

Appendix E

National Type Evaluation Committee (NTETC) Belt-Conveyor Scale (BCS) Sector

February 25, 2010
Meeting Summary

A. NCWM Publication 14 Updates	E1
1. Handbook 44, UR.3.2. (S&T Committee agenda Item 321-1).....	E1
2. Handbook 44, S.1.3.1. (S&T Committee agenda Item 321-3)	E1
3. Handbook 44, N.2.and N.2.1. (S&T Committee agenda Item 321-5) (Number of Tests during Initial Verification).....	E2
4. Handbook 44, T.1.1. (S&T Committee agenda Item 321-6).....	E3
5. Handbook 44, Sections N.3.1.2., N.3.1.3., and S.3.3.1.	E3
B. Proposed Update to NCWM Publication 14 Belt-Scale Checklist	E4
C. Develop a List of Sealable Parameters for BCS Systems.....	E5
D. New Business	E6
1. Revisit parameters used to categorize "Family" groups.....	E6
E. Attendance	E6

A. NCWM Publication 14 Updates

1. Handbook 44, UR.3.2. (S&T Committee agenda Item 321-1)

Background: At the 2009 National Conference on Weights and Measures (NCWM) Annual Meeting, the Conference adopted an amendment to paragraph UR.3.2. to clarify that zero-load and material or simulated-load tests are required to be performed between official testing at intervals determined by the statutory authority or by the manufacturer. Full details of the amendments to the National Institute of Standards and Technology (NIST) Handbook 44 (HB 44) may be found in the Specifications and Tolerances (S&T) Committee 2009 Interim Report.

Discussion/Conclusion: The Sector members agreed that this is a HB 44 User Requirement and not intended for use during type evaluation. No changes are recommended in Publication 14 (Pub 14).

2. Handbook 44, S.1.3.1. (S&T Committee agenda Item 321-3)

Background: At the 2009 NCWM Annual Meeting, the Conference adopted an amendment to paragraph S.1.3.1. to reconcile the value of the minimum scale division (0.1 % of the minimum totalized load) with the value of the minimum test load (800 divisions) listed in paragraph N.2.3.(a).

Recommendation: National Type Evaluation Technical Committee (NTETC) Belt-Conveyor Scales (BCS) Sector Technical Advisor recommended the amendment to NCWM Pub 14 Section 1.8. as shown below to reflect changes in HB 44 BCS Code, design specification S.1.3.1.

- 1.8. (S.1.2. and S.1.3.1.) The scale division shall be in increments of 1, 2, or 5 times 10k where k is an integer and shall not be greater than 0.125 % (1/800) of the minimum totalized load. Yes ☐ No ☐ N/A ☐

1.8.1. What is the scale division?

Unit	Abbreviation
pounds	lb or LB
U.S. short ton	ton or T
U.S. long ton	LT
Metric ton	t
kilograms	kg

1.8.2. Verify that the value of the scale division is protected by an acceptable security means (e.g., physical seal or audit trail).

Discussion/Conclusion: Sector members agreed to recommend the proposed change to Pub 14 BCS Section 1.8., and add a new Section 1.8.2. to verify that the value of the scale division should be a sealable parameter which is protected by a security means as shown above.

3. Handbook 44, N.2. and N.2.1. (S&T Committee agenda Item 321-5) (Number of Tests during Initial Verification)

Background: At the 2009 NCWM Annual Meeting, the Conference adopted an amendment to paragraph N.2.1. to provide clarification of how many test runs are required during an official test. Portions of the wording changes in N.2.1. relate to testing a belt-conveyor scale at a single flowrate (using a minimum of four test runs) if it can be verified that the system is operated using a single flowrate and that rate does not vary in either direction by an amount more than 10 % of the normal flow rate that can be developed at the installation for at least 80 % of the time.

These changes are applicable to specific installations that operate exclusively (within parameters) at one flowrate and would therefore not impact procedures used during type evaluation testing.

Other changes to N.2.1. will impact testing procedures regardless of the specifics of an installation and should therefore result in changes to Pub 14.

Recommendation: To reflect changes in the 2010 edition of HB 44, the technical advisor recommends that Pub 14 page BCS-15 be amended as follows:

13. Field Test Procedure

Field Performance Test of the Belt-Conveyor Scale

~~**N.2.1. Initial Verification. A belt conveyor scale system shall be tested at the normal use flow rate, 35 % of the maximum rated capacity, and an intermediate flow rate between these two points. The system may also be tested at any other rate of flow that may be used at the installation.**~~
(Added 2004)

N.2.1. Initial Verification. – A belt-conveyor scale system shall be verified with a minimum of two test runs at each of the following flow rates:

- (a) **normal use flow rate,**
- (b) **35 % of the maximum rated capacity, and**
- (c) **an intermediate flow rate between these two points.**

Discussion/Conclusion: The sector agreed to recommend the proposed amendments to Pub 14 BCS Section 13. In addition, the members also recommend that a note (as shown below) for Section 13 be **added** to clarify that the site identified for conducting the field permanence test portion of the type evaluation shall be capable of providing tests at various flowrates.

Note: The test site selected for permanence testing shall be capable of testing over a range of flow rates. Any site where the belt-conveyor scale system is limited to a single flow rate will not be considered acceptable.

4. Handbook 44, T.1.1. (S&T Committee agenda Item 321-6)

Background: At the 2009 NCWM Annual Meeting, the Conference adopted and amendment to paragraph T.1.1. Tolerance Values. to clarify the allowable change in zero during an official test. Background information on the amendments to HB 44 may be found in the S&T Committee 2009 Interim Report.

Recommendation: The Technical Advisor recommended that no action is necessary because the amendments to HB 444 requirements shown above are applicable to subsequent field examinations, are not referenced explicitly in Pub 14, and do not apply to type approval test procedures.

Discussion/Conclusion: Sector members agreed with the Technical Advisor's recommendation that no further actions are required.

5. Handbook 44, Sections N.3.1.2., N.3.1.3., and S.3.3.1.

Background: At the 2009 NCWM Annual Meeting, the Conference adopted amendments to paragraphs N.3.1.2., N.3.1.3., N.3.1.4., and to add new paragraph S.3.1.1. in order to:

- Consolidate the requirements in N.3.1.2. and N.3.1.3.;
- Clarify the testing guidelines in N.3.1.3.;
- Renumber the impacted paragraphs; and
- Add a new paragraph to state that the zero balance condition shall not be obscured by the automatic zero-setting mechanism.

Recommendation: The technical advisor recommended that references in Pub 14, pages BCS-16 be amended to reflect the consolidation and renumbering of the paragraphs as shown below:

13. Field Test Procedure

~~N.3.1.2. Initial Stable Zero. The conveyor system shall be run to warm up the belt and the belt scale shall be zero adjusted as required. A series of zero load tests shall be carried out until three consecutive zero load tests each indicate an error which does not exceed ± 0.06 % of the totalized load at full scale capacity for the duration of the test. No adjustments can be made during the three consecutive zero load test readings.~~

~~(Added 2002) (Amended 2004)~~

N.3.1.32. Test of Zero Stability. – The conveyor system shall be operated to warm up the belt and the belt scale shall be zero adjusted as required. A series of zero-load tests shall be carried out **before weighing material** immediately before the simulated or materials test until the three consecutive zero-load tests each indicate an error which does not exceed $\pm 0.06\%$ of the totalized load at full scale capacity for the duration of test. No adjustments can be made during the three consecutive zero-load test readings.

(Added 2002) (Amended 2004 **and 2009**)

N.3.1.43. Check For Consistency of the Conveyor Belt Along Its Entire Length. – After a zero-load test with flow rate filtering disabled, the totalizer shall not change more than plus or minus (± 3 d) 3.0 scale divisions from its initial indication during one complete belt revolution.

(Added 2002) (Amended 2004)

The technical advisor also recommended adding the following language to Publication 14 page BCS-7:

6. Zero-Setting Mechanism

Code Reference: S.3.1. **and S.3.1.1.**

6.3. The completion of the automatic zero-setting operation must be indicated. Yes ☐ No ☐ N/A ☐

6.3.1. Verify that any changes in the zero reference are indicated and/or recorded Yes ☐ No ☐ N/A ☐

Discussion/Conclusion: The Sector members agreed with the proposed changes and recommended that NCWM Publication 14 be amended as shown above.

B. Proposed Update to NCWM Publication 14 Belt-Scale Checklist

Background: During the February 2009 BCS Sector meeting, a draft Pub 14 checklist was developed and offered for use on a trial basis by the National Type Evaluation Program (NTEP) labs that would evaluate manufacturer's replacement instruments. During the meeting, Sector Chairman, Mr. Bill Ripka, Thermo-Fisher, stated that Thermo-Fisher would possibly have an instrument that would be submitted in the near future to undergo the NTEP process. This checklist could then be used on this instrument as a trial basis. The results/comments would then be returned to NTEP Administrator and Sector work group (WG) for review and further development. The entire draft checklist may be found in the 2009 NTETC Belt-Conveyor Scale Sector meeting summary.

Discussion: Based on information provided by NTEP Administrator Mr. Jim Truex, the Sector members were informed that NTEP had not received an instrument from any manufacturer to use as a trial for the checklist that has been drafted. Mr. Lars Marmsater indicated that Merrick Industries will be submitting an indicator to update its NTEP Certificate of Conformance (CC).

Conclusion: NTEP Administrator Mr. Truex indicated that the California NTEP Lab would perform the evaluation when the device is submitted and that the sector will be provided with a report from the NTEP lab for any recommendations to approve or amend the proposed checklist. Sector members agreed that no further work is needed to the checklist at this time, pending a report from NTEP after applying the draft to the evaluation of an instrument. This item will be carried over and placed on the next meeting agenda of the NTETC BCS Sector.

C. Develop a List of Sealable Parameters for BCS Systems

Background: The list shown below was developed during the 2009 NTETC BCS Sector meeting and was to be forwarded to NTEP laboratories for use on a trial basis after which comments and recommended amendments would be forwarded to the Sector WG for further development. The technical advisor reported to the members that no manufacturers' devices have been submitted for NTEP approval and therefore the list has not been used during any evaluations.

Discussion/Conclusion: Sector members agreed that no further amendments to the table are needed at this time, and that the table should be incorporated in the 2011 edition of Pub 14.

Belt-Conveyor Scale Features and Parameters	
Typical Features to be Sealed	Typical Features and Parameters Not Required to be Sealed
Official verification zero reference Official verification span/calibration reference Linearity correction values Allowable range of zero (if adjustable) Selection of measurement units Division value, d Range of over capacity indications (if it can be set to extend beyond regulatory limits) Alarm limits for flow rate (high/low) Automatic zero-setting mechanism (on/off) Automatic zero-setting mechanism (range of a single step) Configuration (speed, capacity, calibrated test weight value if applicable, pulses per belt revolution, load cell configuration)	Display update rate Baud rate for electronic data transfer Communications (Configuration of input, output signal to peripheral devices)
NOTE: The above examples of adjustments, parameters, and features to be sealed are to be considered “typical” or “normal.” This list may not be all inclusive, and there may be parameters other than those listed which affect the metrological performance of the device and must, therefore, be sealed. If listed parameters or other parameters which may affect the metrological function of the device are not sealed, the manufacturer must demonstrate that the parameter will not affect the metrological performance of the device (i.e., all settings comply with the most stringent requirements of HB 44 for the applications for which the device is to be used).	

D. New Business

1. Revisit parameters used to categorize "Family" groups

Mr. Steve Cook, NIST, recommended that the Sector review and revise if necessary the criteria used to base the grouping of instruments submitted for type evaluation as a Family or Type of devices. This topic is recommended to be included on the next NTETC Belt-Conveyor Scale Sector Meeting Agenda.

E. Attendance

2010 NTETC Belt-Conveyor Scale Sector Meeting Attendance				
Name	Company	Mailing Address	Telephone	Email
John Barton	NIST	100 Bureau Drive Mailstop 2600 Gaithersburg, MD 20899	(301) 975-4002	john.barton@nist.gov
Leonard Ian Burrell	Control Systems Technology	No. 3 Southern Street Oatley, NSW 2223 Australia	+61 4 1929-2604	iburrell@controlsystems.com.au
Steven Cook	NIST	100 Bureau Drive Mailstop 2600 Gaithersburg, MD 20899	(301) 975-4003	stevenc@nist.gov
James Hale	Southern Co.	366 Three Oaks Subdivision Road. Langley, KY 41645	(606) 285-3635	jahale@southernco.com
Richard Harshman	NIST	100 Bureau Drive Mailstop 2600 Gaithersburg, MD 20899	(301) 975-8107	richard.harshman@nist.gov
Ken Jones	CA. Division of Measurement Services	6790 Florin Perkins Road Suite 100 Sacramento, CA. 95828	(916) 229-3052	kjones@cdfa.ca.gov
Lars Marmsater	Merrick Industries, Inc.	10 Arthur Drive Lynn Haven, FL 32444	(850) 271-7829	lars@merrick-inc.com
Bill Ripka	Thermo Fisher Scientific	501 90th Avenue. NW Minneapolis, MN.55433	(800) 445-3503	bill.ripka@thermofisher.com
Peter Serrico	Thayer Scale	91 Schoosett Street Pembroke, MA 02359	(781) 826-8101	psirrico@thayerscale.com
Chris Skelton	Control Systems Technology	37 Stanley Street Peakhurst Sydney, NSW 2210 Australia	+61 2 9584-4500	cskelton@controlsystems.com.au
James Truex	NCWM	88 Carryback Drive Pataskala, OH 43062	(740) 919-4350	jim.truex@ncwm.net
David Vaughn	Tennessee Valley Authority	1101 Market Street Chattanooga, TN 37402	(423) 751-3018	tdvaughn@tva.gov