Enter Date: **Enter NVLAP Lab Code:**

NIST HANDBOOK 150-23 CHECKLIST
RADIATION DETECTION INSTRUMENTS

Instructions to the Assessor: This checklist addresses specific accreditation requirements prescribed in NIST Handbook 150-23, Radiation Detection Instruments (RDI).

- All items on this checklist shall be addressed.
- Select “X” for each item that represents a nonconformity.
- Select “C” for each item on which you are commenting for other reasons.
- Select “OK” for each item you observed or verified as compliant at the laboratory.
- 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 150-23, clauses 3, 4, and 5.

3 Accreditation process

3.3 On-site assessment

___ 3.3.3 The laboratory shall have its facilities and equipment in good working order and be ready for examination according to the requirements identified in this handbook, NIST Handbook 150 and the laboratory’s quality manual.

___ 3.3.4 The laboratory shall make available, at the beginning of the on-site assessment, all supporting technical information in a format that is conducive to a detailed review.

___ 3.3.6 c) Laboratory staff shall be available to answer questions; however, the assessor may wish to review the documents and records alone.

___ 3.3.6 e) All equipment required to conduct radiological type testing shall be available for review.

___ 3.3.7 The laboratory shall review all comments for potential improvements in the testing of radiation detection instruments used for homeland security.

3.4 Proficiency testing

3.4.1 Conducting proficiency testing

___ 3.4.1.2 Laboratories shall participate in proficiency when NVLAP announces plans to conduct a proficiency test.

3.4.2 Analyzing and reporting proficiency data

___ The laboratory shall evaluate the proficiency testing results, identify all outliers and follow the requirements of NIST Handbook 150 for the control of nonconforming work.

3.4.3 Proficiency testing nonconformities

___ The laboratory shall correct the problems that led to the poor performance in proficiency testing. The laboratory's accreditation may be suspended if the proficiency testing results indicate continued poor or unsatisfactory performance on consecutive proficiency testing rounds.

4 Management requirements for accreditation

4.2 Management system

___ 4.2.1 The controlled version of the laboratory management system documentation may be paper-based or computer-based. Version control shall be maintained in either case.

___ 4.2.2 If the laboratory uses a computer-based documentation system, the laboratory should consider the ease of usability by the staff. The laboratory shall ensure that the requirements of NIST Handbook 150 are met so that staff is knowledgeable about the online documentation system and can readily retrieve appropriate information.

___ 4.2.3 The laboratory shall create a cross-reference document allowing the laboratory and a NVLAP assessor to verify that all requirements of clauses 4 and 5 and annexes A and B of NIST Handbook 150 and the corresponding NIST Handbook 150-23 are addressed in the management system documentation.

___ 4.2.4 A general reference text on statistics shall be available in the laboratory.

___ 4.2.5 The laboratory shall have copies of applicable standards and standard operating procedures that are used to fulfill test requirements.

___ 4.2.6 In addition to the information specified in NIST Handbook 150, the quality manual and/or supporting management system procedures shall include the following:

___ a) laboratory's facilities and scope of services offered

___ b) equipment inventory including radiation sources used for

___ c) radiation detection instrument models and design specifications for those instruments used in support of type testing, including maintenance and calibration practices

___ d) environmental chambers, thermometers and humidity measurement instrumentation, including maintenance and calibration practices

___ e) procedures for handling and storing sensitive components and materials

___ f) electromagnetic testing instrumentation, including maintenance and calibration practices

___ g) dust and water spray testing instrumentation, including maintenance and calibration practices

___ h) vibration and mechanical shock testing instrumentation, including maintenance and calibration practices

___ i) assembly/disassembly techniques for all portal monitors to be tested, if applicable

___ j) identification and tracking of radiation detection instruments received

___ k) handling, control and shipping of radiation detection instruments used in proficiency testing

___ l) actions concerning damaged radiation detection instruments received in shipping

___ m) instructions to operate all radiation detection instruments, including any operational checks

___ n) data handling and reporting that includes report data file templates following the format given in the testing and evaluation protocols for each type of instrument

___ o) actions when test data indicate a possible problem exists.

4.13 Control of records

___ Records shall be maintained for at least three years.

4.14 Internal audits

___ 4.14.1 The most recent internal audit report shall be available for review during a NVLAP on-site assessment.

___ 4.14.2 Previous internal audit reports for the past three years, if applicable, shall be available for review if requested by the NVLAP assessor.

___ 4.14.3 The internal audit shall cover compliance with NVLAP, laboratory management system, regulatory, and contractual requirements.

___ 4.14.4 The laboratory shall perform a complete internal audit of its management system prior to the first on-site assessment.

4.15 Management reviews

___ 4.15.1 Periodic reviews of the management system shall reflect adherence to NVLAP requirements and the laboratory's quality objectives.

___ 4.15.2 The periodic management reviews shall reflect positive aspects of the management system as well as nonconformities.

___ 4.15.3 The most recent management review report shall be available for review during a NVLAP on-site assessment.

___ 4.15.4 Previous management review reports for the past three years, if applicable, shall be available for review if requested by the NVLAP assessor.

___ 4.15.5 The laboratory shall perform at least one complete management review prior to the first on-site assessment.

5 Technical requirements for accreditation

5.2 Personnel

___ 5.2.1 The laboratory shall maintain a list of personnel designated to fulfill NVLAP requirements including: Laboratory Director, Technical Director, Team Leaders, NVLAP Authorized Representative, and NVLAP Approved Signatories.

___ 5.2.4 Laboratories shall document the required qualifications for each staff position. The staff information may be kept in the official personnel folders or in separate folders that contain only the information that NVLAP assessors need to review.

___ 5.2.5 The training program shall be updated when procedures change.

___ 5.2.6 Staff members shall be retrained when procedures change, or when the individuals are assigned new responsibilities. Each staff member may receive training for assigned duties through on-the-job training, formal classroom study, attendance at conferences, or another appropriate mechanism.

___ 5.2.7 Training materials that are maintained within the laboratory shall be kept up-to-date.

___ 5.2.8 For each staff member, the staff member's immediate supervisor, or a designee appointed by the Laboratory Director, shall conduct an annual assessment and observation of performance.

___ 5.2.9 NVLAP does not make a distinction between full-time laboratory employees and individuals hired on a contract. NVLAP requires that the laboratory maintain responsibility for and control of any work performed within its scope of accreditation. The laboratory shall ensure all individuals performing radiation detection instrument testing activities satisfy all NVLAP requirements, irrespective of the means by which individuals are compensated (e.g., the laboratory must ensure all test personnel receive proper training and are subject to annual performance reviews, etc.).

5.4 Test and calibration methods and method validation

___ 5.4.2 The laboratory shall have written procedures for laboratory personnel to follow when conducting tests. If determined suitable by NVLAP, the laboratory may use the specific standard test method as the only written procedures.

___ 5.4.3 The procedures shall address any information not specifically contained in the standard method and any deviations used by the laboratory.

___ 5.4.4 The procedures shall include equipment operation, calibration checks, and quality control checks.

___ 5.4.5 The laboratory shall develop validation methods to ensure that the test fields and relevant quantities used for equipment testing are within acceptable tolerances. Acceptable tolerances for measurable quantities are set to ± 5 % unless otherwise specified by the ANSI standards and their associated test and evaluation protocols.

___ 5.4.6 The laboratory shall document uncertainty of the radiation fields used for testing and the traceability to NIST or equivalent foreign national metrology institutes.

5.5 Equipment

___ A laboratory shall have adequate facilities and equipment to perform the radiation detection instrumentation tests for which capability is claimed. Adequate facilities and equipment shall include the following:

___ a) sufficient space to perform the validation tests

___ b) proper shielding of areas from unwanted radiation

___ c) necessary environmental chambers for conducting environmental tests

___ d) radiation sources that are NIST-traceable or traceable to a national metrology institute

___ e) safety systems

___ f) properly calibrated test equipment

___ g) electromagnetic and mechanical test equipment for conducting electromagnetic and mechanical tests.

5.6 Measurement traceability

___ 5.6.1 The laboratory shall determine equipment calibration intervals based on the equipment's frequency of use and the environment in which it is used, in accordance with standard test methods.

___ 5.6.2 The laboratory shall provide proof that the calibration intervals used by the laboratory are sufficient.

___ 5.6.3 Proper performance of the testing equipment shall be periodically verified.

___ 5.6.4 The radiation sources and reference standards used and the environmental conditions at the time of calibration shall be documented for all calibrations.

___ 5.6.5 The radiation sources and reference standards used and the environmental chamber conditions at the time of the test shall be documented for all type tests.

___ 5.6.6 Calibration records, type testing records, and evidence of the traceability of the radiation sources and reference standards used shall be made available for inspection during the on-site visit.

___ 5.6.7 Calibration records for equipment used for measurements and evaluation of radiation detection instruments shall include the following:

___ a) notation of all equipment variables requiring calibration or verification

___ b) range of calibration/verification

___ c) resolution of the instrument and its allowable uncertainty

___ d) calibration/verification date and schedule

___ e) identity of the laboratory individual or external service responsible for calibration

___ f) traceability of radiation sources and reference standards.

5.9 Assuring the quality of test and calibration results

___ 5.9.2 The ANSI/IEEE N42 series of standards and their respective testing and evaluation protocols specify radiation sources to be used in the radiological detection tests and radionuclide identification tests. The radiation sources used by the testing laboratories shall be traceable to NIST or to an equivalent national metrology institute, as a requirement for use in the type testing and proficiency testing program.

___ 5.9.3 The IEEE Standard 1012, *IEEE Standard for Software Verification and Validation*, shall be used as a reference when developing procedures for verification and validation of software used to acquire data from the instruments used for testing.

5.10 Reporting the results

___ In addition to the test report requirements found in NIST Handbook 150, 5.10.2, the laboratory shall report the test results in accordance to the latest reporting format provided in the test and evaluation protocols associated with the individual standards.

NIST HANDBOOK 150-23 CHECKLIST
COMMENTS AND NONCONFORMITIES

Instructions to the Assessor: Use this sheet to document comments and nonconformities. For each, identify the appropriate item number from the checklist. Identify each comment with a "C" and each nonconformity with an "X." If additional space is needed, make copies of this page or use additional blank sheets.

Item No.	***C or X***	***Comments and/or Nonconformities***

Item No.	*C or X*	*Comments and/or Nonconformities*