CIPM MRA

Mr Chingis KUANBAYEV

International Liaison and Communication

BIPM

June 2026

The strategic role of the CIPM MRA in the international measurement system

BIPM

The mission of the Metre Convention continues to be met; "to assure the international unification …"


DOCUMENTS DIPLOMATIQUES

DE

LA CONFÉRENCE DU MÈTRE.

PARIS.

IMPRIMERIE NATIONALE.

1875.

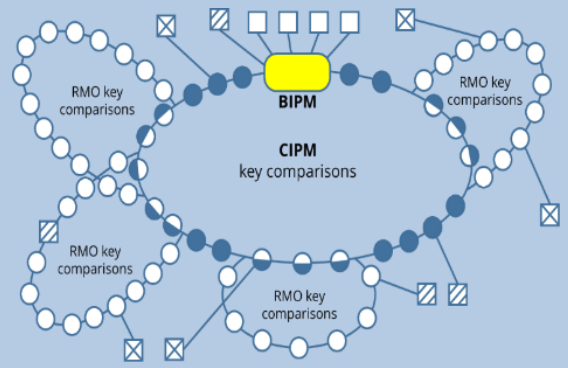
Metre Convention: Article 6 (1875)

Article 6 (1875), *the BIPM is charged with:*
…the ***periodic comparison of national standards*** *with the international prototypes and their official copies…*

(1889), the CGPM *sanctioned international prototypes of the metre and the kilogram, and their official copies were distributed to 18 States*

(1927), the first Consultative Committee was set up *(CCE, now* ***CCEM****)*

CCPR
CCT
CCL
CCTF
CCRI
CCU
CCM
CCQM
CCAUV



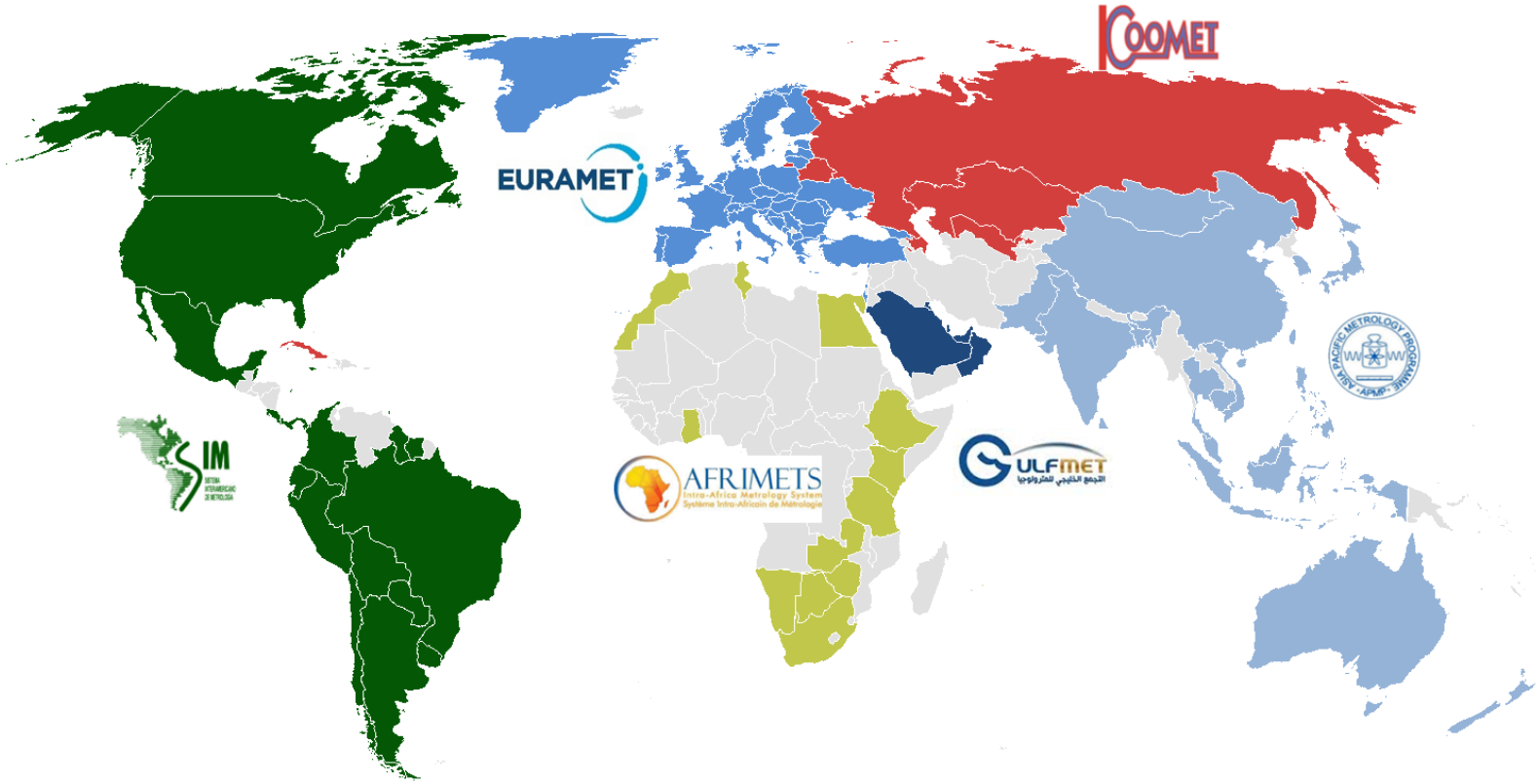
CIPM MRA October 1999

…comprehensive and coherent solution to establish and demonstrate the degree of international equivalence

CIPM MRA provides a network for international engagement on measurement-related issues

More than **250 institutes** participate in the CIPM MRA, and participating countries cover approximately 98 % of the world's GDP.

National Metrology Institutes join this international network grounded on common understanding of the SI, and a precise language for understanding measurement capabilities and utilizing those resources throughout the world.



CIPM MRA - simplifying recognition in a connected world

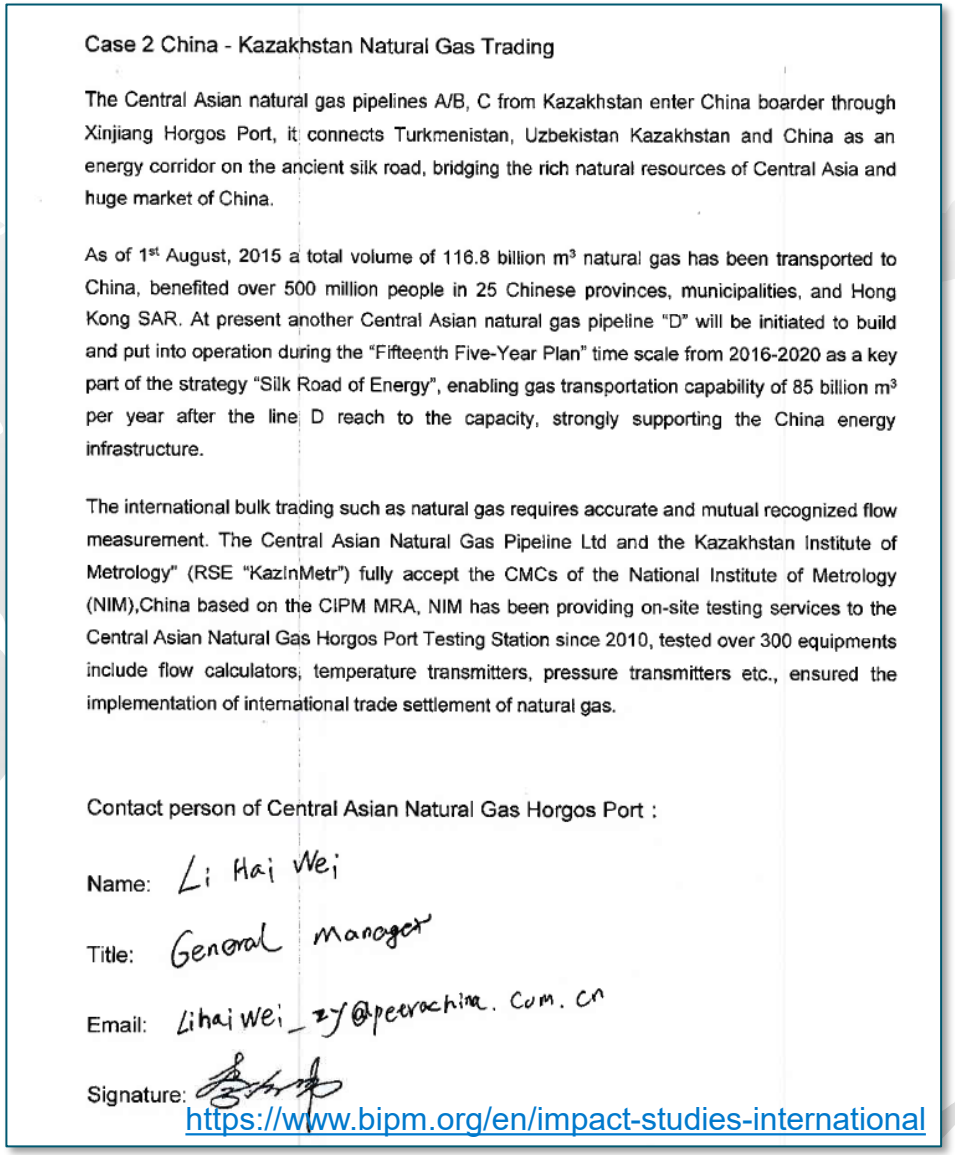
Governments gain access to this network which constitutes a trusted and solid technical foundation for wider agreements related to international trade, commerce, and regulatory affairs.

https://www.wto.org/english/tratop_e/tbt_e/tbt_e.htm

CIPM MRA - simplifying recognition in a connected world

Business, industry and manufacturers can be assured that products and services involving traceable measurements will be accepted in national and foreign markets.

Parties requiring instrument calibration services or reference materials can choose the optimal source based on delivery time, cost, and level of uncertainty, regardless of whether the source is inside or outside the country



Case 2 China - Kazakhstan Natural Gas Trading

The Central Asian natural gas pipelines A/B, C from Kazakhstan enter China boarder through Xinjiang Horgos Port, it connects Turkmenistan, Uzbekistan Kazakhstan and China as an energy corridor on the ancient silk road, bridging the rich natural resources of Central Asia and huge market of China.

As of 1st August, 2015 a total volume of 116.8 billion m^3 natural gas has been transported to China, benefited over 500 million people in 25 Chinese provinces, municipalities, and Hong Kong SAR. At present another Central Asian natural gas pipeline "D" will be initiated to build and put into operation during the "Fifteenth Five-Year Plan" time scale from 2016-2020 as a key part of the strategy "Silk Road of Energy", enabling gas transportation capability of 85 billion m^3 per year after the line D reach to the capacity, strongly supporting the China energy infrastructure.

The international bulk trading such as natural gas requires accurate and mutual recognized flow measurement. The Central Asian Natural Gas Pipeline Ltd and the Kazakhstan Institute of Metrology" (RSE "KazInMetr") fully accept the CMCs of the National Institute of Metrology (NIM),China based on the CIPM MRA, NIM has been providing on-site testing services to the Central Asian Natural Gas Horgos Port Testing Station since 2010, tested over 300 equipments include flow calculators, temperature transmitters, pressure transmitters etc., ensured the implementation of international trade settlement of natural gas.

Contact person of Central Asian Natural Gas Horgos Port :

Name: Li Hai Wei

Title: General Manager

Email: Lihaiwei_zy@petrochina.com.cn

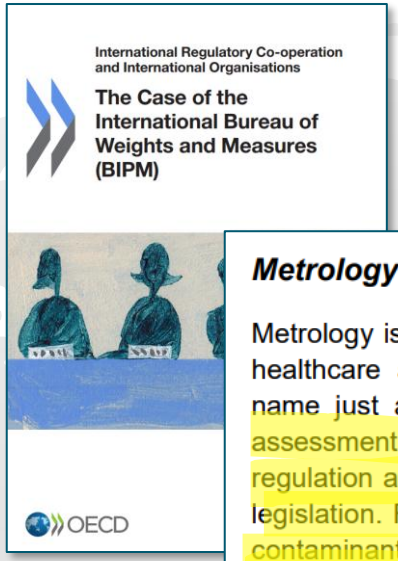
Signature:

https://www.bipm.org/en/impact-studies-international

CIPM MRA - simplifying recognition in a connected world

Regulators can rely on the technical knowledge of their NMI when implementing regulations. Decisions will be based on reliable and objective results.

National regulatory bodies and other agencies utilize effectively the pool of technical knowledge that is generated within an NMI.



Metrology for regulation and legislation

Metrology is a requisite for effective legislation covering product quality, healthcare and safety, the environment and consumer protection, to name just a few. Metrology is required not only to enable an effective assessment of compliance, but also in the development of effective regulation and as an input to the data underpinning the rationale for the legislation. For example, it has enabled regulators to set "the maximum contaminant limit in foodstuff" at parts per million or even parts per billion and know that these limits can be reliably enforced. A study on the impact of the EMRP programme, a multinational metrology research programme of the European Union, shows that 42 EMRP projects out of the 119 funded have direct relevance to some 25 EU regulations and directives (Knee and Jarvis, 2017a).

https://www.bipm.org/en/liaison-partners/oecd

*Example…*UNECE

https://unece.org/trade/wp6/wp6-Recommendations

United Nations ECE/CTCS/WP.6/2023/5

Economic and Social Council

Distr.: General
5 September 2023

Original: English

Economic Commission for Europe

Steering Committee on Trade Capacity a

Working Party on Regulatory Cooperation and Standardization Policies (WP.6)

Thirty-third session
Geneva, 23–24 November 2023
Item 4 of the provisional agenda
Advisory Group on Market Surveillance

Revision of Recommendation
Conformity Assessment and

Submitted by the WP.6 Chair*

Summary

Metrology ensures the uniformity of measu
International System of Units (SI). It all
accurately, more quickly and to a higher st
standardization and the quality infrastructu
of trade. This recommendation and its
assurance of conformity assessment and
exchanges. It further provides guidance for
national metrology system.

Mandate:

The Working Party on Regulatory Coo
Programme of work for 2023 foresees the "
K on Metrological Assurance of Conformity
paragraph 10c).

Proposed decision

"The Working Party adopts the *Revision of*
of Conformity Assessment and Testing."

* This document is submitted under the responsib
substantive clearance procedure through the Ecc
document has not been edited by a professional

GE.23-17023(E)

II. Recommended practice

7. **Recommends that:**

K.1 Governments should support the development and implementation of fully harmonized standards,' guides and technical regulations promoting methods and means of metrological traceability on the basis of the international documents, standards, guidelines and recommendations of the International Bureau for Weights and Measures (BIPM), the International Organization of Legal Metrology (OIML), the International Laboratory Accreditation Cooperation (ILAC), the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

K.2 National technical regulations relevant to international trade and industrial cooperation should contain requirements for the technical competence of conformity assessment bodies and calibration and testing laboratories, taking due note of appropriate international standards that set criteria and the possibility to utilize accreditation as a way of assuring competence, and under the ILAC and the International Accreditation Forum (IAF) arrangements for mutual recognition. It is noted that conformity assessment activities such as inspection and product certification may also include testing and/or calibration.

K.3 Conformity assessment bodies and testing laboratories should have the necessary competence, including an appropriate scope, to ensure that the metrological assurance is established thus ensuring a high level of confidence when estimating parameters characterizing the products from the point of view of their safety, influence on health and environment and consumer protection.

K.4 The choice of which decision rule (how measurement uncertainty is addressed when it impacts on the conformity assessment outcome) is to be followed will d
application and should be clearly stated. Particular regard should be
means of obtaining measurement information used for th
measurement which are the basis for conformity

F. Implementation of Recommendation K.6

20. Metrological traceability is the backbone that ensures confidence in measurements results. It links measurements at the workplace to the SI or other international accepted references. There are various ways to demonstrate to other parties that internationally accepted paths have been followed. The importance of metrological traceability is reflected in the "Joint BIPM, OIML, ILAC and ISO declaration on metrological traceability", which recommends that the following principles should be used whenever there is a need to demonstrate metrological traceability for international acceptability.

- In order to be able to rely on their international acceptability, calibrations should be performed
  - In national metrology institutes which should normally be signatories to the CIPM MRA and have CMCs published in the relevant areas of the KCDB or
  - In laboratories accredited to ISO/IEC 17025 by accreditation bodies that are signatories to the ILAC Arrangement.
- Measurement uncertainty should follow the principles established in the GUM.
- The results of the measurements made in accredited laboratories should be traceable to the SI.
- NMIs providing metrological traceability for accredited laboratories should normally be signatories to the CIPM MRA and have CMCs published in the relevant areas of the KCDB.
- In the framework of the OIML-CS, accreditation should be provided by bodies which are signatories to the ILAC Arrangement and which respect
  metrological traceability to the SI.

21. The above is consistent with ISO/IE
competence of testing and calibration la
the instances where metrologic

…European Aviation Safety Agency

EASA
European Aviation Safety Agency

To all Foreign Part-145 Applicants
and Approval Holders

Cologne 26 Feb 2018 A(D)50850

Subject: Tools calibration requirements
Reference: EASA UG.CAO.00132-001 "Tools and Equipment"

Dear Sir or Madam,

The purpose of this letter is to inform all EASA Part-145 Applicants and Approval holders on changes which will affect the EASA User Guide UG.CAO.00132-001 "Tools and Equipment".
This user guide contains a transition period of 24 months to comply with the requirement to perform tooling calibration in an ILAC Accredited laboratory, which will end on 13 April 2018.

A revision of this user guide is ongoing and unfortunately not expected to be published before the end of 2018. Changes will affect among others the tooling calibration requirements, which result in the need to extend the above mentioned transition period **until 31 December 2018.**

Based on the above, Applicants and Approval Holders are hereby informed that the following calibration laboratories will be acceptable in the revised user guide. These entities may be already used and in any case will be the only acceptable calibration laboratories after the extended transition period:

(a) a National Metrology Institute (NMI) whose service is covered by the CIPM MRA[1]. (Services covered by the CIPM MRA can be viewed in Appendix C of the BIPM KCDB[2] which includes the range and uncertainty for each listed service; refer to "kcdb.bipm" website), or;

https://www.easa.europa.eu/sites/default/files/dfu/tools%20and%20equipment.pdf

European Union Aviation Safety Agency — User Guide

Foreign Part 145 approval - Tools & Equipment	Doc #	UG.CAO.00132-003
	Approval Date	10/11/2022

In order to comply with Part-145 the maintenance organisation shall ensure that:
(a) Tooling requiring calibration is periodically calibrated in accordance with the tool manufacturers' published standards and recommendations.
(b) Where no recommendations for calibration are published or where the calibration methods or standards are not specified, calibration is carried out in accordance with the requirements of the ISO 10012. This standard details both the generic requirements and guidance for the implementation of measurement management systems.

Based on the evaluation above the applicable requirements shall be clearly specified in a calibration order sent to the calibration laboratory together with the tooling, including any relevant specific requirements/information (e.g. tool incidentally damaged or specific accuracy requirements contained in the A/C, engine, CMM or tooling manufacturer instructions, etc.).

When using tooling requiring test, calibration or measurement, a maintenance organisation shall ensure that the calibration or measurement interval required by the tooling manufacturer is complied with. This process is detailed in paragraph 8.4 "serviceability monitoring "of this user guide.

9.2.3. Selection of the calibration provider
When selecting a calibration provider the maintenance organisation shall ensure that the provider falls into one of the cases below provided that the MOE chapter 2.5 "Tools Calibration" is reflecting those cases.

9.2.4. Calibration in "acceptable" laboratories
Tooling shall be calibrated by any of the following laboratories:

(a) a NMI whose scope specifically covers the intended calibration (scope means the services covered by the CIPM MRA and can be viewed in Appendix C of the BIPM KCDB including the range and uncertainty for each listed service; refer to *"kcdb.bipm"* website), or;

(b) a calibration laboratory accredited to ISO/IEC 17025 by an accreditation body which is signatory of the ILAC MRA (Full Members) or an ILAC Recognised Regional Cooperation Body (Signatories and Recognised Regional Cooperation Bodies are listed on ILAC Membership website), where the scope of accreditation specifically covers the intended calibration, or;

(c) original tool m… calibration or a…

(d) calibration ent… agreement wit… data (not appli…

9.2.5. Interpretation…

The term "star… term used.
With this regar… "officially reco… standard used …

[10] this case applies to particular situat…

© European Aviation … Proprietary documen… Internet/Intranet.

https://www.easa.europa.eu/sites/default/files/dfu/ug.cao_.00132-003_tools_equipment.pdf

9.2.4. Calibration in "acceptable" laboratories

Tooling shall be calibrated by any of the following laboratories:

(a) a NMI whose scope specifically covers the intended calibration (scope means the services covered by the CIPM MRA and can be viewed in Appendix C of the BIPM KCDB including the range and uncertainty for each listed service; refer to *"kcdb.bipm"* website), or;

(b) a calibration laboratory accredited to ISO/IEC 17025 by an accreditation body which is signatory of the ILAC MRA (Full Members) or an ILAC Recognised Regional Cooperation Body (Signatories and Recognised Regional Cooperation Bodies are listed on ILAC Membership website), where the scope of accreditation specifically covers the intended calibration, or;

(c) original tool manufacturer identified in the approved maintenance data, provided it is supported by a calibration or accuracy statement, or;

(d) calibration entity[10] which is acceptable in an EASA POAH or Production Organisation under bilateral agreement with the EU. This option is limited to tooling which are the ones specified by the maintenance data (not applicable to alternative tools in use by the production organisation)

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Consumers can be confident that purchases of measured items in the marketplace (e.g., a litre of petrol, or a milligram of medicine) will be fair and safe.

Conformity Assessment Procedures (CAP)

"Any procedure used, directly or indirectly, to determine that relevant requirements in technical regulations or standards are fulfilled.

Conformity assessment procedures include, inter alia, procedures for sampling, testing and inspection; evaluation, verification and assurance of conformity; registration, accreditation and approval as well as their combinations." (TBT, Annex 1.3)

Slide courtesy
L Locks WTO

CIPM MRA: Reliable path for demonstration of metrological traceability

BIPM

ISO/IEC 17025:2017

"General requirements for the competence of testing and calibration Laboratories"

A.3 Demonstrating metrological traceability

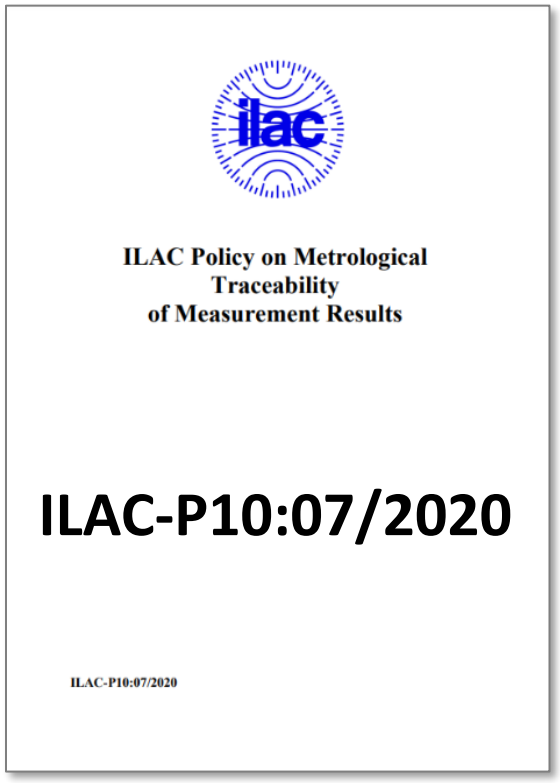
A.3.1 Laboratories are responsible for establishing metrological traceability in accordance with this document. Calibration results from laboratories conforming to this document provide metrological

traceability. Certified values of certified reference materials from reference material producers conforming to ISO 17034 provide metrological traceability. There are various ways to demonstrate conformity with this document: third party recognition (such as an accreditation body), external assessment by customers or self-assessment. Internationally accepted paths include, but are not limited to, the following.

a) Calibration and measurement capabilities provided by national metrology institutes and designated institutes that have been subject to suitable peer-review processes. Such peer-review is conducted under the CIPM MRA (International Committee for Weights and Measures Mutual Recognition Arrangement). Services covered by the CIPM MRA can be viewed in Appendix C of the BIPM KCDB (International Bureau of Weights and Measures Key Comparison Database) which details the range and measurement uncertainty for each listed service.

b) Calibration and measurement capabilities that have been accredited by an accreditation body subject to the ILAC (International Laboratory Accreditation Cooperation) Arrangement or to Regional Arrangements recognized by ILAC have demonstrated metrological traceability. Scopes of accredited laboratories are publicly available from their respective accreditation bodies.

CIPM MRA: Reliable route for metrological traceability


ILAC Policy on Metrological Traceability of Measurement Results

ILAC-P10:07/2020

ILAC-P10:07/2020

https://ilac.org/publications-and-resources/ilac-policy-series/

2. ILAC POLICY ON METROLOGICAL TRACEABILITY OF MEASUREMENT RESULTS

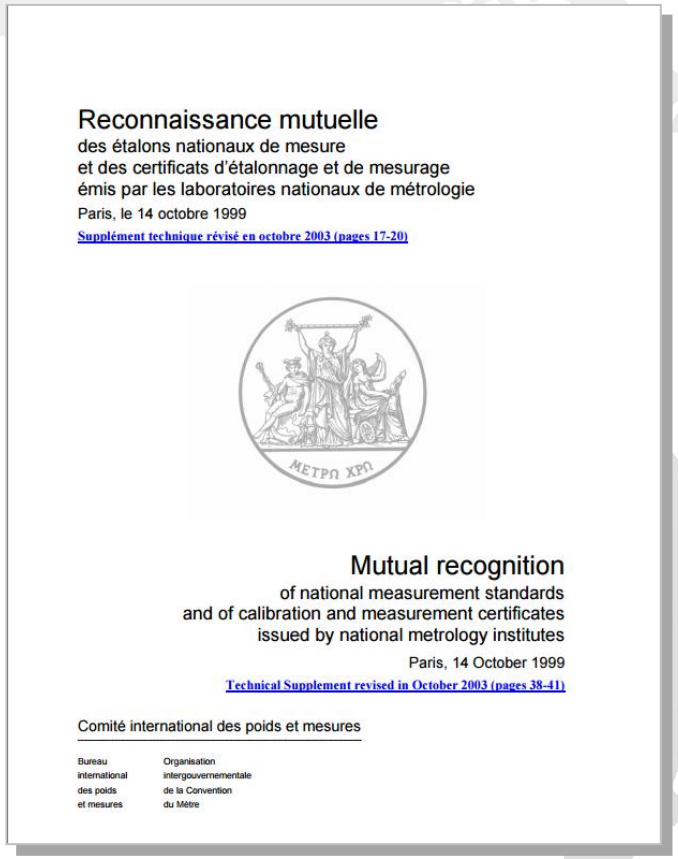
When metrological traceability is required, the ILAC policy is that the measuring equipment [1] shall be calibrated by:

1) A National Metrology Institute (NMI) whose service is suitable for the intended use and is covered by the International Committee for Weight and Measures Mutual Recognition Arrangement (CIPM MRA). Services covered by the CIPM MRA can be viewed in the Bureau International des Poids et Mesures Key Comparison Database (BIPM KCDB) which includes CMCs for each listed service.

Note 1: Some NMIs may also indicate that their service is covered by the CIPM MRA by including the CIPM MRA logo on their calibration certificates, however the fixing of the logo is not mandatory and the BIPM KCDB remains the authoritative source of verification.

Note 2: NMIs from Member States participating in the Metre Convention may take metrological traceability directly from measurements made at the BIPM. The KCDB provides an automatic link to the relevant BIPM calibration services (including the range and uncertainty). Individual calibration certificates issued by the BIPM are also listed.

CIPM MRA - *a secure technical foundation for wider agreements*



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.

Pavillon de Breteuil
F-92312 Sèvres Cedex
FRANCE

bipm.org