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NVLAP LAB CODE:

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NIST HANDBOOK 150-2 CHECKLIST CALIBRATION LABORATORIES PROGRAM

Instructions to the Assessor: This checklist addresses specific accreditation requirements prescribed in NIST Handbook 150-2, *Calibration Laboratories*.

- All items on this checklist shall be addressed.
- Select "OK" for each item you observed or verified as compliant at the laboratory.
- Select "X" for each item that represents a nonconformity.
- Select "C" for each item on which you are commenting for other reasons.
- Place a "N/A" beside any item that does not apply.
- Record the item number and the nonconformity explanation and/or comment on the appropriate comment sheet.

Note: The numbering of the checklist items correlates to the numbering scheme in NIST Handbook 150-2, clauses 3, 4, and 5.

3 Accreditation process

3.3 On-site assessment (field locations)

3.3.2.2 When a laboratory has technical aspects of its accredited work being performed at a field location by staff not based at the laboratory's main facility, the following requirements for NVLAP accreditation shall apply:

NOTE These requirements do not apply to field service calibrations performed by staff based at the main laboratory.

- a) The laboratory shall demonstrate that all requirements of NIST Handbook 150 (other than the calibration) are being managed, performed, or otherwise controlled at the main facility. The management system documentation shall clearly cover the processes for managing the field operations and identify the personnel specifically authorized to perform calibrations at the field locations.

- b) For an initial accreditation of a calibration laboratory having one or more field locations, all field representatives shall be present at the initial assessment of the main facility.

- c) The laboratory shall have field representatives available at the main facility for renewal assessments.

NOTE In advance of the assessment, NVLAP will notify the laboratory which, or how many, of the field representatives are to be present.

- e) The laboratory shall demonstrate that field personnel are trained at the main facility, by staff from the main facility, or by field-based training staff specifically trained at the main facility. The manner in which field personnel are trained shall be included in the training system documentation.

- f) Calibration reports shall be issued by the main facility, indicate the physical locations of the calibrations, and be signed by approved signatories.

- g) The laboratory shall have a defined interlaboratory comparison program between its headquarters and field locations.

3.4 Proficiency testing

3.4.2 Laboratory PT plans

- ___ 3.4.2.1 Accredited calibration laboratories shall develop a proficiency testing participation plan, describing how the laboratory will meet requirements for minimum participation in PT as defined below. This plan shall reflect the laboratories' planned activities that provide continuing evidence that technical competence is being maintained through inter- or intra-laboratory measurement comparisons.

NOTE Assessors will review plan to the extent of verifying that required PT is planned for all parameters being assessed.

- ___ 3.4.2.3
The laboratory shall regularly review the PT plan in response to changes in scope, staffing, methodology, instrumentation, etc. The review shall include a review the Calibration LAP webpage (see <http://www.nist.gov/nvlap>) for up-to-date PT activity information and requirements.

NOTE Review of the PT plan can occur as part of the management review process.

- 3.4.3.2
NVLAP accepts results from laboratories that have participated in proficiency tests not arranged by NVLAP when:

- ___ a) PT providers are accredited to ISO/IEC 17043 for the parameter being tested at the uncertainty level of that test, and
- ___ b) that accreditation to ISO/IEC 17043 is issued by a body which is signatory to a mutual recognition arrangement (MRA) for proficiency testing accreditation in a regional body recognized by the International Laboratory Accreditation Cooperation (ILAC).

- ___ 3.4.3.3
The laboratory shall demonstrate approval by NVLAP of any PT not arranged by NVLAP or meeting the above requirements in 3.4.3.2.

- 3.4.4
NVLAP PT requirements

Unless it has been determined by NVLAP that other planned PT activities (e.g., ILC) are acceptable, laboratories shall meet the following requirements:

- ___ a) Where NVLAP provides coordination for PT, a laboratory accredited for the parameter and range within the specified uncertainty for the test shall participate.

- c) A laboratory shall meet any additional PT requirements stated in the annexes in this handbook related to the parameter(s) for which it is accredited.

- d) The E-normal value (E_n) shall be reported for each measurement result, where applicable.

4 Management requirements for accreditation

- 4.4 When a calibration certificate contains a statement of compliance with a metrological specification, with or without the measurement result(s) and uncertainty (see section 5.10.3 of NIST Handbook 150-2), the calibration laboratory shall notify the customer in writing:

- a) that the uncertainty of measurement will be taken into account when issuing the statement of compliance;

- b) of the laboratory's procedure for measurement uncertainty in statements of compliance (see 5.4.1 of NIST Handbook 150-2); and

- c) that, when measurement results and associated uncertainties are not reported, the item calibrated is not intended for further dissemination of traceability (i.e., to calibrate another device), and the measurement results and associated uncertainties are available upon request.

5 Technical requirements for accreditation

5.4 Calibration methods and method validation

- ___ 5.4.1 When a laboratory offers calibration certificates that contain a statement of compliance with a metrological specification, the laboratory shall have a procedure describing how uncertainty is taken into account in the compliance determination.

NOTE The procedure should convey possible level(s) of risk associated with determination of compliance. The procedure may point to current national or international standards or guidance documents on this subject to meet this requirement.

5.10 Reporting the results

- ___ 5.10.1 All content of certificates or reports of calibration shall conform to the requirements of ISO/IEC 17025.

- ___ 5.10.2 All certificates or reports of calibration shall contain an uncertainty statement which is scientifically determined from measurement data and which agrees with the laboratory's stated definition, except as described in 5.10.3.

- 5.10.3 By exception, and where it has been established during contract review that only a statement of compliance with a specification is required, then the measured quantity value and/or the measurement uncertainty may be omitted on the calibration certificate. In such cases, the laboratory shall meet the requirements in 4.4. Additional requirements may be in the annexes of this handbook. In addition, the following information shall be included on the certificate:

- ___ a) a statement that the item calibrated is not intended for further dissemination of traceability (i.e., used to calibrate another device), thereby meeting the requirements of ILAC P14:01/2013, 6.1; and

- ___ b) a statement that the measurement results, uncertainties, and procedure for applying uncertainty to the statement of compliance are available upon request.

5.10.4 Uncertainty shall be reported in accordance with the following:

- a) The measurement result shall normally include the measured quantity value y and the associated expanded uncertainty U . In calibration certificates the measurement result should be reported as $y \pm U$ associated with the units of y and U . Tabular presentation of the measurement result may be used and the relative expanded uncertainty $U/|y|$ may also be provided if appropriate. The coverage factor and the coverage probability shall be stated on the calibration certificate. To this an explanatory note shall be added, which may have the following content: "The reported expanded uncertainty of measurement (U) is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95 %."

NOTE For asymmetrical uncertainties other presentations than $y \pm U$ may be needed. This concerns also cases when uncertainty is determined by Monte Carlo simulations (propagation of distributions) or with logarithmic units.

- b) The numerical value of the expanded uncertainty shall be given to, at most, two significant figures. Further the following applies:

- 1) The numerical value of the measurement result shall in the final statement be rounded to the least significant figure in the value of the expanded uncertainty assigned to the measurement result.

- 2) For the process of rounding, the usual rules for rounding of numbers shall be used, subject to the guidance on rounding provided in Section 7 of the GUM.

NOTE For further details on rounding, see ISO 80000-1:2009.

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- c) Contributions to the uncertainty stated on the calibration certificate shall include relevant short-term contributions during calibration and contributions that can reasonably be attributed to the customer's device. Where applicable, the uncertainty shall cover the same contributions to uncertainty that were included in evaluation of the CMC uncertainty component, except that uncertainty components evaluated for the best existing device shall be replaced with those of the customer's device. Therefore, reported uncertainties tend to be larger than the uncertainty covered by the CMC. Random contributions that cannot be known by the laboratory, such as transport uncertainties, should normally be excluded in the uncertainty statement. If, however, a laboratory anticipates that such contributions will have significant impact on the uncertainties attributed by the laboratory, the customer should be notified according to the general clauses regarding tenders and reviews of contracts in ISO/IEC 17025.

- d)
As the definition of CMC implies, accredited calibration laboratories shall not report a smaller uncertainty of measurement than the uncertainty of the CMC for which the laboratory is accredited.
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