



International aspects of National Metrology Systems

The need for international recognition and compatibility between national and international metrological requirements.

International mutual recognition of a country’s measurement capability is critical to the removal of technical barriers to trade, and to participation in multilateral trade agreements such as those of the World Trade Organization. Harmonizing national requirements and technical regulations with international documentary standards creates a pathway for participating in the world economy. It is important to note that successful engagement with the international community requires dedicated resources to undertake both the technical activities associated with demonstration of technical competence, and to enable experts to participate in the international forums. It is important that the institutional and legal framework in a country facilitates participation in international organizations. The central government must take the lead in coordinating international issues. National Metrology Institutes (NMIs) and legal metrology authorities should be enabled and encouraged to enter into international and regional agreements and take part in the activities of those international organizations that form those agreements. It should not be forgotten that engaging internationally with peers provides excellent opportunities to benchmark and improve metrological skills.

International metrology organizations

The Metre Convention and scientific metrology: The Metre Convention is the international treaty, signed by representatives of seventeen nations in Paris in 1875, that forms the basis for international agreement on units of measurement. It established a permanent organizational structure for member governments to act in common accord on all matters relating to units of measurement. It founded the International Bureau of Weights and Measures (BIPM), the scientifically expert intergovernmental organization whose mission is to work with NMIs of Member States and Associates of the General Conference on Weights and Measures (CGPM), the RMOs and strategic partners to advance the global comparability of measurements. Currently, more than 100 countries participate in the activities of the BIPM. Participation in the activities of the BIPM helps to:

- demonstrate the international equivalence of national measurement standards and the calibration and measurement certificates issued by the NMI (and other institutes designated to hold national standards)
- exchange knowledge, information, and experience at the international level
- contribute to global decision-making concerning metrological developments.

The CIPM Mutual Recognition Arrangement (CIPM MRA) is the framework through which NMIs demonstrate the international equivalence of measurement standards and accept the calibration and measurement certificates they issue.

The OIML Convention and legal metrology: The OIML Convention, signed in 1955, established the International Organization of Legal Metrology (OIML) and provides the constitution of that organization. The OIML is an intergovernmental treaty organization whose membership includes Member States that participate actively in technical aspects and Corresponding Members that join as observers. The OIML promotes the global harmonization of legal metrology laws and procedures and provides its members with guidance on their national legislation, including the principle that measurements used for trade and regulatory purposes should be made using measurement standards that are legally traceable to the SI. The principal activities of the OIML are the writing of technical standards and the promotion of the acceptance of type evaluation test reports in order to avoid duplication of approval testing.

The OIML Certification System (OIML-CS) is a system for issuing, registering and using OIML Certificates and their associated type evaluation and test reports for types of measuring instruments. The aim of the OIML-CS is to facilitate and harmonize the work of national and regional bodies that are responsible for type evaluation and approval of measuring instruments that are subject to metrological control.

Regional Metrology Organizations

Regional bodies play an important role in the way that all quality infrastructure organizations operate. *Regional Metrology Organizations* (RMOs) are regional associations of NMIs. Within the BIPM context, RMOs work to improve regional metrological capability by sharing expertise and exchanging technical services among members. They have a wide range of activities, including participation in the CIPM MRA. Their participation is critical in carrying out measurement comparisons that demonstrate metrological capabilities and documenting the calibration and measurement capabilities in the BIPM key comparison database (KCDB). Within the OIML, *Regional Legal Metrology Organizations* (RLMOs) are groupings of legal metrology authorities who participate in the development of legal metrological infrastructure and promote free and open trade through the harmonization and removal of technical and administrative barriers to trade. Their activities achieve greater harmony of measurement and testing within their region and build mutual confidence among their members through improved communication in the region.

Other important international quality infrastructure organizations

Quality infrastructure components of standardization and accreditation also have international organizations that work to harmonize practices world-wide and disseminate metrological traceability from the NMI to industry. Because of the metrological elements in these other parts of the quality infrastructure, it is important to be aware of the key international organizations responsible for standardization and accreditation, and to integrate them into the NMS as appropriate. These organizations include:

- **International Organization for Standardization (ISO)** – publishes a range of international standards that apply to the manufacture and testing of various products, and the provision of services.
- **International Electrotechnical Commission (IEC)** – publishes international standards for all electrical, electronic and related technologies.
- **International Laboratory Accreditation Cooperation (ILAC)** – ensures international acceptance of accreditation of calibration laboratories, conformity assessment bodies including, testing laboratories, medical testing laboratories and inspection bodies, proficiency testing providers and reference material producers.
- **International Accreditation Forum (IAF)** – provides international acceptance in conformity assessment in the fields of management systems, products, services, personnel and other similar programmes of conformity assessment.

www.bipm.org



For further information:

This insert has been developed from the BIPM and OIML joint publication:
National Metrology Systems - Developing the institutional and legislative framework.

For more complete information, please refer to this document and its references.
The document is available through the BIPM and OIML websites.

www.oiml.org

