Quality Management System

Ensuring that measurements are right every time

The Quality Management System (QMS) of an institute participating in the CIPM MRA helps to ensure that the calibration and measurement capabilities (CMCs) that they claim can be delivered every time a measurement is performed. The QMS must cover all CMCs of a National Metrology Institute (NMI) published in the BIPM key comparison database (KCDB) and is regularly reviewed and monitored by the local Regional Metrology Organization (RMO).

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The components of a QMS

The QMS of an institute must meet the requirements of ISO/IEC 17025:2017 for calibration and measurement services, and, if applicable, ISO 17034 for certified reference material production. Each RMO reviews and approves the QMS of their member institutes according to their specific requirements. The CIPM MRA does not explicitly specify how that will occur, however it does require adherence to some general principles:

- The RMO will peer review each QMS with either the support of an accreditation body, or directly without third-party involvement. If peer review by an accreditation body is used, that body shall operate according to ISO/IEC 17011 and that body shall be covered by the ILAC MRA or by Regional Arrangements recognized by ILAC. Guidance is given in a *Joint ILAC – CIPM Communication regarding the Accreditation of Calibration and Measurement Services of National Metrology Institutes*.
- Peer-reviewers are selected by the RMO or the institute (applied according to local RMO rules) meeting the criteria outlined in document CIPM MRA-G-12.
- Each RMO will make their guidance documents on QMS openly available.
- RMOs will have a process in place for on-going monitoring of the QMS of each member.
- RMOs will provide annual summary reports to the JCRB on the status of the QMS of the institutes within their RMO.
- RMOs will evaluate the QMS of each member institute at least every 5 years.
- International organizations that participate in the CIPM MRA also have routes to get their QMS approved. Details of this process are described in document CIPM MRA-G-12.

The benefits of a QMS

The QMS ensures the competence of the laboratory and encompasses technical and quality management, bringing benefits observed in daily laboratory practices. It ensures sound and systematic approaches are adopted ranging from personnel training, method development and validation of procedures, through to correct uncertainty budgets, and many other aspects of laboratory operation. Specifically, the QMS covers the procedures, organization, personnel, facilities, reference standards and equipment used by a CIPM MRA participant to make the measurements related to its CMCs. The QMS also ensures problems are addressed appropriately, and new opportunities explored.

NMIs gain from the peer-reviewers' expertise and feedback. Equally, the CIPM MRA processes are strengthened, and greater transparency is achieved through the regular reporting of QMS data between RMOs within the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB). Ultimately, the QMS gives confidence to customers of measurement services that 'what is claimed in the CMC is what will be delivered'.

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For further information:

CIPM MRA Documents: https://www.bipm.org/en/cipm-mra/cipm-mra-documents

CIPM MRA-G-12 *'Quality management systems in the CIPM MRA: Guidelines for monitoring and reporting'*

Joint ILAC – CIPM Communication regarding the Accreditation of Calibration and Measurement Services of National Metrology Institutes