



# CIPM MRA requirements and documentation

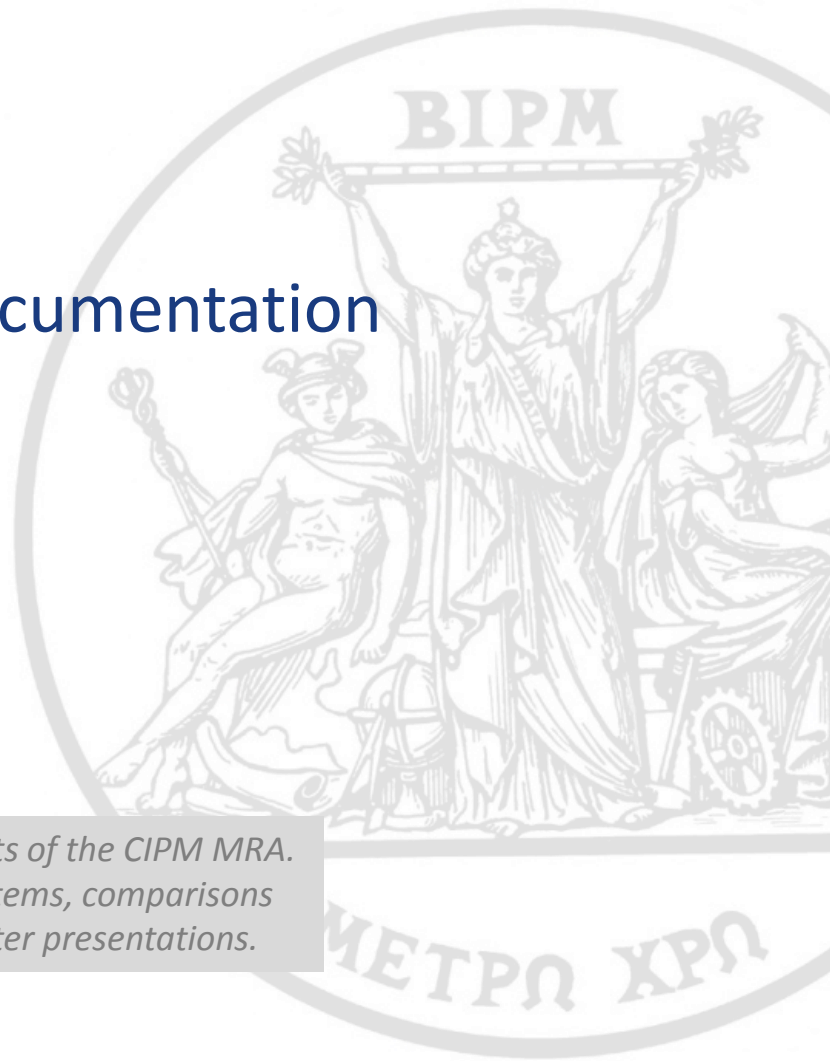
Andy Henson

Director of the International Liaison and  
Communication Department

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*Focuses on the general requirements of the CIPM MRA.  
Detailed information on quality systems, comparisons  
and CMCs will be covered during later presentations.*



# Essential requirements: Engagement

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**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

# Essential requirements: Exclusions

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The ‘recognition’ offered by the CIPM MRA is not unlimited:

- ♦ signature of the CIPM MRA engages NMIs but **not necessarily any other agency in their country**
- ♦ **responsibility for the results of calibrations and measurements rests wholly with the NMIs that makes them** and is not, through the CIPM MRA, extended to any other participating NMI



## 01 – Mechanisms of the CIPM MRA

# Essential requirements: Process

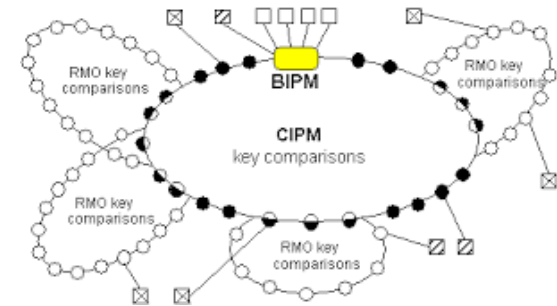
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**The objectives of the CIPM MRA are achieved through:**

- ♦ International comparisons of measurements, to be known as **key comparisons**
- ♦ **Supplementary** international **comparisons** of measurements
- ♦ **Quality systems** and demonstrations of competence by NMIs
- ♦ International **peer evaluation** of CMC claims

# Mechanisms of the CIPM MRA: *comparisons*

- ◆ **A fundamental mechanism** of the CIPM MRA
- ◆ Primary function is to **establish the degrees of equivalence of national measurement standards** which is the technical basis on which NMIs recognize each others national measurement standards
- ◆ Key and Supplemental comparisons are also **demonstrations of NMI measurement capabilities**
- ◆ **Registered in Appendix B of the KCDB**



*There are 3 basic categories*

- ◆ *CIPM key*
- ◆ *RMO key*
- ◆ *Supplementary*

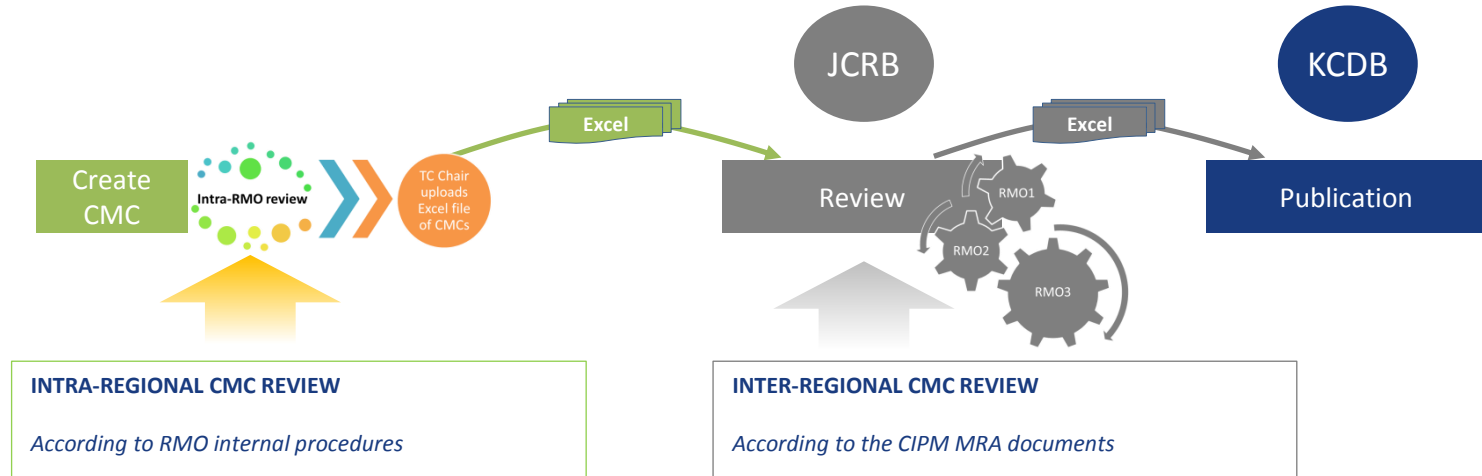
# Mechanisms of the CIPM MRA: *Quality system*

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CIPM MRA requires that all signatory NMIs establish and maintain an appropriate Quality System (QS) as the basis of establishing confidence in each others calibration and measurement activities.

- ◆ NMIs have a choice between **accreditation** and **self-declaration** of their QS
- ◆ RMOs are responsible for oversight and approval of the QSs of their member NMIs
- ◆ RMOs must conduct full review of member NMI QSs at least every five years.

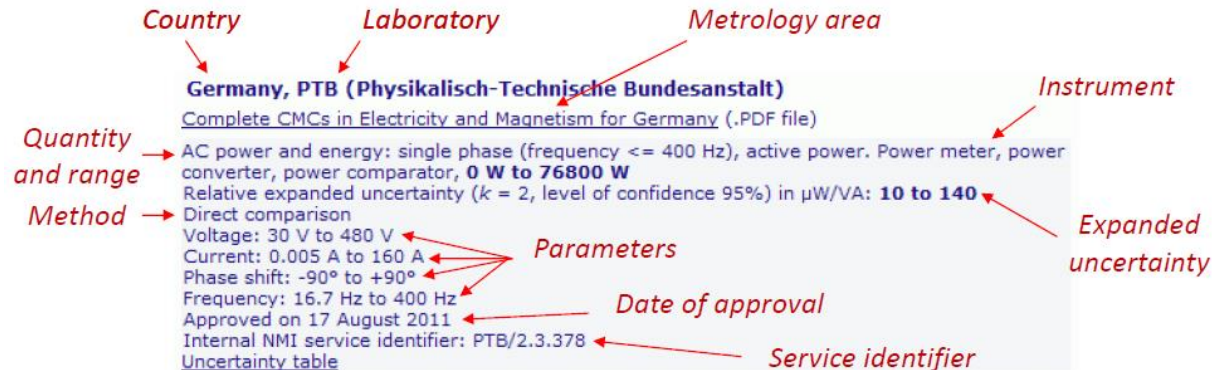
# Mechanisms of the CIPM MRA: *Peer evaluation of CMCs*





# CMCs in the CIPM MRA

- CMCs are described in terms of measurand, the method used, the range, the uncertainty, and if necessary, the influence parameters.



- When the range of uncertainty does not correspond to a linear variation with the value of the measurand, the expanded uncertainty can be described using an uncertainty table.

# CIPM MRA Requirements on metrological traceability

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All CMCs must include information on traceability of the measurements to the SI.

**According to the CIPM MRA, there are two routes to establish traceability:**

1. via a **primary realization** of the unit of measurement concerned, in which traceability is declared to its own demonstrable realization of the SI.
2. via another **NMI or DI having relevant CMCs** with appropriate uncertainty published **in the KCDB**, or through calibration and measurement services offered by the BIPM

# Requirements: *Evidence for CMC declarations*

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CMC declarations must be backed by evidence. Acceptable evidence includes:

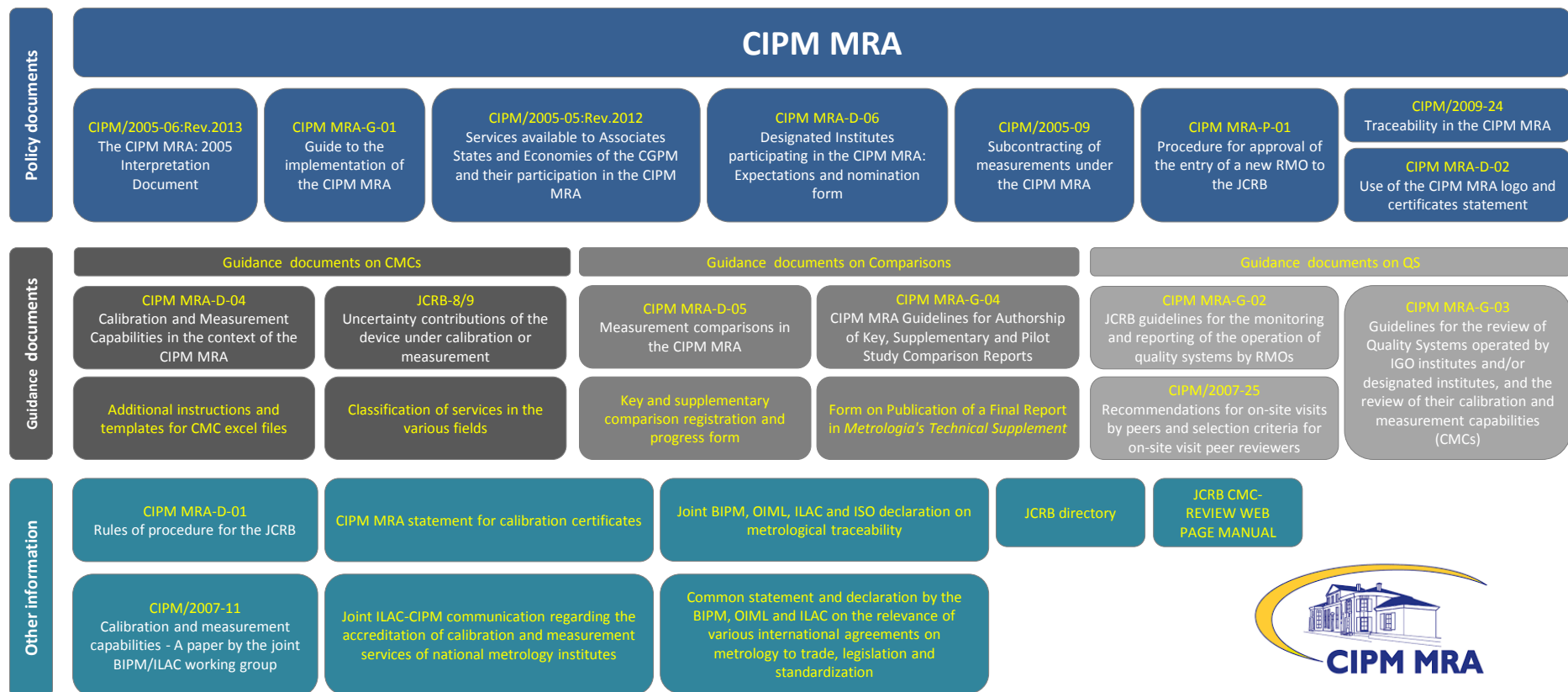
1. Results of key and supplementary comparisons
2. Documented results of past CC, RMO or other comparisons (including bilateral)
3. Knowledge of technical activities by other NMIs, including publications
4. On-site peer-assessment reports
5. Active participation in RMO projects
6. Other available knowledge and experience



## 02 – Documentation

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# CIPM MRA Documents Structure



# JCRB and KCDB back office documents

## JCRB internal documents

Documents

### JCRB-D-01

Template for CIPM MRA public documents

### JCRB-D-02

Template for JCRB internal documents

### JCRB-D-03

Use of the CMCs Review Data Base Program

Procedures

### JCRB-P-01

Procedure for uploading JCRB working documents on the JCRB website

### JCRB-P-02

Procedure for publishing CMCs on the BIPM website

### JCRB-P-03

Procedure for identifying and numbering CIPM MRA documents

### JCRB-P-04

Procedure for modifying files uploaded in the CMCs review website

### JCRB-P-05

Procedure for the Registration of Designated Institutes Participating in the CIPM MRA

## P-14 BIPM KCDB Operation

Comparisons

**P-01** Registration of information

**P-02** Registration of results

**P-08** Process for publication **OPEN**

**P-10** Publication of CCTF-K001.UTC

CMCs

**P-04** Publication for General Physics

**P-05** Publication for Ionizing Radiation

**P-06** Publication for Chemistry

**P-07** Process for publication **OPEN**

Various

**P-03** Registration of News


**P-11** Update of statistics group

**P-12** Update of Exalead

**P-13** Statistics on Associates




# Website: What is the CIPM MRA?



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– the intergovernmental organization through which Member States act together on matters related to measurement science and measurement standards.

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## International equivalence of measurements: the CIPM MRA

→ The CIPM Mutual Recognition Arrangement (CIPM MRA) is the framework through which National Metrology Institutes demonstrate the international equivalence of their measurement standards and the calibration and measurement certificates they issue. The outcomes of the Arrangement are the internationally recognized (peer-reviewed and approved) **Calibration and Measurement Capabilities (CMCs)** of the participating institutes. Approved CMCs and supporting technical data are publicly available from the **CIPM MRA database (the KCDB)**.

[Introduction](#) | [CMCs](#) | [CMC approval process](#) | [Participants](#) | [International comparisons](#) | [CIPM MRA documents](#) | [CIPM MRA review](#)

[About the CIPM MRA database](#) | [KCDB](#)


→ The CIPM MRA responds to the need for an open, transparent and comprehensive scheme to give users reliable quantitative information on the comparability of national metrology services and to provide the technical basis for wider agreements negotiated for international trade, commerce and regulatory affairs.

The CIPM MRA has been signed by the representatives of 102 institutes – from 57 Member States, 41 Associates of the CGPM, and 4 **international organizations** – and covers a further 156 institutes designated by the signatory bodies.

[ [Click here for the full list of participants](#) ]

The Regional Metrology Organizations (**RMOs**) play an important role in the CIPM MRA. The RMOs are responsible for carrying out comparisons and other actions within their regions to support mutual confidence in the validity of the calibration and measurement

# Website: CIPM MRA



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> You are here: International equivalence: the CIPM MRA > text online

## Text of the CIPM MRA

List of contents | Download (PDF) | Appendices to the Arrangement

- The essential points
- Preamble

1. The arrangement
2. Scope of the arrangement
3. Technical basis of the arrangement
4. Responsibilities of the Consultative Committees of the CIPM
5. Responsibilities of the regional metrology organizations
6. Participation in key and supplementary comparisons
7. Confidence in measurements
8. Disputes in the operation of the arrangement
9. Coordination
10. Responsibility and liability for measurements
11. Signing this mutual recognition arrangement and bringing it into force
12. Status of national measurement standards calibrated by the BIPM or by a national metrology institute
13. NMIs that are not members of an RMO
14. NMIs that are members of more than one RMO
15. Entry of new RMOs into the Joint Committee

- Glossary of terms used in this arrangement
- Technical supplement to the arrangement (modified by the CIPM, 2003)

### CIPM MRA docs.

- Policy documents
- Guidance on CMCs
- Guidance on comparisons
- Complementary info.
- Use of the CIPM MRA logo
- See also: JCRB



# Website: Policy documents

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CIPM MRA documents

Clickable overview of the CIPM MRA documents

Policy documents | Guidance on CMCs and QS | Guidance on comparisons | Complementary info. | Use of the CIPM MRA logo | JCRB

	Title	Doc. no.	Latest update
✓	<b>Text of the CIPM MRA</b> [également disponible <a href="#">en français</a> ]		2003
✓	<b>The CIPM MRA Interpretation Document</b>	CIPM/2005-06(REV)	March 2017
✓	<b>Guide to the implementation of the CIPM MRA</b>	CIPM MRA-G-01	June 2013
✓	<b>Traceability in the CIPM MRA</b> Exceptions: AUV   EM   L   M   PR   QM   RI   T   TF	CIPM/2009-24	Oct. 2009
✓	<b>Designated Institutes participating in the CIPM MRA: Expectations and nomination form</b>	CIPM MRA-D-06	March 2017
✓	<b>Services available to Associates States and Economies of the CGPM and their participation in the CIPM MRA</b>	CIPM/2005-05(REV)	June 2012
✓	<b>Use of the CIPM MRA logo and certificates statement</b>	CIPM MRA-D-02	March 2015
✓	<b>Procedure for approval of the entry of a new RMO to the JCRB</b>	CIPM MRA-P-01	Jan. 2011
✓	<b>Subcontracting of measurements under the CIPM MRA</b>	CIPM/2005-09(REV)	March 2017

# Website: Guidelines on CMCs and QS

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Policy documents

Guidance on CMCs and QS

Guidance on comparisons


Complementary info.

Use of the CIPM MRA logo

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	Title	Doc. no.	Latest update
➤	<b>Calibration and Measurement Capabilities in the context of the CIPM MRA</b>	CIPM MRA-D-04	Oct. 2013
➤	<b>Additional instructions and templates for CMC excel files:</b>   <a href="#">General</a>   <a href="#">AUV</a>   <a href="#">EM</a>   <a href="#">PR</a>   <a href="#">QM</a>   <a href="#">RI</a>   <a href="#">TF</a>		
➤	<b>Links to RMO Guidelines on Quality Systems and CMCs:</b>   <a href="#">AFRIMETS</a>   <a href="#">APMP</a>   <a href="#">COOMET</a>   <a href="#">EURAMET</a>   <a href="#">GULFMET</a>   <a href="#">SIM</a>		
➤	For the classification of services in the various fields, see: <a href="#">KICDB</a>   <a href="#">AUV</a>   <a href="#">EM</a>   <a href="#">L</a>   <a href="#">M</a>   <a href="#">PR</a>   <a href="#">QM</a>   <a href="#">RI</a>   <a href="#">T</a>   <a href="#">TF</a>		
➤	<b>JCRB guidelines for the monitoring and reporting of the operation of quality systems by RMOs</b>	CIPM MRA-G-02	Jan. 2011
➤	<b>Guidelines for the review of Quality Systems operated by IGO institutes and/or designated institutes, and the review of their calibration and measurement capabilities (CMCs)</b>	CIPM MRA-G-03	March 2015
➤	<b>Recommendations for on-site visits by peers and selection criteria for on-site visit peer reviewers</b>	CIPM/2007-25	Apr. 2008
➤	<b>Uncertainty contributions of the device under calibration or measurement</b>	JCRB-8/9	Feb. 2002


# Website: Guidelines on Comparisons




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Guidance on CMCs and QS

Guidance on comparisons

Complementary info.

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	Title	Doc. no.	Latest update
✓	<b>Measurement comparisons in the CIPM MRA</b>	CIPM MRA-D-05	March 2016
✓	<b>Key and supplementary comparison registration and progress form</b> (Please save to your computer and complete locally)		July 2017
✓	<b>CIPM MRA Guidelines for Authorship of Key, Supplementary and Pilot Study Comparison Reports</b>	CIPM MRA-G-04	Oct. 2011
✓	<b>Publication of a Final Report in <i>Metrologia's Technical Supplement</i></b> (Please save to your computer and complete locally)		March 2016

# Website: Complementary info.

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	Title	Doc. no.	Latest update
➤	<b>Signatories of the CIPM MRA</b>	CIPM MRA Appendix A	
➤	<b>CIPM MRA statement for calibration certificates</b> [également disponible <a href="#">en français</a> ]		
➤	<b>Rules of procedure for the JCRB</b>	CIPM MRA-D-01	Oct. 2008
➤	<b>JCRB directory</b>		
➤	<b>JCRB CMC-Review Web Page Manual</b>		Feb. 2016
➤	<b>Common statement and declaration by the BIPM, OIML and ILAC on the relevance of various international agreements on metrology to trade, legislation and standardization</b>		
➤	<b>Calibration and measurement capabilities - A paper by the joint BIPM/ILAC working group</b>	CIPM/2007-11	Dec. 2007
➤	<b>Joint ILAC-CIPM communication regarding the accreditation of calibration and measurement services of national metrology institutes</b>		March 2012



# Thank you

[andy.henson@bipm.org](mailto:andy.henson@bipm.org)

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