المركز السعودي للاعتماد
Saudi Accreditation Center

SAAC Policy on Metrology Traceability of International Units

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1 Purpose

This document outlines the general policy for the SAAC regard the Metrology Traceability of international units.

2 Scope

The document applies to the field of accreditation of testing and calibration laboratories, medical laboratories, and to inspection bodies (if possible) at the Saudi Accreditation Center.

3 Reference

- Conformity assessment – General requirements for accreditation bodies providing accreditation services for conformity assessment bodies ISO/IEC 17011:2017
- General requirements for the competence of calibration and testing laboratories ISO/IEC 17025:2017
- Conformity assessment – activity requirements for different types of inspection service providers ISO/IEC 17020:2012
- Medical laboratories - requirements for quality and competency ISO 2012:15189
- International vocabulary in metrology - basic and general concepts and associated terminology (VIM) JCGM 200:2012
- Guide to expressing uncertainty in measurement GUM

4 Terms and definitions

- -**Metrological traceability** (VIM 3 clause 2.41): the property of the measurement result where the result can be linked to a reference through a documented document an uninterrupted series of calibrations, each of which contributes to the uncertainty of the measurement.
- **Metrology Tracking Series** (VIM 3 clause 2.42): The sequence of measurement standards and calibrations used to link the measurement result to a reference.
- **Metrological tracking of the unit of measurement** (VIM 3 clause 2.43): Metrological tracking where the reference is the definition of the unit of measurement through its practical realization.
- **SI** (International System of Units): It is the metrological tracking of the SI unit of measurement.

- **BIPM** (International Bureau of Weights and Measures): It is an intergovernmental organization created under the Meter Convention, through which the member states work together in matters related to measurements, science and measurement standards. The main task of the Bureau is to ensure universal standardization of measurements and traceability measurement to the International System of Units (SI).
- **CIPM MRA** (International Commission for Arranging the Mutual Recognition of Weights and Measures): States signatories to the MRA Convention include BIPM member states, BIPM Associates of the BIPM General Conference for Weights, Measures and other international organizations. MRA provides a means of national comparison measurement services including national measurement standards and calibration/measurement certificates issued by NMIs.
- **KCDB** (BIPM Key Comparison Database): is a public website containing all the information related to the CIPM MRA, an order created the equation of measurements made and certificates issued by all participating signatories.
- **CRM** (Certified Reference Materials): Reference material, accompanied by documents issued by an authoritative body and providing one or more specific property values with associated uncertainties and traceability, using the correct procedures.

5 Contents

5.1 The attribution of all equipment for the devices must be proved when calibrations are performed:

- -Reference equipment, measuring and calibration devices used within the laboratory or used by the accredited inspection body or applying for accreditation are concerned with attribution in accordance with the International System of Metrology.
- Equipment used for sampling collection and preservation.
- Equipment used to measure environmental conditions inside headquarters.

5.2 To prove the attribution of a measuring or calibration device to the International System of Metrology must choose one of the following methods:

5.2.1 Calibration of the device at a national reference calibration laboratory signed to the Mutual Recognition Agreement of the International Committee for Weights and Measures (MRA CIPM), provided that the agreement covers the activity or unit of measurement concerned with calibration and attribution.

Note: The list and scope of the KCDB BIPM Convention, which includes the measurement areas and uncertainty covered by the agreement signed by the reference laboratory.

5.2.2 Calibration of the device at a calibration laboratory accredited by the Saudi Accreditation Center In event the required field is not available, the device can be calibrated at a calibration laboratory accredited by an accreditation body signed an ILAC mutual recognition agreement, provided that the agreement covers the activity and the unit of measurement concerned with calibration and attribution.

5.2.3 Calibration of the device within the laboratory, in which case the laboratory must meet all technical requirements applicable to calibration laboratories, and the center evaluates the calibration activity of the laboratory concerned in accordance with Annex, ILAC P10:01/2020 A.

5.2.4 Calibration of the device within a non-accredited laboratory, in which case the calibration laboratory must meet all technical requirements applicable to accredited calibration laboratories, and the center evaluates the activity of the calibration laboratory in accordance with ILAC Annex P10:01/2020 A.

5.3 For equipment that cannot be proved:

When it is technically not possible to prove the attribution of an instrument to the International System of Weights and Measures, the use of reference materials accompanied by a certificate issued by a national reference body may be used, the laboratory may obtain prior approval from the Centre for the use of a calibration reference device or materials after submitting a file containing the evidence.

Note: Calibration certificates issued by accredited calibration laboratories must bear a mark indicating the relevant accreditation device, and all calibration certificates must include the uncertainty account where appropriate.

5.4 For equipment that does not affect the test/inspection:

When a secondary measuring device is used in conducting a test/inspection process, and/or when it is partially used and the results of its use do not affect the results of the test/inspection, in both cases the conformity assessment body must prepare a study to prove that the measuring device and the uncertainty calculation estimation does not affect the test results and therefore there is no need to prove the attribution and this study is evaluated by the center's evaluators.

5.5 For exceptional cases:

A laboratory (examination, calibration, medical) or inspection body can calibrate a measuring device used to perform a test/inspection in one of two ways:

A. Calibration of the device at a national reference calibration laboratory that is not a signatory to the International Committee for Mutual Recognition and Weights and Measures (CIPM MRA) or that the agreement does not cover the activity or unit of measurement concerned with calibration and attribution. Or

B. Calibration of the device at a calibration laboratory that is not accredited by an accreditation body that has signed the mutual recognition agreements of ILAC or that the agreement does not cover the activity or unit of measurement concerned with calibration and attribution.

In both cases (A) and (B), the conformity assessment body ((laboratory (test, calibrate, medical) or inspection body)) must submit a complete study to prove the attribution of the test / inspection results to the International System of Standards, Weights and Uncertainty Calculation and the Center evaluates the study in accordance with the requirements of Annex ILAC P10:01/2020 A.

Note: The conformity assessment bodies that choose the above two methods (A) and (B) from the exceptional cases must submit a file to the center containing the reasons for choosing these methods attached to the documents, provided that their choice is not due to considerations related to financial costs and that it is exceptional and a last resort considering the absence of other hypotheses.