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*Notes concerning UR.3.2, UR.2.2, N.2.3, and N.3.1.4
A follow-up to the Round Table discussion of February 26-28, 2007*

This memo includes items discussed in the February Round Table and some of the succeeding discussion. Please modify anything that seems in error and provide better wording where possible, including the explanatory notes. Also if there are items discussed at the meeting that are omitted here, please add comments.

The intent of the memo and its revisions is to present a consensus document to WWMA for consideration.

Separate from the H44 items included here, but something that was brought up at the meeting is the question of whether a zero-load test is allowed between material tests during initial or subsequent verification. I think the accuracy of the material test (accuracy of the test, not the belt-conveyor scale) is enhanced by keeping the zero as close to zero as possible. What do the rest of you say?

I have used italics for comments and used regular font for the proposed wording of H44 recommendations.

The first item concerns the "center of zero" concept discussed briefly at the meeting. Everyone seemed to agree conceptually. Please look at the following wording--not sure whether it should be in "S" or somewhere else. Probably Steve Cook can provide guidance.

S.xx? For belt conveyor scales where the totalization indicator is inhibited at low flow rates an active zero indicator shall be provided. If for any revolution of the belt the totalized value at zero-load is greater than $\pm 0.12\%$ of the value totalized at scale capacity in one revolution of the belt, an indicator shall be provided.

I have invented a term "active zero" because the center-of-zero terminology does not really apply. The 0.12% is the same value as T.1.1. One revolution could be a short time on many conveyors so the wider tolerance could prevent false alarms. Perhaps a

one minute and unit revolution statement would be appropriate. For active zero to be useful, it needs to operate in a shorter time than a normal zero-load test (automatic, semi-automatic, or manual). But it needs to be practical. The wording does not identify the totalization that occurs internally as separate from the indicated total. Any ideas?

UR.3.2.

(c) Simulated load tests or material tests, and zero load tests shall be conducted at periodic intervals between official tests in order to provide reasonable assurance that the device is performing correctly.

The action to be taken as a result of a zero load test is as follows

- If the zero error is less than 0.25% adjust to zero.
- If the zero error is at least 0.25% but not more than 0.5%, inspect the conveyor belt scale system, make required corrections and adjust the zero.
- If the zero error is greater than 0.5%, inspect the conveyor belt scale system, make required corrections, adjust to zero and reduce the interval between zero load tests.

Note: There is a need to establish some normal zero-load test interval as a part of initial verification--see proposed UR.3.5. There is also a need to vary that interval--longer interval if the scale is stable, shorter if the zero-load tests require adjustment. These items could be addressed in a belt-conveyor scale manual.

The action to be taken as a result of the material tests or simulated load tests is as follows:

- If the error is less than 0.25%, no adjustment is to be made
- If the error is at least 0.25% but not more than 0.5% the span may be adjusted by an authorized technician and the official with statutory authority will be notified.
- If the error is greater than 0.5%, adjust the span, perform maintenance on the belt conveyor scale system, and schedule an official test.

Note: In the case of zero error and span error, the limiting value has been changed from 0.6% to 0.5%. The value 0.5% is twice the acceptance error and the origin of the 0.6% number is unknown.

T.1.1 requires a zero test "Immediately after material has been weighed over the belt-conveyor scale during the conduct of the materials test...." There is no similar User Requirement. UR.3.2(f) has a sort of partial requirement in the statement "When zero load reference information is recorded for a delivery....." Add a User Requirement as follows and UR.3.2(f) could be deleted as redundant.

UR.3.5 Zero requirements.

(a) For a normal weight larger than the Minimum Totalized Load, a zero test is required before and after the normal weight or as established by the official with statutory authority.

(b) The belt-conveyor scale shall not be used until the belt-conveyor scale system has completed its warm-up period. This period is determined by the official with statutory

authority as a part of N.3.1.2 at initial verification.

(c) The periodic interval at which zero load testing is required is determined by the official with statutory authority.

UR.3.5 (a) is intended to assure that the zero of a belt-conveyor scale has remained within tolerance during a protracted operation such as a continuous operation for 8 hours or the loading of a unit train. The above language is intended to exclude quantities of the Minimum Totalized Load such as a belt-conveyor scale used for loading individual trucks.

UR.3.5 (b) provides a guideline for the user for startup of a belt such as used for loading unit trains or barges. The belt may be idle for extended periods and requires some warm-up before weighing begins. (Phil, does this address your concerns about belt warmup?)

UR.3.5 (c) sets a maximum interval between zero load tests. This interval is initially set based on N.3.1.2 and N.3.1.3 and may be adjusted based on the zero load performance of the belt-conveyor scale over time.

UR.2.2 Belt alignment. The belt shall not extend beyond the edge of the idler roller in any area of the conveyor.

This is the unchanged wording as in H44 2007. There is insufficient evidence of the effect of small lateral movement of the belt to establish a valid requirement. In addition there are no practical devices to measure such lateral alignment changes.

N.2.3 (c) at least 10 minutes of operation or a normal weighment.

The statement "or a normal weighment" was in N.2.3 (c) previously. This wording allows for approval of belt-conveyor scales used for loading trucks, railcars, etc. where the normal weighment is less than 10 minutes.

N.3.1.4 Check for Consistency of the Conveyor Belt Along Its Entire Length. During a zero-load test, the total change indicated in Total shall not exceed 0.18% of the load that would be totalized at scale capacity for the duration of the test. The end value of the zero-load test must meet the $\pm 0.06\%$ requirement of N.3.1.2 and N.3.1.3.

In the current H44, the requirement is stated in divisions. This can result in a changed Consistency requirement solely because of a change in division size. It would also be useful to include some sample calculations in H44 for such items as this. The current H44 allows the divisions to be plus or minus which is too large a tolerance. (Peter, please have Frank take a look at this. PWC).

PWChase