



Objectives and Tasks of NMIs

Some concrete examples

**Seminar „Experiences and Developments in
Legal Metrology“**

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National Measurement System

consist of collective infrastructure of national facilities, expertise, knowledge, research and legal framework which is necessary to meet the national needs for accurate and reliable measurements which are internationally recognised

- **Legislation related to metrology**
- **Government authority in charge of national metrology policy**
- **One or more institutes in charge of tasks assigned at national level for the metrology policy**
- **A system of national measurement standards**
- **Calibration and testing**
- **Accreditation of laboratories, inspection bodies and certification bodies**
- **Training in metrology**
- **Legal Metrology**

Governmental authorities

- Management of national metrology policy which should define the action of government on issues related to metrology
- Ensuring the establishment and maintenance of appropriate metrology infrastructure
- Definition of regulations and their enforcement

Technical tasks should be dealt by competent institutes which may be governmental, semi-public or private. When tasks are delegated to semi-public or private institutes **the government should ensure** that:

- public interest is protected
- accountability
- transparency
- no conflict of interests



Setting up of National Metrology Institute

- Creation of a new entity or
- Modification of one or more existing laboratories or other institutes


Preconditions:

- Legal basis (national metrology infrastructure, national metrology policy, role of NMI, units of measurement)
- Finances (sustainable funding ensured through legislation)
- Personnel
- Equipment
- Premises
- Traceability
- Quality system
- International recognition demonstration of metrological competence by successful participation in inter-laboratory comparisons - CIPM MRA for NMIs

National Metrology Institute

is authorized by national decision to:

- **Prepare and implement the national metrology strategy**
- **Establish, maintain and develop national measurement standards**
- **Disseminate the legal units to other laboratories and users in the country as well as to customers outside the country**
- **Establish traceability arrangement with other NMIs for those units for which there are no national primary standards**
- **Ensure traceability of standards used for verification by legal metrology authorities**
- **Carry inter-comparisons with other NMIs and participate within RMO comparisons and within CIPM MRA framework**

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- A horizontal bar at the top of the slide, consisting of a long blue segment followed by a series of smaller squares in various shades of blue and white.
- Carry out technical work and coordination in legal metrology for which it has been appointed by national authority
 - Maintain quality system
 - Cooperate with national accreditation body (organisation of comparison measurements for calibration laboratories, to provide metrological experts in the accreditation process)
 - Provide technical advice and support to the government, industry, commerce and public on metrology issues
 - Cooperate in standardisation work
 - Provide training and consultation services to customers
 - Participate in international work

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Legal Metrology – main tasks

- Preparing (issuing) regulations
- Conformity assessment procedures(e.g.Type approvals)
- Verifications
- Notified body for NAWI and MID
- Market surveillance and in-service-inspection
- Control of prepackages
- Nomination and supervision of accredited verification bodies
- Training and knowledge transfer
- International cooperation

Establishing National Metrology Institute

- Single NMI for all metrological activities (scientific, legal, industrial)
- One NMI with separate institute for legal metrology activities
- One lead NMI supported by one or more designated institute(s) which are responsible for certain national standards and related services (decentralised organisation)
- Two or more equal status NMIs (decentralised organisation)

As the importance of metrology in non-traditional areas such as chemistry, medicine and food increases, fewer countries have an NMI that covers all subject fields and hence the number of designated institutes is currently growing.

The concept of "designated institutes"

(Paragraphs 1.4 and 1.5 of the CIPM MRA)

Designated institutes are responsible for certain national standards and associated services that are not covered by the activities of the "traditional" NMI

In the majority of countries with DIs the NMI plays a central role in the designation and coordination of the system

The designating authority should take care that financial stability of the NMI and the DIs and appropriate financial resources for the maintenance of national measurement standards are assured

- 20 out of the 37 EURAMET member countries have DIs at all. In this case NMI have a leading role in the establishment, coordination and governance of the national measurement system.
- In the other ones all national standards are maintained exclusively in the NMI. They represent centralised National Metrology Systems

The concept of "designated institutes" - concrete examples

In most countries accreditation or Q-audits by the NMI are a formal requirement for designation and follow-up of the performance of the DI

The highest number of DIs are in Ionising Radiation and Metrology in Chemistry

Germany

Physikalisch-Technische Bundesanstalt (PTB), Braunschweig
is authorized by law to designate other institutes as a NMI for certain quantities:

- Bundesanstalt für Materialforschung und -prüfung (BAM) for large part of chemistry
- Bundesamt für Verbraucherschutz und Lebensmittelsicherheit (BVL), Braunschweig food testing area
- Umweltbundesamt (UBA), Langen for certain measurement standards in environmental measurements

NMI and designated institutes

United Kingdom

National Physical Laboratory (NPL), Teddington is the UK National Measurement Institute

Designated institutes:

LGC, Teddington for chemical and bioanalytical measurements

National Measurement Office, formerly National Weights and Measures Laboratory (NWML) (NMO), Teddington

NEL for liquid and gas flow measurement technologies and provides the UK's national flow measurement facilities



Steps for designation of institutes

Designation by government, other authority or NMI

- Definition of designation criteria
- Designation procedure
- Decision on designation
- Contract containing rights and obligations of designated institute
- Monitoring and reporting of designated institutes

Monitoring the work of the designated institutes

- periodical evaluation by a metrology council or national authority
 - report of laboratory results which is presented to other experts for evaluation
 - quality management audits in DIs performed by NMI
 - impact studies
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- Decision on temporary withdrawal of designation (12 months)
 - Decision on the withdrawal of designation (to repay the amount of co-financing)

Designation procedure

- public call
- an expert committee performs the assessment procedure of legal entities to the effect whether they meet the criteria for recognition as designated institute
- the decision is taken upon the assessment report

Synergyis between scientific and legal metrology

- NMI is responsable for legal metrology as well or
- Close cooperation established between NMI and legal metrology authority

Objectives:

- Better management of resources as NMI provides traceability for legal metrology laboratories
- Facilitating a coherent policy in metrology
- Better knowledge transfer

WELMEC - EURAMET MEMORANDUM OF UNDERSTANDING

- to analyse which technical activities and/or documentary work could be developed jointly in order to avoid duplication of work and increase efficiency
- to exchange the expertise and experts for efficient execution of metrological projects



EURAMET - WELMEC FOCUS GROUP ON FACILITATING NATIONAL METROLOGY INFRASTRUCTURE DEVELOPMENT

- to promote and develop the metrology infrastructure in the countries of the new and emerging EURAMET Members and Associates and WELMEC Associates by an increased cooperation and collaboration to achieve concentration and a synergetic and efficient use of competences and resources



Legal Metrology - Criteria for nomination of verification bodies

- competence, integrity and stability of personnel must be demonstrated
- the laboratory has the resources (staff, financial, equipment, premises) for legal metrology activities
- liability insurance unless liability is assumed by the State in accordance with national law
- knowledge of metrological regulation(s)
- The verification bodies are accredited according to ISO/EN17020

Steps for nomination of verification bodies

Nomination by NMI or other national authority

- Definition of nomination criteria
- Nomination procedure
- Decision on nomination
- Monitoring and reporting of nominated institutes

Responsibilities of nominated bodies

- continuously meet the criteria for the nomination
- actively work in the field of nomination
- work according to good metrological practice
- work according to good business practice
- notify any change which might affect the nomination
- provide all the data regarding verification (electronic data base)
- follow the national needs and to align to technical developments in the field
- take part in expert trainings
- follow the guidelines of NMI

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Monitoring the work of the nominated bodies

- Regular annual systematic surveillance (announced)
- Operational control (not announced) at the site of verification
- Administrative control
- Corrective actions
- Decision on the withdrawal of nomination

Thank you for your attention

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