

**NW&SA Annual Technical Meeting
ST. LOUIS, MO
FEBRUARY 26-28, 2007**

**NIST Handbook 44 Belt-Conveyor Scale
Summary of Round Table Discussion and
List of Action Items**

Prepared by Paul Chase

The following notes are in approximate chronological order from the meeting. Volunteers listed in the "Action" column are encouraged to contact each other, and if necessary, appoint a lead person to facilitate the completion of the task. A list of the NW&SA Annual Technical Meeting attendees and their contact information is on the last page of this summary.

Steve Cook (steven@nist.gov) may be contacted by email if you need additional information on Handbook 44 and other international recommendations. Completed items should be forwarded to Steve Cook at NIST and include a brief discussion about the reasoning or technical justification used to develop any recommendation or position.

Item	Brief Discussion and Summary	Action
1.	Repeatability. Repeatability in H44 is typically applied when test runs are conducted when all conditions of the run are roughly the same. However, this is not stated as such in H44 Belt-Conveyor Systems Code. There was a brief discussion of repeatability.	See Item 4
2.	Clarify initial and subsequent verification. One question concerned which parts, or how many parts of a belt-conveyor scale system would require an initial verification. For example, replacing load cells does not trigger an initial verification. How about belt travel sensor, digitizer, integrator or changing a belt? What if all of the idlers in the weighing area are replaced? Replacing all of the idlers is similar to moving the belt-conveyor scale to a different part of the belt--and that would probably require initial verification.	Send positions or suggestions to Steve Cook.
3.	Linearity. Not stated as linearity in H44, but the requirement of N.2.1 is essentially a linearity test. Discussions included examples of facilities that could not provide flow rates as low as 35% of capacity. Perhaps H44 should say "approximately" 35%. Or lowest feed rate possible near 35%. Most scales operate at 70-75% of capacity, so the 100% of scale capacity is not usually tested and therefore, the conveyor system may not be possible to achieve that flow rate for a material test (see also item 12). (Note: R50 specifies scale capacity, 20% of capacity, and some point in between. Certainly not all of the R50 approved scales can reach exactly those numbers, so some leeway must be allowed. Don't know if there is specific language.)	Al Page, Peter SIRRICO, and Phil Carpentier volunteered to develop language to amend H44 and submit to NW&SA for review and comment.
4.	Repeatability. H44 should be clear about the intended tests. Current language in H44 would allow a test at high flow, med flow, and low flow. If all of the tests results were within tolerance (+/- 0.25%) it could fulfill the three tests without any real measure of repeatability. Admittedly there is a tacit test of repeatability in the fact that the tests at three flow rates must all be within tolerance. Paul Chase expressed a preference for pairs, but that is a major change in H44. Steve Cook will pursue it further.	This should be pursued further. Interested NW&SA members should send their suggestions to Steve Cook.
5.	The words "or a normal weightment" were removed from N.2.3. in 2005. As currently written, a belt-conveyor scale could only be used for truck loadout if each truckload required 10 minutes' operation.	Paul Chase, Phil Carpentier, Bill Ripka, and Peter SIRRICO volunteered to address this and develop a proposal for either H44.

Item	Brief Discussion and Summary	Action
6.	<p>Minimum Totalized Load (MTL). The minimum totalized load has typically been the amount of material weights in 10 minutes partly because of the language in H44 N.2.3. Also MTL can be read as Minimum Test Load. The belt-conveyor scale should be tested at the minimum load for which it will be used so maybe Minimum Test Load and Minimum Totalized Load are really the same.</p> <p>Does clarification on selecting an appropriate division size belong in H44 or examination procedure outline?</p> <p>Volunteers items 6 and 7 Paul Chase, Phil Carpentier, Bill Ripka, Peter SIRRICO</p>	<p>Paul Chase, Phil Carpentier, Bill Ripka, and Peter SIRRICO volunteered to address this and develop a proposal for either H44 or and EPO.</p>
7.	<p>Belt Uniformity. As a result of the discussion of MTL and division size, selecting a smaller division size places a tighter requirement on the belt uniformity of 3 divisions in N.3.1.4. A change to the allowable deviation from 3 divisions to a percentage (%) may alleviate the problem.</p> <p>There is a need to provide an equation for calculating the belt uniformity tolerance.</p>	<p>Interested NW&SA members should send their suggestions to Steve Cook.</p>
8.	<p>N.3.2. Discussion of assorted field problems with material testing. There was some support for defining a specific period for simulated tests.</p> <p>Steve Cook requested everyone present to read over the proposed changes in N.3.2 and provide comments. This section is still in development and will be reviewed at the Western Weights and Measures Association Annual Meeting in September 2007.</p>	<p>Interested NW&SA members should send their positions to the NCWM S&T Committee Technical Advisor (Steve Cook).</p>
9.	<p>Discussion of whether the simulated tests should be required to be within some percentage of the official tests. Consensus was no, do not make such a requirement.</p>	<p>No Action</p>
10.	<p>Discussion of when to use automatic zero. Downside is that a cold belt could auto-zero to a value that would be incorrect when the belt is warmed up. Another zero after warm-up would correct that. Zero must be recorded according to UR.3.3. With automatic zero this could result in a large volume of data. Memory to contain these data is less expensive than formerly. Peter SIRRICO suggested an intermittent auto zero, but this was not fully discussed. Might be feasible to record only changes in zero, but would that reduce the quantity of data appreciably?</p> <p>Al Page is regularly using the three minute zero load test of N.3.1.1. during official testing.</p> <p>With the discussion of zero was a discussion of whether an equivalent to the static scale "center-of-zero" is feasible. Some discussion by manufacturers.</p> <p>There was also some discussion whether something should be included in User Requirements about maintaining zero. Needs some thought--some belt-conveyor scales need to be re-zeroed more often than others.</p>	<p>Peter SIRRICO, Bill Ripka, Phil Carpentier, Paul Chase, Paolo Ricci, Steve Cook volunteered to further develop this topic on the frequency of;</p> <ol style="list-style-type: none"> 1) monitoring the zero condition of the BCS, and 2) rezeroing the BCS.
11.	<p>Belt tracking. Current proposal for belt tracking is difficult to perform. General consensus seems to be to eliminate any change in the current H44. UR.2.2. (n). It may be an item for future consideration.</p>	<p>The Technical Advisor to the NCWM S&T Committee (Cook) will report on the consensus of the group attending the NW&SA/NIST workshop.</p>
12.	<p>Marking requirements. Al Page commented that belt-conveyor scales do not always have consistent marking. For example, the scale capacity is used in testing zero repeatability, flow rates for material testing, and belt uniformity (if it is changed to percent). Currently not all belt-conveyor scales have these data on a permanent tag--it may be written on a tag in the instrument.</p>	<p>Al Page and Steve Cook will develop proposed language for H 44</p>
13.	<p>Official Test Clarification was requested about rezeroing the belt conveyor scale between runs during an official test.</p>	<p>Steve Cook will do additional research and develop a proposal to amend H44.</p>

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