11.

39 Mr. Steve Harrington (OR) commented he still believes there is merit in the proposed changes but suggested removing
40 the retroactive date to allow devices now in service to remain in service. Mr. Russ Vires (SMA) provided some history
41 of the use of both “d” and “e” for scales and that field inspectors did not have the appropriate test weight to properly
42 test these scales to the finest resolution. While supported initially by the SMA, it was not realized that this proposal
43 would have unintended consequences related to the jewelry industry where “d” is commonly used in weight
44 determinations. The SMA recommends that the retroactive date be eliminated to allow manufactures additional time

1 to change the designs on their equipment and so existing scales can continue to be used. Mr. Vires also suggested that
2 this requirement could be formatted as a user requirement.

3 Mr. John Barton (NIST OWM) stated that the exclusion of jeweler's scales in this requirement could provide reason
4 to exclude other applications and this may be a "slippery slope."

5 Mr. Harrington stated that he could also support the proposal formatted as a user requirement.

6 The Committee agrees that this proposal should be withdrawn. The Committee acknowledges paragraph S.1.2.2.2.
7 has merit as it appears currently in HB 44 except for the non-retroactive status, becoming retroactive at a later date.
8 The Committee will address the issue of the non-retroactive and retroactive status in item SCL-20.11.

9 SWMA 2019 Annual Meeting: The Committee recommends this item be Withdrawn. The Committee prefers
10 SCL-20.11.

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

18 CWMA 2019 Interim Meeting: Mr. Loren Minnich (KS) commented that the item should move forward as a voting
19 item with the above amendment. We recommend the item move forward as a voting item with the above amendment.

20 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
21 <https://www.ncwm.com/publication-16> to review these documents.

22 **SCL-20.13 V N.1.5. Discrimination Test.**

23 **Source:**
24 NTEP Weighing Sector

25 **Purpose:**
26 Provide an exception to the discrimination test requirements for scales in which the value of $e = d$ and is less than 5 mg
27 e since this is not a practical test for field inspection.

28 **Item Under Consideration:**
29 Amend NIST Handbook 44, Scales Code as follows:

30 ***N.1.5. Discrimination Test. – Except for digital electronic scales designated Accuracy Class I or II in which***
31 ***the value of $e = d$ and is less than 5 mg, A a discrimination test shall be conducted on all automatic indicating***
32 ***scales with the weighing device in equilibrium at or near zero load and at or near maximum test load, and under***
33 ***controlled conditions in which environmental factors are reduced to the extent that they will not affect the results***
34 ***obtained. For scales equipped with an Automatic Zero-Tracking Mechanism (AZT), the discrimination test may***
35 ***be conducted at a range outside of the AZT range.***
36 ***[Nonretroactive as of January 1, 1986]***
37 ***(Added 1985) (Amended 2004 **and 20XX**)***

38 **Background/Discussion:**

39 The long-accepted procedures for testing discrimination on digital electronic scales in which $e = d$, specify the use of
40 a test load equaling 1.4 e to change the displayed indication by 2 e when applied or removed from the weighing/load-
41 receiving element at a starting reference that is just outside the zone-of-uncertainty between 2 consecutive increments.
42 When $e = 1$ mg or 2 mg on a Class I or II scale, a 1.4 e test load requires the use of decimal milligram test weights to

1 develop the test loads necessary to test discrimination. Field officials are not likely to possess field standards this
2 small; nor do some of the NTEP labs possess them.

3 At the 2019 NTEP Lab Meeting, the weighing evaluators present at the meeting reported they believe it very
4 questionable that a field test of discrimination using such small test loads could be performed and there be confidence
5 in the outcome of the results of those tests. Additionally, the evaluators were not aware of any weights and measures
6 jurisdiction that has issued decimal milligram field standard test weights to field staff. Some of the NTEP weighing
7 evaluators reported they too do not possess test standards this small. Consequently, the NTEP evaluators agreed
8 during the 2019 NTEP Lab Meeting to draft a 2019 Weighing Sector proposal to amend NCWM Publication 14 DES
9 to eliminate the application of the discrimination test on scales in which the value of $e = d$ and is less than 5 mg. The
10 NTEP evaluators also concluded during the 2019 NTEP Lab Meeting, HB 44 Scales Code paragraph N.1.5. would
11 also need to be amended because it specifies a discrimination test be performed on all automatic indicating scales.

12 During the 2019 NTEP Weighing Sector Meeting, the Sector agreed to recommend (in Item 5 of its 2019 agenda)
13 adding text to NCWM Publication 14 DES making clear the discrimination test for type evaluation is only intended
14 to apply to scales in which the value of $e = d$ and is greater than or equal to (\geq) 5 mg. The following changes were
15 agreed to and recommended by the Sector:

16 Amend the title of Sub-Section 44.2 (NCWM Publication 14 DES) as follows:

44.2. Discrimination Test (Scales in which the value of $e = d$ and is ≥ 5 mg). The following tests shall be performed within 10 e of zero and at the maximum test load. 44.2.1. ...
--

18 Because NTEP evaluates weighing and measuring equipment to verify conformance with NIST Handbook 44
19 requirements, members of the Sector concluded Scales Code paragraph N.1.5. will first need to be amended as
20 proposed in part 16. of this form to be able to make the changes recommended to Sub-Section 44.2. of NCWM
21 Publication 14 DES.
22

23 A similar exception is provided in OIML R 76 where it is specified in clause 3.8.2.2. Digital Indication, the
24 discrimination procedures apply only to instruments with $d \geq 5$ mg. Consequently, amending Scales Code paragraph
25 S.1.5. as proposed would improve harmonization of HB 44 and OIML R-76 requirements.

26 Participants of the 2019 NTEP Lab Meeting and 2019 Weighing Sector Meeting were not aware of any opposition to
27 the proposed changes; both groups reporting at those meetings a belief that discrimination testing is not currently
28 being performed on the scales for which the proposal is directed.

29 During the 2020 NCWM Interim Meeting open hearing session, the Committee heard from Mr. Darrell Flocken
30 (NTEP) who clarified that this proposal was submitted by the NTEP Weighing Sector and not directly from NTEP.
31 Mr. Russ Vires stated that the SMA supports the item with the following amendments:

32 *N.1.5. Discrimination Test. – ~~Except for digital electronic scales designated Accuracy Class I or~~*
33 *~~H in which the value of $e = d$ and is less than 5 mg. A~~ discrimination test shall be conducted on all*
34 *automatic indicating scales with the weighing device in equilibrium at or near zero load and at or near*
35 *maximum test load, and under controlled conditions in which environmental factors are reduced to the*
36 *extent that they will not affect the results obtained. For scales equipped with an Automatic Zero-Tracking*
37 *Mechanism (AZT), the discrimination test may be conducted at a range outside of the AZT range.*

38 *[Nonretroactive as of January 1, 1986]*

39 *(Added 1985) (Amended 2004)*

40 There were additional comments expressing concern whether this issue is more appropriate to appear as a requirement
41 in HB 44 Scales Code or rather a determination to be made at the discretion of the enforcing jurisdiction.

42 During the Committee's work session, the members determined that the item was fully developed by the submitter
43 and should move to a vote. The Committee assigned a Voting status to the proposal.

1 **Regional Association Comments:**

2 WWMA 2019 Annual Meeting: The item was not addressed by this region.

3 SWMA 2019 Annual Meeting: The item was not addressed by this region.

4 NEWMA 2019 Annual Meeting: The item was not addressed by this region.

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

7 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
8 <https://www.ncwm.com/publication-16> to review these documents.

9 **LMD – LIQUID MEASURING DEVICES**

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

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

13 **Source:**

14 Arizona, Florida, Maine, Michigan and Cambridge, Massachusetts; Skimmer Task Group

16 **Purpose:**

17 To prevent access and tampering by unauthorized persons to any area of the device where electronic financial
18 transactions occur, credit card information is obtained, and or personal information is stored or transmitted.

20 **Item Under Consideration:**

21 Amend NIST Handbook 44, Liquid Measuring Device Code as follows:

22 **UR.4.2. Security for Retail Motor-Fuel Devices (RMFD). Any retail motor fuel device capable of**
23 **conducting customer initiated electronic financial transactions must be secured to substantially restrict**
24 **the ability of unauthorized persons to manipulate it to obtain payment information that could be used**
25 **to commit fraud. The following is a non-exhaustive list of ways that restriction of such manipulation**
26 **may be accomplished:**

27 **(a) A physical lock, locking device, or a physical securing device that will restrict access to the**
28 **electronic financial transaction compartment of the RMFD. A lock, locking device or securing**
29 **device shall not be manipulated with commonly available tools. A lock shall not allow the use**
30 **of a universal key. A universal key is a key that is readily available in the market or can be**
31 **easily purchased in a hardware or common retail store. A single non-universal key for all of**
32 **the like devices at a retail facility or for all of the like devices at a chain of retail facilities is**
33 **acceptable or;**

34 **(b) Electronic alarming or disabling of the equipment if unauthorized access is attempted or;**

35 **(c) Advanced payment acceptance technologies that increase protections against the theft of**
36 **payment information itself or do not allow access to such information in a form that may be**
37 **used to commit fraud or;**

38 **(d) Another security solution that has been approved by the local or state weights and measures**
39 **jurisdiction with authority.**

1 **(Added, 20XX)**

2
3 **Background/Discussion:**

4 *NOTE: Additional information can be found in the 2018 NCWM Annual Meeting Report.*

5 A significant potential financial impact to consumers and credit issuing companies has been recognized by weights &
6 measures jurisdictions and prompts the need to offer more protection to both buyer and seller in these transactions.
7 The current design of these devices offers little to no barrier to fraud through theft of credit information. A general
8 belief is that the current design of retail motor-fuel dispensers (RMFDs), in most cases, already violates G.S.2. by
9 facilitating easy access to allow installation of these fraudulent card reading devices. Therefore, some NCWM
10 members are advocating stronger means to be implemented to decrease the potential for fraudulent activity with these
11 devices.

12 The Florida Department of Agriculture and Consumer Services estimates that, on average, each skimmer results in
13 100 counterfeit cards, each of which are used to make \$1,000 in fraudulent purchases. In other words, a single skimmer
14 typically leads to \$100,000 in theft. This is recognized as a nationwide problem that causes millions of dollars in
15 fraudulent charges to consumers, device owners, and banking institutions each year. One approach to mitigate the
16 detrimental effect on consumers is to implement upgraded security measures on the weighing and measuring devices
17 that fall within the guidelines of HB 44.

18 One possible opposing argument to this proposal is that these preventative measures should be in User Requirements
19 instead of in Specifications, but this is intended to be a long-term solution. The State of Florida has enacted legislation
20 to require device users to add security measures. They have found that most owner/operators have chosen to use
21 security seals or non-standard locks on the dispensers and that 85% of the skimming equipment being found is in
22 devices with user applied security measures. User-applied security measures are not as effective as electronic security
23 and/or unique, tamper proof locks.

24 Manufacturers of these devices may argue that the cost to make the necessary upgrades will be prohibitive. This item
25 is not intended to be retroactive and the cost of the additional security measures will be universal and not place any
26 manufacturer at a competitive disadvantage. Several manufacturers of electronic security systems designed for retail
27 motor fuel dispensers have products available and at least three new manufacturers of low-cost systems have recently
28 come into the marketplace (at least one of them is working with OEM manufacturers and the security systems are
29 being integrated into newly manufactured dispensers).

30 During the 2018 NCWM Interim Meeting, the Committee heard testimony regarding the installation of fraudulent
31 credit card reading devices on retail motor fuel dispensers and the resulting millions of dollars in fraudulent charges
32 to consumers, device owners and banking institutions each year. In general, testimony provided to the Committee
33 acknowledged the problem presented by the illegal use of “skimmers” however, there was not a consensus as to
34 whether this is an issue to be addressed by weights and measures officials.

35 The Committee agreed to make this an “Assigned” item and requesting the formation of a Task Group (TG) to address
36 this issue. The Committee identified stakeholders as likely members of such a task group as individuals from
37 convenience store associations, meter manufacturers, retailers, petroleum marketers association, weights and measures
38 regulators (one from each region), and the NIST Office of Weights and Measures.

39 At the 2018 NCWM Annual Meeting the Committee received an update on this item from the Chairman of the NCWM
40 Skimmer Task Group (TG), Mr. Hal Prince (FL). Mr. Prince reported work is ongoing on this item and much of the
41 TG discussion has revolved around two key questions:

- 42 1. Is this a weights and measures issue that NCWM should take on?
- 43 2. If so, does weights and measures have the authority to require manufacturers and users of commercial
44 weighing and measuring equipment to take whatever steps needed to ensure such equipment prevents
45 unauthorized access to non-metrological changes to the equipment?

1 Mr. Prince further reported that members of the TG were recently surveyed and asked these questions, but results are
 2 not yet available. It is hoped more information will be available to report at the next (2019) NCWM Interim Meeting.
 3 See the S&T Committee 2018 Final Report for additional details.

4 During the 2019 NCWM Interim Meeting, the Skimmer Task Group presented the Committee new language
 5 developed to address issues of fraud due to skimmer technology. The Skimmer TG's revised proposal would add a
 6 new User Requirement paragraph, UR.4.2., to the Liquid Measuring Device Code in NIST Handbook 44 and eliminate
 7 the original proposed paragraphs G-A.1. and G-S.2. in the General Code of NIST Handbook 44.

8 This item is not intended to be retroactive and the cost of the additional security measures will be universal and not
 9 place any manufacturer at a competitive disadvantage. Several manufacturers of electronic security systems designed
 10 for retail motor fuel dispensers have products available and at least three new manufacturers of low-cost systems have
 11 recently come into the marketplace (at least one of them is working with OEM manufacturers and the security systems
 12 are being integrated into newly manufactured dispensers).

13 During the 2019 Interim Meeting open hearings, the NCWM S&T Committee heard comments to agenda item GEN-1
 14 and the Skimmer Task Group provided an update of their activities and actions. The comments heard during the open
 15 hearing and Skimmer Task Group updates and actions are summarized below:

- 16 • From a polling of its members, the Skimmer Task Group determined that the issue was within weights and
 17 measures purview by a vote of 11-2. As such, the task group drafted a user's requirement during their
 18 meetings to replace paragraphs G-A.1. and G-S.2. with paragraph UR 4.2. Security for RFMDs to the Liquid
 19 Measuring Device Code in NIST Handbook 44;
- 20 • Questions were raised whether this revised proposal was intended to be retroactive or nonretroactive. The
 21 TG Chair, Mr. Hal Prince (FL) stated that a determination has not been made but it would be a decision to
 22 be made by the TG. During the NCWM S&T Committee work session, the members agreed that this item
 23 should be given an Informational status to allow for full vetting of the new proposal by the NCWM
 24 membership.

25 At the 2019 NCWM Annual Meeting, the Committee heard from Mr. Hal Prince providing an update and stating that
 26 during the period this item had been an Assigned item, the TG met routinely until the proposal was made Informational
 27 by the Committee at the 2019 Interim Meeting. He noted that the original proposal had been revised to only
 28 recommend a new user's requirement be added to the NIST Handbook 44 Liquid Measuring Devices Code. Mr.
 29 Prince also recommended that the Committee maintain the item's current Informational status for at least one
 30 additional cycle to ensure that it is fully vetted and to possibly be presented in community outreach programs to gain
 31 feedback from additional stakeholders. The Committee agreed to maintain Informational status.

32 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Hal Prince (FL, Chair of the
 33 Skimmer Task Group) who reported that the task group met in January 2019 to finalized the language in the proposal
 34 and the task group believes this item should be given a Voting status.

35 The following support this item moving forward with Voting status: Kevin Schnepf (CA), Brent Price (Gilbarco),
 36 Charlie Stutesman (KS), Tim Chesser (AR), Dmitri Karimov (MMA)

37 Ms. Tina Butcher (NIST OWM) restated OWM's previous comments that this is not a weights and measures issue but
 38 that W&M should play a cooperative role with law enforcement concerning skimmers. Ms. Butcher asked, if dispenser
 39 owners are responsible for skimmers which may be installed without their knowledge and what is the cost to the owner
 40 to deter the installment of skimmers? Mr. Hal Prince responded that this proposal gives the States the authority to
 41 enforce security and that the cost to enforce the security is variable depending on the method used. It will be up to
 42 each state as to how to enforce this requirement.

43 Ms. Fran Elson Houston (OH) noted that credit card companies have extended the time allowed for device owners to
 44 bring dispensers in compliance with their security standards for credit card readers and Mr. Prince responded that the
 45 TG did address Ms. Houston's information concerning compliance with credit card company requirements. Mr.

1 Jimmy Cassidy (MA) expressed his support for this item in going forward with a Voting status. Mr. Mike Harrington
2 (IA) noted that he believes the issue is more complex than just the issue of skimmers.

3 During the Committee's work session, the committee agreed that this item should be given a Voting Status.

4 **Regional Association Comments:**

5 WWMA 2019 Annual Meeting: Mr. Clark Cooney (CA) supported this item as did Mr. Brent Price (Gilbarco).

6 The Committee acknowledges this item is an Informational item and that during the July 2019 NCWM Annual meeting
7 the submitters recommended this item be vetted further during the next cycle.

8 SWMA 2019 Annual Meeting: Mr. Hal Prince (FL, Chair of the Skimmer Task Group) stated that he and the Task
9 Group believe the item is fully developed and they support this item being made a Voting Item. Tim Chesser (AR),
10 Brent Price (Gilbarco) and Ed Coleman (TN) also supported moving the item to a Voting Item.

11 The Committee agreed that this item is fully developed and recommends making it a Voting Item.

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

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

18 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
19 <https://www.ncwm.com/publication-16> to review these documents.

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

21 *NOTE: The item under consideration includes changes from the Committee during the 2020 Interim Meeting.*

22 **Source:**

23 7-Eleven, Inc.

24 **Purpose:**

25 Allow additional time to automatic timeout on retail motor fuel dispensers, as conditions may warrant.

26 **Item Under Consideration:**

27 Amend NIST Handbook 44, Liquid Measuring Device Code as follows:

28 **S.1.6.10. Automatic Timeout – Pay-At-Pump Retail Motor-Fuel Devices.** – *Once a device has been*
29 *authorized, it must de-authorize within three minutes ~~two minutes~~ if not activated. Re-authorization of the device*
30 *must be performed before any product can be dispensed. If the time limit to de-authorize the device is*
31 *programmable, it shall not accept an entry greater than three minutes ~~two minutes~~.*

32 *[Nonretroactive as of January 1, 2017]*

33 *(Added 2016)*

34

1 **Background/Discussion:**

2 At certain large locations, the existing two-minute timeout is insufficient and frustrating for some customers. In
3 addition to facility size, customer needs also often justify the need for a longer timeout. For instance, customers with
4 limited mobility, customers tending to children or elderly, and customers who opt to utilize restroom facilities before
5 dispensing their fuel have expressed a desire for additional time.

6 The need for an automatic timeout is valid to ensure that a customer's purchased fuel is not dispensed to another
7 customer or subject to theft, however, additional time is needed in certain situations and facilities should be enabled
8 to apply additional time if facility conditions and/or customer needs warrant.

9 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Mr. Charlie Stutesman (KS) who
10 supports this item as a Voting item. Mr. Loren Minnich reported that regional associations supported the item with
11 amendments to the time to reflect 3 minutes. Mr. Kevin Schnepf (CA) and Mr. Tim Chesser (AR) both expressed
12 support for this item. Mr. Brent Price supported this item with changes. Ms. Diane Lee (NIST OWM) noted that
13 NIST believes the 2-minute time limit is appropriate. Per the NIST OWM comments if 3 minutes is selected
14 consideration should be given to when a customer would be at risk of use of the dispenser by another customer and
15 how likely a customer's transaction could be compromised. Also, per the NIST OWM analysis, the proposal
16 recommends "180 seconds (or five minutes where conditions warrant)" NIST, OWM believes specifying two units of
17 time is confusing and that 5 minutes is too long.

18 Ms. Lee also recommended that any changes made to this paragraph also be made to similar paragraphs for other retail
19 fuel devices including VTM, LPG, MFM, H₂, and EVSE systems.

20 Mr. Dmitri Karimov (MMA) supports regional and NIST recommendations. Mr. Ken Ramsburg (MD) noted that he
21 believes the 5-minute time-out period is excessive. Mr. Tim Chesser (AR) stated that he believes the changes
22 recommended would require that a new Form 15 be submitted.

23 Mr. Mike Keilty (Endress + Hauser) recommended that the committee look at a proposal in 2016 or 2017 from North
24 Carolina that referenced elderly consumers who may need additional time between authorization and product
25 dispensing. Mr. Keilty noted that he believes this item needs more work and noted that devices are already permitted
26 up to 3 minutes for time out. Mr. Jim Willis (NY) noted he supported the amendments presented in the proposal. Mr.
27 Charles Stutesman (KS) stated that any time period allowed for time-out on dispensers must align with programing
28 the POS. He further stated that the POS is not able to distinguish whether a transaction was initiated by credit card
29 payment or cash payment and that the recommended changes may require corresponding changes to the POS.

30 During the Committee's work session, the committee agreed that this item should be given a Voting status with
31 changes to adopt a three-minute time out.

32 The following is the item, as amended, included on the S & T Committee Agenda as LMD-20.2 for consideration
33 during the 2020 Annual Meeting:

34 ***S.1.6.10. Automatic Timeout – Pay-At-Pump Retail Motor-Fuel Devices. – Once a device has been***
35 ***authorized, it must de-authorize within three minutes ~~two minutes~~ if not activated. Re-authorization of the device***
36 ***must be performed before any product can be dispensed. If the time limit to de-authorize the device is***
37 ***programmable, it shall not accept an entry greater than three minutes ~~two minutes~~.***

38 *[Nonretroactive as of January 1, 2017]*

39 (Added 2016)

40

41 Below is the item as presented during the S & T Committee open hearing at the 2020 Interim meeting:

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

1 *limit to de-authorize the device is programmable, it shall not accept an entry greater than ~~two minutes~~ 180 seconds*
2 *(or five minutes where conditions warrant).*

3 *[Nonretroactive as of January 1, 2017]*

4 (Added 2016)

5
6 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
7 <https://www.ncwm.com/publication-16> to review these documents.

8 **Regional Association Comments:**

9 WWMA 2019 Annual Meeting: Mr. Kurt Floren (L.A. County, CA), Mr. Brent Price (Gilbarco), Mr. Clark Cooney
10 (CA), Ms. Cadence Matijevich (NV) stated their support of the proposal but recommended a change to the proposed
11 five-minute time period in that it was excessive.

12 The Committee agreed that the item has merit and should be given Voting status provided that the time period stated
13 in the proposal as 180 seconds should be stated as “three minutes” and that the “(or five minutes where conditions
14 warrant)” be deleted from the proposal as shown below.
15

16 **S.1.6.10. Automatic Timeout – Pay-At-Pump Retail Motor-Fuel Devices.** – *Once a device has been*
17 *authorized, it must de-authorize within ~~two minutes 180 seconds~~ three minutes (or five minutes where conditions*
18 *warrant) if not activated. Re-authorization of the device must be performed before any product can be dispensed.*
19 *If the time limit to de-authorize the device is programmable, it shall not accept an entry greater than ~~two minutes~~*
20 *180 seconds ~~three minutes(or five minutes where conditions warrant)~~.*

21 *[Nonretroactive as of January 1, 2017]*

22 (Added 2016)

23 SWMA 2019 Annual Meeting: Mr. Brent Price (Gilbarco) stated that S.1.6.10 is confusing where it states “(or five
24 minutes where conditions warrant)”. He would like to see that statement removed.

25 The Committee agrees with Mr. Price’s comment and has modified the amendment as recommended. The Committee
26 recommends this item as a Voting Item with the modified language.

27
28 **Automatic Timeout – Pay-At-Pump Retail Motor-Fuel Devices.** – *Once a device has been authorized, it must*
29 *de-authorize within ~~two minutes 180 seconds (or five minutes where conditions warrant)~~ if not activated.*
30 *Re-authorization of the device must be performed before any product can be dispensed. If the time limit to de-*
31 *authorize the device is programmable, it shall not accept an entry greater than ~~two minutes~~ 180 seconds (or five*
32 *minutes where conditions warrant).*

33 *[Nonretroactive as of January 1, 2017]*

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

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

42 *[Nonretroactive as of January 1, 2017]*

43 (Added 2016)

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

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

8 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
 9 <https://www.ncwm.com/publication-16> to review these documents.

10 **LPG – LPG AND ANHYDROUS AMMONIA LIQUID-MEASURING DEVICES**

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

12 **Source:**
 13 NIST OWM

14
 15 **Purpose:**
 16 Reformat the requirements for zero-set-back interlock and time-out features for clarity and consistency in the LPG
 17 code to align the format with other measuring devices codes.

18
 19 **Item Under Consideration:**
 20 Amend NIST Handbook 44, Liquid Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices Code as
 21 follows:

22 S.2.5. Zero-Set-Back Interlock.

23

24 ***S.2.5.1. Zero-Set-Back Interlock, Stationary (Other than Stationary Retail Motor-Fuel***
 25 ***Dispensers) and Vehicle-Mounted Meters, Electronic.*** - A device shall be so constructed ***so***
 26 ***that after an individual delivery or multiple deliveries at one location have been completed, an***
 27 ***automatic interlock system shall engage to prevent a subsequent delivery until the indicating***
 28 ***element and, if equipped, recording element have been returned to their zero position. ~~For~~***
 29 ***individual deliveries, if there is no product flow for two minutes the transaction must be***
 30 ***completed before additional product flow is allowed. The 2 minute timeout shall be a sealable***
 31 ***feature on an indicator.***

32 *[Nonretroactive as of 2021]*

33 *(Added 2019)(**Renumbered and Amended 2020**)*

34

35 ***S.2.65.2. Zero-Set-Back Interlock for Stationary Retail Motor-Fuel Devices.*** – A device shall
 36 ***be constructed so that:***

37

38 (a) *after a delivery cycle has been completed by moving the starting lever to any position*
 39 *that shuts off the device, an automatic interlock prevents a subsequent delivery until*
 40 *the indicating elements and recording elements, if the device is equipped and*
 41 *activated to record, have been returned to their zero positions;*

42

43 (b) *the discharge nozzle cannot be returned to its designed hanging position (that is, any*
 44 *position where the tip of the nozzle is placed in its designed receptacle and the lock*

1 *can be inserted) until the starting lever is in its designed shut-off position and the*
2 *zero-set-back interlock has been engaged; and*

3
4 *(c) in a system with more than one dispenser supplied by a single pump, an effective*
5 *automatic control valve in each dispenser prevents product from being delivered*
6 *until the indicating elements on that dispenser are in a correct zero position.*

7 *[Nonretroactive as of January 1, 2017]*

8 *(Added 2016) **Renumbered 2020***

9
10 S.2.6. Automatic Timeout.

11 **S.2.6.1. Stationary (Other than Stationary Retail Motor-Fuel Dispensers) and Vehicle-Mounted**
12 **Meters, Electronic. For individual deliveries, if there is no product flow for three minutes the**
13 **transaction must be completed before additional product flow is allowed. The 3-minute timeout**
14 **shall be a sealable feature on an indicator.**

15 **[Nonretroactive as of 2021]**

16 **(Added 2020)**

17
18 **S.2.6.2. Automatic Timeout Pay-at-Pump Retail Motor-Fuel Devices. – Once a device has been**
19 **authorized, it must de-authorize within two minutes if not activated. Re-authorization of the**
20 **device must be performed before any product can be dispensed. If the time limit to de-authorize**
21 **the device is programmable, it shall not accept an entry greater than two minutes.**

22 **[Nonretroactive as of 2021]**

23 **(Added 2020)**

24 **Background/Discussion:**

25 Similar metering technology is in use in corresponding stationary, vehicle-mounted, and vehicle refueling applications
26 across multiple handbook measuring devices codes. In each case once the system is turned off no new delivery can
27 be initiated until all indications are returned to zero. Additionally, in instances where deliveries do not commence
28 within a specified period after a system is authorized, the system must automatically deauthorize the transaction. This
29 proposal further clarifies LPG measuring devices code requirements for the zero-set-back interlock and automatic
30 timeout features and aligns the operation of equipment across corresponding handbook codes.

31 This proposal is a follow-on to changes adopted to the LPG Code in July 2019 and is intended to reformat the
32 requirements for zero-set-back interlock and time-out features for clarity and consistency in the LPG code to align the
33 format with other measuring devices codes. OWM recommends the proposed changes to align the corresponding
34 requirements for stationary retail motor-fuel dispensers (RMFDs) and other stationary devices and vehicle-mounted
35 applications with those in Section 3.30 Liquid-Measuring Devices (LMD) and Section 3.31 Vehicle Tank Meters
36 (VTM) Codes. Unlike the VTM Code and the LMD Code, the LPG & Anhydrous Ammonia (NH₃) Code addresses
37 both vehicle-mounted and stationary devices. This proposal would address the zero-set-back interlock and timeout
38 requirements in separate paragraphs.

39 OWM notes that a paragraph was added to the LMD Code in 2016 to include a provision for an automatic timeout on
40 “pay-at-pump” retail motor fuel dispensers where payment is rendered via a card at the dispenser. It was not until
41 2019 that a corresponding paragraph was made part of LPG code to address LPG retail motor-fuel dispensers. By
42 modifying the LPG timeout requirements making them separately designated paragraphs (i.e., new S.2.6.1. and
43 S.2.6.2.) the LPG code requirements will include clearer language that mirrors the corresponding LMD requirement
44 for RMFDs.

45 OWM acknowledges the 2019 comments from CWMA and SWMA expressing a preference for a two-minute time
46 out rather than a three-minute time out to harmonize with other codes. OWM has found that a time out limit of three
47 minutes aligns with the current VTM Code while a two-minute time out limit aligns with the current LMD Code for
48 stationary devices.

1 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Ms. Diane Lee (NIST OWM)
 2 who reported that this proposal is a follow-up to changes that made to the LPG Code in 2019. Ms. Lee further stated
 3 that this will separate the interlock and timeout requirements in the LPG Code to better align with the LMD and VTM
 4 codes. Mr. Dmitri Karimov (MMA) supports this proposal as a voting item,

5 Mr. Charlie Stutesman (KS) supports this proposal as a voting item with any amendments to this requirement to match
 6 the automatic time-out requirements that are being considered in LMD-20.2. Mr. Brent Price (Gilbarco) supported
 7 this proposal as Voting item. Mr. Kevin Schnepf (CA) supported this proposal as voting with the changes
 8 recommended. Mr. Jim Willis (NY) supported this proposal as a Voting item with the recommended changes.

9 During the Committee's work session, the committee agreed that this item should be assigned a voting status.

10 **Regional Association Comments:**

11 WWMA 2019 Annual Meeting: Mr. John Barton (NIST OWM) stated that this item is a follow-up item to changes
 12 that were adopted in the NCWM Annual Meeting in July 2019. It is intended to reformat requirements for zero-set
 13 back interlock in the LPG Code to align with requirements in the LMD and VTM Codes.

14 The Committee agrees with the proposal and recommends a Voting status.

15 SWMA 2019 Annual Meeting: Ms. Diane Lee (NIST OWM) recommended the Committee harmonize the language
 16 in this item to align with the LMD Code in the handbook.

17 After consideration of this item the Committee recommends this item be made a Voting Item with the term "two
 18 minutes" changed to "180 seconds" on lines 46 and 48 on page S&T 49.

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

24 CWMA 2019 Interim Meeting: Mr. Charlie Stutesman (KS) commented that he would like this item separated and
 25 that S.2.5. move forward as voting and S.2.6. move forward as developing until the length of the time out is sorted
 26 out. We recommend the item be separated and that S.2.5. move forward as voting and S.2.6. move forward as
 27 developing for these reasons.

28 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
 29 <https://www.ncwm.com/publication-16> to review these documents.

30 **WTR – WATER METERS**

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

32 **Source:**

33 California Department of Food and Agriculture, Division of Measurement Standards
 34

35 **Purpose:**

36 Add marking requirements for meter size and water flow direction indication marking requirements.
 37

38 **Item Under Consideration:**

39 Amend NIST Handbook 44, Water Meters Code as follows:

40 *Note: The item under consideration includes changes recommended by the Committee at the 2020 Interim Meeting.*

1 **S.3.2. Meter Size and Directional Flow Marking Information. A water meter shall be clearly and indelibly**
2 **marked with the following information:**

3 **(a) meter size on the indicator face plate; and**

4
5 **(b) water flow direction.**

6 **(Added 20XX)**

7 **Background/Discussion:**

8 Meter size must be identified to select the suitable device for the application. (NIST H-44 G-UR.1. Selection
9 Requirements.) Water flow direction must be identified to help ensure the device is installed correctly. (NIST H-44
10 G-UR.2. Installation Requirements.)

11 The proposed amendments, if adopted, would require additional marking and may impact manufacturing processes.

12 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Mr. Kevin Schnepf, CA DMS,
13 who recommended that the proposal be amended to delay enforcement and to add a nonretroactive date. Ms. Tina
14 Butcher, NIST, OWM stated that NIST OWM supports the requirement to mark the meter size and flow direction.
15 Ms. Butcher also requested that more information be acquired from manufacturers as to accomplish the marking such
16 as stamping or casting in the meter housing.

17 Mr. Gallin Chen (Dune Laboratory, Inc.) requested that a range of meter sizes be accepted as a marking for meter size.
18 Mr. Dmitri Karimov (MMA) agreed that the proposal has merit but noted that specifying cast or stamped marking is
19 too restrictive.

20 A representative from Los Angeles, California supported this proposal as a voting item. Mr. Charles Stutesman (KS)
21 supported this item as a voting item.

22 During the Committee's work session, the committee agreed that this item should be given a Voting status with an
23 amendment to the language in part (b).

24 The following is the item, as amended, included on the S & T Committee Agenda as WTR-20.1 for consideration
25 during the 2020 Annual Meeting:

26 **S.3.2. Meter Size and Directional Flow Marking Information. A water meter shall be clearly and indelibly**
27 **marked with the following information:**

28 **(c) meter size on the indicator face plate; and**

29
30 **(d) water flow direction.**

31
32 Below is the item as presented during the S & T Committee open hearing at the 2020 Interim meeting:

33 **S.3.2. Meter Size and Directional Flow Marking Information. A water meter shall be clearly and indelibly**
34 **marked with the following information:**

35 **(a) meter size on the indicator face plate; and**

36
37 **(b) water flow direction designated by an arrow cast or stamped into the body of the meter.**

1 **Regional Association Comments:**

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

4 SWMA 2019 Annual Meeting: No comments were heard on this item. The Committee decided to make No
 5 Recommendation.

6 NEWMA 2018 Interim Meeting: The Committee and the body agree that this item should be moved to voting status.
 7 No comments were heard regarding negative aspects to the proposal.

8 CWMA 2019 Interim Meeting: Ms. Rachele Miller (WI) supports this as a voting item. We recommend the item
 9 move forward as voting.

10 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
 11 <https://www.ncwm.com/publication-16> to review these documents.

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

13 **Source:**

14 County of San Diego Department of Agriculture
 15

16 **Purpose:**

17 Clarify S.1.1.4. Advancement of Indicating and Recording Elements shall also be applicable to non-mechanical water
 18 meters.
 19

20 **Item Under Consideration:**

21 Amend NIST Handbook 44, Water Meters Code as follows:

22 *NOTE: The item under consideration includes changes recommended by the S&T Committee at the 2020 Interim*
 23 *Meeting.*

24 **S.1.1.4. Advancement of Indicating and Recording Elements.** – Primary indicating and recording elements
 25 shall be susceptible to advancement advance only by the ~~mechanical~~ normal designed operation of the device,
 26 intended by the manufacturer.
 27 (Amended 2020)

28 **Background/Discussion:**

29 Existing NTEP certified water meters function based on either a mechanical or a non-mechanical measuring element.
 30 Non-mechanical water meters do not contain moving parts that change position (rotate) proportional to water flow
 31 traversing the meter. Instead, these meters calculate and register volume based on non-invasive flow velocity
 32 measurements and other physical parameter determinations. Common non-mechanical water meter designs make use
 33 of the ultrasonic flow measuring principle, such as those conformed by NTEP CC no. 17-141 or 19-018. Future
 34 technologies are also expected to rely on other kinds of contactless flow measuring principle, e.g., electromagnetic
 35 induction.

36 To strict interpretation of current code language, ultrasonic and non-mechanical water meters would not be able to
 37 comply to S.1.1.4. The intent of this proposal is to harmonize this paragraph with existing language in similar codes
 38 such as 3.34. Cryogenic Liquid-Measuring Devices or 3.38. Carbon Dioxide Liquid-Measuring Devices, and to clarify
 39 the intent of the requirement is to apply not only to water meters that measure volume mechanically, but also to non-
 40 mechanical water meters.

41 During the 2020 NCWM Interim Meeting open hearings the Committee Mr. Garrett Cooper, San Diego Co., CA
 42 provided amendments to the language proposed under S.1.1.4. Ms. Tina Butcher, NIST, OWM noted that the use of
 43 the term mechanical may be misinterpreted and recommends striking “Mechanical.” Ms. Butcher also suggested that

1 the language be reviewed with other NIST HB 44 codes for harmonization. Mr. Dmitri Karimov, MMA, agreed with
2 the proposed changes to the language offered by Mr. Cooper of San Diego Co., CA. Mr. Kurt Floren, LA Co., CA
3 submitted additional changes to the language.

4 During the Committee's work session, the committee agreed that this item has merit and that the amendment offered
5 by San Diego Co., CA was appropriate. The committee agreed that this item should be given a Voting status.

6 **Regional Association Comments:**

7 WWMA 2019 Annual Meeting: Mr. Garrett Cooper (San Diego County, CA) stated that there are many non-
8 mechanical meters in use that incorporate non-invasive technology and that the proposal should be expanded to include
9 all meters. Mr. Kurt Floren (L.A. County, CA) stated that he is not comfortable with the use of the term "normal"
10 operation and suggests that there is a better means to define this. Mr. Floren suggests the description "as intended by
11 the manufacturer" as a replacement. Mr. Clark Cooney (CA) agrees and recommends a change to the use of "normal"
12 operation.

13 The Committee agreed that the item has merit however, there were some concerns about the use of the word "normal"
14 in the proposal in reference to the operation of the device. The Committee agree this proposal should be assigned a
15 Developing status. The Committee also recommends the submitter work with CA DMS and LA County to wordsmith
16 the terminology used in the proposal.

17 SWMA 2019 Annual Meeting: Committee heard no comments on this item. The Committee decided to make No
18 Recommendation.

19 NEWMA 2019 Interim Meeting: The Committee and the body agree that this item be moved to a voting status, but
20 with a language change. The Committee is concerned with the use of the term "normal". The language change
21 suggested is "as intended by the manufacturer". During open hearings, Mr. Frank Greene (CT) suggested replacing
22 "normal" with another term as it is ambiguous. Mr. Jason Flint (NJ) presented the language change offered by the
23 Western Weights and Measures Association report.

24 CWMA 2019 Interim Meeting: Mr. Charlie Stutesman (KS) commented that he supports this item as voting if the
25 phrase "be susceptible to" is removed and the word "advancement" is changed to "advance" as shown above. We
26 recommend this item as a voting item with these changes.

27 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
28 <https://www.ncwm.com/publication-16> to review these documents.

29 **MFM – MASS FLOW METERS**

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

31 **Source:**
32 NIST OWM

33 **Purpose:**
34 Reformat to more clearly specify the maximum permissible quantity value for "d" for liquids, Compressed Natural
35 Gas (CNG) and Liquefied Natural Gas (LNG) applications.

36 **Item Under Consideration:**
37 Amend NIST Handbook 44, Mass Flow Meters Code follows:

38 **S.1.3.3. Maximum Value of Quantity-Value Divisions.**

39 The maximum value of the quantity-value division shall not exceed the following.

1 (a) For compressed natural gas dispensed as an engine fuel:

2 (1) 0.001 for gasoline gallon equivalent (GGE) units; or

3 (2) 0.001 diesel gallon equivalent (DGE) units; or

4 (3) 0.001 kg or 0.001 lb for mass units.

5 **(b) For all gases other than compressed natural gas dispensed as an engine fuel a maximum value not**
 6 **greater than 0.2 % of the minimum measured quantity.**

7 **(Added 2020)**

8 **(bc)** For liquefied natural gas dispensed as an engine fuel:

9 (1) 0.001 for diesel gallon equivalent (DGE) units; or

10 (2) 0.001 kg or 0.001 lb for mass units.

11 (Added 2019)

12 **(ed)** For all liquids other than liquefied natural gas dispensed as an engine fuel a maximum value not greater
 13 than 0.2 % of the minimum measured quantity.

14 (Amended 1994, ~~and 2019~~, and 2020)

15 **Background/Discussion:**

16 During its March 2019 collaborations with Mr. Dimitri Karimov (Liquid Controls, LLC) to rework the requirement,
 17 OWM was made aware that there is a gap in this requirement with regard to the maximum quantity-value division for
 18 gases other than CNG. OWM did not want to make any such corrective amendments to include *all* other gas
 19 applications at that time believing that this could jeopardize the proposal moving forward for adoption at the July 2019
 20 NCWM Annual Meeting. OWM instead developed this proposal for submission in the 2020 cycle for a new paragraph
 21 to be designated S.1.3.3.(b) to address the maximum permitted value of “d” for all other gases.

22 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
 23 <https://www.ncwm.com/publication-16> to review these documents.

24 Specifying the maximum size of the unit recognized for the sale of a commodity is: 1) consistent across the handbook
 25 codes; 2) essential for the selection of suitable dispensing equipment; and 3) necessary to facilitate transparency in
 26 sales transactions and for making comparisons in fuel pricing. A specification to address the maximum value of “d”
 27 for vapor (gaseous) products clearly applicable in Application paragraph A.2 was inadvertently omitted in previous
 28 modifications of the code in 1994 and 2016 to address “d” for alternative fuel applications. In spring 2019 while
 29 already in the process of addressing limits for the maximum “d” for LNG applications, it was deemed that any further
 30 amendments to the code to fully address all other product applications be resubmitted for national consideration during
 31 the 2020 weights and measures standards development cycle. This latest proposal clarifies and places a limit on the
 32 maximum value of the quantity division for indicated and recorded deliveries of hydrocarbon gases in the vapor state
 33 which is currently missing from the code.

34 In 2019 the weights and measures community were informed about the planned 2020 update of paragraph S.1.3.3 to
 35 specify a maximum quantity value for “d” for all other gas applications. No opposing arguments have been heard at
 36 this time since the proposed modification to paragraph S.1.3.3 is considered more of a housekeeping item.

37 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Ms. Tina Butcher (NIST OWM)
 38 who pointed out that this item is a housekeeping item to correct the omission of a specification for the maximum value
 39 of “d” for products that fall under the category “all gases other than CNG.” Mr. Dmitri Karimov (MMA) and Mr.
 40 Kevin Schnepf (CA) supported this item.

41 During the Committee’s work session, the committee agreed that this item should be given a Voting Status.

42

1 **Regional Association Comments:**

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

6 SWMA 2019 Annual Meeting: Committee heard no comments on this item. The Committee decided to make No
7 Recommendation.

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

11 CWMA 2019 Interim Meeting: Mr. Charlie Stutesman (KS) commented that he supports this item as voting. We
12 recommend this item as a voting item.

13 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
14 <https://www.ncwm.com/publication-16> to review these documents.

15 **EVF – ELECTRIC VEHICLE FUELING SYSTEMS**

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

18 **Source:**
19 NIST OWM

20 **Purpose:**
21 Ensure there are no inconsistencies in the tentative code between the temperature range requirement of – 40 °C to +
22 85 °C (– 40 °F to 185 °F) specified for the EVSE’s operation and the requirement in paragraph S.5.2. EVSE
23 Identification and Marking Requirements that specifies an EVSE must be marked with its temperature limits when
24 they are narrower than and within -20 °C to + 50 °C (-4 °F to 122 °F).

25 **Item Under Consideration:**
26 Amend NIST Handbook 44, Electric Vehicle Fueling Systems (EVFS) – Tentative Code as follows:

27 **S.5.2. EVSE Identification and Marking Requirements.** – In addition to all the marking requirements
28 of Section 1.10. General Code, paragraph G-S.1. Identification, each EVSE shall have the following information
29 conspicuously, legibly, and indelibly marked:

- 30 (a) voltage rating;
31 (b) maximum current deliverable;
32 (c) type of current (AC or DC or, if capable of both, both shall be listed);
33 (d) minimum measured quantity (MMQ); and
34 (e) temperature limits, if narrower than and within ~~–20 °C to +50 °C (–4 °F to 122 °F)~~ – 40 °C to + 85 °C
35 (– 40 °F to 185 °F).

36
37 **Background/Discussion:**

38 In 2012 the USNWG began work to develop legal metrology standards for electricity measuring systems used in both
39 electric vehicle fueling and submetering applications under a single code. In 2014 the USNWG agreed to widen the
40 temperature range in NIST HB 44, section 3.40, paragraph S.3.5. for systems components to – 40 °C to + 85 °C based
41 on input that the wider range is an ANSI standard commercial temperature range. This range was adopted in 2015
42 and appears in the current NIST HB 44. However, only in ANSI C12.1 Section 4 in 4.7.3.16 Test Number 30 Effect

1 of Operating Temperature is $-30\text{ }^{\circ}\text{C}$ specified as the lowest minimum temperature limit and in 4.7.3.17 Test Number
2 31 Effects of Relative Humidity is $+85\text{ }^{\circ}\text{C}$ specified as the maximum temperature limit.

3 Electric Vehicle Service Equipment (EVSE) must be capable of operating accurately over the temperature range
4 specified in Section 3.40 Electric Vehicle Fueling Systems – Tentative Code or marked accordingly. Paragraph S.3.5.
5 Temperature Range for Systems Components specifies that an EVSE not capable of operating over the specified
6 temperature range of $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$ to $185\text{ }^{\circ}\text{F}$) must be marked with its narrower temperature range as
7 shown below.

8
9 **S.3.5. Temperature Range for System Components.** – EVSEs shall be accurate and correct over the
10 temperature range of $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$ to $185\text{ }^{\circ}\text{F}$). If the system or any measuring system components
11 are not capable of meeting these requirements, the temperature range over which the system is capable shall be
12 stated on the NTEP CC, marked on the EVSE, and installations shall be limited to the narrower temperature
13 limits.

14 The submitter has been working to ensure there are no inconsistencies between the temperature range requirements
15 specified for the EVSE’s operation and the requirement in paragraph S.5.2. EVSE Identification and Marking
16 Requirements that specify an EVSE must be marked with its temperature limits when they are narrower than and
17 within $-20\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $122\text{ }^{\circ}\text{F}$).

18 During the 2019 NCWM Interim Meeting open hearings, the Committee heard no comments on item EVF-3. During
19 the committee’s work session, the members agreed with the submitter and the regional weights and measures
20 associations that this item should be assigned developing status.

21 During the 2019 NCWM Annual Meeting, Ms. Tina Butcher (NIST OWM) updated the Committee stating that work
22 is ongoing through the USNWG subcommittee and recommends that this item be carried over to the next revision
23 cycle. The Committee agreed by retaining the item’s Developing status and no changes to the item were recommended
24 at this time.

25 The NCWM National Type Evaluation Program (NTEP) has indicated that a temperature range of $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$
26 ($-40\text{ }^{\circ}\text{F}$ to $185\text{ }^{\circ}\text{F}$) is beyond the capabilities of its evaluation laboratories. An option that NTEP has also indicated
27 it may explore is to accept data from accredited facilities capable of testing systems over the entire $-40\text{ }^{\circ}\text{C}$ to $85\text{ }^{\circ}\text{C}$
28 ($-40\text{ }^{\circ}\text{F}$ to $185\text{ }^{\circ}\text{F}$) temperature range. Manufacturers will have to provide the test data needed by NTEP to evaluate
29 these systems for this environmental factor.

30 NIST has received some feedback and is continuing an assessment of the temperature ranges specified in these
31 paragraphs. To date no negative comments have been received on the newly developed proposal for expanding the
32 paragraph S.5.2 marking requirement temperature range from $-20\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $122\text{ }^{\circ}\text{F}$) to $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$
33 ($-40\text{ }^{\circ}\text{F}$ to $185\text{ }^{\circ}\text{F}$) from the inquiry circulated to the USNWG Electric Vehicle Fueling Equipment Subgroup.
34 The proposed modification to paragraph S.5.2 also appears to align the marking and operating temperature range
35 requirements in NIST HB 44 with the requirements California is developing for its California Code of Regulations
36 Section 4002 EVFS (3.40).

37 The proposed modification to paragraph S.5.2 to align the marked temperature range limits with those specified for
38 operation of an EVSE will eliminate any inconsistencies for this parameter. Consequently, having heard no opposition
39 to this modification the submitter recommends this item’s status be upgraded from developing to voting in 2020.

40 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Ms. Tina Butcher (NIST OWM)
41 who reported that this item aligns requirements for references to temperature limits so that the temperature limits in
42 paragraph S.5.2 now align with the temperature limits in S.3.5. Mr. Kevin Schnepf (CA) supported the item.

43 During the Committee’s work session, the committee agreed that this item should be given a Voting status.

44
45

1 **Regional Association Comments:**

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

4 SWMA 2019 Annual Meeting: Committee heard no comments on this item.

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

8 CWMA 2019 Interim Meeting: Committee heard no comments on this item. The Committee decided to make No
9 Recommendation.

10 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
11 <https://www.ncwm.com/publication-16> to review these documents.

12 **EVF-20.2 V Definitions: submeter**

13 **Source:**

14 USNWG EVF&S

15 **Purpose:**

16 To provide a clear technical definition of what a sub-meter is.

17 **Item Under Consideration:**

18 Amend NIST Handbook 44, Appendix D. Definitions as follows:

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

21 **Background/Discussion:**

22 Changes being made to this definition up-dates the terminology being used in the Watthour Metering sections by the
23 Working Groups Submeter watt-hour Subgroup. There has been confusion in some state jurisdictions causing the
24 enforcement agency to believe that only a Utility could operate a sub metering system. A technical definition that does
25 not use references to “Utility” which appears to be interpreted as allowed only if provided by the “Serving Utility”.
26 This definition also provides some technical consideration on how to categorize meters. UL/IEC/CSA61010-01 ED3
27 provides technical detail on where a meter can be in building wire infrastructure. This definition approach would make
28 a clear distinction a specific meter’s ability to be in various places in the wiring infrastructure, in technical terms and
29 clear up whether it must be specifically provisioned by the “Serving Utility”. The following excerpts are referenced
30 from 61010-1© IEC:2010 Annex K identifying, technically, where meters of specific protection design can be. If there
31 is another requirement to identify sales and service ownership and allowances, it is recommended that this be done
32 elsewhere in the code.

- 33 • **OVERVOLTAGE CATEGORY IV** is for equipment installed at or near the origin of the electrical supply
34 to a building, between the building entrance and the main distribution board. Such equipment may include
35 electricity tariff meters and primary overcurrent protection devices. Manufacturers may also design
36 equipment for OVERVOLTAGE CATEGORY IV when an even higher degree of reliability and
37 availability is desired.
- 38 • **OVERVOLTAGE CATEGORY III** is for equipment intended to form part of a building wiring
39 installation. Such equipment includes socket outlets, fuse panels, and some MAINS installation control
40 equipment. Manufacturers may also design equipment for OVERVOLTAGE CATEGORY III when a
41 higher degree of reliability and availability is desired.
- 42 • **OVERVOLTAGE CATEGORY II** is for equipment intended to be supplied from the building wiring. It
43 applies both to plug-connected equipment and to PERMANENTLY CONNECTED EQUIPMENT. Sub-

1 clause 6.7 covers only the requirements for OVERVOLTAGE CATEGORY II with a nominal supply
 2 voltage up to 300 V. The requirements for higher OVERVOLTAGE CATEGORIES and for
 3 OVERVOLTAGE CATEGORY II with a nominal supply voltage above 300 V are covered by this annex.

- 4 • **OVERVOLTAGE CATEGORY I** is used, within the context of IEC 60364-4-44, for equipment intended
 5 to be connected to a MAINS supply in which means have been taken to substantially and reliably reduce
 6 TRANSIENT OVERVOLTAGES to a level where they cannot cause a HAZARD.
- 7 • OVERVOLTAGE CATEGORY I is not relevant to this standard.

8
 9 Generalizing the definition allows water, gas and other revenue billing categories of meter to be included. It does
 10 not express to ownership and operation of submeter. That should also be done elsewhere in the code.

11 The submitter commented that at this time the only opposing argument might be that a “Serving Utility” may react to
 12 not being in control of these devices. The code should also be clear in other areas besides the definition for
 13 understanding abilities to use a sub-metering for tariff billing down-stream of the mains meter.

14 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Mr. Kurt Floren (L.A. County,
 15 CA) who asked if there is a definition for “master meter” that is included in the proposal. Mr. Floren noted that a
 16 definition is needed. Ms. Tina Butcher (NIST OWM) agreed with Mr. Floren’s comment and noted that the work
 17 group should provide a definition. Mr. Richard Suiter (Richard Suiter Consulting) suggested not using “master meter”
 18 but rather “primary” meter instead.

19 During the Committee work session, the committee agreed that this item should be given a Voting status and that it
 20 should be amended to reflect the HB 44 Code it is applicable to [3.40]

21 **Regional Association Comments:**

22 WWMA 2019 Annual Meeting: Ms. Lisa Warfield (NIST OWM) stated that this item is fully developed and ready
 23 for a Voting status. Mr. Kevin Merritt (ID) asked if this language would apply to an LPG meter? Ms. Warfield
 24 responded that this does not apply to an LPG meter and that the definition for “submeter” referred to in this proposal
 25 should not be confused with the use of “master meter” as used when referring to calibrations. Mr. Kurt Floren (L.A.
 26 County, CA) asked the question “is the term master meter defined?” Ms. Warfield responded that the term “master
 27 meter” is defined and that the definition was derived from that definition from Measurement Canada.

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

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

33 **submeter - a meter or meter system downstream of the master meter. [3.40]**
 34 **(Added 20XX)**

35 SWMA 2019 Annual Meeting: The item was not submitted to this region.

36 NEWMA 2019 Interim Meeting: The item was not submitted to this region.

37 CWMA 2019 Interim Meeting: The item was not submitted to this region.

38 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
 39 <https://www.ncwm.com/publication-16> to review these documents.

1 **TIM – TIMING DEVICES CODE**

2 **TIM-20.1 V S.1.1.3. Value of Smallest Unit.**

3 **Source:**
4 NIST OWM

5 **Purpose:**
6 Establish a suitable limit for the maximum value of the quantity division for indicated and recorded time-based or
7 related services delivered through electric vehicle fueling systems.

8 **Item Under Consideration:**
9 Amend NIST Handbook 44, Electric Vehicle Fueling Systems follows:

10 **S.1.1.3. Value of Smallest Unit.** – The value of the smallest unit of indicated time and recorded time, if
11 the device is equipped to record, shall not exceed the ~~equivalent of~~ following:

12 (a) **For parking meters:**

13 (1) one-half hour on parking meters indicating time in excess of two hours, or

14 (2)(b) six minutes on parking meters indicating time in excess of one but not greater than
15 two hours; or

16 (b) **For an EVSE equipped with integral time-based feature:**

17 (1) one minute on an EVSE indicating time not greater than or equal to 60 minutes, or

18 (2) hours and minutes on an EVSE indicating time intervals in excess of 60 minutes;

19 (c) **For all other devices** five minutes ~~on all other devices~~, except those equipped with an in-service
20 light.

21 (Amended 1975 and 2020)

22 **Background/Discussion:**

23 In 2015 modifications were made to NIST Handbook 44 Section 5.55 Timing Devices to address an electric vehicle
24 fueling system (EVFS) capable of applying additional fees for time-based services. However, no limits were placed
25 on the value of the smallest unit of indicated time and recorded time in the equipment’s design requirements.

26 Charging sessions will vary from twenty minutes to twelve hours depending on the capacity of the electric vehicle and
27 EVFS. An EVFS must also make available in either printed or electronic format complete and clearly defined
28 transaction information about the start and stop time of a service, power loss event, or rate change. This transaction
29 information for time intervals must be available in values or increments that ensure transparency when displayed or
30 recorded and allow for straight forward value comparison of services in the calculation of fees.

31 Current Timing Devices Code paragraph S.1.1.3 Value of Smallest Unit specifies the maximum value of increments
32 of time indicated or recorded by a parking meter and other devices such as laundry dryers or car washes that measure
33 time during which services are being dispensed. Since modifications to the code in 2015 did not address the
34 permissible smallest value of the unit of time on EVSEs; this proposed modification of paragraph S.1.1.3. establishes
35 a limit on the unit of time at one minute for time less than or equal to 60 minute and in hours and minutes for time
36 intervals greater than 60 minutes.

1 NIST Handbook 44 Section 5.55 Timing Devices Code paragraph S.1.1.2 Units specifies that indications and recorded
 2 representations of time shall be in terms of minutes for time intervals of 60 minutes and hours and minutes for time
 3 intervals greater than 60 minutes. Paragraph S.1.1.2 does not specify what a suitable *maximum* value of the quantity
 4 division for EVSE time-based indications should be which is necessary given the range in length of a charging session
 5 can be 20 minutes to 12 hours and for additional time-based fees (such as idling after a full charge) that can also vary
 6 and might be assessed in conjunction with the electrical energy delivery. Consequently, a proposal to modify
 7 paragraph S.1.1.3 was developed to include specific requirements that were inadvertently omitted in the 2015 updates
 8 to the Timing Devices Code to addresses the EVSE application.

9 A similar recommendation has been submitted to modify the corresponding EVFS requirement in NIST HB 44 Section
 10 3.40 Electric Vehicle Fueling Systems – Tentative Code paragraph S.1.3.2. EVSE Value of Smallest Unit to specify
 11 the maximum permissible value of the indicated and/or recorded electrical energy unit by an EVSE.

12 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Ms. Tina Butcher, NIST, OWM,
 13 who stated that the item is fully developed and that the EVSE work group is in consensus with the proposed changes
 14 to establish a limit on the unit of time in the timing device code.

15 During the Committee’s work session, the committee agreed that this item should be given a Voting status.

16 **Regional Association Comments:**

17 WWMA 2019 Annual Meeting: There were no comments heard during the open hearing session on this item. The
 18 Committee agrees that the item is fully developed and should be given a Voting status.

19 SWMA 2019 Annual Meeting: Committee heard no comments on this item. The Committee decided to make No
 20 Recommendation.

21 NEWMA 2019 Interim Meeting: The Committee and the body agree that this item be moved to a voting status. Mr.
 22 James Cassidy (MA) and Mr. Jim Willis (NY) voiced support.

23 CWMA 2019 Interim Meeting: Mr. Doug Musick (KS) commented that it may not be clear when part (b) and (c)
 24 apply. We recommend this item move forward as a developing item.

25 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
 26 <https://www.ncwm.com/publication-16> to review these documents.

27 **GMA – GRAIN MOISTURE METERS 5.56 (A)**

28 **GMA-20.1 V S.2.5. Provisions for Sealing.**

29 **Source:**

30 NTEP Grain Analyzer Sector

31 **Purpose:**

32 Correct an error caused by a 2019 amendment that inadvertently removed applicability of the provisions in Table
 33 S.2.5.1. for any devices manufactured prior to 2020.

34 **Item Under Consideration:**

35 Amend NIST Handbook 44, Grain Moisture Meter Code 5.56 (a) as follows:

36 **S.2.5. Provision for Sealing.** – For devices and systems in which the configuration or calibration
 37 parameters can be changed by use of a removable digital storage device, security shall be provided for those
 38 parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:

1 ~~Provision shall be made for applying a~~ **An approved means of** security **shall be provided** seal in a manner that
 2 ~~requires the security seal to be broken, or for using other approved means of providing security (e.g., audit trail~~
 3 ~~available at the time of inspection as defined in~~ **paragraphs S.2.5.1 Sealing Requirements for Devices**
 4 **Manufactured Between January 1, 1999 and January 1, 2020** ~~Categories of Device and Methods of~~ **and**
 5 **S.2.5.2 Sealing Requirements for Devices Manufactured on or after January 1, 2020** ~~before any change that~~
 6 affects the metrological integrity of the device can be made to any mechanism.

7 (Amended 2019, 2020)

8
 9 **S.2.5.1. Sealing Requirements for Devices Manufactured Between January 1, 1999 and January 1,**
 10 **2020. - The appropriate sealing requirements in Table S.2.5.1. shall apply.**

<i>Table S.2.5.1.</i>	
<i>Categories of Device and Methods of Sealing</i>	
<u>For Devices Manufactured Between January 1, 1999 and January 1, 2020</u>	
<i>Categories of Device</i>	<i>Methods of Sealing</i>
<i>Category 1¹: No remote configuration capability.</i>	<i>Seal by physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.</i>
<i>Category 2²: Remote configuration capability, but access is controlled by physical hardware.</i> <i>A device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for remote configuration.</i>	<i>The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.</i>
<i>Category 3³: Remote Configuration capability access may be unlimited or controlled through a software switch (e.g., password).</i> <i>When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.</i>	<i>An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants). A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to 25 times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)</i>

<u>Table S.2.5.1.</u>	
<i>Categories of Device and Methods of Sealing</i>	
<u>For Devices Manufactured Between January 1, 1999 and January 1, 2020</u>	
<i>Categories of Device</i>	<i>Methods of Sealing</i>
<p><u>Category 3a: No remote capability, but operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc.) in normal operation.</u></p> <p><u>*When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.</u></p>	<p><u>Same as Category 3</u></p>
<p><u>Category 3b: No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password).</u></p> <p><u>*When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.</u></p>	<p><u>Same as Category 3</u></p>
<p>¹ Not allowed for devices manufactured on or after January 1, 2020</p> <p>² Required for all devices manufactured on or after January 1, 2020</p>	

[Nonretroactive as of January 1, 2020 1999]

[*Nonretroactive as of January 1, 2014]

(Amended 1998, 2013, and 2019, 2020)

1 **Note:** Zero-setting and test point adjustments are considered to affect metrological characteristics and must be
2 sealed.

3 (Added 1993) (Amended 1995 and 1997)

4 **S.2.5.2. Sealing Requirements for Devices Manufactured on or after January 1, 2020. - An event logger is**
5 **required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time**
6 **of the change, and the new value of the parameter (for calibration changes consisting of multiple constants,**
7 **the calibration version number may be used rather than the calibration constants.)**

8 **A printed copy of the information must be available through the device or through another on-site device.**
9 **The event logger shall have a capacity to retain records equal to 25 times the number of sealable parameters**

in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)

Background/Discussion:

At its 2018 Grain Analyzer Sector meeting, the GA Sector agreed to a proposal to change the sealing requirements for NTEP grain moisture meters. Changes were proposed to NIST HB 44 Section 5.56(a) Table S.2.5. requiring all grain moisture meters have an event logger and meet the requirements that are associated with a Category 3 device after 2020. The Sector believed that due to the complexities of these devices, an event logger would be appropriate sealing. In addition, there are currently eight NTEP grain moisture meter and these meter except for one are equipped with an event logger.

At the 2019 Annual Meeting the S&T committee heard comments from NIST OWM that the GA Sector’s proposal may lead to confusion as to when to apply the new requirements and encouraged the S&T committee to consider the NIST OWM proposal included in the OWM Analysis provided at the 2019 Annual Meeting. During the S&T committee meeting, members were unable to determine possible confusion in the existing proposal. A comment was made that a non-retroactive date was not included in the proposal and the committee selected a non-retroactive date of 2020.

The changes were adopted into the 2020 version of NIST HB 44. After further review it was noted that adding a nonretroactive date of 2020 caused an unintentional error. The table now only applied to devices manufactured or place into service after 2020 and the table no longer applied to devices that are currently in use.

At the 2019 Grain Analyzer Sector meeting the Sector discussed the error in the 2020 version of NIST HB 44, Section 5.56(a), Table S.2.5. and considered two proposal for changes to correct the error in NIST HB 44. A proposal to remove the nonretroactive date and italics from the table (see Below) and the proposal in the item under consideration.

Table S.2.5. Categories of Device and Methods of Sealing

Categories of Device	Method of Sealing
<p>Category 1¹: No remote configuration capability</p>	<p>Seal by physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999.) If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.</p>
<p>Category 2¹: Remote configuration capability, but access is controlled by physical hardware.</p> <p>Device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for remote configuration.</p>	<p>The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters; one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999.) If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.</p>
<p>Category 3²: Remote Configuration capability, access may be unlimited or controlled through a software switch (e.g. password.)</p> <p>When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measure mode.</p>	<p>An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change and the new value of the parameter (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants.) A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to twenty-five (25) times the number of sealable parameters in the device, but not more than 1000</p>

	records are required. (Note: Does not require 1000 changes to be stored for each parameter.)
¹ Not allowed for devices manufactured on or after January 1, 2020	
² Required for all devices manufactured on or after January 1, 2020	

~~Non retroactive as of January 1, 2020.~~

Amended 1998, 2013, 2019, **2020**

The GA Sector received no objections or concerns to both proposals and agreed with the suggestion to remove the nonretroactive date and italics during the meeting. But, realizing errors that could be introduced by changing an existing table that applies to other devices in use, the Grain Analyzer Sector requested that this proposal be further reviewed at NIST and an appropriate proposal be sent to the Sector for ballot to be included on the 2020 NCWM S&T Agenda that would correct the error in the NIST HB 44 Section 5.56(a).

After review of the GA Sector's proposal to remove the nonretroactive date and italics from Table S.2.5, NIST, OWM provided the following comments and recommendations:

- Making changes to an existing sealing table that applies to many devices that are currently in use may inadvertently leave a gap in enforcement for these devices. Finding all gaps associated with these changes to the table is a timely process and all gaps may not be observed within the limited time frame to review changes before they are submitted in the current process for adoption into NIST HB 44.
- Dates with a non-retroactive status, address more than just the date to apply the requirement, a nonretroactive status also applies to those devices:
 - manufactured within a state after the effective date,
 - brought into a state after the effective date,
 - place into commercial service after the effective date, and
 - undergoing type evaluation, including devices that have been modified to the extent that a new NTEP certificate of Conformance (CC) is required.
 deleting a non-retroactive date may present a gap in how to apply the requirements to devices falling into one of these categories and including dates with only guidance of when to apply the requirement may also have gaps as to how to deal with devices falling into the categories mentioned.
- Regulatory jurisdictions have associated a Category 3 device as having remote configuration. Changes to this category of device may cause confusion in weights and measures jurisdictions. In addition, a philosophy for sealing has been published which recognizes Category 3 devices as those devices with remote configuration.
- As such, NIST OWM recommends keeping the 2019 NIST HB 44, Section 5.56(a) Table S.2.5 to address those devices currently in service.

Per the Grain Analyzer Sectors' requested that NIST OWM technical advisor balloted the Sector with a proposal that provides appropriate changes to correct the error in the 2020 version of NIST HB 44 Section 5.56(a) Table S.2.5., The ballot was forwarded to the GA Sector and received 10 Affirm Votes and 1 Affirm vote with comments. The proposal is based on the 2020 version of NIST HB 44 that includes the following changes that were adopted into the 2020 version of NIST HB 44, Section 5.56.(a):

- adoption of paragraph G-S.8.2 that resulted in an update to Section 5.56(a) paragraph S.2.5.
- the adoption of changes to 5.56(a) Table S.2.5. which created an unintentional error of limiting NIST HB 44, Section 5.56 (a), Table S.2.5 to devices manufactured after 2020.

The proposal includes dates of when to apply sealing requirements. The format of this wording is consistent with wording used in NIST HB 44 Section 2.20. Scales code, Section S.2.1.3.

1 During the 2020 NCWM Interim Meeting open hearings the Committee heard from Ms. Diane Lee (NIST OWM)
2 who stated that this item corrects errors that were adopted into the GMM Code, Table S.2.5 in 2020 edition of the
3 handbook and clarifies effective dates for when to apply the requirements. Mr. Doug Musick (KS) stated that he
4 believes the current requirements are more easily interpreted with the proposed language. He also noted that editorial
5 changes may be needed in S.2.5.2. for the number of events for the event counter. Ms. Tina Butcher (NIST OWM)
6 noted that these changes are necessary due to multiple options regarding sealing.

7 During the Committee's work session, the committee agreed that this item should be given a Voting status.

8 **Regional Association Comments:**

9 This item was submitted by the NTEP Grain Analyzer Sector following the fall 2019 regional meetings.

10 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
11 <https://www.ncwm.com/publication-16> to review these documents.

12 **MDM – MULTIPLE DIMENSION MEASURING DEVICES**

13 **MDM-20.1 V S.1.3. Negative Values, S.1.6. Customer Indications and Recorded**
14 **Representations, S.1.7. Minimum Measurement, S.1.8. Indications Below**
15 **Minimum and Above Maximum, S.2. Design of Zero Tare ~~Tare~~ Dimensional Offset**
16 **and Appendix D – Definitions: dimensional offset**

17 *NOTE: This item includes an editorial change to include a definition for Dimensional Offset. This definition was*
18 *included in the original submission of this proposal (submitted on a separate Form 15) however, it was omitted in the*
19 *Committee's 2020 Interim Meeting agenda when published.*

20 **Source:**

21 NTEP Multiple Dimension Measuring Device Work Group

22 **Purpose:**

23 Better define and document current practices related to the removal of a conveyance method (skid, pallet, etc.) from
24 the final measurement.

25 **Item Under Consideration:**

26 Amend NIST Handbook 44, Multiple Dimension Measuring Devices Code as follows:

27 **S.1.3. Negative Values.** – ~~Except when in the tare mode, n~~ Negative values shall not be indicated or recorded.
28 **(Amended 20xx)**

30 **S.1.6. Customer Indications and Recorded Representations.**

31 ...

**Table S.1.6.
Required Information to be Provided by Multiple Dimension Measuring Systems**

Information	Column I ¹	Column II ¹		Column III
	Provided by device	Provided by invoice or other means		Provided by invoice or other means as specified in contractual agreement
		Customer present	Customer not present	
1. Device identification ²	D or P	P	P	P or A
2. Error message (when applicable)	D or P	P	N/A	N/A
3. Hexahedron dimensions ³	D or P	P	P	P or A
4. Hexahedron volume (if used) ³	D or P	P	P	P or A
5. Actual weight (if used) ³	D or P	P	P	P or A
6. Tare Dimensional Offset (if used) ³	D or P	N/A	N/A	N/A
7. Hexahedron measurement statement ⁴	D or P or M	P	P	P or G

A = AVAILABLE UPON REQUEST BY CUSTOMER⁵
D = DISPLAYED
G = PUBLISHED GUIDELINES OR CONTRACTS
M = MARKED
N/A = NOT APPLICABLE
P = PRINTED or RECORDED IN A MEMORY DEVICE and AVAILABLE UPON REQUEST BY CUSTOMER⁵

Notes:

¹ As a minimum all devices or systems must be able to meet either column I or column II.

² This is only required in systems where more than one device or measuring element is being used.

³ Some devices or systems may not utilize all of these values; however, as a minimum either hexahedron dimensions or hexahedron volume must be displayed or printed.

⁴ This is an explanation that the dimensions and/or volume shown are those of the smallest hexahedron in which the object that was measured may be enclosed rather than those of the object itself.

⁵ The information “available upon request by customer” shall be retained by the party having issued the invoice for at least 30 calendar days after the date of invoicing.

(Amended 2004 and 20xx)

S.1.7. Minimum Measurement. – Except for entries of ~~tare~~**dimensional offset**, the minimum measurement by a device is 12 d. The manufacturer may specify a longer minimum measurement. For multi-interval devices, this applies only to the first measuring range (or segment) of each measurement axis (length, width, and height).

(Amended 2017 and 20XX)

1 **S.1.8. Indications Below Minimum and Above Maximum.** – When objects are smaller than the
 2 minimum dimensions identified in paragraph S.1.7. Minimum Measurement or larger than any of the maximum
 3 dimensions plus 9 d, and/or maximum volume marked on the device plus 9 d, or when a combination of
 4 dimensions, including ~~tare~~**dimensional offset**, for the object being measured exceeds the measurement capability
 5 of the device, the indicating or recording element shall either:

- 6 (a) not indicate or record any usable values; or
- 7 (b) identify the indicated or recorded representation with an error indication.
- 8 (Amended 2004, ~~and~~-2017 **and 20xx**)

9
 10 **S.2. Design of Zero and ~~Tare~~**Dimensional Offset.****

11
 12 **S.2.1. Zero or Ready Adjustment.**

13
 14 **S.2.2. ~~Tare~~**Dimensional Offset.**** – The tare function shall operate only in a backward direction (that is,
 15 in a direction of underregistration) with respect to the zero reference or ready condition of the device. The
 16 value of the tare division or increment shall be equal to the division of its respective axis on the device.
 17 ~~There shall be a clear indication that tare has been taken.~~ **The dimensional offset shall eliminate the effect**
 18 **of the conveyance method resulting in the measurement of only the object intended to be measured.**

19 **(Amended 20xx)**

20
 21 **S.2.2.1. Maximum Value of ~~Tare~~**Dimensional Offset** for Multi-Interval** (Variable Division-
 22 Value Devices). – A multi- interval device shall not accept any ~~tare~~**dimensional offset** value greater
 23 than the maximum capacity of the lowest range of the **height** axis for which the tare is being entered.

24 **(Added 2016 and 20xx)**

25 ~~**S.2.2.2. Net Values, Mathematical Agreement.** – All net values resulting from a device~~
 26 ~~subtracting a tare entry from a gross value indication shall be indicated and recorded, if so equipped, to~~
 27 ~~the nearest division of the measuring range in which the net value occurs. In instances where the tare~~
 28 ~~value entered on a multi-interval device is in a lower partial measuring range (or segment) than the~~
 29 ~~gross indication, the system shall either alter the tare entered or round the net result after subtraction of~~
 30 ~~the tare in order to achieve correct mathematical agreement.~~

31 Consider a multi-interval device having two partial measuring ranges for the “x” axis:

- 32 ● Partial measuring range 1: 0 to 100 inches in 0.2 inch increments
- 33 ● Partial measuring range 2: 100 to 300 inches in 0.5 inch increments

34 The following examples clarify the two acceptable methods this device can use to achieve
 35 mathematical agreement when tare has been entered in a lower partial measuring range than the
 36 gross indication.

37 **(Added 2016)**

Acceptable Example 1.			
Altering of a Tare Entry to Achieve Accurate Net Indication			
Gross Indication of Item Being Measured	Tare Entered	Value of Tare after Being Altered by the Device	Acceptable Net Indication
154.5 in	41.2 in	41.0 in	113.5 in
154.5 in	41.4 in	41.5 in	113.0 in

38 **(Added 2016)**

Acceptable Example 2. Rounding of the Net Result (Following the Subtraction of Tare) to Achieve Accurate Net Indication			
Gross Indication of Item Being Measured	Tare Entered	Net Result Before Rounding (Gross Indication minus Tare Entered)	Acceptable Net Indication Rounded to Nearest 0.5 Inch
154.5 in	41.2 in	113.3 in	113.5 in
154.5 in	41.4 in	113.1 in	113.0 in

1 (Added 2016)

2 Add the following definition to NIST Handbook 44 Appendix D.

3 **Dimensional offset: The effect of eliminating the conveyance material on a measurement made by a**
 4 **multiple dimension measuring device resulting in only the object intended to be measured being**
 5 **measured. [5.58.]**

6 **Background/Discussion:**

7 At the May 2019 meeting of the Multiple Dimension Measuring Device (MDMD) Work Group, the members of the
 8 work group discussed the correctness of the use of the word ‘tare’ when referring to the removal of the height of a
 9 conveyance method (pallet, skid, etc.) for the purpose of obtaining a measurement of only the actual object intended
 10 to be transported. For example; a transportation company may want to place the object on a pallet to facilitate the ease
 11 of handling, however; the transportation company does not want the height of the pallet to be included in the cost
 12 calculations when determining the charge to the company requesting the transportation of the object.

13 The word ‘tare’, because of its extensive use and how it is applied in the weighing community, is always thought of
 14 as the removal of a weigh value from a gross weight value to obtain a net weight value. The function of removing a
 15 pallet or skid height from the total height of an object in the measuring field does not result in a net height, it results
 16 in measuring only the object sitting on the pallet.

17 The work group discussed topic in detail and as a result of the discussions, the members of the work group, including
 18 representatives from device manufacturers, device users, and NTEP evaluators, came to the conclusion that the word
 19 “tare” should be replaced with the term “dimensional offset”.

20 During the 2020 NCWM Interim Meeting open hearings the Committee heard from a member of the Multiple
 21 Dimension Measuring Device (MDMD) Work Group (submitter) commenting that this item is primarily a
 22 housekeeping item replacing the use of the term “tare” with “dimensional offset” to more accurately represent the
 23 process and performance of MDMDs. Since these devices are calculating a measurement of volume occupied by the
 24 object being measured and not typically weighing that object, the work group believes this is a more accurate term.
 25 The submitter recommends a voting status. Other comments were heard in support of a voting status. Mr. Kevin
 26 Schnepf (CA) noted that a definition of “dimensional offset” is not shown in the Item Under Consideration however,
 27 the definition is included in the title of the proposal, and recommended it be added to the item.

28 During its work session, the Committee agreed this item should be given a Voting status with definition for
 29 “dimensional offset” added. This definition was included in the original submission of this proposal (submitted on a
 30 separate Form 15) however, it was omitted in the 2020 Interim Meeting S&T Committee’s agenda when published.
 31 The definition intended to be added to HB 44 Appendix D is shown below.

32 **Dimensional offset: The effect of eliminating the conveyance material on a measurement made**
 33 **by a multiple dimension measuring device resulting in only the object intended to be measured**
 34 **being measured. [5.58.]**

1 **Regional Association Comments:**

2 WWMA 2019 Annual Meeting: No comments were heard during the open hearing session. The Committee agrees
3 the item has merit and should be assigned a Voting status.

4 SWMA 2019 Annual Meeting: During Open Hearings the Committee heard comments from Mr. Russ Vires (Mettler-
5 Toledo) who supports the item as written. The Committee also heard comments from Mr. Dick Suiter (Richard Suiter
6 Consulting, MDM Work Group Member) who clarified that the goal of the work group is to change the term “Tare”
7 to “multi- dimensional offset.”

8 After consideration of this item the Committee recommends this item move forward as a Voting Item

9 NEWMA 2019 Interim Meeting: The Committee and the body agree that this item should be moved to voting status.
10 During open hearings, Mr. Dick Suiter (Richard Suiter Consulting), a MDMD WG member, commented that MDMD
11 code was borrowed from Scale code using “tare” as a term. The MDMD doesn’t use “tare” when determining
12 measurements so the language change is a housekeeping item.

13 CWMA 2019 Interim Meeting: Mr. Dick Suiter (Richard Suiter Consulting) commented that this is a housekeeping
14 item and it should move forward as voting. Mr. Doug Musick (KS) suggested that a definition of “Dimensional
15 Offset” may need to be developed. We recommend this item as a voting item.

16 Additional letters, presentation and data may have been submitted for consideration with this item. Please refer to
17 <https://www.ncwm.com/publication-16> to review these documents.

18 **OTH – OTHER ITEMS**

19 **OTH-20.1 V Appendix D – Definitions: submeter**

20 *This item has been renumbered as EVF-20.2.*

Mr. Loren Minnich, Kansas | Committee Chair
Mr. Jason Flint, New Jersey | Member
Mr. Josh Nelson, Oregon | Member
Mr. Brad Bachelder, Maine | Member
Mr. Jason Glass, Kentucky | Member
Mr. Luciano Burtini, Measurement Canada | Canadian Technical Advisor
Mr. John Barton, NIST, OWM | NIST Technical Advisor
Ms. G. Diane Lee, NIST, OWM | NIST Technical Advisor
Mr. Mike Manheim, NCWM | NTEP Technical Advisor

Specifications and Tolerances Committee