

BIPM-GULFMET-2022

CIPM MRA Overview

Roles and responsibilities within the CIPM MRA: NMIs (DIs), BIPM, CCs, JCRB, RMOs

Bureau
International des
Poids et
Mesures



7 June 2022
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BIPM

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CIPM MRA

Reconnaissance mutuelle
des étalons nationaux de mesure
et des certificats d'étalonnage et de mesurage
émis par les laboratoires nationaux de métrologie
Paris, le 14 octobre 1999

[Supplément technique révisé en octobre 2003 \(pages 17-20\)](#)



Mutual recognition
of national measurement standards
and of calibration and measurement certificates
issued by national metrology institutes

Paris, 14 October 1999

[Technical Supplement revised in October 2003 \(pages 38-41\)](#)

Comité international des poids et mesures

Bureau
international
des poids
et mesures

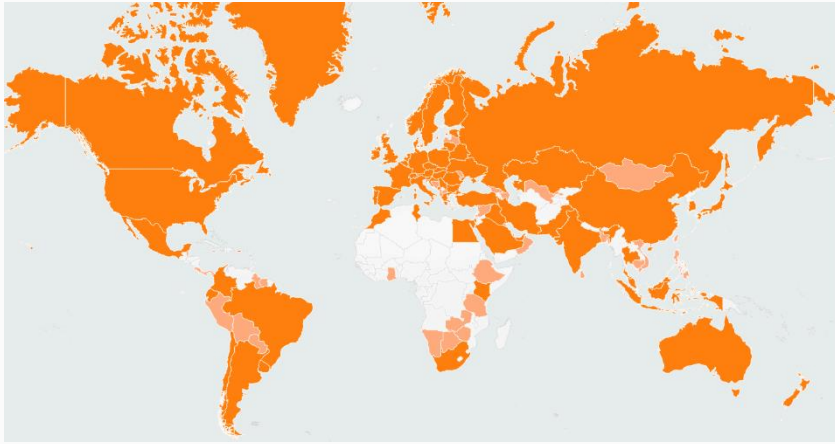
Organisation
intergouvernementale
de la Convention
du Mètre

The CIPM Mutual Recognition Arrangement (CIPM MRA) is the framework through which **NMIs demonstrate**

- the international equivalence of their measurement standards and
- the calibration and measurement certificates they issue.

It provides governments and other parties with a secure technical foundation for wider agreements related to international trade, commerce and regulatory affairs.

Member States and Associates (May 2022)



- 63 Member States*
- 37 Associates of the CGPM
(States and Economies)

** The official term is "States Parties to the Metre Convention"; the term "Member States" is its synonym and used for easy reference.*



The CIPM MRA was signed by representatives of:

- 100 Institutes
 - 63 Member States
 - 37 Associates
- 4 International organizations
(ESA, IAEA, JRC, WMO)
and covers plus 150 Designated Institutes

1 774 comparisons
1121 KCs, 653 SCs

25 733 CMCs
Peer-reviewed declarations

Participation

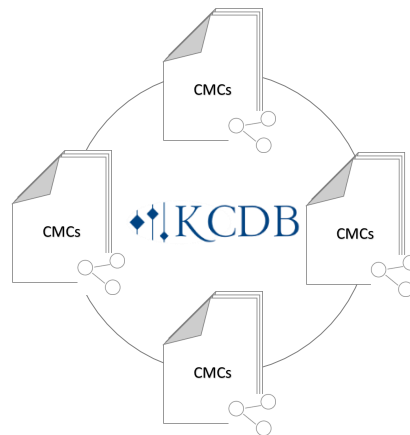
The CIPM MRA is open to:

- NMIs of the Member States
- certain international and intergovernmental organizations (IGO) invited by the CIPM
- NMIs of Associate States and Economies of the General Conference

Engagement

By signing the CIPM MRA, an NMI agrees to:

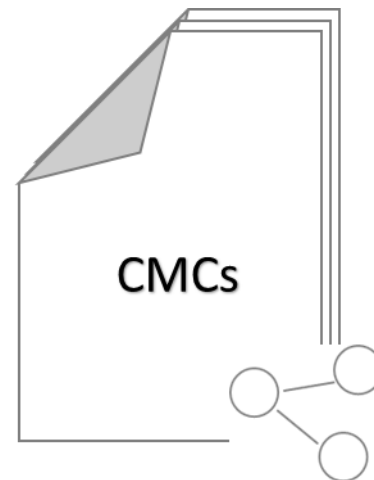
- accept the process specified in the CIPM MRA for establishing the database
- recognize the results of key and supplementary comparisons as stated in the database
- recognize the calibration and measurement capabilities of other participating NMIs as stated in the database



Outcomes of the CIPM MRA

The outcomes of the CIPM MRA are the internationally recognized (peer-reviewed and approved) **Calibration and Measurement Capabilities (CMCs)** of the NMIs declared on the publicly available BIPM key comparison database (KCDB).

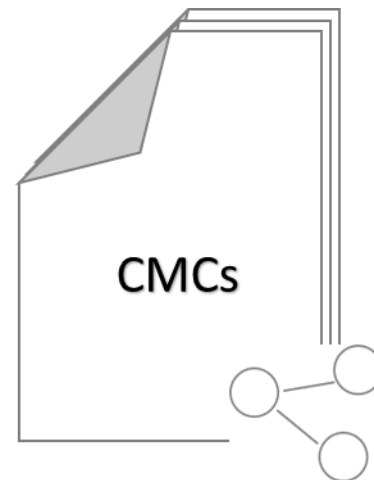
These CMCs declared by NMIs form the top of the metrological traceability chain that supports, amongst others, the 70 000+ accredited calibration and testing laboratories worldwide.



Services covered by CMCs

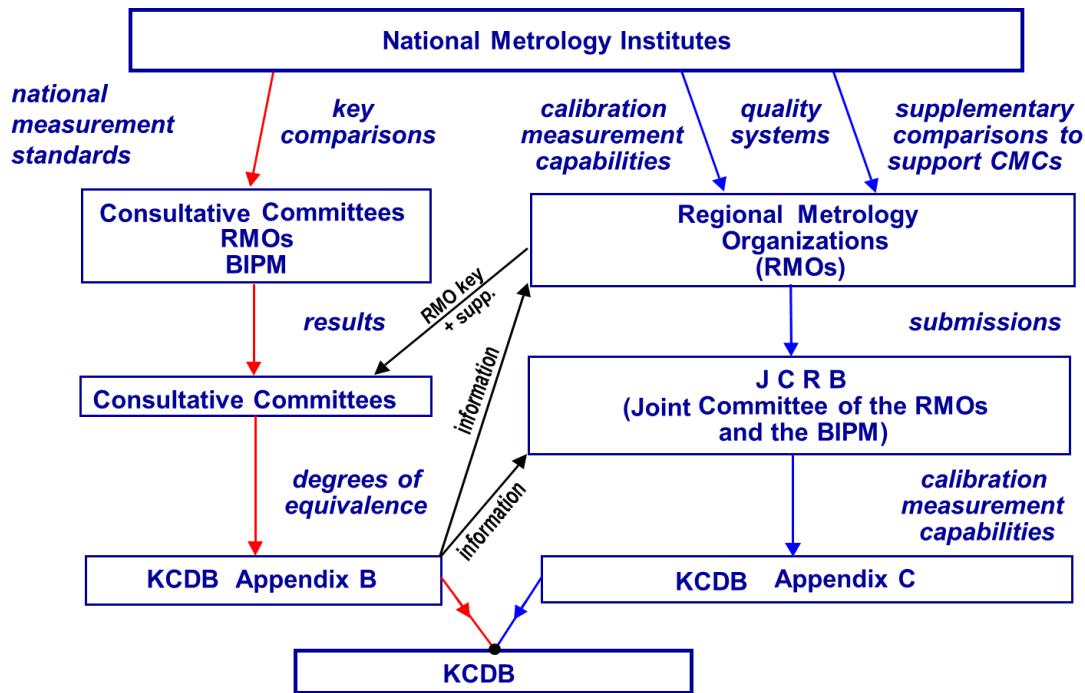
In context of the CIPM MRA calibration and measurement capabilities underpin:

- calibrations and measurements delivered by NMIs in accordance with the requirements of the ISO/IEC 17025:2017
- certified reference materials (CRMs) that are produced by NMIs according to ISO 17034:2016.

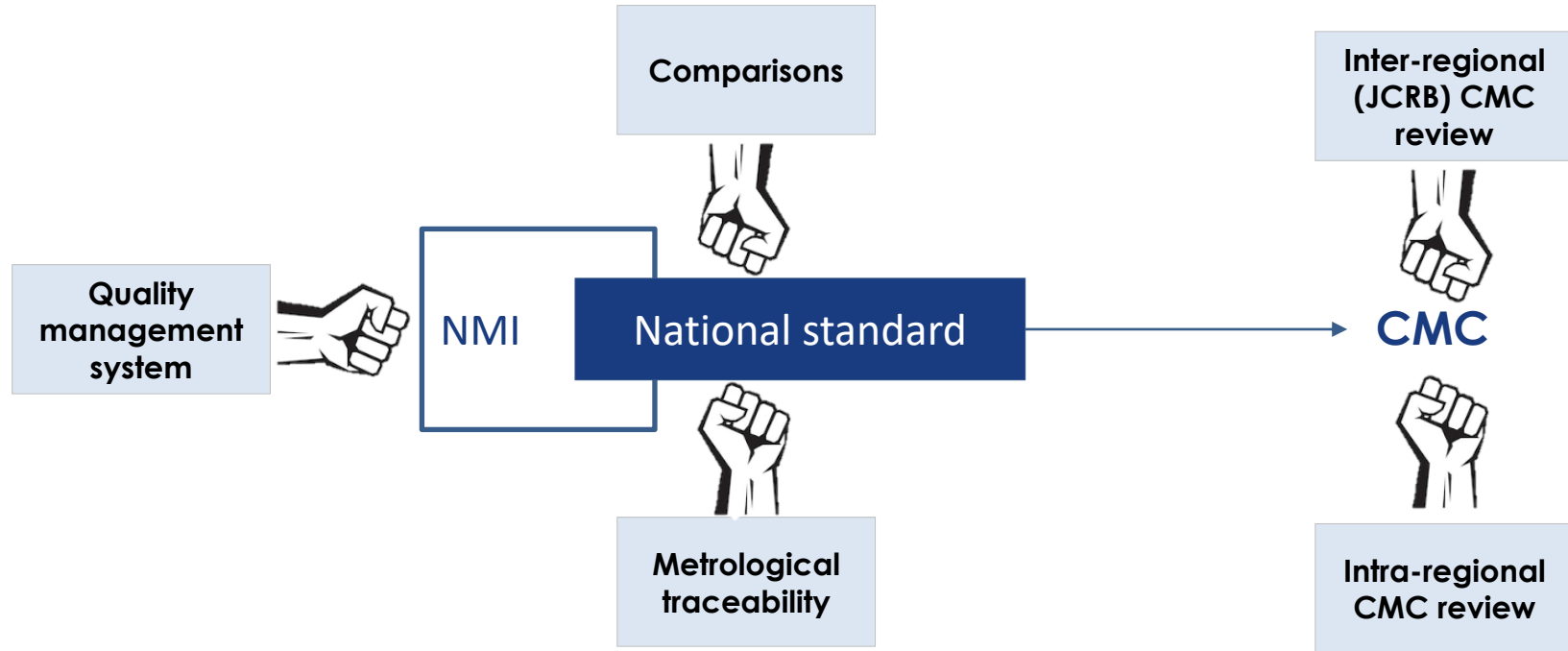


CMCs' declaration process

*CIPM Consultative Committee
WGs play a vital role ensuring
consistent and technically
valid application*

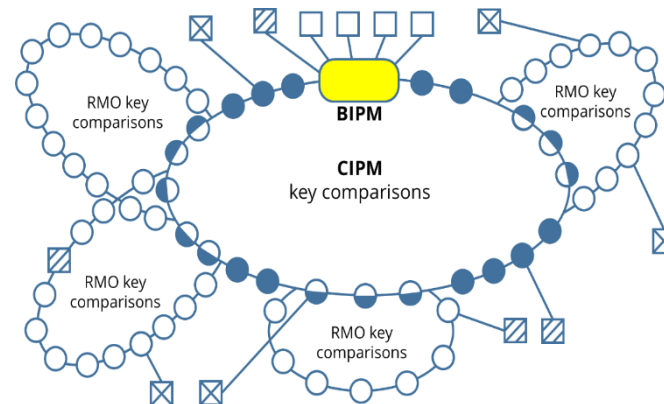


In simplest term...



Comparisons

- A fundamental mechanism of the CIPM MRA.
- Are carried out by the Consultative Committees of the CIPM, the BIPM and the RMOs.
- Support the CIPM MRA processes.
- Peer-evaluated.
- Published in the BIPM key comparison database (KCDB) and usually in the *Metrologia* Technical Supplements.
- Published comparisons identify the participants and their individual results.



There are 3 basic categories

- CIPM key
- RMO key
- Supplementary

Quality management system

Requirements for NMIs on QMS

QMS shall cover all declared CMCs and meet the requirements:

- ISO/IEC 17025 for CMCs, and (if applicable)
- ISO 17034 for CRM production

Requirements for RMO on establishing confidence

RMO shall peer review each quality management system either:

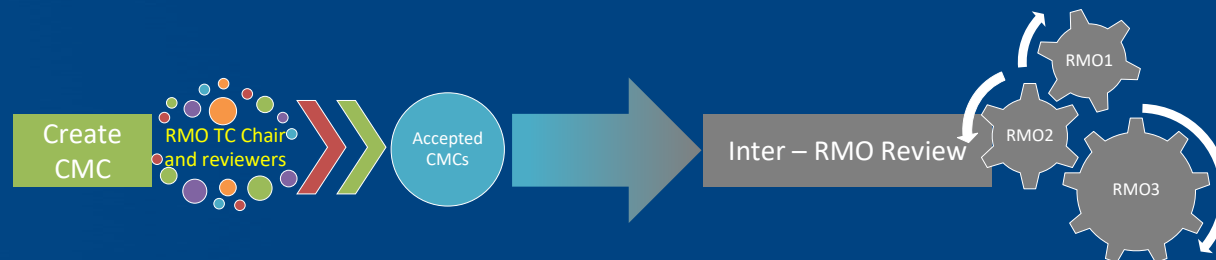
- with the support of an accreditation body; or
- directly, without third-party involvement

Metrological traceability

NMI shall establish its metrological traceability route to the SI via one of the following routes:

- A primary realization or representation of the unit of measurement concerned.
- Another NMI having relevant CMCs in the KCDB or through calibration and measurement services offered by the BIPM.

Peer review of CMCs



INTRA-REGIONAL CMC REVIEW

According to RMO internal procedures

INTER-REGIONAL CMC REVIEW

According to the CIPM MRA documents

Calibration and Measurement Capabilities – CMCs

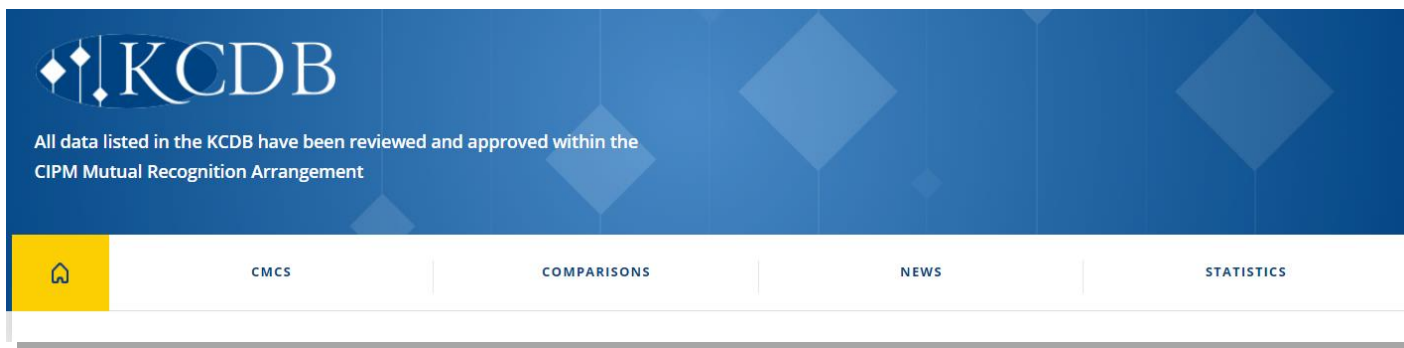
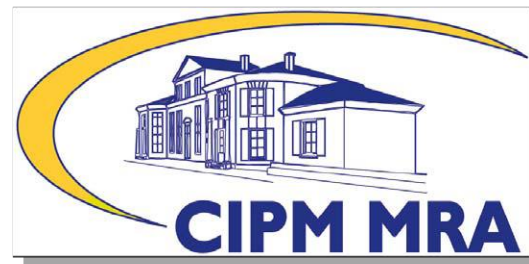
Type a keyword

SEARCH

→ [Advanced search](#)

Validity

By placing the logo on a calibration certificate and the statement, NMI is indicating that the calibration falls within NMI's calibration and measurement capabilities published in the KCDB under the CIPM MRA.



However, the authority is the KCDB...

02 - Key players

National Metrology Institutes

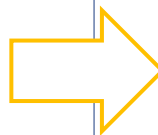
- Only one institute can sign the CIPM MRA on behalf of a Member State or Associate of the CGPM.
- When more than one institute is designated to hold national measurement standards in State or economy, the signatory must notify the BIPM so that all institutes can be identified in the KCDB.
- The signatory of the CIPM MRA takes responsibility for establishing an appropriate mechanism so that CMCs designated at the national level follow the approval process established by the JCRB and that CMCs do not overlap between institutes.

Designated Institutes

The CIPM MRA introduced the concept of "designated institutes" as responsible for certain national standards and associated services that are not covered by the activities of the "traditional" NMI.

The metrological scope and responsibilities of the NMI and other DIs of the same State or economy must always be clearly differentiated.

These DIs participate in the CIPM MRA within their limited area of activity in the same way as the NMIs.



*Designation process is outlined in
the CIPM MRA-P-13*

Nomination of a Designated Institute

Name of State/Economy:

Name of body that has the authority to designate:

Name of the institute to be designated (DI):

DI legal entity:
(if different from above)

DI Acronym: DI website:

DI mailing address:

Post code: City: Tel/Fax:

Contact Person at DI:

Contact Person's e-mail:

Metrology area of designation*:

Note that within the meaning of the CIPM MRA only one Institute per State or Economy can be designated for any given metrology area**

We confirm that we have the authority to designate within the meaning of the CIPM MRA and this designation is compatible with the spirit, rights and obligations of the CIPM MRA and with document CIPM MRA-P-13. Furthermore, we confirm that the organization being designated understands and accepts the rights and obligations of designation.

Your name and position within the designating body:

Signature: Date:

Please return to:
BIPM Pavillon de Breteuil
F-92312 Sèvres Cedex, France
e-mail: jcjb_es@bipm.org

*Chemistry, photometry, force, flow, volume, radioactivity, etc.

**The metrological responsibilities of signatory NMIs and other DI of the same State or Economy must always be clearly differentiated. If within a State the signatory NMI and a DI both have responsibilities within the same metrology area, the designation scope must be specified in sufficient detail to distinguish their responsibilities. This should be done using the classification of services as available on the KCDB: <https://www.bipm.org/kcdb/>

NOTE 1 Starting date of participation in the CIPM MRA will be considered as the date when the BIPM receives the signed designation form and it is this date that the BIPM will display.

Roles and responsibilities

- Overall coordination is by the BIPM under the authority of the CIPM
- Consultative Committees of the CIPM (CCs), the Regional Metrology Organizations (RMOs) and the BIPM are responsible for carrying out the key and supplementary comparisons
- Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) coordinating the activities among the RMOs in establishing confidence for the recognition of calibration and measurement certificates, according to the terms of the Mutual Recognition Arrangement

Coordination role: BIPM and the JCRB

The main responsibilities of the JCRB:

- coordinating the activities among the RMOs in establishing confidence for the recognition of calibration and measurement certificates
- making policy suggestions to the RMOs and to the CIPM on the operation of the CIPM MRA
- reporting the activities of the JCRB
- review any CIPM MRA related requests from RMOs
- ...

Details available through the Appendix E of the CIPM MRA:
<https://www.bipm.org/en/cipm-mra/cipm-mra-documents>

The JCRB operates under the auspices of the CIPM and comprises representatives of the RMOs.

The BIPM Director chairs the JCRB, supported by the JCRB Executive Secretary:

- ***Chairman of the JCRB: Dr Martin Milton, BIPM Director***
- ***Executive Secretary: Dr Olav Werhahn***
- ***CIPM Secretary***
- ***RMO representatives to the JCRB***
- Representatives may bring up to 4 advisers

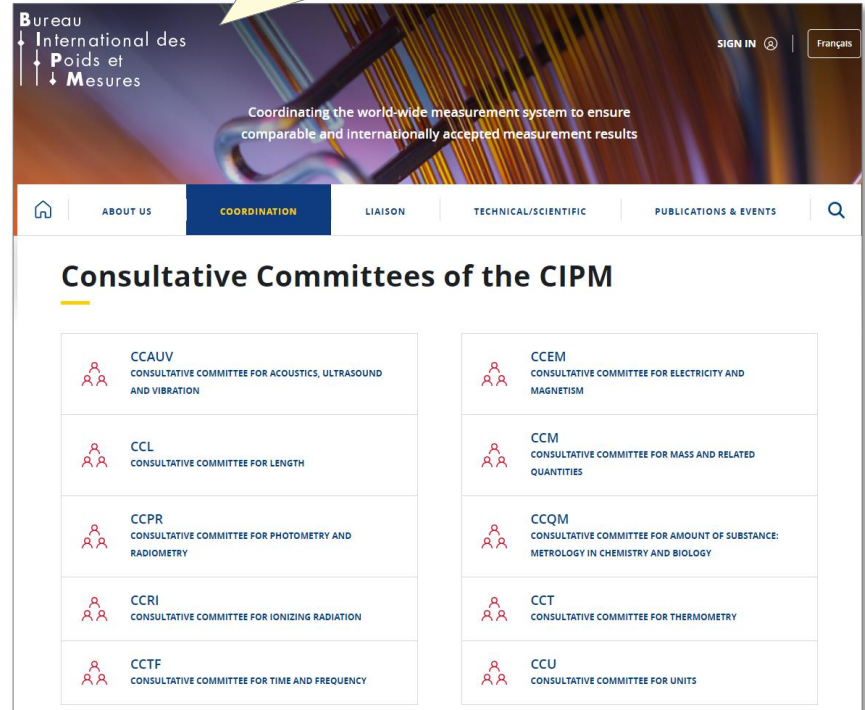
The Executive Secretary position has always been a secondment position from one of the Member State NMIs to the BIPM, the secondment typically being for a two-year period.

Technical role: CCs

Within the framework of the CIPM MRA, the Consultative Committees are charged with planning and execution of key comparisons, and affirming the validity of the results. Particularly, these responsibilities are:

- a) to identify the key comparisons in each field
- b) to initiate and organize, with the collaboration of the BIPM, the execution of key comparisons
- c) to review the results of CIPM key comparisons and determine the reference values and degrees of equivalence
- d) to approve the final report of CIPM key comparisons
- e) to examine and confirm the results of RMO key and supplementary comparisons
- f) to examine and confirm the results of bilateral key comparisons

The CIPM Consultative Committees have wide range of responsibilities in their metrological fields that are described on their dedicated webpages.



<https://www.bipm.org/en/committees/cc>

Technical role: RMOs

The Regional metrology organizations (RMOs) play an important role in the CIPM MRA. In particular, they:

- a) make proposals to the Consultative Committees on the choice of key comparisons
- b) carry out the RMO key comparisons
- c) participate in the JCRB
- d) carry out supplementary comparisons and other actions designed to support mutual confidence in the validity of calibration and measurement certificates issued by participating institutes



Thank you