

NRC INSPECTION MANUAL

DRP

INSPECTION PROCEDURE 49061

SAFETY-RELATED PIPING - QA REVIEW

PROGRAM APPLICABILITY: 2512

49061-01 INSPECTION OBJECTIVES

01.01 To determine whether the technical requirements detailed or referenced in the appropriate sections of the facility SAR, associated with safety-related piping (outside the reactor coolant pressure boundary) have been adequately addressed in the construction specification, drawings and work procedures; and whether the established system of management controls is adequate.

01.02 To determine whether quality assurance plans, instructions and procedures for safety-related piping (except welding and NDE) have been established in the facility QA Manual and implementing procedures; and whether these documents conform to the QA Program as described in Chapter 17 of the facility SAR.

01.03 To determine whether specification or procedural controls associated with safety-related piping are adequate and determine whether any potentially generic problems or other weaknesses exist within the preparing technical organization.

Inspection Schedule

May Be Started

Six months before piping installation starts.

Must Be Started

No requirement

Must Be Completed

Before work is 10% complete.

49061-02 INSPECTION REQUIREMENTS

02.01 For each onsite organization with QA/QC responsibilities in the area of safety-related piping (outside the reactor coolant system boundary) complete the relevant inspection requirements of Inspection Procedure 35100. Usually IP 35100 will be completed before conducting the inspections contained in IP 49061. Depending on the facility contracting arrangements, it may be appropriate to perform certain parts of IP 50090 (Piping Support and Restraints) in conjunction with this procedure. (Safety-related piping systems are listed in Section 03 of IP 49063.)

02.02 Determine whether appropriate and adequate procedures are included or referenced in the QA Manual to ensure that the following specific activities are

controlled and performed according to NRC requirements and SAR commitments relating to safety-related piping:

- a. Procedures require that the purchase documents identify the appropriate material specifications and any special requirements, and that these documents require material test reports/certification of the following:
 - 1. chemical composition
 - 2. physical characteristics
 - 3. nondestructive examination results
 - 4. heat treatment history (if applicable)
 - 5. welding of prefabricated sections
- b. Receiving inspection procedures contain provisions for ensuring:
 - 1. piping materials are in conformance with purchase specifications, including special requirements
 - 2. marking, identification, and storage level classifications
 - 3. as-received cleanliness and protection
 - 4. receiving inspection reports are generated as required
 - 5. disposition of nonconforming items
- c. Inspection (QC) procedures covering storage and issue of the piping and related appurtenances include provisions for:
 - 1. segregation of sizes and types of material
 - 2. storage identification
 - 3. storage conditions/protection
 - 4. confirmation of issue of specified material
- d. Procedures cover handling of the piping and related appurtenances to ensure protection from physical damage or contamination while handling.
- e. Procedures cover installation of the piping and related appurtenances to verify that the following meet applicable requirements:
 - 1. location
 - 2. grinding, cutting, bending, etc.
 - 3. piping system tolerances
 - 4. cold spring
 - 5. installation records to be generated during installation

6. type, size, location and adjustment of hangers, bellows, restraints, snubbers (Reference IP 50090)
 7. clearances to prevent interference
 8. hydrostatic testing (where required)
 9. hold points
 10. removal of arc strikes
- f. Procedures cover design changes, including field changes, to ensure proper review and coordination among participating design organizations.
 - g. Inspection and work performance procedures for cleaning piping contain provision for:
 1. cleaning materials - conformance to specifications, concentration, temperature, and use
 2. cleanliness criteria and measurement methods
 3. removal and installation of metering devices, orifice plates, valve internals, etc., that are removed from system to facilitate flushing
 4. installation and removal of fine strainers, blind flanges, temporary piping and dams
 5. record-keeping requirements

02.03 Review the licensee's plans and schedules to audit compliance with and effectiveness of the QA/QC requirements associated with safety-related piping, including (but not limited to) design, procurement, receipt/storage, installation, and testing.

02.04 Determine whether licensee management has an established program for ensuring that all personnel involved in the above mentioned activities are suitably proficient, skilled, or otherwise qualified by experience or training to perform their assigned duties.

02.05 If deemed appropriate, complete Items 02.01 and 02.02 for an expanded sample of onsite organizations having QA/QC responsibilities relative to safety-related piping.¹

49061-03 INSPECTION GUIDANCE

General Guidance

- a. Completion of the inspection requirements in this procedure and of IP 49051 (Reactor Coolant Pressure Boundary Piping) may be accomplished simultaneously. The organization(s) involved and the work sequence will partly determine whether the inspection (49051 and 49061) should be done at the same time.
- b. Applicable parts of the SAR should be reviewed to determine licensee commitments relative to construction and inspection requirements before

¹ This requirement shall also be conducted if the licensee's performance is categorized by the SALP program as Category 3, or if Regional management at the Division Director level concludes that recent findings will likely result in a Category 3 rating during the next SALP evaluation unless immediate action is taken.

performing this inspection. The inspector(s) should utilize the appropriate SAR section during the review of the licensee's implementing construction specifications, drawings, work procedures, and QA implementing procedures. Most of this review can be completed during inspection preparation within the regional office after the documents have been obtained from the site.

- c. Refer to IP 35100 for additional guidance.
- d. The purpose of the inspection requirements in Section 02 of this procedure is to determine whether the licensee-contractor(s) has met QA Program requirements for piping receipt, fabrication, erection, inspection, and testing of safety-related piping systems outside the reactor coolant pressure boundary. (The piping systems are in Quality Groups B and C, as defined in RG 1.26.)
- e. Also, this inspection requirement should provide specific information about the licensee commitments, plans, and schedules for performing required comprehensive audits in the areas of interest listed above. Information should be obtained about audit procedures, checklists, auditor qualification, schedules, and the identification of those having direct audit responsibilities. Specific attention should be directed toward reviewing licensee actions for ensuring that only qualified personnel are permitted to perform the construction and inspection work covered by this procedure. Information obtained will be useful also during the performance of IPs 49063, 49065, and 50090.
- f. Each of the items identified in 49061-02 that are applicable to a particular facility should be reviewed. The inspection items (where applicable) should be completed for selected onsite organizations which have QA responsibilities for this piping.
- g. Completion of Procedure 50090 satisfies requirements for safety-related pipe supports such as hangers, snubbers, and restraints.
- h. The license-contractor procedures involved will vary from site to site, 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 (ASME B&PV Section III, applicable industry standards and Regulatory Guides, for example) 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's inspection will be transmitted to responsible quality assurance and management personnel. The regional inspector must determine if the licensee controls are adequate and are properly implemented in a timely manner.
- i. Findings from this inspection activity should address each element as being satisfactory, being unresolved and requiring resolution; or being in violation and requiring correction. When significant inadequacies are identified in specifications or procedures (indicating a possible weakness within the preparing technical organization), the inspector should so inform cognizant Regional supervision. The issue should be addressed at the appropriate level of licensee management.

03.01 Prevalent errors and Concerns. This section is included to provide background for inspectors on what past problems of a generic nature have been identified and where certain areas should be more closely scrutinized to give NRC early information on potential problems.

- a. The status of protective measures at the time of site receipt and initial storage of piping and piping system components.

- b. Adequacy of dunnage for piping and piping system components during storage. Dunnage treated with five retardants may expose pipe to excessive levels of halogens and chlorides.
- c. Continued adequacy of such things as end caps for piping and protective coverings for weld prep areas.
- d. Weather protection in the form of canvas or plastic covering. (In most deficient cases, the original protective covering was adequate, but inattention to damage and normal "wear and tear" led to substandard or unacceptable protective covers.
- e. Sites near salt water should receive special attention to ensure that protective storage measures consider potential salt water or salt spray damage, and in particular, damage to components of stainless steel components.
- f. Storage areas located on sandy soil, or near sandy beaches, require special attention to avoid the entry of wind-driven sand particles into piping components.
- g. Improper location of storage. In many instances, storage locations are selected without consideration for construction traffic patterns, or possible falling objects and/or missiles. (See also 10 CFR 50, Appendix B, Criterion XIII, and RG 1.38.)
- h. Adequacy of snubber installation, testing, and inspection procedures, especially with respect to alignment and testing.
- i. Inadequate or illegible piping identification. (Damaged by handling and/or environment.)
- j. Refer to IP 49063-03 for additional errors/concerns that may appropriately be factored into the QA review.

49061-04 REFERENCES

SAR, Chapters 1, 3, 5, 6 and 17, including pertinent Codes and Standards referenced in these chapters.

Regulatory Guide 1.26, Quality Group Classifications and Standards

Regulatory Guide 1.28, Quality Assurance Program Requirements (Design and Construction).

Regulatory Guide 1.29, Seismic Design Classification.

Regulatory Guide 1.37, Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants.

Regulatory Guide 1.39, Housekeeping Requirements for Water-Cooled Nuclear Power Plants.

Regulatory Guide 1.58, Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel.

Regulatory Guide 1.88, Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records.

Regulatory Guide 1.144, Auditing of Quality Assurance Program for Nuclear Plants.

END