



AMERICAN
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DETERMINATION OF UNCERTAINTY OF MEASUREMENT POLICY



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Document No.

P-LAB-03

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1. Scope:

This policy provides information required to estimate and calculate uncertainty of measurement in testing and calibration as well as Calibration Measurement Capabilities of laboratories.

2. Introduction on determination of uncertainty of measurement

ISO/IEC 17025 requires testing/calibration laboratories to apply procedures for estimating uncertainty of measurement, report the estimated uncertainty of measurement, where applicable and retain records as necessary. In order to prevent laboratories interpreting the term of uncertainty of measurement and procedures of estimation incorrectly and giving wrong impression to customers, it would be necessary to guide them in the proper direction. The ILAC P14 policy document addresses the estimation of uncertainty of measurement and its expression on calibration certificates of accredited laboratories and the evaluation of the CMC on the scopes of accreditation in line with the principles agreed up on between ILAC and the BIPM. In addition, AAA has prepared specific guidelines for calculation of uncertainty of measurements in different field of testing. Therefore, it is recommended to read this policy along with the field specific guidelines and Annex - A of ILAC P14 (A paper by the joint BIPM/ILAC working group) for more information.

3. AAA general policy for determination of uncertainty of measurement in testing and calibration

- 3.1 Laboratories shall identify all the components able to influence uncertainty of measurement in the given situation and make a reasonable estimation based on existing knowledge and methods of analysis. This estimation shall be based on the knowledge of the performance of the method, measurement

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scope, previous experience and validation data.

- 3.2 Applicant and accredited laboratories shall evaluate the uncertainty for every calibration covered in their scopes of accreditation where the uncertainty is necessary for the interpretation of the measurement results.
- 3.3 In general, measurement uncertainties shall be evaluated and reported according to the method described in ISO/IEC Guide 98-3:2008 “Uncertainty of Measurement – Part 3: Guide to the Expression of Uncertainty in Measurement” (GUM), including its supplement documents published jointly by BIPM, IEC, IFCC, ISO, IUPAC, IUPAP and OIML. This set of documents is referred to as “the Guide” in the subsequent clauses.
- 3.4 Uncertainty evaluation shall be documented and supporting evidence shall be provided.
- 3.5 Applicant and accredited calibration laboratories shall evaluate the calibration and measurement capability (CMC) for calibrations included in their scopes of accreditation. The reported uncertainty shall not be smaller than the CMC.
- 3.6 The complexity of the mathematical model shall be commensurate with the required degree of accuracy.
- 3.7 In reporting the result of a measurement, the following information shall be included as a minimum :
 - 3.7.1 an unambiguous definition of the measurand,
 - 3.7.2 the estimate of the measurand,
 - 3.7.3 the 95% confidence level expanded uncertainty,
 - 3.7.4 the coverage factor, and
 - 3.7.5 the unit of measurement for the estimate of the measurand and the expanded uncertainty.
- 3.8 The quoted uncertainties shall apply to the estimate of the measurand

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obtained by the calibration laboratory at the time of the calibration.

3.9 For reporting of measurement uncertainty in test reports, laboratories can refer to the ILAC G17 – Introducing the Concept of Uncertainty of Measurement in Testing in Association with the Application of the Standard ISO/IEC 17025

3.10 For qualitative tests, the evaluation of measurement uncertainty is not required.

5. References:

- ISO/IEC 17025:2005/2017 General requirements for the competence of testing and calibration laboratories
- ISO 15189:2012 Medical laboratories - Particular requirements for quality and competence
- ISO/IEC 17020:2012 Conformity assessment - Requirement's for the operation of various types of bodies performing inspection
- ISO/IEC 17011:2017 Requirements for bodies providing assessment and accreditation of conformity assessment bodies
- ISO/ IEC 17025: General Requirements for the Competence of Testing and Calibration Laboratories
- ILAC- P14:01/2013: ILAC Policy for uncertainty in calibration
- EURACHEM / CITAC Guide CG 4: 2012: Quantifying Uncertainty in Analytical Measurement
- ILAC-G8:03/200 : Guidelines on the Reporting of Compliance with Specification
- APLAC TC 004, Issue 04, 09/10: Method of stating test and calibration results and compliance with specification

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- ILAC – G17: 2002: Introducing the Concept of Uncertainty of Measurement in testing in association with the application of the Standard ISO/IEC 17025
- JCGM -200:2012: International vocabulary of metrology – Basic and general concepts and associated terms (VIM), 3rd edition

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