Discussion points for the revision of OIML R60 Parts 1&2, 2CD

Members of OIML TC9 project 1 (revision of R60 – Metrological Regulation for Load Cells):

The following list of items represents issues relating to the 1CD of R60 (parts 1&2) which were included in TC9 p1 member’s comments. These issues are primarily technical in nature and should be taken into consideration by the Project Group. While some of the recommended changes have been incorporated into the 2CD, the decisions of TC9 p1 will determine the final disposition of those proposed changes. The comments included in this list are unedited and appear as they were received.

A meeting of TC9 p1 to discuss and deliberate on these issues is anticipated however, the date and location have not been determined at this time. Your comments on these and other issues are welcomed, however the items appearing on this list will likely be resolved through discussions at a future meeting of the Project Group.

John Barton (USA), TC9 p1 Project Convener

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| **2CD paragraph 3.1.2:**  Japan submitted the comment:  We recommend reviewing the present categorization of load cells with a new criterion for example, whether the load cell employs a digital processing. At present, it is classified whether they have an ‘active’ electric component with a recognizable function regardless a use of the digital processing.  Recommended action:  TC9 p1 should consider further the process of categorization of load cells. Are there additional categories which should be part of the criteria? |
| **2CD paragraph 3.3:**  Japan submitted the comment:  Is it meant to mention only Strain gauge as Construction of load cells?  Many comments suggest to keep in mind other principles like Electromagnetic force compensation, Vibrating string, …  Although alternative technologies are mentioned to be considered in 2.1, it may be useful to consider those in terminology, too.  Same recommendation as above. |
| **2CD paragraph 3.4.2:**  Germany submitted the comment:  We had proposed to insert a figure / sketch after the note (see PTB-Document “Proposals and points of discussion for the 2nd Revision of R60”). This figure is missing.  Recommended action:  This illustration has been incorporated in 2CD (see paragraph 9.4.1). TC9 p1 should determine the usefulness of this illustration and whether it is to remain. |
| **2CD paragraph 6.5.2 (6.4.2 1CD)**  CECIP submitted the comment:  Add an asterisk to Dmax and add the following remark:  Remark: or as close as possible to Dmax, considering the technical shortcoming of the test equipment.  Recommended action:  TC9 p1 to determine if this proposal is acceptable and should be incorporated as suggested. |
| **2CD paragraph 6.6.2 (6.5.2 1CD)**  France submitted the comment:  We think this point should be discussed together with 9.10.4.6 as suggested in the inserted comment #112 in 9.10.4.6 (i.e. page 54/111 of pdf marked version of 1CD).  Comment #112: Recommends using a range of up to 5 kPa lower and higher than atmospheric pressure in increments of 1 kPa.  Recommended action:  This suggestion should be reviewed by TC9 p1 and appropriate changes to test procedures considered. |
| **2CD paragraph 6.7.1.1-b, 6.7.1.2, and 6.7.1.5 (6.6.1.1-b, 6.6.1.2, and 6.6.1.5 1CD)**  Netherlands submitted the comment:  Electronics of load cells may not be sufficient intelligent to detect and act upon a significant fault. In such a case the electronics/software of the indicator shall have provisions for such functionality. This may also concern 6.6.2.1. Suggest adding some wording.  Recommended action:  This should be discussed and considered by TC9 p1. Consider the potential that any note added to indicate that the LC may not be capable of detecting and acting upon a significant fault and placing that responsibility on the weighing instrument could be perceived as extending beyond the desired scope of this Recommendation. |
| **2CD paragraph 6.7.2**  Germany submitted the comment:  General remark on disturbance tests: If battery power supply test is deleted then load cells may not be used in instruments powered by batteries. Moreover, they may not be used within vehicle on-board weighing systems if the tests corresponding to B.3.7 of R76 have not been performed. Should be clarified within the scope of R60.  Recommended action:  TC9 p1 is asked to consider these consequences and determine if this clause is to be reinstated or if scope of R60 is not to consider battery power supplies. |
| **2CD paragraph 6.7.2.2 (6.6.2.2 1CD)**  Australia submitted the comment:  These tests are not applicable to strain gauges.  Suggest deleting ‘(including load cells using strain gauge technology)’  Span stability requirements are not only applicable to load cells with electronics, suggest moving this test to general requirements. It would then be more efficient to incorporate this into the temperature and humidity test profile.  Recommended action:  TC9 p1 should consider moving this requirement within the document so that it is applicable to all load cells. |
| **2CD paragraphs related to disturbance tests (6.11.3.4 1CD)**  Germany submitted the comment:  General remark on disturbance tests: If battery power supply test is deleted [paragraph 6.11.3.4 in WD] then load cells may not be used in instruments powered by batteries. Moreover, they may not be used within vehicle on-board weighing systems if the tests corresponding to B.3.7 of R76 have not been performed. Should be clarified within the scope of R60.  Recommended action:  Paragraph 6.11.3.4 in R60 WD was deleted as a result of the discussions at the TC9 meeting in September 2011. TC9 p1 should consider this issue and determine the validity of comment. TC9 p1 should also consider whether amendments are necessary to broaden the scope of R60 or if this clause is to be reinstated. |
| **2CD paragraph 7.1**  France submitted the comment:  "In the 6th paragraph of 7.1, is the condition "For achieving the severity level II, the use of cryptographic methods for protection are necessary" bound to paragraph 5.2.3.3 of OIML D31/2008 ? Does that mean that any other solution is forbidden ?  Australia submitted the comment:  The risk of someone changing the load cell configuration is low compared with the effort required for the suggested software checking; therefore this test seems disproportionately onerous. Suggest that severity level I, validation procedure A is sufficient for all load cells including those on an open network.  SCAIME submitted the comment:  We propose the suppression of “for achieving the severity level II, the use of cryptographic methods for protection are necessary”. It is an acceptable solution under terms of OIML D31, not a mandatory requirement.  Recommended action:  TC9 p1 should address the requirements involving communications capabilities of load cells and establish a set of appropriate criterion. |
| **2CD paragraph 8.2**  Australia submitted the comment:  Suggest deleting this requirement. Requirements documents shouldn't seek to override National Legislation. 'Responsibility for compliance' and definition of 'in use' are for each member state to determine and are outside the remit of a recommendation.  France submitted the comment:  In the second paragraph, “…, the owner of the load cell has the responsibility that the instrument is well maintained…”, “the owner of the load cell” should be replaced with “the owner of an instrument including the load cell(s)”.  Recommended action:  TC9 p1 should discuss these proposed changes and determine what language will represent the desired scope and authority of this Recommendation |
| **2CD Paragraph 8.2.1**  Netherlands submitted the comment:  There is a general trend to use 1/5 MPE  Recommended action:  TC9 p1 should consider whether to adopt the change of the limit of uncertainty of 1/3 MPE to 1/5 MPE |
| **2CD Paragraph 9.3**  SCAIME submitted the comment:  It should be mandatory to add information on the test report if a repair occurred during an evaluation. Give information and details on which sample and at which step.  3rd paragraph, we consider that allowing repairs and modifications is subject to contestation, and we will prefer to amend the paragraph. Any modification should be forbidden during the evaluation. Repairing for digital LC may eventually be accepted during any of the required additional tests.  Recommended action:  TC9 p1 should further consider and discuss the policy(ies) on modification or repair to load cells submitted for type evaluation |
| **2CD Paragraph 9.4.5 (9.4.4 1CD)**  CECIP and Germany submitted the comment:  There is no reason to forbid a ratio smaller than five. So, please use the old wording.  Recommended action:  Wording in this paragraph was modified from the WD and again from the 1CD. The current language must be reviewed by TC9 p1 to determine if the language in 2CD is acceptable |
| **2CD Paragraph 9.7.2.1 and Table 7 (9.7.3.1 1CD)**  A number of comments were submitted regarding the environmental test conditions listed in Table 7. TC9 members challenged the reference conditions as stated in the table and suggested that they be amended. Parameters for: humidity; atmospheric pressure; DC and AC voltages; conducted RF fields; surges; as well as other language used in this table are being questioned.  Recommended action:  TC9 p1 should perform a review of 9.7.2.1 Environmental conditions and Table 7. Appropriate values should replace those existing values where necessary. |
| **2CD Paragraph 9.7.3.3 (9.7.4.3 1CD)**  CECIP submitted the comment:  Suggestion:  \* The proposed upper limit of Emin + 10 % Emax for the minimum load seems very high (typing error?).  We suggest Emin + 10 % Emin (see also proposal in next bullet).  \* For simplicity, we suggest combining the 1st two sentences, and “compressing” the text as follows:  “The minimum load, Dmin, (hereafter referred to as “minimum test load”) shall be between the minimum dead load, Emin, and Emin + 10%.  The maximum load, Dmax, (hereafter referred to as “maximum test load”) shall be between 90 % of Emax and Emax (refer to Fig. 1).”  Recommended action:  Paragraph 9.7.3.3 in 2CD was amended as proposed by CECIP. This change however, must be reviewed by TC9 p1 for confirmation. |
| **2CD Paragraph 9.8.3 and Table 9 (9.8.3 and Table 8 1CD)**  Germany submitted the comments:  A REMARK to table 8:  Are absolute time figures necessary? Difficult especially with high loads with the loading time! Re-instate wording of OIML R60 (2000)  And  Creep has an exponential time dependency. Is it acceptable to assume a linear time dependency of the output?  CECIP submitted the comment:  Time allowed for: Loading and Stabilization bring together as one time as in the old OIML R60. It’s too difficult especially with high loads.  Japan submitted the comment:  It is not realistic to apply a constant value for loading and stabilization time for all kinds of load cell because a longer waiting time is generally required for a load cell with high resolution (i.e. classes A and B). We propose assigning different values of waiting time for different classes as given by the revised table 8 shown below. **[The table 8 referred to has been incorporated in 2CD as Table 9]**  France submitted the comment:  In Table 8, we suggest to replace column “Loading” by “Loading or unloading.”  A number of additional comments were submitted regarding the content and specificity of Table 8.  Recommended action:  TC9 p1 should review reformatted Table 9 and determine if changes are appropriate. Also discuss the comment from Germany regarding the linear (non-linear) time dependency of load cell output. |
| **2CD Paragraph 9.8.3.2**  Germany submitted the comment:  Creep has an exponential time dependency. Is it acceptable to assume a linear time dependency of the output?  Recommended action:  TC9 p1 to consider at next meeting |
| **2CD Paragraph 9.10.1.5**  Germany submitted the comment:  REMARK: There is no stability criterion.  Recommended action:  TC9 p1 should discuss and draft criteria as needed |
| **2CD Paragraph 9.10.1.13**  Germany submitted the comments:  For load cells with extended temperature ranges, the accuracy and creep tests should be conducted at the "standard" temperatures -10°C, +20°C and +40°C. In addition (NOT instead), the accuracy and creep tests should be conducted at the extended lower and higher temperature limits, e.g. at -40°C and +70°C. There should not be a difference of more than 30 Kelvin between any two temperatures tested. It will be necessary to define the sequence of these temperatures during the tests e.g. +20 +40 +70 -10 -40.  And,  It should be also possible to measure at lower temperature first and then at higher temperature. But the first and last measurements should be carried out with 20°C.  Recommended action:  TC9 p1 should consider these points regarding test procedures and determine if they are appropriate and whether to incorporate the suggested changes into R60. |
| **2CD Paragraph 9.10.2**  METAS submitted the comment:  The formulation of the creep test is so strict that most of load cells used for dynamic weighing will fail the test and this test is not relevant for load cells used only dynamic weighing.. This difficulty was discussed at the meeting in September 2011 at the PTB. Would it be possible, for example, to provide a possibility of not performing the creep test and not providing creep test results with a justification of doing so, like it is mentioned for the atmospheric pressure test (A4.4).  Recommended action:  TC9 p1 should consider the proposed variation of test procedure and determine whether it is appropriate or not. |
| **2CD Paragraph 9.10.4.6**  NL and CECIP submitted the comment:  Method outdated, It is sufficient to perform the test by comparing the output of the “bare” (unloaded) load cell at only 2 different pressures: the atmospheric pressure at the moment, and one higher pressure (higher pressure is easier to achieve than lower pressure); just as in R 60 (2000).  And although in favour of keeping the test as is in R 60 (2000), it may be considered to describe performing the 2nd measurement at a pressure level of 5 kPa higher than atmospheric pressure. (instead of 1 kPa).  Prescribing higher pressure levels and/or more measurements will result in the need for purchase of more expensive equipment and require longer testing time resulting in more (and unnecessary) costs.  Germany submitted the comment:  REMARK: There is a kind of contradiction to 6.5.2 because there absolute values are listed.  Change text:  Change the barometric pressure in increments of 1 kPa within a range of 105 kPa (5 kPa greater than atmospheric pressure) to 95 kPa (5 kPa less than atmospheric pressure) and …  Recommended action:  TC9 p1 should examine this test procedure and determine if it needs to be updated or otherwise amended. |
| **2CD Paragraphs 9.10.7 – 9.10 7.7 (9.10.7 – 9.10.7.6 1CD)**  Many comments were submitted regarding disturbances related to power supply. Questions included: whether AC and DC supplies are to be considered in R60; whether the test should be performed on the load cell or the instrument it is installed in; the need for tests to be developed to evaluate load cells powered by other than mains network; and the alignment of R60 test procedures with those in R76.  The Secretariat of TC5/SC1 has offered to update these test procedures (under 9.10.7) with the current DD of D11. In addition, a recommendation was made to incorporate the tables used in D11 (with appropriate specific changes made to relate to R60) under this section.  Recommended action:  TC9 should address a wide range of considerations with regard to power supply and determine what is appropriate.  Offer from Secretariat of TC5/SC1 will be accepted to update these test procedures.  TC9 p1 should be polled to determine if tables from the format used in D11 should be incorporated into R60. |
| **2CD Paragraph 9.10.7.11 (9.10.7.9 1CD)**  CECIP submitted the comment:  In our opinion, there is no need for this span stability being a separate test. Instead, it will do to compare the span of the load cell at the end (after the “maltreatment” by the all the tests) with the span measured during the first test.  France, SCAIME, and the UK also submitted comments related to the test procedure steps (i.e., duration of and the timing between subsequent steps, recovery time allowed) and differences in the test procedures between R60 and R76.  Recommended action:  TC9 p1 should consider whether test procedures should specify span stability to be conducted as a separate test procedure or if it is acceptable to incorporate the observation of span characteristics during other test procedures. Also the entire procedure as specified should be reviewed and detail added as needed. Harmonization with R76 should be achieved. |
| **2CD Annex C Section 5 (OIML Certificate, Further information)**  Japan submitted the comment:  Regarding the first sentence, “The manufacturing process ...... essential changes are only allowed with the permission of the notified body”, what is the practical criterion for “essential changes”? In addition, we consider that “notified body” is a term used only in EU.  Recommended action:  Term "essential changes" to be defined by TC9 p1. |
| **2CD Annex E (load transmission)**  China submitted the comment:  For test of small-scale load cell, the ratio of the mass of "load transmission device" and Emax or Dmax should be quantified. If the mass of "load transmission device" is larger than a certain quality, it should be noted in test report. Otherwise, “Emin = 0 or Dmin = 0” would not be regarded.  Recommended action:  TC9 p1 should establish values for this ratio |