

Designated Institutes (DIs) **process, role, maintenance of national** **measurement standards and services to be** **delivered**

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Why Designated Institutes (DIs) ?

- Over the last century and certainly over the last 5 decades ever increasingly need for better and global comparability and traceability and smaller measurement uncertainties
- Expanding need for metrology in broad and new areas
- Triggered by industrial developments, global trade, regulators, societal needs
- NMIs do not cover all fields
- Urgent needs and financial restrictions require immediate, efficient and effective solutions
- Requires making use of all available and suitable capabilities and competences in the country ➡ **Designated Institutes**



Anything new here ? No, not really!

- Official, but often also informal, metrological infrastructures exist already for many decades, e.g.:
- The Netherlands: VSL and other laboratories, like PTT, TNO, National Health Research Institute and several universities
- Finland: MIKES and other governmental and private laboratories
- France: LNE and other laboratories, like LCIE, Obs. de Paris, etc.
- Germany: PTB and BAM
- UK: NPL, NEL and LGC (and other governm. and university inst.)
- Italy: CNR-IMGC (Colonetti), IEN (Galileo Ferraris), ENEA-INMRI

Only in 1999 the CIPM MRA introduced the term “Designated Institute” (DI)

Now more visible through the CIPM MRA and rapid development of metrology in new areas, like (bio-)chemistry



CIPM MRA

■ Art. 1.4

- Each signatory to this arrangement is the national metrology institute designated by the appropriate national governmental or other official authority of the Member State of the Metre Convention as being responsible for national measurement standards. For any state that has more than one such designated institute, the arrangement is signed by one institute on behalf of all, the names of the other institutes being attached to the document (so, all institutes are designated; the main DI/ the "NMI", being the "coordinating institute", signs the CIPM MRA also on behalf of the others)
- *The same applies for designated NMIs/DIs of Associates of the CGPM, as well as for institutes of intergovernmental and international organizations designated by the CIPM (e.g. IAEA, IRMM, WMO)*
- *It should be noted that participating NMIs/DIs of states, not (yet) having own CMCs, nevertheless recognize the DoEs of the national measurement standards of, and the calibration and measurement certificates issued by the other participating institutes as far as these have been specified in the KCDB*

Designation process for Designated Institutes (DI)

- Potentially only for institutes that:
 - maintain (potential) national measurement standards, and
 - will act as a NMI in a well defined area of metrology, and
 - will deliver on an equal footing traceability to any interested customer
- Potential DIs should have already broad experience in accurate (test)-measurements and apply metrological principles, in particular with respect to traceability and measurement uncertainty; **DI activities are on top and above testing activities!**
- Designated Institutes have to be prepared to:
 - invest in staff and equipment;
 - train specialized metrological staff in charge of the metrological activities;
 - have separate laboratory rooms available, which are equipped with fit-for-purpose national measurement standards and other relevant equipment, which is maintained at adequate (fit-for-purpose) laboratory conditions;
 - participate actively in relevant RMO and Consultative Committee (Working Group) activities (comparisons and other activities)
 - develop and publish CMCs



Designation process for Designated Institutes (DI)

- The designation is done by either:
 - The government/responsible ministry/authority, or
 - The coordinating NMI, if this NMI is authorized to do so by its government
- The designation is announced to the Director of the BIPM by official letter from the government or responsible authority, preferably through the Embassy in Paris of the state concerned
- The RMO concerned is responsible and charged to carry out on-site quality management system assessments, assessing whether the quality system is in compliance with ISO/IEC 17025 (calibration) and, if relevant, ISO Guide 34, and whether the claimed CMCs are covered by the Quality Management System
- The on-site assessment visits should verify whether the DI delivers real metrological calibration/CRM/PT services, and not just testing services
- CMC approval is done by intra- and inter RMO review



Designation process for Designated Institutes (DI)

- The BIPM is not in a position to judge whether an officially announced designation of a DI is operating in compliance with all the criteria
- DI experts are expected to participate actively in the relevant RMO TCs and, if applicable, in the relevant CCWGs and CCs
- If, after a reasonable period of a number of years, the DI does still not have any CMCs published, withdrawal as a DI should be considered
- CMCs, in fact describing testing capabilities are not acceptable for approval in the scope of the CIPM MRA and do not qualify for publication in the KCDB
- CMC categories under the heading “other/other materials” are not intended to be used for the publication of testing and other measurement capabilities
- The Director of a DI is welcome at NMI Directors meetings organized by the CIPM, so to represent all metrological fields



Designation process for Designated Institutes (DI)

- The role of the “coordinating” NMI in the scope of the CIPMMRA
 - The CIPM MRA is an agreement of mutual recognition of national measurement standards and acceptance of “calibration” certificates issued by the NMIs/DIs, signed on the level of the NMI/DI Directors (it is not an Agreement signed by the Governments of the participating States)
 - So, the “coordinating” NMI has signed the CIPM MRA on behalf of all NMIs/DIs in the country
 - The “coordinating” NMI is expected to coordinate and to speak on behalf of all NMIs/DIs in the country
- However, in the participating countries quite different situations exist with respect to:
 - Level of authorization and responsibility
 - Overall organizational structure
 - Financing structure
 - Metrological infrastructure



Designation process for Designated Institutes (DI)

- Different national metrological infrastructures
 - Only one NMI
 - Strong, major NMI with clear authority to sign
 - Small or weak NMI with stronger/more developed other DIs
 - No real NMI, only a coordinating office with many DIs
 - Different ministries claim authority and designate
 - Complex financing structure/financing comes from different ministries or from private sources (the one who pays → decides)
 - CROSQ (CARICOM) signed on behalf of 11 independent countries
- CIPM MRA signed by different levels of authorities
 - Coordinating NMI Director
 - Higher level/ministerial level authority
- Organizational structure and responsible authorities are changing
- National coordination often fails
- Recognition of national autonomy

Services, providing for the needs of the country, to be delivered by NMIs and DIs

- Calibrations and capability to assign values to transfer standards and reference samples
- Certified Reference Materials (production, certification)
- Reference value assignment of Proficiency Testing samples (own PT schemes and/or third party PT schemes)
- Reference Data (e.g. atomic spectra database)
- Validation of measurement methods/procedures
- Delivering traceability to industry, laboratories and ILAC Arrangement accredited “calibration” and testing laboratories, CRM producers and PT providers
- Delivering traceability to sector specific reference laboratories (e.g. clinical and food reference laboratories)

Realizing traceability

- Only by own primary realisation or from another recognized NMI/DI
- Traceability can not come from a non-NMI/DI (accredited or not-accredited)
- Traceability can not come from CRMs delivered by non-NMIs/DIs
- NMI/DI may carry out purity analysis on “commercial” bought CRMs and, if CRM quality is in conformity with fit-for-purpose requirement, use these (in that case traceability comes from the NMI itself)
- List with exceptions to be proposed by Consultative Committees, to be approved by the CIPM, and published by the BIPM
- Traceability is not realized by obtaining “satisfactory” results in a comparison or in a PT scheme, but PTs are very useful for bench marking and awareness creation



Value assignment and Sub-contracting

- Value assignment based on own capabilities
- Sub-contracting/collaboration only in addition to own measurement capabilities
 - For extra check of own capabilities
 - Can not lead to smaller measurement uncertainty claims than can be achieved with own measurement capabilities
- Sub-contracting in case of special, expensive equipment, like NMR facilities or a reactor for NAA
- NMI responsible for implementing and assessing quality system requirements (in conformity with ISO/IEC 17025 and ISO Guide 34)

101st CIPM meeting, June 2012, concerning DIs

- JCRB issues discussed and approved by the CIPM
 - JCRB Resolution 28/1
 - Laboratories should only be designated under the CIPM MRA when they have responsibility for national measurement standards and the dissemination of units (i.e. providing traceability), as demonstrated by provision of appropriate and relevant services to customers
 - JCRB Resolution 28/2
 - Prior to the acceptance of CMCs the QMS, which has to be in accordance with the ISO/IEC 17025 (and ISO 34 for CRMs) and in line with the requirements for calibration laboratories, must be in place
 - Covering all claimed CMCs, and
 - Reviewed at an on-site assessment by well reputed peers

THANK YOU

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