December 5, 2016

Comments on S&T Items 3100-1, 3200-5, 3600-2

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Position: I am opposed to these items and the items should be withdrawn. The proposed changes go against the principles of Handbook 44, the principles of OIML R76, and violate the WELMEC guideline. The adoption of accuracy classes for scales established relationships among accuracy classes, scales within accuracy classes, the number of scale divisions in scales, and the sizes of scale divisions. The adoption of accuracy classes DID NOT CHANGE the suitability of equipment criteria used to determine which scales are acceptable for use in specific applications.

Explanation:

Handbook 44 requirements apply to weighing devices depending upon the application in which they are used, how the devices operate and, in some cases, the commodities weighed on the scales. The Scales Code establishes design criteria and performance requirements based upon the application of the devices and how they are used, such as, vehicle scales, weigh-in-motion systems, axle-load scales, railway track scales (for static weighing), coupled-in-motion railroad weighing systems, uncoupled-in-motion railroad weighing systems, hopper scales, and grain hopper scales. The proposed changes would violate the basic principles of Handbook 44, OIML R76 and the WELMEC guidelines to say that different criteria should apply to devices used in the same applications based upon how the scales are designed. **Specifically, the proposed changes state that if a scale sums weight values mathematically, then the scales should be exempt from compliance with accuracy class parameters for scales. This should not be allowed.**

One of the basic principles of Handbook 44 is that any scale may be used in an application provided it meets the minimum accuracy required for the application and it meets all other design, installation and performance criteria that apply to the weighing application. Scales with higher accuracy may be used in a given application, provided that the scale is suitable for the application (such as General Code G-UR.1.1., G-UR.1.2., G-S.2., G-S. 3., and Scales Code UR.1., among others). A scale manufacturer may design a scale in any manner (e.g., mechanical scales, levers, weighbeams or dials, full electronic scales, analog-output load cells or digital-output load cells) that meets the Handbook 44 criteria that apply to scales used in a given weighing application. This concept is explicit as it applies to tolerances in T.N.1.1.

> **T.N.1.1. Design.** – The tolerance for a weighing device is a performance requirement independent of the design principle used.

OIML R76 (2006 Edition) 2.2 states, “The requirements apply to all instruments irrespective of their principles of measurement.” This principle is consistent with Handbook 44. The R76 excerpt is provided below.

2.2 Principles of the metrological requirements

The requirements apply to all instruments irrespective of their principles of measurement.

Instruments are classified according to:

- the verification scale interval, representing absolute accuracy; and
- the number of verification scale intervals, representing relative accuracy.

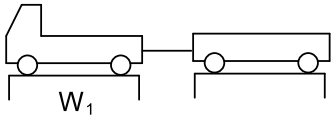
Mr. Andersen cites the 2009 WELMEC guide to support his proposals; however, Mr. Andersen's interpretation is wrong. Mr. Andersen overlooked the fact that when a multi-plate weighbridge is used with one indicator, the number of scale divisions for the multi-plate scale cannot exceed the number of scale divisions for the individual weighbridges. WELMEC clarified this situation in the 2015 WELMEC guide. The 2015 guide clearly states (see below) that the installation promoted by Mr. Andersen is not acceptable.

WELMEC 2, 2015: Guide on Common application of Directive 2009/23/EC Non-automatic weighing instruments

Multi-plate weighbridge with one indicator:

W1+2 is a weighing range (Compatibility of modules and mpe must be satisfied for it)

The configuration of two weighbridges, each with its own indicator, is not considered to be acceptable when used in the following manner:



(See also Sections 3.1.2 and 3.1.533)

The Application of T.N.4.4. Shift or Section Tests

Mr. Andersen appears to argue that T.N.4.4. (as it applies to agreement among sections) should not apply to a vehicle scale comprised of three separate weighing/load-receiving elements with separate weight indicators that are summed together to obtain the total weight of the vehicle; however, he apparently supports the idea that it is acceptable to apply T.N.4.4. to a vehicle scale that has only a single platform. It is wrong to differentiate how T.N.4.4. applies to vehicle scales based upon the design of the weighing/load-receiving element of a vehicle scale. Scales used as vehicle scales should comply with the same requirements for the application, including T.N.4.4.

Accuracy Classes

The adoption of accuracy classes did not change how Handbook 44 criteria apply to devices used in specific applications; rather, the adoption of accuracy classes categorizes scales by accuracy, established relationships between accuracy, numbers of scale divisions in scales, and the sizes of scale divisions (Scales Code Table 3). The kinds of scales that are appropriate for use in specific applications are based upon suitability of equipment criteria as stated in the General Code and in the Scales Code. The adoption of accuracy classes for scales did not change the suitability of equipment criteria.

Scales Code Table 7a states the lowest accuracy class that is typically acceptable for a given application. For any given application, scales of higher accuracy classes may be used provided the scales comply with the other requirements that apply to the given application. This concept is the same for scales marked with an accuracy class and for unmarked scales.

Within the same accuracy class (except Class III L), the tolerances for scales with same division values, but with greater numbers of scale divisions, are tighter than for scales with lower numbers of scale divisions. Scales with the same number of scale divisions, but with smaller scale divisions, have tighter tolerances (in terms of weight) than scales with larger scale divisions.

Mr. Andersen's proposals would allow scales that sum digital weight values to be exempt from the parameters for accuracy classes, even though the three "scales" are used as a vehicle scale. His proposals violate the international and national principles for accuracy classes and should be rejected.