

## A Note on Supplementary comparisons

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This Note is in response to questions that have arisen at recent meetings of Consultative Committees and Working Groups as to the status and formality of Supplementary comparisons in the CIPM MRA. This Note should be read in conjunction with the text of the MRA and *Guidelines for CIPM key comparisons* both of which are on the BIPM website:

([http://www.bipm.fr/enus/8\\_Key\\_Comparisons/mra.html](http://www.bipm.fr/enus/8_Key_Comparisons/mra.html))

Sections 1 to 4 present the situation with respect to the text of the MRA and *Guidelines for CIPM key comparisons* and in Section 5 some recommendations are made.

### 1. Supplementary comparisons in the main text of the MRA

Supplementary comparisons are not mentioned in paragraphs 1, 2, 3 or 4 of the main text of the MRA in which the structure of the MRA, the technical basis and the responsibilities of the Consultative Committees are laid out.

Supplementary comparisons first appear in paragraph 5 (d) where they appear as among the actions carried out by the RMOs in support of CMCs.

Participation in supplementary comparisons is laid out in paragraph 6.3 and again mentioned in 7.3.

According to paragraph 9.3, the coordination of supplementary comparisons along with other actions carried out by the RMOs comes under the JCRB. In the text of the main body of the MRA there are no further specifications concerning supplementary comparisons.

### 2. Supplementary comparisons in the technical supplement to the MRA

There is no mention of supplementary comparisons in sections T1 to T7 of the Technical supplement to the MRA. It is made clear that supplementary comparisons do not have a KCRV and hence do not result in degrees of equivalence.

Supplementary comparisons are first mentioned in T8 (e) where it is stated that the CCs have the responsibility to examine and confirm the results of RMO key and supplementary comparisons and incorporate them in Appendix B and the KCDB.

T10 states that supplementary comparisons may be carried out by CCs and RMOs and that they are to meet specific needs not covered by key comparisons, including comparisons to support confidence in CMCs.

### 3. Supplementary comparisons in the Appendices to the MRA

It is stated that Appendix B should contain the results of supplementary comparisons but it is left open as to how these are presented. They do not appear in Appendix D, the list of key comparisons

### 4. Supplementary comparisons in the *Guidelines for CIPM key comparisons*

Supplementary comparisons are mentioned in the *Guidelines for CIPM key comparisons* only at the very end, in Section 12, where it states that supplementary comparisons whose results are intended to be included in Appendix B must be carried out following these guidelines.

### 5. Comments

#### 5.1. Role of supplementary comparisons

A reading of the full text of the MRA will show that supplementary comparisons do not have the same function nor the same formality as key comparisons. All of the effort that goes into establishing the degree of equivalence of national measurement standards is concentrated on key comparisons. Supplementary comparisons are “to meet specific needs not covered by key comparisons”.

#### 5.2. Inconsistency in T8

There is an inconsistency, however, in the text since in T8 (e) it requires the Consultative Committees to “*examine and confirm the results of RMO key and supplementary comparisons and incorporate them in Appendix B and the KCDB.*” This is not consistent with the introductory text of T8 which refers only to key comparisons. Furthermore, nowhere in this paragraph does it mention Consultative Committee supplementary comparisons, which are permitted under Paragraph T10.

*I propose that we resolve this inconsistency by:*

- (a) allowing RMO supplementary comparisons to be approved by RMOs with the additional step of passing them through the Consultative Committees being considered as a formality only and*
- (b) limiting the number of supplementary comparisons carried out by Consultative Committee so that they take place only to meet specific needs that cannot easily be covered by CIPM key comparisons; most supplementary comparisons will thus be RMO comparisons, which is in the spirit of the text of the MRA.*

#### 5.3. Publication of the results of supplementary comparisons

*I propose that the results of supplementary comparisons appear in the KCDB and Appendix B normally only in the form of the text of the Final Report. Graphs and Tables of results will appear only if specifically requested (the final*

*reports of supplementary comparisons can appear in the Metrologia Technical Supplement if requested).*

#### **5.4. Guidelines for carrying out supplementary comparisons**

*I proposed and it was accepted by the CIPM in October 2002, that the sentence in section 12 of the Guidelines for CIPM key comparisons be modified to read:*

*“Supplementary comparisons should be carried out following protocols inspired by these Guidelines for CIPM key comparisons”*