

mise en pratique of the definition of the kilogram

version 6.3 (CCM/13-06A)

comments (CCM/13-06B)

version 7.0 (CCM/13-06C)

the way forward

from version 5.2 to version 6.3

- v6.3 based on comments received on v5.2
These comments were sent by WGSI-kg members, usually after consultations within their respective NMIs.
- Comments to v5.2 were made using editing features of Word. The comments received, often contradictory, were not synthesized. Instead RD produced v6.3, which was inspired by comments on v5.2. This approach lacked transparency.
- v6.3 distributed for discussion at the Nov. 2012 Workshop. Oral comments were very helpful but written comments submitted on a template were essential.
- Nevertheless, a synthesis of all templates submitted by Workshop participants was challenging due to the different formats used and different suggestions for restructuring the document.

major themes in comments received

- Simplify!
 - Realizations should be briefly described, with details provided in references or annexes.
- Emphasize that the new definition does not require the unit of mass to be realized at a nominal value of 1 kg, and then disseminated.
 - Make a clear distinction between the unit of mass, the kilogram, and its realization at a particular nominal value.
- Use existing mechanisms of the CIPM MRA for establishing CMCs; remove *ad hoc* dissemination methods such as "Ensemble World" (but no unanimity; so should be discussed further.)

mep v7.0 - 1

- Main text is now 8 pages long, including references.
- There are only a few simple equations in the main text, and these show how the new definition can be realized by a watt balance or the XRCD method.
- There is only one key comparison. It is an ongoing BIPM KC that can be used by a single NMI to compare with the last value of the KCRV (and contribute to an updated KCRV) or by many NMIs, for example to establish the first KCRV based on the new definition.

mep v7.0 - 2

- Key points raised at WGSI-kg meeting on 19 February:
 - Is v7.0 clear enough on the distinctions among a realization, a primary realization and a primary standard? (Are these distinctions always useful?)
 - Is the wording on (primary) realizations of the definition of the kilogram at different nominal values of m_x now acceptable?
 - Is the distinction between uncertainty and relative uncertainty now made clearly enough?

mep v7.0 - 3

- Key points raised at WGSI-kg meeting on 19 February:
 - The words "kilogram unit" should not be used.
(The unit of mass is the kilogram.)
 - Statements referring to the "size" or the "magnitude" of a unit are difficult/impossible to translate into other languages and should therefore not be used in the *mep*.

mep v7.0 - 4

- Should section 2.3 have been eliminated? (MSL says yes, PTB says keep this section but modify it; it has been modified.)
- Major criticisms of v6.3 Section 3 and its subsections should be re-examined in the context of v7.0. See especially comments from LNE, PTB and MSL. Is the role of the BIPM ensemble of reference mass standards clearly defined? Are NMIs happy to maintain their own reference mass standards?
- What is the difference between a BIPM on-going KC and a CCM KC? Is this distinction worth maintaining, or can the *mep* be written with only a BIPM on-going KC (as in v7.0)?

mep v7.0 - 5

- Can the final campaign to link the mass of the IPK to the mass of standards used to measure h be considered to be the first KC referred to in the *mep*?
- Are Annex A3 (Maintenance of Primary Realizations) and shorter statements in the main text of section 2, now acceptable comments on maintaining (or improving) realizations of the unit of mass by the WB and XRCD methods?
- Annex 4 should be expanded.
- There are a number of editing errors in v7.0.

The way forward - 1

- Many references cited in v7.0 do not yet exist; some annexes in v7.0 are too long for this document or, perhaps, not long enough.

Solution: **Special issue** of *Metrologia* in 2015 devoted to the *mep* and its supporting documents. Both the WGSI-kg and *Metrologia* editor agree.

Need to begin planning now.

The way forward - 2

- New template for comments on v7.1
(CCM/13-06D)
 - All comments should be made using the template (even comments made orally at this meeting).
 - Send comments to chair of WGR-kg with copy to *interim* CCM Executive Secretary.
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 - Deadline for comments: 30 April 2013