

National Type Evaluation Program

Weighing Sector Agenda

August 18, 2026; 9:00 am to 5:00 pm

August 19, 2026, 9:00 am to 12:00 pm

St. Louis, Missouri

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, 2.21 Belt-Conveyor Scale Systems, 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 the National Council 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.

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
ABWS	Automatic Bulk Weighing Systems	NCWM	National Council 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)

1. Items that were adopted at the 2026 Annual meeting of the NCWM.

1.1 ITEM BLOCK 2 (B2) – REFERENCES TO TYPE EVALUATION

Source:

NIST Office of Weights and Measures

Purpose:

To remove several paragraphs that require a device or systems to comply with NIST Handbook 44, before being submitted for NTEP evaluation.

Original Justification:

These paragraphs specify that a device must meet NIST Handbook 44 requirements before being submitted for type evaluation. These paragraphs were part of various codes when they had a tentative status but were not removed when the code was changed to permanent status.

Codes adopted prior to 1998 did not include a variation of this paragraph. The language creates a circular argument, in that a device can't be determined to comply with NIST Handbook 44 until evaluated, but the device can't be submitted for evaluation until it is determined to comply with NIST Handbook 44.

The submitter acknowledged that these paragraphs establish the responsibility of manufacturers to design devices that comply with NIST Handbook 44 requirements, and, although they are not included in each section, they should remain.

Recommendation:

The NCWM adopted this item. No action is needed by the Weighing Sector informational only.

Discussion/Conclusion:

1.2 ITEM BLOCK 3 (B3) – METHOD OF SEALING, CATEGORY 3

Source:

Endress+Hauser Flow USA Inc. and Metron

Purpose:

In 2022, HB 44 Code Section 3.30 LMD Table S.2.2 Methods of Sealing, Category 3 was amended. The purpose of this proposal is to amend the same section found in the other HB 44 Device 3.XX Code Sections with the same language.

Original Justification:

Technology has advanced in all measurement areas with the integration of electronics for measuring devices and wireless transmission.

It is not practical to have direct wired connections to measuring devices where there are multiple devices or where access is limited for safety or installation requirements.

It was shortsighted to not address this when the change was made to 3.30 LMD Table S.2.2 Methods of Sealing Category 3 back in 2022.

The proposed language enables non-wired transmission from the measuring device to another device from which the information can be printed.

The submitter acknowledged these potential arguments against:

Do not change the other code sections Method of Sealing Category 3 because the LMD code section was modified for RMFDs which are burdened if required a direct wired connection.

Devices are not secure and could be fraudulently adjusted if wireless transmission is allowed for all measuring devices.

Weighing devices in Code Sections 2.XX are not recognized in the proposal.

The submitter requested Voting status in 2026.

Recommendation:

The NCWM adopted this item. The NTEP administrator recommends changing the sealing section in Publication 14 Digital Electronic Scales for all device types to reflect the language adopted in Block 3 for category three sealing.

Discussion/Conclusion:

1.3 SCL-25.1 S.5.2., S.6., and UR.3.1

Recommendation:

The NCWM adopted this item. No action is needed by the Weighing Sector informational only. The 20 d is a recommendation not a requirement and NTEP does not focus on User requirements.

Discussion/Conclusion:

Carry-over Items

1. Verifying the Performance Adequacy of a Reference Scale and Recommendations for Amendments to Publication 14 for Belt Conveyor Scales

Source:

NIST OWM's Legal Metrology Devices Group

Background:

During a 2016 meeting of the USNWG on BCS, the USNWG recognized that there has been a difference of opinion in the interpretation of tolerance application among regulatory officials, manufacturers, and users of belt-conveyor scale type systems. The work group confirmed through their discussions that the tolerance prescribed in Handbook 44 Section 2.21. are being applied to the range of test run results by some evaluators as a “plus or minus” tolerance while others are taking a more conservative position and applying the tolerance as an absolute value. This lack of clarity in the Belt-Conveyor Scale Systems Code and the difference in interpretation of how the tolerance is to be applied was identified as a source of inconsistency in the regulation of this type of dynamic weighing systems. Since the USNWG recently amended the Belt-Conveyor Scale Systems Code to recognize systems that operate using multiple rates for the flow of material, this inconsistency was considered to be a significant issue that the work group should address.

The USNWG consulted past records of work group meetings, NTEP Sector meetings, and NCWM conference reports, along with other resources in attempts to determine the correct and intended application of the allowable variation between consecutive test runs when material tests are conducted. The USNWG was unable to arrive at any definitive conclusion on this issue through this research but they agreed it is necessary to amend the Belt-Conveyor Scale Systems Code to clearly identify the proper application of tolerances under specific sets of test conditions.

After lengthy discussion and much deliberation, the USNWG arrived at a consensus and agreed the existing tolerance should be applied as an absolute value when comparing test results performed under practically identical conditions (referring primarily to the flow rate of material). They also concluded that when comparing test results from test 1 runs performed under different conditions, the tolerance should be applied as a plus or minus value to the range of 2 test results.

The changes included in the attached proposal are intended to clarify how the prescribed tolerances are to be applied when comparing totalization operations during material tests on a “belt-conveyor scale system” or a “weigh-belt system.” The recommended changes will specify the application of tolerance when material test runs are performed under practically identical conditions, and the proper application of tolerance when those test runs are performed under different conditions.

During deliberations on the issue of how tolerances are to be applied in a comparison of material test results, the USNWG acknowledged that advances in design and technology have resulted in belt-conveyor scale systems and weigh-belt systems capable of performing within more stringent tolerances. The work group also recognized that the international recommendation OIML (R50) incorporates different accuracy classes for these types of systems. It was also noted the Handbook 44 Scales Code (Section 2.20.) incorporates different accuracy classes for weighing devices regulated under that code. The members of the work group agreed there were benefits to introduce different accuracy classes for belt-conveyor scales and weigh-belt systems in Handbook 44 Section 2.21., believing that adding another accuracy class of dynamic weighing systems would provide more alternatives for determining the weight of various products in a wider array of commercial applications.

The additional changes in this proposal recommending the introduction of two different accuracy classes would retain the existing performance requirements (0.25 % relative to the weight of reference material used) and add a second accuracy class for devices/systems capable of complying with more stringent performance requirements (0.1 % relative to the weight of the reference material). In addition to introducing a new accuracy class with a smaller tolerance, other changes are included in this proposal to accommodate the addition of a second accuracy class. This proposal also recommends changes to account for differences in minimum scale division size, marking requirements, minimum test load size, and requirements pertaining to zero-tests (see attached document). These changes to the U.S. standards will harmonize more closely with international recommendation OIML R50 and

bring the Belt-Conveyor Scale Systems Code in alignment with certain requirements in the Scales Code in Handbook 44.

There may be opposing arguments from some that do not support allowing a “plus or minus” application of tolerances to the range of results from consecutive material test runs when those runs are performed under different flow rates.

In proportion to the number of these types of systems in commercial use, there are relatively few systems that are installed in a manner with the intent and/or ability to alter the flow rate of material.

Ensuring compliance with the provisions outlined in Section 3.2. in the Fundamental Considerations of Handbook 44 may prove challenging in some installations, depending upon the available equipment for weighing reference materials and conducting the test of the belt-conveyor scale system or weigh-belt system. The USNWG has received information, however, from a device manufacturer (and member of the USNWG) that has demonstrated that these requirements are achievable.

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 $\pm 0.1\%$ 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: Belt Conveyor Scale Sector members in attendance at the October 29, 2019 meeting were notified that changes being recommended for NCWM Publication 14 were posted on the NCWM’s website approximately two weeks prior to the meeting. Not all members at the Sector meeting had the opportunity to complete a full review of those recommended changes. Those Sector members agreed they would complete their review and provide any comments regarding edits or other changes by Friday, November 1, 2019. Those comments would be provided to NIST technical advisor who would then incorporate any necessary changes and forward the amended recommendations to the NTEP Administrator prior to the November 15th deadline. No significant changes were recommended by members attending the October 29, 2019 Sector meeting.

During the 2019 Weighing Sector 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.

2021 Weighing Sector Meeting:

John Barton provided background information related to the need for the development of a test procedure for the use of a reference scale to weigh material that will be used for the evaluation and testing of a belt-conveyor scale designed to perform to the new Class 0.1 tolerance. Peter Sirrico provided an overview of the test procedure used to evaluate this type of instrument. John Barton commented that he is heading up a Work Group charged with researching possible ways to use existing an scale as a reference scale while maintaining confidence that the accuracy of the reference material is held to the required value of 1/3 of the applied tolerance.

John Barton asked if anyone would be willing to participate in the Work Group. Eric Golden (Cardinal Detecto), and Kevin Chesnutwood (NIST Force Group) offered to participate in the Work Group. Pascal Turgeon (Measurement Canada) offered to share the Measurement Canada EPO and any supporting documentation from either him or Ron Peasley (Measurement Canada).

The item remains on the Weighing Sectors Agenda as a Carry Over Item for the 2022 Weighing Sector Meeting.

2022 Weighing Sector Meeting:

The members present agreed that this item is important to the testing of a belt-conveyor scale operating at the 0.1% tolerance level. The members also agreed that the item requires additional work and agreed to keep the item on the Weighing Sector Agenda for the 2023 meeting.

Discussion/Conclusion

2025 Update:

Peter J. Sirrico, consultant for Thayer Scale, was unable to attend this year's meeting. This item will remain on the agenda for 2026 and if there is no change it will be removed. Additionally, it was recommended to review past discussions, specifically from Darrel Flocken and John Barton, on this topic and create a subgroup to move the proposal forward. The subgroup can include NTEP, Thayer Scale, NIST, and Measurement Canada. Jeff Gibson will work with Peter Sirrico to start the subgroup. Specific topics include reviewing past information, reviewing the need for 0.1 accuracy, and reviewing the guidelines for accuracy class selection.

2026 Update:

Time to remove from the agenda?

2. Automatic Weighing System, Static vs Dynamic Testing, VCAP

The NCWM/NTEP has been approached with the idea of modifying or removing the need to perform dynamic testing under the influence of temperature. This is a carryover item from the 2023 Weighing Sector meeting to allow any additional information to be brought forward.

2024 Weighing Sector:

The ad hoc group Marel/Mettler-Toledo needs to submit form 15 to change NTEP policy to remove the dynamic portion of influence testing from VCAP. Marel thinks a report needs to be generated from the data collected.

Discussion/Conclusion:

2025 Weighing Sector:

Marel/Mettler-Toledo will continue working on this and reconvene next year at the weighing sector. The action items include seeing if additional AWS manufacturers will participate and capturing data that confirms if static and dynamic results are the same. The data will need to be normalized to compare various scale capacities. The data can be sent to NTEP who would present the anonymous data to the NTEP Committee. The data does not need to be extensive. The weighing sector can submit a form 15 by November but chose not to for this item at this time.

2026 Weighing Sector:

Discussion/Conclusion:

New Items

1. Permanence testing is it needed when the D value is lowered but capacity remains the same.

Source: NTEP Administrator

NTEP does not have a position currently; there is nothing listed in technical policy and this has been handled on a case-by-case basis in the past. NTEP believes it would be beneficial for manufacturers and evaluators to have this in technical policy, so NTEP is looking for feedback from manufacturers of devices.

Discussion/Conclusion:

2. Benefits to having the steel thickness, gauge and height of the device listed on the certificate?

Source: NTEP Administrator

NTEP has been contacted by regulatory and service companies that having the height of the device and the steel thickens or gauge would be beneficial.

Discussion/Conclusion:

3 Accuracy of Net Zero (See NIST Accuracy of Net Zero) attachment.

Source: NIST

Jan Koinineburg with the NIST OWM will give a short presentation on Accuracy of Net Zero.

Discussion/Conclusion:

4. Progressive Tare (See Weighing Sector Agenda Item Progressive Tare) attachment.

Source: Richard Suiter Consulting

Discussion/Conclusion

5. Permeance of markings on devices exposed to the elements. (See Permeance of Markings)

Source: Kansas

Discussion/Conclusion:

6. Measurmenat Canada updating Field Verification requirements (See MC Agenda Item 1 thru 3)

Source: Measurement Canada

Discussion/Conclusion:

7. Weighing Sector 2027 meeting location

Source: NTEP Administrator

The Weighing Sector meets the third week of August and is a one- or two-day meeting. Looking for location recommendations.

8. Meeting Attendees

The following individuals participated in the 2026 Weighing Sector meeting.

Name	Company

End of Report