



**NEXT**

# NEXT Laboratory Quality Assurance Program Description

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# Meeting Focus

- Basis:
  - Discuss the Basis of the ACU NEXT Lab Quality Assurance Program
- Scope:
  - Describe the ACU NEXT Lab Quality Assurance Scope
- Submission:
  - Discuss ACU's proposal to submit the Quality Assurance Program for approval before submission of the Construction Permit (CP) application.

- **QUALITY**

- The degree to which an item or process meets or exceeds requirements and expectations.

- **QUALITY ASSURANCE**

- Those planned and systematic actions necessary to provide adequate confidence that the structure, system or component will perform satisfactorily in service.

- **SAFETY-RELATED STRUCTURES, SYSTEMS AND COMPONENTS**

- Those Structures, Systems and Components (SSCs) that are relied upon to remain functional during and following design basis events to assure:
  - 1) The integrity of the fission product physical boundary;
  - 2) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
  - 3) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the applicable guideline exposures set forth in 10 CFR Part 20.

**10 CFR 50.34(a)(7) requires each applicant for a construction permit to build a production or utilization facility to include, in its preliminary safety analysis report, a description of the quality assurance program to be applied to the design and construction of the structures, systems, and components of the facility**

## **NRC Regulatory Guide 2.5 – “Quality Assurance Program Requirements for Research and Test Reactors”**

- Endorses ANSI/ANS 15.8

**The general requirements for establishing and executing a quality assurance program for the design, construction, testing, modification, and maintenance of research and test reactors in ANSI/ANS-15.8-1995 provide an acceptable method for complying with the program requirements of 10 CFR 50.34, “Contents of Applications; Technical Information.”**

The Quality Assurance Program is implemented using a Graded Approach

Designate safety classification by the safety significance of the reactor design.

3 Safety Class, or QA Categories:

1. **Safety-related (SR) SSCs**, as defined earlier, means those structures, systems and components that are relied upon to remain functional during and following design basis events.
2. **Augmented Quality SSCs** support Safety-Related SSCs and have been designated as requiring additional quality level oversight.  
This designation may be applied to any item that is subject to non-safety related regulatory requirements but may benefit from additional rigor.
3. **Non-Safety Related (NSR) SSCs** are SSCs not considered safety related or important to safety.

## The QAM specifies:

- QA Policy
- Quality System implementation
- Organizational structure
- Staff roles, responsibilities, and authorities
- Technical activities
- Corrective Action Program

## Planning:

### QA Program Description (QAPD)

Prepared and in internal review

## Implementation:

### Quality Assurance Manual (QAM)

Prepared and in internal review

#### Quality Procedures (QPs):

35 identified QPs – Implement QAM Requirements

30 are prepared and in internal review

#### Work Instructions (WIs)

3 identified WIs – Provide supporting implementing instruction to the QPs

1 prepared and in internal review

# QAM Requirements Cross Walk

## ANSI/ANS 15.8 requirements

## QAM Section

1	Organization	2.1	<ul style="list-style-type: none"><li>• Quality assurance hierarchy</li><li>• Organization responsibilities</li></ul>
2	Quality assurance program	2.2	<ul style="list-style-type: none"><li>• Quality assurance hierarchy</li><li>• Organization, personnel training and qualification</li></ul>
3	Design Control	2.3	<ul style="list-style-type: none"><li>• Design control</li></ul>
		2.5	<ul style="list-style-type: none"><li>• Instructions, procedures, and drawings</li></ul>
		2.9	<ul style="list-style-type: none"><li>• Control of special processes</li></ul>
4	Procurement Document Control	2.4	<ul style="list-style-type: none"><li>• Procurement document control</li></ul>
5	Procedures, Instructions and Drawings	2.5	<ul style="list-style-type: none"><li>• Instructions, procedures, and drawings</li></ul>
		2.9	<ul style="list-style-type: none"><li>• Control of special processes</li></ul>



# QAM Requirements (Cont'd)

## ANSI/ANS 15.8 requirements

## QAM section

6	Document control	2.6	• Document control
7	Control of purchased items and services	2.7	• Control of purchased items and services
8	Identification and control of items	2.8	• Identification and control of items
9	Control of special processes	2.9	• Control of special processes
10	Inspections	2.10	• Inspections

# QAM Requirements (Cont'd)

## ANSI/ANS 15.8 requirements

## QAM Section

11	Test control	2.11	<ul style="list-style-type: none"><li>• Test control</li></ul>
12	Control of measuring and test equipment	2.12	<ul style="list-style-type: none"><li>• Control of measuring and test equipment</li></ul>
13	Handling, storage, and shipping	2.13	<ul style="list-style-type: none"><li>• Handling, storage, and shipping</li></ul>
14	Inspection, test, and operating status	2.10 2.11 2.14	<ul style="list-style-type: none"><li>• Inspections</li><li>• Test control</li><li>• Inspection, test, and operating status</li></ul>
15	Control of nonconforming items and services	2.15	<ul style="list-style-type: none"><li>• Identification and control of nonconforming items</li></ul>

# QAM Requirements (Cont'd)

## ANSI/ANS 15.8 requirements

## QAM Section

16	Corrective actions	2.16	<ul style="list-style-type: none"><li>• Corrective action</li></ul>
17	Quality Records	2.17	<ul style="list-style-type: none"><li>• Quality assurance records</li></ul>
18	Assessments	2.18	<ul style="list-style-type: none"><li>• Audits, assessments, and surveillances</li></ul>
19	Experimental Equipment	2.19	<ul style="list-style-type: none"><li>• experimental equipment</li></ul>

# Status of QAM, QPs and WIs

QAM	Quality Assurance Manual	Prepared
QP-00-01	Quality Assurance Procedures	Prepared
QP-01-01	Organization	
QP-01-02	Contract Review	Prepared
QP-02-01	Annual Management Review	Prepared
QP-02-02	Quality Orientation and Training	Prepared
QP-02-03	Qualification of Lead Auditor	Prepared
QP-02-04	Inspection and Test Personnel	Prepared
QP-03-01	Design Control	Prepared
QP-03-02	Hardware Requirements Specification	Prepared
QP-03-03	Software Quality Assurance Program	Prepared
QP-03-04	Software Quality Assurance Plans	Prepared
QP-03-05	Software Classification	Prepared
QP-03-06	Software Verification and Validation	Prepared
QP-03-07	Cyber Security	
QP-04-01	Procurement Document Control	Prepared

# Status of QAM, QPs and WIs (cont.)



Nuclear Energy eXperimental Testing

QP-05-01	Work Instructions	Prepared
QP-05-02	Drawing Control	Prepared
QP-06-01	Document Control	Prepared
QP-07-01	Control of Supplier Document	Prepared
QP-07-02	Vendor Evaluation and Approval	Prepared
QP-07-03	Acceptance of Items and Services	Prepared
QP-07-04	Supplier Nonconformances	Prepared
QP-07-05	Commercial Grade Dedication	Prepared
QP-08-01	Identification and Control of Materials, Parts, and Components	Prepared
QP-09-01	Control of Special Processes	
QP-11-01	Test Control	
QP-12-01	Control of Measuring and Test Equipment	Prepared
QP-13-01	Handling Storage and Shipping	Prepared
QP-14-01	Inspection, Test, and Operating Status	Prepared
QP-15-01	Control of Nonconformances	Prepared
QP-15-02	Reporting Defects and Noncompliance to 10CFR Part21	Prepared
QP-16-01	Corrective Action Request	Prepared
QP-17-01	Quality Assurance Records	Prepared
QP-18-01	Quality Assurance Audits	Prepared
QP-19-01	Experiment and Test Control	



# Status of QAM, QPs and WIs (cont.)

WI-03-01	Control of Engineering Calculations
WI-03-02	Control of Design Analysis
WI-06-01	Control of Engineering Drawings

Prepared

# Quality Assurance Submission

## ACU purposes:

1. **Submit the QA Program in early 2021 for NRC review and approval before submission of the CP application.**
2. **Pre-CP submittal activities under the QA program:**
  - Conduct of Research
  - Technical Assessments
  - R&D Validation and Verification (V&V)
  - Construction of a potential future reactor room
  - Molten Salt Research Reactor Conceptual Design Work



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