The interpretation of a CMC

From the CIPM-MRA D-04:

In the context of the CIPM MRA and ILAC Arrangement, and in relation to the CIPM-ILAC Common Statement, the following shared definition was agreed upon:

"A CMC is a calibration and measurement capability available to customers under normal conditions: (a) as published in the BIPM key comparison database (KCDB) of the CIPM MRA; or (b) as described in the laboratory's scope of accreditation granted by a signatory to the ILAC Arrangement. "

Where the term NMI is used it is intended to include Designated Institutes (DIs) within the framework of the CIPM MRA."

NOTES

1. The meanings of the terms Calibration and Measurement Capability, CMC, (as used in the CIPM MRA), and Best Measurement Capability, BMC, (as used historically in connection with the uncertainties stated in the scope of an accredited laboratory) are identical. The terms BMC and CMC should be interpreted similarly and consistently in the current areas of application.

2. Under a CMC, the measurement or calibration should be: performed according to a documented procedure and have an established uncertainty budget under the management system of the NMI or the accredited laboratory; performed on a regular basis (including on demand or scheduled for convenience at specific times in the year); and available to all clients.

3. The ability of some NMIs to offer "special" calibrations, with exceptionally low uncertainties which are not "under normal conditions," and which are usually offered only to a small sub-set of the NMI's clients for research or for reasons of national policy, is acknowledged. These calibrations are, however, not within the CIPM MRA, cannot bear the equivalence statement drawn up by the JCRB, and cannot bear the logo of the CIPM MRA. They should not be offered to clients who then use them to provide a commercial, routinely available service. Those NMIs which can offer services with a smaller uncertainty than stated in the database of Calibration and Measurement Capabilities in the KCDB of the CIPM MRA, are, however, encouraged to submit them for CMC review in order to make them available on a routine basis where practical.

PROPOSED interpretation of the qualified definition of a CMC as used by CCRI

Considering the definition of a CMC is that it is a capability available to customers under normal conditions "as published in the BIPM key comparison database" (Appendix C of the KCDB), the CCRI recognizes the importance for NMIs/DIs to be able to publish CMCs in Appendix C for any properly-validated and supported metrological service they make available to customers. Nevertheless, such availability does not preclude an NMI/DI from equally providing services to customers not published in Appendix C of the KCDB. Such providence, in order to be considered in the context of the CIPM MRA, must necessarily derive from (be traceable to) a CMC published in Appendix C, and the derivation itself must be clearly documented for the benefit of any customer. This should include description of

traceability to a published CMC in an NMI's/DI's quality management system documentation and be made available to customers through publicly-available literature, catalogs of services or other mechanisms. Laboratories claiming traceability to quantities not published in Appendix C must similarly describe the traceability chain to the published quantities in their measurement quality system documentation.

From the CIPM-MRA D-02:

A CMC is deemed to cover services that meet all of the following criteria:

- *Use the same instrument type/measurement method as that identified in the CMC, noting that more than one instrument type/measurement method can be listed in one CMC,*
- *Fall within the range covered by the CMC,*
- *Have measurement uncertainty no less than the uncertainty quoted in the CMC, with appropriate treatment, documented in the quality system, for any methods/instruments listed that are derived, i.e. involve further steps in the metrological traceability chain.*

From Section 3.2. Use of the "CIPM MRA statement"

The following "CIPM MRA statement" shall also be included on the calibration certificates together with the logo…

> *This certificate is consistent with the calibration and measurement capabilities (CMCs) that are included in Appendix C of the Mutual Recognition Arrangement (CIPM MRA) drawn up by the International Committee for Weights and Measures (CIPM). Under the CIPM MRA, all participating institutes recognize the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C*

Regarding the Use of the CIPM MRA Logo and Statement on Calibration Certificates

For those NMIs/DIs that intend to use the CIPM MRA logo and statement on calibration certificates for services not directly published in Appendix C but are rather demonstrated as traceable to published CMC(s), and in keeping with the spirit of CIPM-MRA D-02, the following shall be met:

- The instrument listed in the relevant CMC must be identified on the certificate, as is the transfer instrument used (e.g., ionization chamber, gamma-ray spectrometer, etc.) for traceability
- The quantity measured (e.g., activity, dose rate) is within the range given for the relevant CMC
- The measurement uncertainty is no less than that stated for the relevant CMC, and is expected to be greater due to propagation through the traceability chain
- The traceability chain is documented and reviewed as part of the quality management system

The determination of the appropriateness of a given transfer instrument for a given measurement is a shared responsibility between the RMO WG on CMCs and the relevant Key Comparison Working Group, and is to be agreed upon by members of the relevant Section of CCRI.

Certificates not using the CIPM MRA logo or statement fall outside the scope of this document. Nevertheless, similar guidance would be considered good practice for all metrological services performed under the auspices of the CIPM MRA.

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15/3/2019