
INSPECTION PROCEDURE 69020

INSPECTIONS OF SAFETY-RELATED ITEMS (AND SERVICES) DURING CONSTRUCTION OF NON-POWER PRODUCTION AND UTILIZATION FACILITIES

Effective Date: March 25, 2025

PROGRAM APPLICABILITY: IMC 2550

This procedure provides guidance for inspection of work activities associated with the construction of Non-power Production and Utilization Facilities (NPUFs).

69020-01 INSPECTION OBJECTIVES

- 01.01 To determine if on-site construction of NPUFs is being accomplished in accordance with the construction permit, licensing basis, and other applicable quality, technical, and regulatory requirements.
- 01.02 To determine if records reflect work accomplishment consistent with the construction permit, licensing basis, and construction specifications.
- 01.03 To determine if there are any potentially generic quality program problems that may warrant a follow-up quality assurance (QA) inspection.

69020-02 INSPECTION REQUIREMENTS

- 02.01 Specific inspection requirements for each type of technical inspection is provided in the appendices of this IP.
- 02.02 As a part of the planning process, inspectors should ensure that the items selected for inspections are safety related. If construction of safety-related items (and services) cannot be directly observed, then inspectors may conduct record review and observation of the as-built condition of safety-related items to fulfill the inspection requirements. If there are no safety-related items within the item type for the facility, then the associated appendix in this IP for that item type does not need to be completed.

69020-03 INSPECTION GUIDANCE

Definitions

- a. Direct Observation Techniques. Direct observation includes observing in-process construction-related activities such as fabrication, qualification, assembly, installation, inspection, examination, and testing to determine if the activity was performed in accordance with work control documents (e.g., applicable instructions, procedures, and/or drawings).

- b. Record Review. Record review includes review of a sample of completed records to determine whether the construction-related work activity was performed in accordance with applicable instructions, procedures, and/or drawings. For the records reviewed, the inspectors should determine whether the records were (1) adequate to furnish identifiable and retrievable evidence of activities affecting quality, and (2) met other requirements prescribed by the licensee's record management program.

If possible, the inspectors should also perform a walk-down of the completed work activity associated with the records reviewed, to determine whether the as-built item conforms with the final design, construction documents, and the records reviewed.

- c. Independent Assessment/Inspection. The inspectors may also conduct an independent assessment or inspection (walk-down, measurement, etc.) to determine whether the as-built item conforms to the final design.

General Guidance

NRC inspections should include one or more of the following inspection techniques: (1) direct inspection of in-process work activities, (2) review of completed records of work activities, or (3) independent assessment or inspection of completed work activities. The NRC will focus on direct inspections of construction activities at NPUFs when practical. The items listed in the appendices of this inspection procedure (IP) may be inspected via records review and observation of the as-built condition of the items when direct observation of construction activities is not practical. Each of the appendices to this IP may be performed separately and should be performed at the appropriate time during plant construction for the items being inspected. However, to gain efficiency, two or more appendices may be performed concurrently. Some portions of the appendices may not be applicable to some NPUFs. Additionally, efficiency gains may be realized by performing QA program implementation inspections (IP 69021) in conjunction with this IP. The overall NPUF inspection approach is described in detail in Inspection Manual Chapter 2550, "Non-Power Production and Utilization Facilities (NPUF) Licensed Under 10 CFR Part 50: Construction Inspection Program (CIP)."

During the inspection planning process, the inspector should review the applicable portions of the construction permit, licensing basis including the Safety Analysis Report (SAR), the final design, and the construction specifications. Technical requirements are established by the final design of the facility. The final design is prescribed by a "flow-down" of technical requirements from the NRC issued construction permit/license through design documents to final construction documents. Design output documents will usually reference industry codes and standards that provide specific requirements for the design, fabrication, assembly, and testing. Note that some facilities may use the term "license application," or "LA" instead of SAR. These terms are considered synonymous for this inspection procedure. Inspectors should also review the Quality Assurance Program (QAP) and the licensing basis for the QAP. Most NPUFs are expected to commit to ANS/ANSI 15.8, "Quality Assurance Program Requirements for Research Reactors."

The licensee/contractor procedures involved may vary from contractor to contractor, and may take many forms, such as formal procedures, instructions, checklists, drawings, etc. Review the inspection procedures/lists and compare with the requirements in the applicable codes and construction specifications. Evaluation should indicate whether adequate quality-related inspections are established and are based on appropriate criteria, and further, whether the results of the licensee/contractor's inspection will be transmitted to responsible construction quality inspection and management personnel. The NRC inspector should determine if the licensee controls are adequate and are properly implemented in a timely manner.

Quality requirements are defined by the licensee's QAP. The QAP description is reviewed and approved by the NRC staff. The applicable quality assurance program requirements are identified in the licensee's quality assurance program implementing documents. NPUFs will generally commit to and use ANSI/ANS 15.8, "Quality Assurance Program Requirements for Research Reactors," to develop their QAP description.

This IP is not intended to implement a programmatic evaluation of Quality Assurance program effectiveness. This will be accomplished as part of QA inspections directed by IMC 2550. However, inspectors should familiarize themselves with the requirements in the facility's QAP that apply to the work activity they are inspecting and evaluate the implementation of QA requirements directly applicable to the work activity being inspected.

This IP should be performed in conjunction with IP 69021, "Inspections of Quality Assurance Program Implementation During Construction of Non-Power Production and Utilization Facilities" and IP 69022, "Inspections of Operational Readiness During Construction of Non-Power Production and Utilization Facilities."

69020-04 RESOURCE ESTIMATE

Each of the appendices of this IP contains resource estimates for that appendix.

69020-05 PROCEDURE COMPLETION

This inspection procedure is complete when the applicable appendix inspection samples are completed for the facility. Due to the wide variety and complexity of construction activities, completion of a sample is not dependent on the number of inspection activities completed during the inspection. Inspectors are not expected to complete every activity in the appendices. Instead, inspectors shall prioritize inspection activities during their visit to the site based on 1) importance of the activity to safety, 2) availability of the activity at the time of the inspection, and 3) available inspection resources. Inspectors may consult with their supervisor and/or NRC headquarters technical staff, if necessary, to prioritize inspection activities. If the characteristics of a specific facility and the corresponding safety significance of the activities addressed by an appendix to this IP are such that additional samples are warranted, or if NRC management has significant construction quality concerns, then the cognizant construction oversight and NRR program office branch chiefs may approve additional samples. An appendix to this IP need not be completed if there are no safety-related items (or services) covered by that appendix at an NPUF.

69020-06 REFERENCES

NOTE: Additional references specific to Appendix A through Appendix M are included in the Reference section of that appendix.

10 CFR Part 21, "Reporting of Defects and Noncompliance."

10 CFR 50.55, "Conditions of construction permits, early site permits, combined licenses, and manufacturing licenses."

10 CFR 70 Subpart H, "Additional Requirements for Certain Licensees Authorized to Possess a Critical Mass of Special Nuclear Material."

END

List of Appendices:

- Appendix A: Foundations and Buildings
- Appendix B: Structural Concrete
- Appendix C: Structural Steel and Supports
- Appendix D: Piping Systems
- Appendix E: Pipe Support and Restraints
- Appendix F: Mechanical Components
- Appendix G: Electrical Cable
- Appendix H: Electrical Components and Systems
- Appendix I: Ventilation and Confinement Systems
- Appendix J: Instrumentation and Control Systems
- Appendix K: Welding
- Appendix L: Fire Protection Systems
- Appendix M: Inspection of Digital Instrumentation and Control (DI&C) System/Software Design

List of Attachments:

- Revision History for IP 69020

Attachment 1 – Revision History for IP 69020

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional Non-Public Information)
N/A	ML15083A168 12/14/15 CN 15-029	Initial issuance to provide guidance for the safety-related items and services during construction of non-power and utilization facilities.	Briefing for inspectors, prior to performing inspection covered by this IP.	ML15189A134
N/A	ML24264A192 03/25/25 CN 25-005	Procedure was rewritten for conformance with changes to IMC 2550. Appendices split out into standalone documents.	N/A	N/A