



Draft EURAMET Position Paper

Role and Responsibilities

of DIs

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Outline

- Background
- Genesis and evolution of the document
- Contents of the document
- Next steps

EURAMET Guide n. 10 (2008): EURAMET and the operation of NMIs

- [...] *has been prepared by EURAMET as a guide to the operation of National Metrology Institutes [...]*
- The CIPM-MRA [...] *requires the signatory NMIs to participate in key and supplementary comparisons as well as in the peer review of the CMCs [...]*
- EURAMET membership criteria
 1. The *traceability route* to the SI shall be *identified* and have been in operation for at least *three years*
 2. The NMI shall show evidence of *appropriate participation in international comparisons*
 3. The NMI shall show evidence of *active participation in EURAMET projects*



EURAMET Guide n. 11 (2011)

National Metrology Infrastructure in EURAMET Member Countries – An Analysis and Recommendations

- 1.2.** [...] *DIs and NMIs should be considered as being at the same metrological level, consequently having to fulfil the **same criteria** with respects to activities related to the maintenance of national standards [...]*
- 1.3.** [...] *The reason for being a DI is the **active participation in the CIPM MRA**. That mans it is expected that a DI has succeeded in publishing CMCs in the KCDB with a **reasonable** time after its designation [...]*
- 2.3.** [...] *The highest number of DIs are in Ionising Radiation (IR) and Metrology in Chemistry (**MC**) [...]*
- 2.8.** [...] *A non negligible number of DIs is not directly involved in the meetings of EURAMET TCs and SCs [...]*



EURAMET Guide n. 11: Recommendations

- 3.2.** *Clear rules must exist on the designation of an institute, on what is expected of a DI, and the status, rights and duties of a DI in the RMO. In order to assure that these rules are aligned at the international, regional and national level, but also congruent with the EURAMET strategy, EURAMET should work more closely with BIPM and the other RMOs, in the JCRB, but also beyond the standard agenda of the JCRB meetings.*
- 3.5.** [...] *The only reason to be a DI is to register CMCs [...]*
- 3.6.** [...] *The scope of designation and the envisage CMCs must be clearly identified and in line with the service categories defined by the corresponding CCs [...].*
- 3.8.** [...] *the difference between calibration and testing should be worked out clearly. EURAMET TCs and the CCs of the Metre Convention need to be consulted for this discussion [...]*

JCRB Resolutions 28/1 & 28/2 (April 2012)

EURAMET made proposals for JCRB resolutions which had been adopted at the 28th meeting

28/1: The JCRB resolves

“Laboratories should only be designated under the CIPM MRA when they have responsibility for national measurement standards and the dissemination of the units (i.e. providing traceability), as demonstrated by provision of appropriate and relevant services to customers.”

28/2: The JCRB resolves:

“The QMS that must be in place prior to the acceptance of CMCs must be according to ISO/IEC 17025 (and ISO 34 for CRMs) in line with requirements for calibration laboratories.”

Slide provided by Wolfgang Schmid, TC-MC meeting, 07/02/13

Genesis and evolution of the document

- TC-MC meeting, Braunschweig, 5-8 February 2013
 - inputs from the Convenor's meeting
 - discussion during the TC-MC meeting (following the presentations given by Wolfgang Schmid and Robert Kaarls)
 - First draft of the position paper (M. Sega, W. Schmid, B. Guettler, R. Kaarls, R. Brown), circulated among the TC-MC Contact Persons
- EURAMET TCC/BoD meeting, Delft, 5-6 March 2013
 - Feedbacks to be given from TC Chairs
- EURAMET GA, Reykjavik, 27-30 May 2013
 - Presentation of the final draft (M. Sega, W. Schmid, B. Guettler, R. Kaarls, R. Brown, J. Drnnovsek)

Contents of the position paper

Starting from:

- Introduction
- Situation of DIs in EURAMET
- Services delivered by NMIs and Dis for disseminating the SI

Recommendations are made on

- Criteria for a CMC related to a national measurement standard
- Realizing metrological traceability
- Designation process for DIs
- Specific recommendations for EURAMET

Criteria for a CMC related to a national measurement standard

In particular to be considered for the proposal of a new DI

- The CMC claim is related to an **existing or intended service**.
- The practical implementation of the service **is demonstrated** by being able to show for example existing cases of providing the service, certificates issued, etc.
- There is a clear and on-going **commitment** to provide the service on a **long-term basis**, treating all customers on an **equal footing**.
- The CMC provides a **“dissemination of the unit”** via calibration, value assignment or certified reference materials
- The service can be at primary, secondary (or even lower) metrological level, fit-for-purpose in the national metrological hierarchy. But it has to be the **reference at the national level**.



Criteria for a CMC related to a national measurement standard (II)

- As the national reference it represents the “**connection**” between the **national** metrology infrastructure and the **international** metrology system, described in the CIPM MRA, operating under the aegis of the Inter-Governmental Treaty of the "Metre Convention".
- The validity of a CMC is checked in accordance with the **rules described in the CIPM MRA** and **criteria and guidance given by the JCRB and approved by the CIPM**. This requires **active participation** in international intercomparison exercises organised by CCs or RMOs and **attendance at meetings** when comparisons are discussed.
- Criteria of **complementarity**: The CMCs offered by DIs should be complementary (in terms **of measurands or ranges**) but not overlapping to those of other DIs or the NMI in the country. It is the responsibility of the coordinating NMI or the national responsible authority for the national metrological infrastructure to guarantee the complementarity.

Realizing metrological traceability (Starting from VIM definition)

- Only by **one's own primary realisation** or via services offered by **another recognized NMI/DI**. Details can be found on specific CIPM documents published by BIPM.
- Traceability **cannot** come from a **non-NMI/DI** (accredited or not-accredited)
- Traceability **cannot** come from CRMs delivered by **non-NMIs/DIs**.
- A **list with exceptions** to this is proposed by the relevant CC, 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 **benchmarking performance** and creating awareness of **measurement competence**.

Designation process for Designated Institutes (DI) (I)

The designation is done by the **authorised body** of the country:

- government/responsible ministry/authority, or
- coordinating NMI, if authorized to do so by its government

The **scope** of the designation **must be specified**. A contractual arrangement between the national responsible authority for the metrological infrastructure or the coordinating NMI, if this NMI is authorized to do so, and the DIs of a country on the scope of designation is recommended for this purpose.

Institutes should only be designated if they:

- **hold** and **maintain** (potential) national measurement standards, and
- have **appropriate** metrological experience and scientific expertise and
- will **act as a NMI** in a well defined area of metrology, and
- will **deliver traceability** in a well-defined metrology area, on an **equal footing basis** to all its customers.

Designation process for Designated Institutes (DI) (II)

Potential DIs should have already **broad experience** in accurate measurements in their field of designation and **apply metrological principles**, in particular with respect to traceability and measurement uncertainty. **DI activities are on top, above and different from testing activities**, consequently requiring different error budget analysis and appropriate quality systems!

Designated Institutes must be prepared to:

- **invest** in staff and equipment to support their designation;
- **train** specialized metrological staff in charge of their metrological activities;
- have **appropriate laboratory** space available, which will be equipped with national measurement standards and other relevant equipment, maintained at fit-for-purpose laboratory conditions;
- **participate in metrological research** such as EMRP, EMPIR, etc.
- participate actively in relevant **RMO** and **Consultative Committee** (Working Group) activities (comparisons and other activities)
- develop and publish **CMCs**
- **disseminate** units based on their CMCs

Designation process for Designated Institutes (DI) (III)

- The Director of a DI is **welcome and expected** at EURAMET General Assemblies, to represent all metrological fields
- DI experts are expected to **actively participate** in the relevant RMO TCs and, if applicable, in the relevant CCWGs and CCs
- The BIPM is **not** in a position to judge whether an officially announced designation of a DI is in compliance with all criteria for DIs. In the framework of the CIPM MRA the **responsibility to check compliance** with all criteria for DIs is assigned to the **RMOs**.
- The RMO concerned is responsible and is charged to carry out **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 QMS, in compliance with the **scope of designation**.

Designation process for Designated Institutes (DI) (IV)

- If, after a **reasonable** period of a number of years, the DI has not made significant attempts to obtain CMCs, withdrawal as a DI should be considered. One could consider to accept the DI at its designation with a preliminary status. Once they have CMCs published, they get a permanent status, according to EURAMET e.V. Byelaws and Rules of Procedure

Specific recommendation for EURAMET:

- To evaluate the **capability and competence of a new DI**, a **technically oriented on-site visit** by reputed, internationally recognized peers shall be carried out, as soon as a first CMC claim is ready for submission before presenting its QMS to the TC-Q (a “normal” quality project is not sufficient).
- To evaluate the **capability and competence for a “new service”** (NMI or DI) an **onsite-visit** by peers is recommended; the relevant TC should take a decision. The accreditation scope of the DI will be also taken into account, if relevant.
- To have a **mutual exchange of information** between NMIs and DIs regarding annual reporting to TC-Q and other relevant information.
- DIs should maintain **regular interactions** with their NMIs about their activities within the scope of designation as well as broader EURAMET and MRA issues
- DIs that intend to participate in **European metrology research programmes** are expected to develop and maintain CMCs and to actively participate in the evaluation process and in the mutual exchange of information described above.

Next steps

- Presentation of the paper to the **EURAMET GA** for consideration and approval as a EURAMET paper
- Submission to the JCRB

Inputs for discussion...