

National Type Evaluation Program (NTEP) Weighing Sector Meeting Summary

August 18, 2020; 12:00 pm to 4:00 pm / Online Zoom Meeting

INTRODUCTION

The charge of the NTEP Weighing Sector is important in providing appropriate type evaluation criteria based on specifications, tolerances and technical requirements of NIST Handbook 44 Sections 1.10. General Code, 2.20 Scales, 2.22 Automatic Bulk Weighing Systems, and 2.24 Automatic Weighing Systems. The Sector’s recommendations will be presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in NCWM Publication 14 *Technical Policy, Checklists, and Test Procedures* for national type evaluation.

The Sector is also called upon occasionally for technical expertise in addressing difficult NIST Handbook 44 issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

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*.

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ABWS	Automatic Bulk Weighing Systems	NCWM	National Conference on Weights and Measures
AREMA	American Railway Engineering Maintenance-of-Way Association	NIST	National Institute of Standards and Technology
AWS	Automatic Weighing Systems	NTEP	National Type Evaluation Program
CC	Certificate of Conformance	OIML	International Organization of Legal Metrology
DES	Digital Electronic Scales	OWM	Office of Weights and Measures
HB 44	NIST Handbook 44	R	Recommendation
IZSM	Initial Zero-Setting Mechanism	SS	National Type Evaluation Program Software Sector
LMD	Liquid Measuring Device	S&T	Specifications and Tolerances Committee
MC	Measurement Canada	SMA	Scale Manufacturers Association
MRA	Mutual Recognition Agreement	WS	National Type Evaluation Program Weighing Sector

Details of All Items
(In order by Reference Key)

CARRY-OVER ITEMS

1. Recommended Changes to NCWM Publication 14 Based on Actions at the 2020 NCWM Annual Meeting

Source:
2020 NCWM Annual Meeting

Due to the cancellation of the NCWM Annual Meeting, there no item for this section of the agenda.

Discussion/Conclusion:

Mr. Darrell Flocken (NTEP Administrator) reported that because of the cancellation of the 2020 NCWM Annual Meeting, there are no new items to discuss. It was reported that a reduced 2020 NCWM Annual Meeting will be held directly before the 2021 NCWM Interim Meeting in January 2021 and will focus only on agenda items with a voting status. As there will be no possibility to hold a WS meeting after the voting and before the distribution of Publication 14, any adopted item will be included in the agenda for the 2021 WS meeting.

2. HB 44 Scales Code paragraph S.1.2.2.3. Deactivation of a “d” resolution

Source:
2018 S&T Committee Final Report

This item remains in the Carry-over section of this agenda as it is still an item being discussed at the National S&T Committee level. Several new proposals have been submitted, each addressing the concerns with the specification requiring $e = d$ when a Class I or II instrument is used in a direct sales application. An update on the S&T Committee agenda item will be provide.

Information contained in the 2019 Weighing Sectors Meeting Summary is repeated below for reference.

Background/Discussion: This item appeared on the 2018 Weighing Sector agenda as Item 1.a. and included not only a discussion of newly adopted Scales Code paragraph S.1.2.2.3. Deactivation of a “d” Resolution, but also a discussion on the interpretation of Scales Code paragraph S.1.2.2.2. Class I and II Scales used in Direct Sales. With respect to the paragraph S.1.2.2.3. Deactivation of a “d” Resolution, there were two recommendations to make changes to NCWM Publication 14 DES suggested by the NIST Technical Advisor, neither of which the Sector believed were immediately necessary after discussing the item. Thus, no changes were recommended by the Sector and the NIST Technical Advisor considers this portion of the item to be completed.

With regard to the Sector’s 2018 discussion on the interpretation of paragraph S.1.2.2.2., the NIST Technical Advisor provided OWM’s interpretation of how the paragraph applies. OWM’s interpretation of paragraph S.1.2.2.2. was that only the scale models having the same value of “d” and “e” would comply with paragraph S.1.2.2.2. as of its date of enforcement. That is, paragraph S.1.2.2.2. would not allow the disabling of the “d” resolution so that only “e” were displayed to enable a scale to be used in a direct sale application. The paragraph specifies the two values must be equal and the information provided on a CC confirms whether they are or aren’t equal. OWM’s interpretation of the paragraph prompted several members of the Sector to offer opinions on how they viewed the proper application of the paragraph and to raise questions concerning OWM’s interpretation of it. Members of the Sector concluded the intent of paragraph S.1.2.2.2. isn’t to require “e” and “d” to be the same value, but rather the paragraph should specify when “e” and “d” are different values, only the “e” value can be displayed on Class I and Class II scales used in a direct sale application. As a result of the Sector’s technical

position on this issue, Mr. Rick Harshman (NIST Technical Advisor) and Mr. Darrell Flocken (NTEP Administrator) agreed at the 2018 WS meeting to draft an NCWM Form 15 to amend the paragraph to reflect the Sector's technical position on this issue.

During the discussion of this item at the 2018 WS meeting, it was also suggested that the mechanism to disable/enable the "d" resolution needed to be secured (i.e., behind whatever means of security is provided). A final concern relating to Sector's plan to amend paragraph S.1.2.2.2. to allow for the disabling of the "d" resolution is the effect this might have on the display of values for scales that differentiate values of "d" and "e."

See the 2018 Weighing Sector Meeting Summary for additional details concerning the Sector's discussion of these two paragraphs and the conclusions reached by the Sector.

2019 NTEP Lab Meeting Discussion of Weighing Labs Item 2. The 2019 NTEP Lab Meeting included an item on the Weighing Labs agenda to discuss the outcome of the 2018 Weighing Sector's technical position on the application of paragraph S.1.2.2.2. Class I and II Scales used in Direct Sales. The NTEP weighing evaluators were asked to consider the following questions developed by the NIST Technical Advisor relating to the Weighing Sector's technical position:

1. If disabling of the "d" resolution is permitted on a Class I and II scale in which the values of "d" and "e" are different to allow use of the scale in a direct sale application, what additional NTEP inspection/testing is needed to confirm the scale complies in both applications? (Note: One test thought to be necessary is a test to confirm a scale is rounding properly once the "d" resolution is disabled).
2. What are "display" requirements for the two applications given that Scales Code paragraph S.1.2.2.1. requires the differentiation of the two values when both are displayed.
3. How are evaluators to reference the two applications on a CC so field officials can readily tell from the CC the permissible applications?
4. How are "e" and "d" to be marked on the scale for each application?
5. Must the disabling feature be a sealable event (i.e., behind the seal)?
6. How might paragraph S.1.2.2.2. be changed to reflect and make clear the Sector's interpretation.

OWM also noted that being able to disable the "d" resolution provides a means for service technicians to use the disabling feature to decrease scale resolution which can also change the outcome of a performance test (rejection versus approval).

Measurement Canada's Technical Advisor to the 2019 NTEP Labs reported MC had previously evaluated a scale that a manufacturer wanted to be able to produce. The "d" resolution on this scale could be deactivated using a switch that was behind the security mechanism. Mr. Harshman (NIST Technical Advisor) indicated this is exactly what he believes U.S. scale manufacturers want to be able to do; yet, when this is done, digital rounding may be an issue as well as how the weight information on the scale will be displayed (given the "d" resolution is required to be differentiated from the "e" resolution if "e" and "d" are continuously displayed during normal operation). An additional concern is how field officials will be able to easily determine if a CC issued for the device includes both applications? Mr. Darrell Flocken (NTEP Administrator) suggested manufacturers could make evident the two applications by listing each separately on the CC or including text in the "Standards Features and Options" block on the CC indicating the two different applications.

Mr. Flocken also commented during the 2019 NTEP Lab Meeting he believed the WS's technical position on this issue would not necessarily require a change to Scales Code paragraph S.1.2.2.2. Class I and II Scales Used in Direct Sales. A change to NCWM Publication 14 to allow for the deactivation of the "d" resolution is all that would be needed to include: 1) added test criteria that verifies proper rounding; 2) appropriate display of information; and 3) that the switch is located behind the sealing mechanism. Mr. Harshman concurred with Mr. Flocken's view and agreed to develop a 2019 Weighing Sector proposal to amend NCWM Publication 14 rather than draft proposed changes to paragraph S.1.2.2.2. as was previously agreed at the 2018 WS meeting.

Recommendation:

A discussion on the future implementation of Scales Code paragraph S.1.2.2.2. Class I and II Scales used in Direct Sales is a new item on the Weighing Sector's 2019 agenda (i.e., Additional Item 8) and may result in a Sector recommendation to postpone implementation of the paragraph and/or amendments to the paragraph. For this reason, the NIST Technical Advisor recommends discussing everything related to paragraph S.1.2.2.2. as part of Additional Item 8. Regarding Mr. Harshman's agreement at the 2019 NTEP Lab Meeting to develop a 2019 WS proposal to amend NCWM Publication 14, this work has not been completed because a Sector discussion of Additional Item 8 may result in there being no immediate need to amend NCWM Publication 14 DES.

Since it was decided at the 2019 NTEP Lab Meeting, changes to paragraph S.1.2.2.2. are not needed, the NIST Technical Advisor considers Item 2 of this agenda concluded. The item will not be carried over onto next year's WS agenda.

Discussion/Conclusion: This item was combined and discussed with New Item 8 of the 2019 WS agenda since they relate to the same issue; yet propose different Sector actions/recommendations. With respect to this particular item, Mr. Harshman (NIST Technical Advisor) explained he purposely had not drafted a 2019 WS proposal to amend NCWM Publication 14 as agreed at the 2019 NTEP Lab Meeting because he knew the outcome of a WS discussion of Additional Item 8 of this agenda may result in a recommendation to develop a WS proposal to amend HB 44 Scales Code paragraph S.1.2.2.2. Class I and II Scales used in Direct Sales or postpone its implementation. If the Sector were to agree to either of these actions after discussing the concern detailed in Additional Item 8, there would be no immediate need to develop a WS proposal to address the disabling of the "d" resolution on Class I and II scales in which "d" and "e" are different values in NCWM Publication 14. Because neither of these actions resulted from the Sector discussion of Additional Item 8, members of the Sector agreed Mr. Harshman should move forward with the development of a 2020 WS proposal to amend the DES part of NCWM Publication 14 to allow for the deactivation of the "d" resolution on Class I and II scales in which "e" and "d" are different values. It was also agreed the draft proposal should address all concerns made known at the 2019 NTEP Lab meeting as reported in the "Background/Discussion" portion of this item.

Mr. Harshman agreed to draft a proposal on behalf of the 2019 WS members and present the draft to Mr. Darrell Flocken (NTEP Administrator) and Mr. Rob Upright (Chairman of the 2019 WS) for final review.

2020 Weighing Sector Meeting:

During the 2020 WS Meeting, Mr. Rick Harshman (NIST, OWM) reported the following.

At the 2020 NCWM Interim Meeting the S&T Committee accepted NY's proposal to delete NIST Handbook Scales Code Paragraph S.1.2.2.3. Deactivation of a "d" resolution and paragraph S.1.2.2.2. Class I and II Scales Used in Direct Sales and made it a Voting item.

These two paragraphs address two entirely different concerns regarding a "d" resolution that differs from an "e" resolution on Class I and II scales. My personal belief is that NY believed these two paragraphs were somehow connected or were added to the handbook to address a similar issue, which is not at all the case.

Members of OWM's Legal Metrology Devices Program drafted paragraph S.1.2.2.3. in 2018 after it was brought to our attention there existed some Class II scales (and perhaps Class I also) that if the d resolution were turned off or deactivated, the scale would not round e values properly. This remains an ongoing concern and explains the need for this paragraph to remain in the handbook.

3. Implementation of NIST Handbook 44 Scales Code paragraph S.1.2.2.2. Class I and II Scales Used in Direct Sales

Source:

Mettler-Toledo, LLC

This item remains in the Carry-over section of this agenda as it deals with the same basic issue as in Item 2 of this document and it is still an item being discussed at the National S&T Committee level. Several new proposals have been submitted, each addressing the concerns with the specification requiring $e = d$ when a Class I or II instrument is used in a direct sales application. An update on the S&T Committee agenda item will be provide.

Information contained in the 2019 Weighing Sectors Meeting Summary is repeated below for reference.

Background

NIST Handbook 44 Scales Code paragraph S.1.2.2.2. Class I and II Scales used in Direct Sales was added to the Handbook in 2017 and will become enforceable for new scales going on the market in January 2020 with a retroactive date of January 2023. This change was made primarily due to the direct sales of cannabis to customers in several states and the scale operators were inexperienced with the higher precision scales and the need to calculate price only based on values of "e."

An unintended consequence is there are other applications, such as jewelry and gold, where Class I and II scales with $d \neq e$ are used by experienced operators and it is not clear whether or not the use of these scales is now permitted in direct sales. Discussions with several states show there is a lack of consistency in how these states interpret "direct sales" as it relates to these applications.

This new specification, if not modified, will result in Class I and II scales that support $d = e$ for direct sales but are more expensive in order to provide the same suitability for use as is available in $d \neq e$ scales. This and the concern that current scales will not be suitable after 2023 will be a burden for those in the jewelry business.

Recommendation: Further discussion is requested with the Weighing Sector to explore the proposed recommendations shown in the text boxes below and other alternatives.

The two recommendations are as follows:

1. Amend NIST Handbook 44 Scales Code paragraph S.1.2.2.2. Class I and II Scales Used in Direct Sales as follows:

S.1.2.2.2. Class I and II Scales Used in Direct Sales. – When accuracy Class I and II scales are used in direct sale applications the value of the displayed division "d" shall be equal to the value of the verification scale interval "e," and "e" does not equal "d," the commercial transaction shall be calculated based on the value of the verification scale interval "e" and not on the value of the displayed division "d."

[Nonretroactive as of January 1, 2020; to become retroactive as of January 1, 2023~~5~~]

(Added 2017)

2. Amend the current NIST Handbook 44 Appendix D definition of "direct sale" as follows:

direct sale. – A sale in which both parties in the transaction are present when the quantity is being determined. An unattended automated or customer-operated weighing or measuring system is considered to represent the device/business owner in transactions involving an unattended device. [1.10]. Verification of previously weighed and marked items is not considered a direct sale.

(Amended 1993 and 20XX)

NIST Technical Advisor's note and additional recommendation: *Should the Sector, after considering the changes proposed by this item, conclude the changes are not needed or are inappropriate, it is recommended the Sector develop and propose changes to NCWM Publication 14 DES to allow for the deactivation of the "d" resolution to include:*

- *added test criteria that verifies proper rounding when the d resolution has been deactivated;*
- *appropriate display of information; and*
- *that the switch to activate/deactivate the "d" resolution is located/secured behind the sealing mechanism.*

Discussion/Conclusion: Mr. Russ Vires (Mettler-Toledo, LLC) announced Mettler Toledo had updated its NCWM Form 15 proposal since the 2019 WS agenda had been circulated to members. As a result, the two recommended changes proposed by Mettler Toledo in the agenda are no longer valid. The following represents the most current changes being proposed by Mettler Toledo, LLC and will be considered by the four Regional Weights and Measures Associations when they meet in the fall of 2019:

S.1.2.2.2. Class I and II Scales Used in Direct Sales. – Except for jewelers' scales, when accuracy Class I and II scales are used in direct sale applications the value of the displayed division "d" shall be equal to the value of the verification scale interval "e.

[Nonretroactive as of January 1, 2020~~3~~; ~~to become retroactive as of January 1, 2023~~]

This updated proposal was projected onto a screen upon Mr. Vires announcement so members of the WS could consider its merits during the discussion of this item.

Mr. Marc Wolff (Mettler-Toledo, LLC) gave a very informative presentation on the operational characteristics of Class I & II scales with regard to scale resolution and the display of "e" and "d" values (his presentation slides have been inserted as an attachment to this report and are also posted on NCWM's website). His presentation focused on a very important concern Mettler Toledo has regarding the implementation of HB 44 Scales Code paragraph S.1.2.2.2. Class I and II Scales Used in Direct Sales. Of particular concern is the effect that the nonretroactive and retroactive dates of January 1, 2020 and January 1, 2023, respectively, are having on Mettler Toledo's marketing of Class II scales to the jewelry industry. Because this requirement becomes enforceable in only a few short months and then becomes retroactive in just a little over three years (Jan. 1, 2023), it is creating uncertainty in the marketplace. This uncertainty has led scale distributors of Mettler Toledo products to delay purchasing new Class II scales until it becomes clearer how weights and measures officials are going to apply the requirement once it becomes enforceable. The increased cost of the Class II scales suitable for this application having to comply with paragraph S.1.2.2.2. is thought to be fueling this market uncertainty. An Accuracy Class II scale with maximum capacity of 620 g and both "e" and "d" equal to 0.01 g costs more than two and a half (2.5) times that of an Accuracy Class II scale with the same capacity (620 g) with "e" equal to 0.1 g and "d" equal to 0.01 g.

Mr. Wolff offered the following justification for proposing jewelers' scales being exempt from paragraph S.1.2.2.2.:

- The buying and selling of jewelry (gemstones in particular) typically involves two companies and it is expected each will weigh the product;
- Weighing of gemstones (for trade) requires a Class I scale with the indication in millicarats (mct), 1 mct equals 0.2 mg (0.0002 g). Additionally, the value of "e" is required to be equal to 10 "d" on these scales;
- Accuracy Class I single-range scales with the value of "e" equal to "d" are not currently available from any scale manufacturer;

- Accuracy Class I scales are not permitted for use in direct sale applications outside the US.

Mr. Vires reported discussions with several states indicate there may be confusion in how paragraph S.1.2.2.2. is interpreted as it relates to jewelers' scales. Mr. Eric Golden (Cardinal Scale Manufacturing Co.) asked if a message could be posted on the Weights and Measures Directors' listserv asking for input on how this might be enforced?

Mr. Richard Harshman (NIST Technical Advisor) reported there isn't any way to prevent paragraph S.1.2.2.2. from becoming enforceable to new equipment placed into service as of January 1, 2020. One action the Sector could take is to develop a Sector position on the issue, providing members could agree on one, and then communicate that position to the different states using the Weights and Measures Directors' listserv. If members of the Sector can't agree on a position, the Sector's reporting that there was no agreement on a solution to this issue (no consensus reached) might alone be enough to provide indication to the community that there's a problem with the upcoming implementation of this paragraph. One other option might be to propose extending the dates of enforcement of paragraph S.1.2.2.2. if other Sector members believe more time would be helpful in alleviating the concern.

This ongoing discussion prompted other members to provide their opinions of the paragraph, the changes being proposed by Mettler Toledo, and acceptable/unacceptable applications of a Class II scale with different values of "e" and "d." Mr. Darrell Flocken (NTEP Administrator) and Mr. Loren Minnich (KS) indicated they felt the S&T Committee had made a mistake when forwarding existing paragraph S.1.2.2.2. as a voting item. This requirement should not have been drafted as a Specification Requirement. They advocated deleting paragraph S.1.2.2.2. and replacing it with a User Requirement. As a User Requirement it becomes more of an issue involving enforcement rather than the design of a device. Mr. Minnich noted there are several new items on the agenda of the S&T Committees of the Regional Associations proposing changes relating to this issue in the coming year. One of those items proposes deleting the current Specification Requirement and replacing it with a User Requirement.

Mr. Harshman commented he was not in favor of the exemption proposed by Mettler-Toledo. There should be only one scale resolution on scales used in a direct sale application. This should apply across the board regardless of the commodity being weighed. He noted "e" values do not round when "e" and "d" are different values on a Class I and II scale. Both, therefore, must be read to obtain an accurate weight determination. You can't simply ignore "d" because it is the "d" value that provides indication of where an applied load happens to fall between two increments of "e." What prompted Oregon (in 2017) to draft paragraph S.1.2.2.2. was that Inspectors in that State discovered some scale operators reading just the "e" value and others reading both "e" and "d." It was very confusing. OIML R-76 does not permit a second resolution on scales used for direct sale. Mr. Harshman also commented he agreed with Mr. Flocken and Mr. Minnich that the requirement should have been drafted as a User Requirement.

Mr. Vires followed up by reminding everyone there are already some requirements in HB 44 Scales Code that are specifically applied to "jewelers' scales." He stated it was his hope in submitting this item to the Sector that members could agree on a possible solution and a Sector position could be attained and then communicated to the states in hopes of diffusing much of the uncertainty in the marketplace.

Mr. Rob Upright (WS Chairman) asked the group if there was interest in seeing if members could agree on a position. He first elected, however, to poll the different members of the Sector to determine whether they supported Mettler- Toledo's proposal. It became evident during this process that agreement could not be reached on a WS position.

Mr. Flocken, acknowledging an earlier statement made by Mr. Harshman, suggested the WS could issue a statement of sorts stating that there has not been any consensus reached regarding this issue. Alternatively, the Sector might simply remain silent. It could be beneficial to wait and see what comments come out of the fall Regional Association Meetings.

In conclusion, members of the Sector agreed there is no consensus for a resolution of this issue; however, there was general agreement paragraph S.1.2.2.2. would be better suited as a User Requirement.

2020 Weighing Sector Meeting:

During the 2020 WS Meeting, Mr. Darrell Flocken (NTEP Administrator) reported that this item remained on the WS agenda because of the cancelled 2020 NCWM Annual Meeting. It was also reported that this item was given a Withdrawn status coming out of the 2020 NCWM Interim Meeting. The Withdrawn status was assigned as a third proposal from the State of New York (S&T agenda item SCL 20.10) recommended the removal of Handbook 44, Scales Code, paragraphs S.1.2.2.2 and S.1.2.2.3. This item was given a Voting status. If item SCL 20.10 is adopted, this item addresses a concern that no longer exists. However, if item SCL 20.10 is defeated, the submitter may want to resubmit this proposal.

4. Verifying the Performance Adequacy of a Reference Scale

Source:

NIST OWM's Legal Metrology Devices Group

Background

At the 2019 NCWM Annual Meeting, the NCWM adopted amendments to the Belt-Conveyor Scales Systems (BCSS) Code, including adding a new Accuracy Class 0.1 and accompanying Note paragraph that requires the quantity of material used to conduct a material test on a Class 0.1 BCSS to be weighed on a reference scale to an accuracy within 0.035% (which equates to 0.35 lb/1,000 of test load). The tolerance to be applied to an Accuracy Class 0.1 BCSS is +/- 0.1% of the test load. OWM has some questions regarding the means of verifying the accuracy of some scales using procedures that will ensure when those scales are used to weigh material for a material test of a Class 0.1 BCSS, the actual mass of the material is within the 0.035% specified. Mr. John Barton (NIST OWM) and Mr. Rick Harshman (NIST OWM) will provide an overview of some test procedures being developed by OWM that can hopefully be used to confirm the adequacy of the reference scale (when used as a mass comparator) so that the scale can then be used to weigh reference material to within the 0.035% accuracy specified.

Although the NTEP Belt-Conveyor Scale Sector will be considering recommended changes to the Belt-Conveyor Scale and Weigh-Belt Systems portion of NCWM Publication 14 in the near future, it is thought members of the Weighing Sector might find this topic of interest because reference scales are used in other applications and may need to be tested similarly to determine their adequacy for use in weighing material. For example, reference scales are used to verify the performance of CNG Retail-Motor Fuel Dispensers.

Discussion/Conclusion: Mr. John Barton (NIST OWM) provided an overview of some of the changes that were adopted at the 2019 NCWM Annual Meeting affecting the Belt-Conveyor Scales Systems (BCSS) Code. Most notably are new requirements intended to address a 0.1 Accuracy Class BCSS. As its accuracy class implies, the tolerance to be applied to a 0.1 Accuracy Class BCSS will be $\pm 0.1\%$ of the test load, which is the level of accuracy some manufacturers of weigh-belts (a type of belt-conveyor scale system) are claiming their systems can meet. Measurement Canada has evaluated at least one of these systems and found its performance to be within the specified tolerance.

A new Notes paragraph being added to the BCSS Code in 2020 requires the quantity of material used to conduct a material test on a 0.1 Accuracy Class BSCS to be weighed on a reference scale to an accuracy of 0.35 %. This item was added to the Weighing Sector's 2019 agenda to solicit input from members on how best to establish the test loads needed to be able to test these systems in a field environment given the degree of accuracy required of the material. Scales performing to within this level of accuracy (0.035%) may not be available or the procedures typically used to verify the accuracy of some scale types may not be adequate to ensure that when product for a material test is weighed on those scales it will be within the 0.035% specified. For example, a section test on a vehicle scale using 25 000 lb of certified test weight and each section determined to be within 0.035% of the applied test load doesn't ensure axle-loads of vehicles positioned on these same sections weighing 35 000 lb will also be within 0.035% of their true value. Additionally, influences from environmental conditions

may result in the need to postpone tests to a time when more favorable conditions exist. Measurement Canada's testing of one of these systems involved using a static railroad scale as a mass comparator and two test cars of known mass; one approximately equal to the weight of an empty railcar, and the other, approximately equal the weight of a railcar filled with material.

NTEP may soon begin receiving applications for type evaluations of these higher accuracy (0.1%) BCSSs. It too will need test procedures for verifying the adequacy of a reference scale used to weigh the material used for testing these higher accuracy systems. Current NCWM Publication 14 BCSS procedures for verifying the adequacy of a reference scale are intended for reference scales used to weigh product for a material test of BCSS having an applicable tolerance of $\pm 0.25\%$. These current procedures are inadequate for use in verifying the adequacy of a reference scales used for weighing product for a material test of a BCSS system with a $\pm 0.1\%$ applicable tolerance.

The development of adequate test procedures for the reference scale will be a main focus of an upcoming meeting of the NTEP Belt-Conveyor Scale Sector. The meeting is planned for October 2019.

During the discussion of this item, Mr. Pascal Turgeon (Measurement Canada) and Mr. Zach Tripoulas (MD NTEP evaluator) offered to provide assistance in the development of the procedures.

2020 Weighing Sector Meeting:

During the 2020 WS Meeting, Mr. John Barton (NIST, OWM) updated the participants on the ongoing efforts of addressing the best approach to defining the needs and performance level of a reference scale needed to perform testing on a Class 0.1 Belt Conveyor Scale. Mr. Barton also mentioned his appreciation for the information and documentation sharing offered by Measurement Canada. Mr. Barton reported that he hopes to hold a meeting of the work group in the late September time frame to keep this item moving forward.

NEW ITEMS

5. Marking the Concentrated Load Capacity (CLC) When Two Vehicle Scale Platforms are Installed in a Side-By-Side Configuration

Source:

Mettler-Toledo, LLC

Background:

There is no clear information in Pub 14 or Handbook 44 for CLC marking requirements for side-by-side vehicle scale when used as:

1. Side-by-side complete scale with total weight summed
2. Side-by-side not complete scale where one side used as weigh in, the other as weigh out

Recommendation:

Mettler Toledo is recommending Publication 14 be revised as shown in the box below.

5. Additional Marking Requirements- Livestock, Vehicle, and Railway Track Scales

Code Reference: G-S.1., G-S.5.1., S.6.3, S.6.4. and S.6.5.

5.1. The section capacity of a railway track and livestock scale shall be marked on or adjacent to the identification badge on the indicating element. The section capacity shall be prefaced by the words "Section Capacity" or an abbreviation of that term. Abbreviations shall be "Sec Cap" or "Sec C." All capital letters and periods may be used.

5.2. Vehicle or axle-load, scale shall be marked with the concentrated load capacity of the scale. Such marking shall be identified as "concentrated load capacity" or by the abbreviation "CLC" and shall be accurately and conspicuously shown:

5.2.1. On, or adjacent to, the identification or nomenclature plate that is attached to the indicating element of the scale. **AND**

5.2.2. On the load-receiving element of the scale. These capacity markings shall be added to the load-receiving element of any such scale not previously marked at the time of modification.

5.3. The marked nominal capacity on all vehicle and axle-load scales shall not exceed the concentrated load capacity times the quantity of the number of sections in the scale minus 0.5.

5.4. Combination vehicle/railway track and combination vehicle/livestock scales shall be marked with (1) the nominal capacity and CLC for vehicle weighing, and (2) the nominal capacity and section capacity for railway and livestock weighing. The emin for both vehicle weighing and railway weighing shall also be marked.

Note: Combination scales (vehicle/railway track and vehicle/livestock) shall be marked with all required information

5.5. The marked concentrated load capacity (CLC) for a side-by-side vehicle scale:

5.5.1. Complete scale side-by-side would be marked with 2 x CLC that is listed on CoC

5.5.2. Side-by-side not a complete scale each side would be marked with CLC that is listed on CoC

5.5.6. The nominal scale capacity for railway track scales shall not exceed the lesser of (1) The sum of the Weigh Module Capacities as shown in Table S.6.4.M. or Table S.6.4, or (2) the Rated Sectional Capacity (RSC) multiplied by the Number of Sections (Ns) minus the Number of Dead Spaces (Nd) minus 0.5. As a formula this is stated as $RSC \times (Ns - Nd - 0.5)$, or (3) 290 300 kg (640,000 lb)

NTEP Administrators Note: Handbook 44, Scales Code, Section S.6.1. mentions that the CLC value is used in the formula as a variable in determining the Nominal Capacity of a vehicle or axle load scale. The decision to move forward with this proposal must consider any impact to the application and use of this formula.

S.6.1. Nominal Capacity; Vehicle and Axle-Load Scales. – For all vehicle and axle-load scale, the marked nominal capacity shall not exceed the concentrated load capacity (CLC) times the quantity of the number of sections in the scale – 0.5.

As a formula, this is stated as: $\text{nominal capacity} < \text{CLC} \times (N - 0.5)$

Where N = the number of sections in the scale.

[Nonretroactive as of January 1, 1989]

Discussion/Conclusion:

This item was introduced, and the discussion was led by Mr. Scott Davidson (Mettler-Toledo, LLC). Mr. Davidson mentioned that there was no clear direction regarding the marking of the Concentrated Load Capacity CLC value when a two platform vehicle scale was used to weight off road or oversize vehicles where the vehicle is positioned on both weighing/load receiving elements (w/lre). The possibilities were that each w/lre was marked as a separate device with the CLC and capacity values within the value range stated on the NTEP Certificate of Conformance, or the two devices were considered one complete device and the CLC and capacity values would be marked as two times that of a single device.

During the discussion, comments were heard from Eric Golden (Cardinal Scale Manufacturing Co.) Rick Harshman (NIST, OWM), and Loren Minnich (Kansas) with all stating that in a side-by-side installation, as described, each w/lre would be considered a separate device and should be marked with individual CLC and capacity values. It was also noted that this will require the identification of each w/lre when applying the CLC and capacity marking on the indicating element.

Based on the agreement that each w/lre should be marked as a separate and individual device, it was noted that no change to paragraph 5. ***Additional Marking Requirements- Livestock, Vehicle, and Railway Track Scales*** was

Needed, however; it was agreed that some clarification of the marking requirements would be of value. To support this, the following change to paragraph 5.2. was agreed to. This change will be included in the 2021 edition of Publication 14.

5. Additional Marking Requirements- Livestock, Vehicle, and Railway Track Scales

Code Reference: G-S.1., G-S.5.1., S.6.3, S.6.4. and S.6.5.

5.1. The section capacity of a railway track and livestock scale shall be marked on or adjacent to the identification badge on the indicating element. The section capacity shall be prefaced by the words "Section Capacity" or an abbreviation of that term. Abbreviations shall be "Sec Cap" or "Sec C." All capital letters and periods may be used.

5.2. Vehicle or axle-load, scale shall be marked with the concentrated load capacity of **each load-receiving element**, ~~the scale~~. Such marking shall be identified as "concentrated load capacity" or by the abbreviation "CLC" and shall be accurately and conspicuously shown:

5.2.1. On, or adjacent to, the identification or nomenclature plate that is attached to the indicating element of the scale. **AND**

5.2.2. On the load-receiving element of the scale. These capacity markings shall be added to the load-receiving element of any such scale not previously marked at the time of modification.

5.3. The marked nominal capacity on all vehicle and axle-load scales shall not exceed the concentrated load capacity times the quantity of the number of sections in the scale minus 0.5.

5.4. Combination vehicle/railway track and combination vehicle/livestock scales shall be marked with (1) the nominal capacity and CLC for vehicle weighing, and (2) the nominal capacity and section capacity for railway and livestock weighing. The emin for both vehicle weighing and railway weighing shall also be marked.

Note: Combination scales (vehicle/railway track and vehicle/livestock) shall be marked with all required information

5.5. The nominal scale capacity for railway track scales shall not exceed the lesser of (1) The sum of the Weigh Module Capacities as shown in Table S.6.4.M. or Table S.6.4, or (2) the Rated Sectional Capacity (RSC) multiplied by the Number of Sections (Ns) minus the Number of Dead Spaces (Nd) minus 0.5. As a formula this is stated as $RSC \times (Ns - Nd - 0.5)$, or (3) 290 300 kg (640,000 lb)

6. Change in Meeting Documentation Development Process

Source:

NTEP Administrator

Background:

The responsibility for the development of the meeting agenda and summary documents has changed. Beginning with the 2021 meeting a member of the Weighing Sector, with the help of NTEP personnel, will assume this responsibility. This change is based on direction from the NTEP Committee and the NCWM Board of Directors and aligns the responsibility with the current action of other Sectors, Work Groups, and Task Groups.

During the transition period from now until the 2021 meeting, the NTEP Administrator will create the meeting agenda and complete a meeting summary report for distribution to the Sector Members, at a later date.

In addition to the assignment of the individual or individuals responsible for these documents, I would encourage the Sector to develop a timeline document to assist the individual in the ability to develop a meeting agenda in a timely manner and with the least impact to their current responsibilities. Due to meeting time constraints, I would offer my assistance to develop this timeline document offline, with the distribution, review, and acceptance of the document to occur within six months from the adjournment of this meeting. A few items to be addressed in this timeline document would be:

1. A deadline for the submittal of new proposals, and reports from subgroups with specific assigned tasks,
2. A deadline for the distribution of the agenda and summary documents.

I would suggest that the timeline document be placed on the Weighing Sector home page on the NCWM Web Site.

Discussion/Conclusion:

As reported at the 2020 NCWM Interim in Riverside, CA, NIST and the NCWM Board of Directors agreed to a change in the responsibilities for the development of the meeting agenda and the writing of the meeting summary. This change removes these tasks from the NIST Technical Advisor and moves them to the responsibility of the individual Sectors. To move forward with this change, the Sector Members are tasked with creating a position assigned to an individual who will be responsible for creating these documents. I need to point out that the NIST and NTEP Technical Advisors will support the individual in these tasks. As this may be the first you heard of this change, the NTEP Technical Advisor agreed to write the Meeting Summary for the 2020 meeting.

During the discussion, Mr. Loren Minnich (Kansas) agreed to accept this task. Ms. Tina Butcher (NIST, OWM) and Mr. Darrell Flocken (NTEP Administrator) provided comments on how this is a shared task at the National S&T Committee for the writing of their meeting summary.

Mr. Flocken mentioned that he is planning to develop a sector guideline document including possible work instructions and timelines that will be usable by all sectors.

Mr. Rob Upright (Sector Chair) thanked Mr. Minnich for agreeing to fill this position beginning with the 2021 WS meeting.

7. Discussion regarding Load Cell Capacities and v_{min} Values on NTEP Certificates of Conformance

Source:

Cardinal Scale Manufacturing Company

Background:

Mr. Eric Golden (Cardinal Scale Manufacturing Co.) introduced the idea of creating a method to allow the elimination of the table listed on the NTEP Certificate of Conformance (CC) that mentions specific technical specification such as capacity and v_{min} .

Discussion/Conclusion:

Mr. Golden pointed out that a capacity range is mentioned in the For: box of a CC, however; the table in the Standard Features and Options box lists specific capacities. In the event that a manufacturer wants to build a capacity that is within the capacity range in the For: box but not listed in the table, the manufacturer must submit an application to add this single capacity to the table.

Mr. Darrell Flocken (NTEP Administrator) mentioned that NTEP has no policy specifically stating the need for the table, however; the v_{min} value listed in the table, by device capacity, is needed to permit field officials to confirm the use of the proper load cell or load cell replacement when determining suitability of the load cell using the v_{min} Relationship Formula in Handbook 44, Scales Code, Paragraph S.5.4.

Mr. Golden explained that OIML has a method that allows the v_{min} value to be calculated using other specifications of the load cells performance. Using this method eliminates the need for the table listing each capacity and its associated v_{min} value.

Mr. Golden asked for volunteers to work with him to develop a proposal to remove the need for the table. The following individuals agreed to participate:

Scott Davidson	Mettler-Toledo, LLC
Darrell Flocken	NCWM
Andy Goddard	Marel
Jan Konijnenburg	Rice Lake Weighing Systems, Inc.
Rob Upright	VPG Transducers

Note: NTEP can support this work group by offering the use of the NCWM Zoom meeting scheduling capabilities.

8. Discussion on Use of Vehicle and Axle-Load Scales in Charging Service Fees

Source:

NIST-OWM

Background:

Mr. Rick Harshman (NIST, OWM) discussed a new proposal submitted to the Regional S&T Committees addressing the use of a vehicle and axle-load scales when charging a service fee.

Discussion/Conclusion:

Mr. Harshman explained that this is a developing item and was interested in any comments or feedback the meeting participants may have on the subject. Several members provided comments. Additional comments, or questions should be directed to Mr. Harshman.

9. Share New S&T Regional Proposal – Modify HB44, Scales Code, S.1.1. Zero Indication

Source:

Jack Walsh (Town of Wellesley, MA)

Background:

This item is being presented to the meeting participants as information only.

Discussion/Conclusion:

Mr. Darrell Flocken (NTEP Administrator) commented that the proposal recommends a change to requiring the display of a zero load indication when the scale enters into or during the operation of a screen saver or power saver mode. This proposal was submitted to the Region S&T Committee for discussion and possible addition to the NCWM S&T Committee Agenda for the 2021 meeting cycle. The submitter is recommending a voting status for the proposed specification changes. As the item deals with an issue related to scales, it was felt that there was merit with sharing this item to the meeting participants. Comments, or questions regarding this item should be directed to the submitter or presented during the Committees open hearings.

10. Next Meeting

The sector agreed to hold its next meeting during the week of August 16, 2021. This would have Monday, August 16, 2021 as a travel day with the meeting days being Tuesday and Wednesday, August 17th and 18th, 2021 respectively. The members recommended meeting locations of Annapolis, Maryland; Pittsburgh, Pennsylvania; or Minneapolis, Minnesota.

Mr. Darrell Flocken (NTEP Administrator) reported that due to a decrease in membership and attendance of the Belt Conveyor Scale Sector (BCSS), consideration is being given to combining the Belt Conveyor Scale Sector meeting with the Weighing Sector (WS) Meeting. Both Sectors will maintain their individual identity. The combined meeting agenda would be such that the BCSS agenda items would be placed first or last in consideration of their members time. However, BCSS members will be welcome and encouraged to participate in the WS meeting and the WS members will be welcome and encouraged to participate in the BCSS meeting.

11. Meeting Attendees

The following individuals participated in the 2020 Weighing Sector meeting.

Weighing Sector Members:

Rob Upright	VPG Transducers
Darrell Flocken	NCWM
Loren Minnich	Kansas
Tina Butcher	NIST, Office of Weights and Measures
Rick Harshman	NIST, Office of Weights and Measures
Tom Buck	Ohio
Kevin Chesnutwood	NIST, Office of Weights and Measures
Andy Goddard	Marel
Robert Meadows	Kansas
Bill Miller	Mettler-Toledo, LLC
Eric Morabito	New York
Cinthia Reyes	California
Zacharias Tripoulas	Maryland
Pascal Turgeon	Measurement Canada
Steven Beitzel	Systems Associates, Inc.
Scott Davidson	Mettler-Toledo, LLC
Eric Golden	Cardinal Scale Manufacturing Co.
Scott Henry	Zebra Technologies
Jan Konijnenburg	Rice Lake Weighing Systems, Inc.
Louis Straub	Fairbanks Scales, Inc.
Russ Vires	Mettler-Toledo, LLC
Jerry Wang	A&D Engineering, Inc.

Other Participants:

John Barton	NIST, Office of Weights and Measures
Mike Manheim	NCWM
Luciano Burtini	Measurement Canada
John Roach	California
Sprague Ackley	Digimarc