



Bureau International des Poids et Mesures



A Brief History of the CIPM MRA

Omer Altan, Executive Secretary of the JCRB



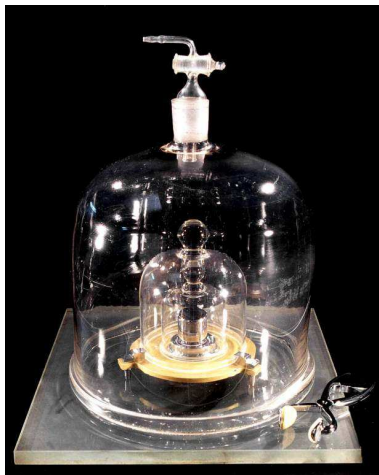
FGNMID CIPM MRA Workshop
Skopje, April 27-29, 2011

The Metre Convention

The Metre Convention was signed on May 20, 1875 by representatives of 17 states.

From the text:

“Desiring the international uniformity and precision in standards of weight and measure...”



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The Metre Convention

The main driver of the Metre Convention was the growth in the international trade of manufactured products in the middle of the 19th century and the need to have a formal agreement on units of measurements between major trading partners.

The Meter Convention established the BIPM, CIPM and CGPM.



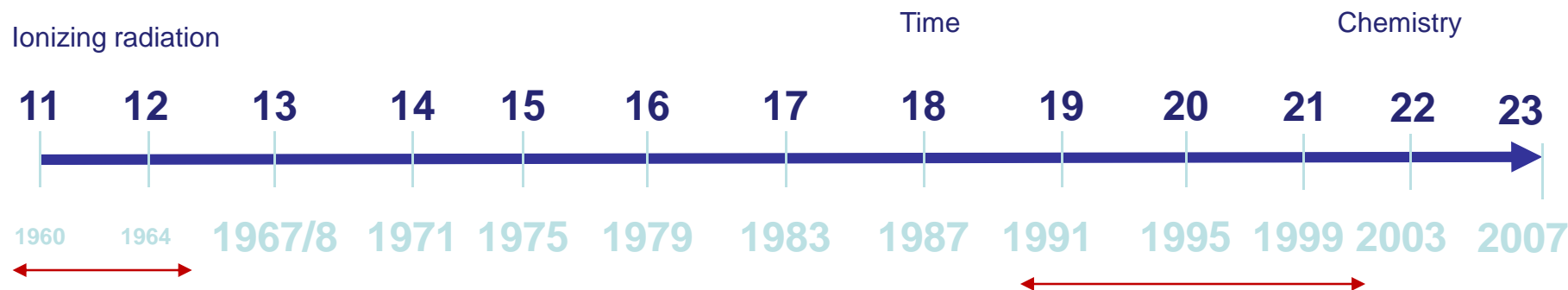
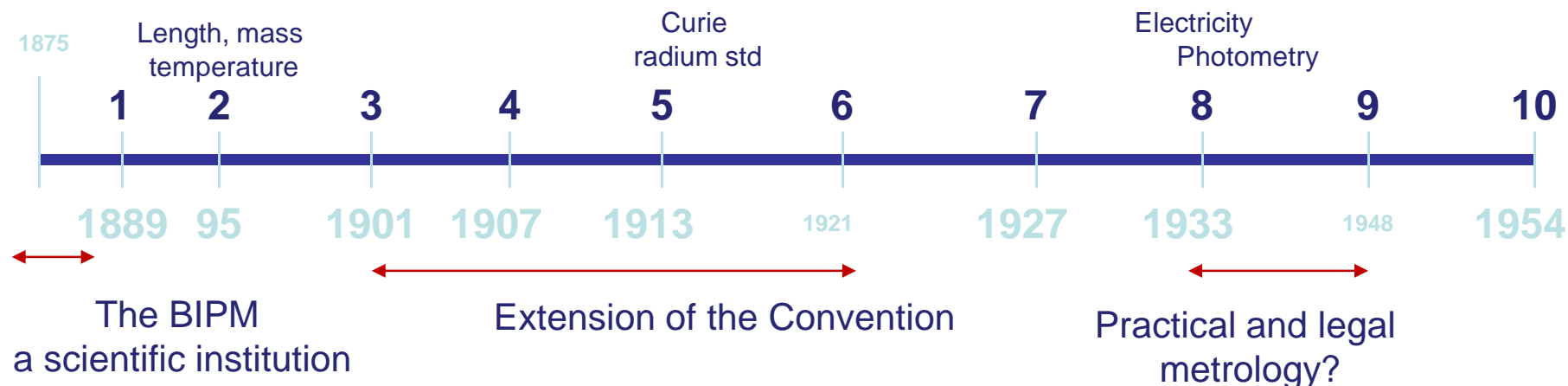


Expanding role of the BIPM

At the beginning, the BIPM was concerned only with the metre and the kilogram, but it soon became necessary to include thermometry in order to investigate the thermal expansion of the Pt-Ir metre standard artefact.

BIPM gradually expanded its fields of activity to include electricity, photometry, ionizing radiation, time, and finally, chemistry.

CGPMs and the Evolution of the Metre Convention and the Work of the BIPM



The SI

Large investment in new laboratories, extension of the site

New buildings, metrology in chemistry, biotechnology, medicine etc?

creation of CCQM

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1999 CIPM MRA



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The Emergence of National Metrology Institutes

Beginning in the late 1800s, countries began establishing scientific institutes to provide national measurement standards and to support national needs for accurate and reliable measurements. These are now known as National Metrology Institutes

PTB – Germany 1887

NPL – UK 1900

NIST – USA 1901

NMIJ – Japan 1903

NPLI – India 1947

NIM – China 1955

NIS – Egypt 1963

INMETRO – Brazil 1973

KRISS – S. Korea 1975

The BIPM and the National Metrology Institutes

From the beginning, one of the important activities of the BIPM was the carrying out of international comparisons of national standards.

In the early days these were mostly among the so-called “grands laboratoires” namely the PTR (Germany) the NPL (UK) and the NBS (USA)

On the basis of the results of these comparisons, which over the years included more and more NMIs and more and more types of standards, international consistency of national measurement standards was assured.



The emergence of bilateral agreements

In the 1980s **bilateral agreements** started to be signed between NBS (later NIST) and other NMIs in order to meet increasing demands for specific documented demonstrations of equivalence between national standards.

American regulators and companies were requiring foreign partners to demonstrate “traceability to NBS” for all their measuring equipment.

The series of comparisons conducted under the coordination of BIPM were not considered sufficient to meet these requirements.

First Moves Towards the CIPM MRA

In 1986, the bureau of the CIPM, concerned that the increasing number of bilateral agreements between NMIs might call into question the role of the BIPM in the coordination of the global system of measurement, proposed to the CIPM that these agreements be brought under the auspices of the BIPM and that new comparisons be conducted if necessary.

The CIPM refused the proposal, noting that NMIs were free to sign bilateral agreements as fitted their needs.

First Moves Towards the CIPM MRA

There were to three other factors that were developing at the time:

- **Pressure from accreditation bodies** for demonstration of NMI capabilities to which the laboratories they accredited were expected to be traceable and of equivalence of NMI calibration certificates.
- **The development of regional groupings** of NMIs to undertake cooperative activities - EUROMET in Europe, APMP in the Asia – Pacific
- **The reduction of tariff barriers** resulting from GATT Uruguay round of negotiations and the conclusion of the Technical Barriers to Trade Agreement increased attention paid to TBTs among which intergovernmental acceptances of testing methods and standards is of relevance to metrology.

Timeline of the CIPM MRA

October 1992

CIPM decides that BIPM should seek a broad role in international traceability of measurements and standards - first official step to the CIPM MRA

October 1993

CIPM considers a draft scheme for using BIPM and CC comparisons as the basis for formal *worldwide traceability*

October 1994

CIPM adopts a draft resolution for the 20th CGPM: “*Worldwide traceability of measurement standards*”

Timeline of the CIPM MRA

Resolution 2 of the 20th CGPM (1995)

→ World-wide traceability of measurement standards

← (1) → (3)

The 20th Conférence Générale des Poids et Mesures,

considering

- the increasingly stringent requirements of science, technology and international trade for traceability in measurement at many levels of accuracy,
- the existence of groups of cooperating national metrology laboratories in different regions of the world,
- the need to demonstrate world-wide equivalence or traceability of measurement standards among national laboratories and regional groups of cooperating national laboratories,
- the calibration services of the Bureau International des Poids et Mesures (BIPM) for the national laboratories,
- the role of the BIPM in carrying out and coordinating world-wide comparisons of standards at the highest level among the national laboratories,
- the necessary participation of national laboratories in international comparisons,

welcomes the trend towards regional grouping of national metrology laboratories as an efficient way of promoting cooperation and regular comparisons of national standards among laboratories, some of which do not participate in comparisons carried out by the BIPM or the Comités Consultatifs,

recognizes the global advantages of interconnections between the comparisons carried out under the auspices of the BIPM and those of the regional groups of metrology laboratories,

recommends

- that national metrology laboratories, in collaboration with the BIPM, ensure that the necessary comparisons between national standards are carried out in sufficient number to demonstrate international traceability of measurement standards,
- that adequate interconnections are maintained between the comparisons carried out under the auspices of the BIPM and those carried out by the regional groups,
- and that the results of comparisons carried out by the regional groups be communicated to the BIPM in appropriate form for them to be published by the BIPM and thereby given wide international recognition.

Reference:

➡ *Comptes Rendus de la 20^e CGPM* (1995), 1996, 220

The reader should note that the official version of this Resolution is the [French text](#).

Timeline of the CIPM MRA

February 1997

First and second drafts of the CIPM MRA

Meeting of 38 NMI directors agree that the principle of an international MRA preferable to bilateral agreements or linked regional arrangements. Revisions to 2nd draft requested.

September 1997

CIPM adopts 7th draft and creates the Joint Committee of the RMOs and the BIPM (JCRB) to be responsible for coordinating implementation of the CIPM MRA

Timeline of the CIPM MRA

1998

Negotiations with NMIs and other interested parties continue over the text of the CIPM MRA and mechanisms for KCs and CMCs

April 1999

Final text sent to printers and to Directors with invitation to sign during 21st CGPM

July 1999

Last minute objections to text! After agreement with objecting party, new final text sent to printers.

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Timeline of the CIPM MRA

The CIPM MRA was signed on October 14, 1999 at the College de France by the directors of 38 NMIs and two international organizations.

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



Mutual recognition

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

Paris, 14 October 1999

Comité international des poids et mesures

Bureau
international
des poids
et mesures

Organisation
intergouvernementale
de la Convention
du Mètre