

Annex E: Requirements for NVLAP-accredited legal metrology laboratories

E.1 Scope

The purpose of this annex is to specify the criteria legal metrology laboratories (also referred to herein as State weights and measures laboratories) shall meet that are in addition to the requirements of ISO/IEC 17025, NIST HB 150, and NIST HB 150-2 and any of its applicable Annexes. These additional requirements apply to legal metrology laboratories that are both NVLAP accredited and NIST Office of Weights and Measures (OWM) recognized.

While NVLAP-accredited laboratories that are *not* State weights and measures laboratories may choose to follow the requirements in this annex, they will not be assessed to them by NVLAP.

E.2 Training requirements

Training requirements for State weights and measures laboratories are published in NIST Handbook 143, *State Weights and Measures Laboratories Program Handbook*, which is available on the NIST OWM website, accessible from www.nist.gov. These requirements are summarized in Table E.1 and shall be met by personnel in State weights and measures laboratories who hold approved signatory status for calibration certificates.

E.3 Regional Measurement Assurance Program (RMAP) Requirements

The OWM annually holds Regional Metrology Assurance Program (RMAP) training events for coordination of national weights and measures issues, distribution of updated procedures, and ongoing professional development activities. Proficiency testing, detailed in E.4 below, is also included in these RMAP events. Laboratory personnel involved in calibrations covered by their accreditation shall attend the annual OWM Regional Metrology Assurance Program training events as required for ongoing NIST Office of Weights and Measures recognition.

E.4 Proficiency testing (PT) requirements

PTs are conducted as a part of each RMAP and constitute one of the primary methods used for assessment of competence.

E.4.1 NVLAP-accredited State weights and measures laboratories shall participate in all RMAP PTs for capabilities listed on their NVLAP scope of accreditation and for those capabilities they desire to add to their scope of accreditation.

E.4.2 RMAP proficiency tests are accepted by NVLAP, and State weights and measures laboratories shall include them in the Proficiency Testing Schedule required for submission with each application to NVLAP for accreditation or renewal of accreditation.

E.4.3 Results of RMAP PTs shall be available for review during the NVLAP assessment process.

E.4.4 State weights and measures laboratories having capabilities on their NVLAP scopes of accreditation for which RMAP PT is not available shall ensure that proficiency testing is done by other means. Laboratories may, under the guidance of OWM and following the documented procedures, coordinate “Mini-MAPs” with other laboratories to cover these capabilities.

Table E.1. NIST Office of Weights and Measures training requirements as published by OWM

Recognition Level	Training Required	For Whom	How Often
All Measurement Parameters	Regional Measurement Assurance Program (RMAP) Training	At least one staff member	Annually
Legal Metrology* Mass, Echelon III Volume, Echelon II	<ol style="list-style-type: none"> 1. Fundamentals of Metrology (1 week course) 2. Introduction and Orientation to Mass and Volume Procedures* 3. Fundamentals of Metrology, Laboratory Auditing Program (LAP) problems 4. Successful completion of proficiency testing 	Usually all staff, at least one staff member	Once Initially Refresher portions covered during Regional Measurement Assurance Program (RMAP) training
Mass Calibration Echelon III and II	<ol style="list-style-type: none"> 1. All of the above, plus: 2. Mass Seminar (2 week course) 3. Successful completion of proficiency testing for each area on the laboratory Scope 	Usually all staff, at least one staff member	Once Initially Refresher recommended every 10 years
Advanced Mass Calibration, Echelon I	<ol style="list-style-type: none"> 1. All of the above, plus: 2. Advanced Mass Seminar (1 week course) 3. Advanced Laboratory Auditing Program (LAP) problems 4. Successful completion of proficiency testing using weighing designs 5. Optional: Advanced Hands-On Mass Seminar (if available) 	At least one staff member	Once Initially Refresher recommended every 10 years
Volume Calibration, Echelon I and II	<ol style="list-style-type: none"> 1. Legal Metrology Requirements and Mass Calibration Requirements noted above 2. Volume Calibration Course (1 week) 3. Successful completion of proficiency testing for each area on the laboratory scope using gravimetric calibrations 	Usually all staff, at least one staff member	Once Initially Refresher recommended every 10 years
All measurement parameters in addition to mass and volume	<ol style="list-style-type: none"> 1. Documented evidence of training 2. Successful completion of proficiency testing in each area of the laboratory Scope 	At least one, as needed	At least once; Refresher as needed

E.5 Conformity assessment and calibration intervals

E.5.1 State weights and measures laboratories commonly have additional regulatory requirements resulting from the adoption into State law or regulation of requirements from documentary standards. When this is the case, State weights and measures laboratories shall meet these additional requirements, when applicable including, but not limited to:

- a) assessment of submitted standards for full conformity to specified documentary standards referenced in State law or regulation, except where exemptions to full conformity are noted according to ISO/IEC 17025 or the documentary standards themselves;
- b) inclusion on calibration certificates of statements of conformity as assessed in E.5.1a;
- c) inclusion on calibration certificates of calibration intervals when such intervals are defined and/or required by State laws or regulations.