



Standard Guide for Establishing and Maintaining a Quality Assurance Program for Analytical Laboratories Within the Nuclear Industry¹

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1. Scope

1.1 This guide covers the establishment and maintenance of a quality assurance (QA) program for analytical laboratories within the nuclear industry. References to key elements of **ASME NQA-1** and **ISO 9001** provide guidance to the functional aspects of analytical laboratory operations. When implemented as recommended, the practices presented in this guide will provide a comprehensive QA program for the laboratory. The practices are grouped by functions, which constitute the basic elements of a laboratory QA program.

1.2 The essential, basic elements of a laboratory QA program appear in the following order:

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Quality Assurance Program	6
Training and Qualification	7
Procedures	8
Laboratory Records	9
Control of Records	10
Control of Procurement	11
Control of Measuring Equipment and Materials	12
Control of Measurements	13
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2. Referenced Documents

2.1 ASTM Standards:²

- C859** Terminology Relating to Nuclear Materials
- C1068** Guide for Qualification of Measurement Methods by a Laboratory Within the Nuclear Industry
- C1128** Guide for Preparation of Working Reference Materials for Use in Analysis of Nuclear Fuel Cycle Materials
- C1156** Guide for Establishing Calibration for a Measurement Method Used to Analyze Nuclear Fuel Cycle Materials

¹ This guide is under the jurisdiction of ASTM Committee C26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.08 on Quality Assurance, Statistical Applications, and Reference Materials.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

C1210 Guide for Establishing a Measurement System Quality Control Program for Analytical Chemistry Laboratories Within the Nuclear Industry

C1215 Guide for Preparing and Interpreting Precision and Bias Statements in Test Method Standards Used in the Nuclear Industry

C1297 Guide for Qualification of Laboratory Analysts for the Analysis of Nuclear Fuel Cycle Materials

D1193 Specification for Reagent Water

D4840 Guide for Sample Chain-of-Custody Procedures

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E178 Practice for Dealing With Outlying Observations

E542 Practice for Calibration of Laboratory Volumetric Apparatus

E617 Specification for Laboratory Weights and Precision Mass Standards

E694 Specification for Laboratory Glass Volumetric Apparatus

E1578 Guide for Laboratory Informatics

2.2 Other Standards:

ISO 9001 Quality Management Systems—Requirements

ISO 1042 Laboratory Glassware—One-Mark Volumetric Flasks

ISO/IEC 17020 General Criteria for the Operation of Various Types of Bodies Performing Inspection

ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories

ANSI N15.41 Derivation of Measurement Control Programs—General Principles

ANSI N15.51 Measurement Control Program—Nuclear Materials Analytical Chemistry Laboratory

JCGM 20:2008 International Vocabulary of Metrology—Basic and General Concepts and Associated Terms (VIM)

ASME NQA-1 Quality Assurance Requirements for Nuclear Facility Applications³

3. Terminology

3.1 For definitions of pertinent terms not listed here, see Terminology **C859**.

³ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990.