INSPECTION PROCEDURE 75001 ATTACHMENT 03

PIPING, PIPE SUPPORTS, AND RESTRAINTS

Effective Date: April 1, 2026

PROGRAM APPLICABILITY: IMC 2573

75001.03-01 INSPECTION OBJECTIVE

To verify that safety-related (SR) and non-safety-related, safety-significant (NSRSS) piping, pipe supports, and restraints can perform their required safety functions (RSFs).

75001.03-02 INSPECTION REQUIREMENTS

02.01 Vertical Slice Inspection of Quality Assurance:

Verify the licensee, manufacturer, or project vendor is effectively implementing its quality assurance (QA) and quality control (QC) requirements, in accordance with the quality assurance program (QAP) for activities associated with SR and NSRSS piping, pipe supports, and restraints. Inspection guidance for this portion of the inspection is provided in IP 75001, Appendix A.

02.02 SSC Inspection Samples:

Verify the piping, pipe supports, and restraints are designed and constructed in accordance with ASME Code requirements.

Verify the as-built piping, pipe supports, and restraints meet the design requirements in the design specifications, the design report, and the safety analysis report (SAR).

02.03 Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). Only applicable for construction under a COL.

Verify the inspections, tests, and analyses (ITA) are performed and that the acceptance criteria (AC) in the combined license (COL) are met.

02.04 Operational Program Inspections:

Inspect implementation of the operational programs related to Pre-Service Inspection (PSI); Reliability and Integrity Management Program (RIMP); Pre-Service Testing (PST); and Environmental, Seismic, and Functional Qualification of SSCs.

75001.03-03 INSPECTION GUIDANCE

General Guidance

The purpose of this inspection procedure is to provide insights into the quality of work being performed in the inspection area for piping, pipe supports and restraints. These insights will support the Advanced Reactor Construction Oversight Program's (ARCOP) continual assessment process described in Inspection Manual Chapter (IMC) 2572, "Assessment of Advanced Reactor Construction Projects."

The specific components selected for inspection, and the depth and breadth of inspection may vary widely between inspections and will depend on the structure, system, and component's (SSCs) risk significance for the design, the timing and location of the inspection, and the construction activities completed or in progress at the time of inspection.

Each inspection using this IP will constitute at least one inspection sample, regardless of how many sections are implemented during the inspection. As described in IMC 2572 and IMC 2573, "Inspection of the Advanced Power Reactor 'Quality of Reactor Plant Construction' Strategic Performance Area," the number of inspection samples needed to complete inspections in the inspection area are determined by the specified range of inspection samples listed in the project-specific inspection scoping matrices and on the results of the continual assessment process.

This IP is used for various advanced reactor designs and is scalable and flexible. Completion of every section/step of this IP is not expected or required for individual inspections or to complete the baseline inspection program for a project. Inspectors should perform the inspection activities in the following sections of this IP, as available.

In addition to the guidance below, inspectors may refer to Attachment 1 of this IP for supplemental inspection guidance and to other IPs as necessary to aid in completing the inspections in this procedure. Mechanical components installed within the piping system are inspected under IP 75001.05, "Mechanical Systems and Components"; however, mechanical components are included in the piping system seismic analyses.

Inspection samples shall be selected in accordance with the ARCOP project-specific inspection scoping matrices, as described in IMC 2573.

Specific Guidance

03.01 Quality Assurance Implementation

The inspectors should refer to IP 75001, "Inspection of Manufacturing and Construction Quality for Advanced Power Reactor Structures, Systems, and Components," and IP 75001, Appendix A, "Implementation of the Quality Assurance Program," for additional inspection guidance. The inspectors should select a sample of QA attributes to inspect during each inspection based on the scope and content of the planned inspection, the prior completed samples, and indication of potential issues in a particular attribute.

03.02 SSC Inspection Samples

ASME Code Design and Construction Requirements

a. Inspectors should be aware of the applicable ASME Codes specified in the safety analysis report, design specification, and design report. The applicable divisions of ASME Section III and ASME Section XI will vary depending on the project's licensing basis. ASME B31.1, "Power Piping," for NSR piping of low safety significance is not included in this IP.

b. Verify that the ASME Code Section III design specifications and design reports for piping, piping supports and restraints exist. Review applicable documents to determine that the ASME Code Section III requirements for the material, design, fabrication, installation, examination, and testing of the as-built SR and NSRSS piping, pipe supports, and restraints are met and are consistent with the design specification, approved safety analysis report and any engineering design change(s).

c. Refer to IP 75001.ENG, "Inspection of Design and Fabrication Requirements," for additional specific inspection guidance for design control and fabrication activities.

d. If Leak Before Break (LBB) analyses are used for ASME Code Class 1 and 2 system piping, then verify that piping and interconnected equipment nozzles are bound by the as-designed LBB analysis.

e. Verify that SR and NSRSS as-built piping, pipe supports, and restraints conform to the rules of construction of the ASME Code (welding, non-destructive examination (NDE) and pressure testing should be a focus). ASME Code Section III Data Reports should exist and be reviewed to determine that the requirements of ASME Section III, the design specification, design report, and SAR are met, and that the authorized nuclear inspector (ANI) has signed the ASME Data Reports when required by the Code.

f. Observe welding and NDE activities and confirm the activities conform to the requirements of ASME Section IX and Section V respectively. The inspectors should refer to IP 75001.WELD, "Inspection of the Welding and Nondestructive Examination Programs," for additional specific inspection guidance on welding and NDE.

g. Observe the hydrostatic/pressure tests of piping installations and verify that the tests are in accordance with the applicable code, per the design specifications.

h. Verify protective features are installed in accordance with the as-built Pipe Break Hazard Analysis Report. SR SSCs should be protected against or qualified to withstand the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.

i. Verify that the length of piping between each containment penetration and its associated outboard containment isolation valve is less than or equal to the specified maximum length (does not apply to functional containment).

03.03 ITAAC Verification: (Only applicable for construction under a COL)

Review the licensee's plan for completion of applicable ITAAC associated with the work activities being inspected. Review the activities that the licensee intends to credit for future ITAAC closure. For example, if the licensee intends to rely on a specific quality control (QC)

observation during the installation of an SSC, then the inspector should review a sample of these QC observations to determine whether the activity was performed in accordance with applicable quality and technical requirements. Because ITAAC have special regulatory significance, licensees should document ITAAC closure under their QAP. This means that even if an ITAAC is for a non-safety-related SSC, the completion package and subsequent notifications on ITAAC will be controlled by the QAP.

03.04 Operational program inspection activities:

a. ASME Pre-Service Inspection and Reliability Integrity Management Program

Determine the applicable pre-service inspection (PSI) requirements for SR and NSRSS as-built piping, pipe supports, and restraints. The PSI requirements will be performed either according to the requirements of ASME Section XI, Division 1, “Rules for Inservice Inspection of Nuclear Power Plant Components,” or Division II, “Requirements for Reliability and Integrity Management (RIM) Program for Nuclear Reactor Facilities,” as described in the SAR. Refer to IP 75001.WELD for additional guidance for inspection of PSI and RIM requirements. Note that the pre-service inspections for dynamic restraints (e.g., snubbers) are specified in the ASME OM code, article ISTD-4000.

b. Pre-Service Testing of Dynamic Restraints

Determine the applicable operation and maintenance (OM) Code and verify the pre-service testing (PST) of the SR and NSRSS dynamic restraints conforms to the ASME Code for “Operation and Maintenance of Nuclear Power Plants,” (OM Code), Subsection ISTD or ASME OM-2 Code “Component Testing Requirements at Nuclear Facilities,” Section DRD as described in the SAR. Refer to IP 75001.QUAL, for additional inspection guidance for pre-service testing of dynamic restraints.

c. Seismic Qualification of the as-built piping, pipe supports, and restraints:

ASME class 1, 2 and 3 piping, piping supports, and restraints are seismically qualified through adherence to ASME Section III rules. The inspection steps in the previous sections of this IP include seismic qualifications. For dynamic restraints (e.g., snubbers), seismic qualification follows ASME QME code. See IP 75001.QUAL for inspection of active mechanical components such as snubbers.

75001.03-04 RESOURCE ESTIMATE

The number of inspection samples and inspection hours are identified in the site-specific inspection scoping and planning matrix.

75001.03-05 PROCEDURE COMPLETION

Completion of this IP is based on 1) completing the minimum required inspection samples identified in the site-specific inspection scoping matrix and 2) an assessment pursuant to IMC 2572 that there is reasonable assurance that the activities for piping, pipe supports, and restraints are being accomplished with quality in accordance with the licensing basis requirements.

75001.03-06 REFERENCES

AISC, Manual of Steel Construction

ANSI N45.2.2, "Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants"

ANSI N45.2.6, "Qualifications for Inspection, Examination and Testing Personnel"

American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, Section III, Division I and Division V (applicable edition)

ASME, Boiler and Pressure Vessel Code, Section II (applicable edition)

ASME, Boiler and Pressure Vessel Code, Section V s (applicable edition)

ASME, Boiler and Pressure Vessel Code, Section VIII (applicable edition)

ASME, Boiler and Pressure Vessel Code, Section IX (applicable edition)

ASME, Boiler and Pressure Vessel Code, Section XI (applicable edition)

ASME, Section III, Subsection NF, Supports, Rules for Construction Nuclear Facility Components.

ASTM E1032-06, “Standard Test Method for Radiographic Examination of Weldments”

ASTM E94-04, “Standard Guide for Radiographic Examination”

IMC 2573, “Inspection of the Advanced Power Reactor ‘Quality of Reactor Plant Construction’ Strategic Performance Area”

IP 75001, “Inspection of Manufacturing and Construction Quality for Advanced Power Reactor Structures, Systems, and Components”

NRC Bulletin 79-02, “Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts”

NRC Bulletin 79-14, “Seismic Analyses for As-Built Safety-Related Piping Systems”

NRC Bulletin 87-02, “Fastener Testing to Determine Conformance with Applicable Material Specifications”.

Regulatory Guide (RG) 1.38, "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants"

RG 1.58, "Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel"

END

List of Attachments:

Attachment 1: Supplemental Inspection Guidance
Attachment 2: Revision History for IP 75001.03

Attachment 1: Supplemental Inspection Guidance

The purpose of this attachment is to provide guidance for inspection of piping, pipe support, and pipe restraint systems and components per Section 02.02 of the main body of this IP. Some of the sections and guidance in this attachment may not apply to all facilities. ITAAC are only applicable to facilities constructed under a COL. Inspectors may consider:

a. Purchase and Receipt of Materials

Select purchase orders for materials, such as welding consumables, piping, including prefabricated spool pieces and fittings, and pipe supports and restraints, then verify the following:

1. The selected materials conform with the purchase specifications, e.g., all piping is the correct size, material type, thickness, seamless or with seams, the specified length and quantity, and with the ends of the piping suitable for welding.
2. Quality documentation is the type required by the purchase order (e.g., Certified Material Test Report (CMTR) or Certificate of Compliance).
3. Any chemical and physical test results, including heat treatment, as applicable, for a CMTR, comply with the material specification required by the design documents.
4. Markings and identification of the materials are clear and legible.
5. There is no evidence of damage to the materials, e.g. excessive corrosion, gouges, chemical damage, etc.
6. Piping material complies with its cleanliness requirements.
7. The necessity of surface protection, closures, and packaging for the materials is stated in purchase order.
8. Receipt inspection reports were generated and conform to the licensee's procedures.
9. Nonconformances affecting the integrity of the materials were properly addressed in accordance with the licensee's procedures.

b. Storage and Handling

For randomly selected materials such as welding consumables, piping, including pre-fabricated spool pieces, and fittings verify proper storage and handling in accordance with approved procedures. Typically, storage inspections include the following inspection items for the materials stored:

1. Proper storage classification of materials.
2. Status of protective measures at the time of receipt and initial storage.
3. Soundness of dunnage or packing material.
4. Soundness and correct placement of such things as end caps for piping and protective coverings for weld preparation areas.
5. Soundness and correct placement of weather protection in the form of canvas or plastic coverings.
6. Protective storage measures to prevent saltwater damage (chloride contamination), e.g., in marine environments.
7. Protective storage measures against invasion of sand or windblown grit.
8. Correct and readily visible material identification, in accordance with the purchase order, and with no damage incurred by handling and/or environment.

9. Controls against the use of fire retardants near stainless steel piping to prevent any exposure to excessive halogens or chlorides.
10. Segregation of all sizes and types of material to the extent possible.

c. Installation of Piping

For additional guidance on welding and nondestructive examination (NDE) refer to IP 75001.WELD, and the Nondestructive Examination paragraph below. Verify welds and the installation of associated piping components are accomplished in accordance with approved drawings, qualified procedures, construction specifications, and applicable codes and standards by verifying the following, as applicable:

1. The piping is being installed at the proper location in the plant, at the slope specified, and with the proper clearances from other piping and obstructions in accordance with approved drawings.
2. Welding procedures are in accordance with the codes and standards specified in the design documents.
3. Welders are qualified for the piping material, electrode/process, and their positions.
4. Welding procedures, detailed drawings and instructions, if applicable, and weld data sheets are at the workstation or readily available.
5. Surfaces to be welded have been prepared, cleaned, and inspected in accordance with applicable procedures.
6. Weld joint geometry is as specified in the drawings.
7. Examinations, e.g., by visual (VT) or dye penetrant (PT), of the surfaces to be welded have been performed, and the surfaces were found acceptable in accordance with the specified codes.
8. Components to be welded are assembled at specified gap and alignment within the limits allowed by the drawings or codes.
9. Piping material and welding consumables are of the specified type and grade and are uniquely identified (such as by heat number) preferably by markings on the material or at least in the traveler or accompanying documentation.
10. Tack welds and temporary attachments, such as bridging bars or fit-up clips have been performed by qualified welders, in accordance with qualified welding procedure specification.
11. Gas purging, if specified, is used in accordance with the applicable procedure and is provided to shield the welding operation from adverse environmental conditions.
12. Preheat and interpass temperature, if specified, is maintained in accordance with applicable procedure requirements by observing welder’s instrumentation.
13. Welding equipment, including power cables and gas lines, are in good condition, and ammeters and voltmeters used for automatic welding have been calibrated in accordance with applicable procedure requirements.
14. Procedures specify appropriate holding and baking temperatures and out-of-oven exposure time for each class of coated electrode.
15. Welding consumable cleanliness is maintained, and electrode moisture pickup is limited in accordance with procedures.
16. Control and identification of welds rods after being issued to the welder are maintained in accordance with procedures.
17. Rod stubs are controlled and disposed of in accordance with procedures.

18. Interpass cleaning, grinding (especially starts and stops) and back-gouging, if applicable, are conducted in accordance with the applicable procedures.
19. Temporary attachments, arc strikes, and weld splatter are removed and inspected in accordance with specified procedures.
20. A welder's identity is recorded by stamping the weld or by other means, such as, documentation.
21. Repairs performed after the weld is completed and found acceptable by visual inspection or other NDE methods shall be accomplished in accordance with approved repair procedures and shall be documented.
22. Any repairs or modifications to ASME Code-stamped components shall be properly documented in the applicable Code data report as required by ASME Sections III and XI.
23. Select welds requiring post weld heat treatment (PWHT) over the course of the piping installation phase of construction, then verify that PWHT is performed in accordance with the design specifications and applicable code requirements. The inspector should also verify that when Charpy impact qualification is required for welds requiring PWHT, that both the base metal and the weld material were properly qualified in accordance with the applicable code.

d. Installation of Pipe Supports & Restraints

For concrete expansion anchor installation refer to IP 75001.01, Attachment 1. Depending on the specific type of support or restraint, verify through direct inspection and record reviews the following attributes:

1. Restraint is assembled and installed at the correct location in accordance with the design specifications and drawing(s), and within specified tolerances.
2. Functional restraint directions are in accordance with the design drawing.
3. Components are not bent, deformed, loose, or otherwise out of specification.
4. Clearance between the restraint and piping are within specified tolerances.
5. Bolts, nuts, washers, locking devices and other fasteners are tight and secure and are of the correct type, size, material, and grade with required identification markings.
6. Threaded fasteners have sufficient thread engagement, and where required, pre-load requirements have been met using properly calibrated torque wrenches.
7. Threaded connections used to adjust support load settings have suitable locking devices in place.
8. Hot/cold settings are correct for the existing condition of the attached piping system or if settings are not indicated, the thermal and/or dynamic displacements are within the working range of the support.
9. Restraints in high ambient temperature environments or near high temperature components have suitable service ratings to accommodate the expected operating temperatures.
10. Sliding or rolling supports are provided with material and/or lubricants suitable for the environment and with compatible contact surfaces.
11. The contact surfaces of sliding or rolling supports are free of paint, weld spatter, concrete, or other construction debris that would invalidate assumed design forces.

12. Clearances between restraints or supports and adjacent components, equipment, and structures are in accordance with specified rattle space requirements or have otherwise been explicitly evaluated.
13. Spherical end-bearings, if present, are free to rotate and are staked in place, as required.
14. Snubber installations should consider the following attributes:

    - Bleed holes are open and free from foreign material.
    - Hydraulic fluid levels are correct, or lubricants are applied as specified and there does not appear to be excessive leakage.
    - Seals are not deteriorated (if visually observable without dismantling).
    - Connecting joints, moving parts, piston shafts, seals, etc., are free from foreign material such as concrete, paint, weld spatter, excessive dirt, dust, or other material that may obstruct proper operation.
    - The mechanical Snubber internal mechanism should be checked for debris or foreign material if it was installed during construction.

15. Contact area between support baseplates and structural elements (concrete floors, walls, etc.) meet specified minimums.
16. Shims or washers, if used to level baseplates, are within specified limitations and any grouting complies with specified installation procedures.
17. Energy absorbing materials, if used in high energy pipe break pipe whip restraints, have not been damaged or otherwise deformed.
18. Verify spring cans are within the expected or required range and are not pinned.
19. Inspection of welding and NDE associated with the installation of the pipe restraints and supports should be in accordance with the design documents. IP 75001.WELD contains additional inspection guidance.
20. The integral welded attachments to piping (lugs for riser clamps or axial restraints, stanchions, etc.) that affect pressure boundary material are in accordance with their design codes and standards as identified in the design specification.

e. Nondestructive Examination

Observe welds with NDE in progress and verify that the final NDE has been performed and found acceptable, in accordance with the applicable codes by verifying the following as applicable.

1. The NDE procedure is in accordance with the applicable code as specified in the design specification.
2. The NDE is performed in strict accordance with the procedure by examiners that are qualified for that NDE method.
3. The temperature of the weld surface is within that qualified for the procedure.
4. For liquid penetrant testing (PT), adequate dwell time was allowed for penetrant application.
5. For magnetic particle testing (MT):

    - Yoke strength was demonstrated at the intervals specified in the procedure.
    - The spacing and current for prods are in accordance with the procedure.

- Arc marks caused by prods are removed.

6. For ultrasonic testing (UT), the examiner's qualifications, the UT equipment used complies with the procedure, and all UT process variables were strictly controlled.
7. For radiography testing (RT):

   - The type of source, source strength, film type, source to film distance, use of intensifying screens, type and thickness of material being radiographed, and exposure times are in accordance with the procedure.
   - The image quality indicators are the correct type and thickness.
   - The required sensitivity and radiograph density meet the applicable code requirement.
   - Applicable radiological safety requirements are met during testing.

f. General Guidance for Observation of In-Process Installation Activities

Prior to and during the observation of in-process work activities, the inspectors should verify that the conditions of the work area conform to specified requirements and precautions have been taken to prevent conditions that could adversely affect the quality of the items during installation. The inspectors should also observe in-process work activities to verify that in-process work activities do not adversely affect other (already installed) SSCs (Check design and licensing basis references such as ASME NQA-1, Part II, Subparts 2.3 and 2.8). Specifically, the inspectors should observe in-process work activities to determine whether (as applicable):

1. Protection from adjacent construction activities is being provided, including implementation of appropriate exclusion and area cleanliness requirements.
2. Protection from inclement weather and other ambient conditions adverse to quality is being provided.
3. Materials that may be deleterious to the items being installed are controlled.
4. Installation of the item will not adversely affect the subsequent installation of materials and equipment.
5. Repair or rework on any nonconforming items can be performed satisfactorily.
6. Nonconformances for adjacent items potentially impacting the items being installed have been dispositioned or controlled.
7. Welding operations, including materials and process controls, adequate purging, and the removal of purge dams upon completion.
8. Adequacy of protective measures to ensure that the item will not be damaged during installation.
9. Adequacy of housekeeping, barriers, and protective equipment to ensure that items will not be damaged or contaminated by adjacent construction activities.
10. As appropriate, the inspectors should verify the following as-built attributes:

    - Item identification,
    - Location and orientation of components,
    - Leveling and alignment,
    - Clearances and tolerances,
    - Tightness of connections and fastenings,

- Fluid levels and pressures,
- Absence of leakage,
- Physical integrity, and
- Cleanliness.

g. Guidance for ASME Records Review

For systems constructed in accordance with the ASME code, the inspectors should review a sample of completed ASME Code Design Reports to determine whether these reports comply with the ASME Section III Code requirements.

1. If applicable, verify that a registered professional engineer prepared and certified the ASME Design Report in accordance with ASME Code requirements.
2. Verify that the ASME Code Design Report included the proper supporting documentation. For example, supporting documentation should include:

- certified ASME Code Section III Data Report forms,
- construction records (including construction drawings, deviations, repairs, etc.),
- records of walkdowns of each piping segment to identify differences between as-designed and as-built critical functions (pipe supports, welds, component and pipe locations, weights, orientation/moments, etc.),
- procurement documentation,
- fabrication records,
- receipt inspection records, and
- other documentation as applicable.

h. General Guidance for Construction Testing

1. Piping

(a) Cleaning and flushing. Completed piping systems should be cleaned and flushed prior to any required system hydrostatic or operational testing. Portions of piping systems which are completed as a part of a prefabricated module should be cleaned and flushed at the module fabrication facility prior to shipment. For these cases the construction cleaning and flushing inspection may consist of observing a portion of a receipt-inspection, visual-inspection of the received modules piping system(s).

For cleaning and flushing conducted at the site, the inspector should observe the activities for proper procedure controls, (e.g., water quality, control of foreign materials, controls over the installation/removal of cleaning and flushing devices, and protection of plant equipment.)

(b) Hydrostatic testing. Construction tests involving hydrostatic testing should involve the review of procedures against applicable fabrication codes and/or standards as called out in the design and construction specifications, witnessing of pertinent portions of selected hydrostatic tests, and review of completed test records. For completed piping systems, the test procedures should include:

- The system boundary includes all pressure vessels, piping, pumps, and valves which are part of the piping system to be tested, up to and including the outermost containment isolation valve in system piping that penetrates primary reactor containment.
- Any applicable system safety and relief valves.
- The system is vented during the filling operation.
- Water quality is specified as required by the latest licensee approved specifications for the temperatures to be present during the test.
- Temperature requirements are stated to ensure that components are maintained above the nil ductility transition temperature during hydrostatic pressure testing.
- The minimum hydrostatic test pressure is as specified in the applicable design and/or fabrication specification.
- The maximum hydrostatic test pressure is less than the limits in the applicable design and/or fabrication specification.
- The hydrostatic test pressure is maintained for a minimum of 10 minutes before initiation of the examination for leakage.
- The examination for leakage includes all joints, connections, and regions of high stress, such as openings, attachments, and thickness transition sections. This examination shall be at a pressure equal to the design pressure or three-fourths of the test pressure, whichever is greater.
- The examination of pumps and valves shall be at test pressure.
- All portions of the piping system within the hydro boundary should have the same design pressure.
- Flow rate of pressure relief device(s) must exceed the flow rate of the hydro supply pump.
- When components or welded joints are embedded or are otherwise inaccessible for inspection at the time of the system hydrostatic test, the test method complies with allowable alternative provisions, as applicable.

(c) Test Conduct. Consider if testing is conducted in accordance with approved procedures, and the adequacy of test program records, including preliminary evaluation of test results. During conduct of the observed test(s) consider the following:

- The latest revision of the test procedure(s) is available and in use by all crew members.
- The minimum crew requirements are met.
- The test prerequisites are met.
- Joints, including welded joints, are left uninsulated and exposed for examination during the test.
- The valve lineup/system checklists are complete.
- Water quality and temperature are as stated in the procedure(s).
- Properly calibrated pressure gauges of the required range are installed where required.
- Properly calibrated relief valves of the required set point and capacity are installed where required.

- Pump and valve hydrostatic test requirements were either met on a shop hydrostatic test or during a field hydrostatic test.
- Required plant systems are in service.
- Special test equipment required by the procedure is calibrated and in service.
- Test is performed as required by the approved procedure.
- Criteria for interruption of testing and continuation of an interrupted test are adhered to.
- Significant events, unusual conditions, test discrepancies or interruptions to testing are documented.
- Crew actions are correct and timely during the performance of the test. Adequate coordination exists among crew members to conduct the test properly.
- All data are collected by the proper personnel.
- Temporary modifications such as jumpers, strainers, spool pieces, or blank flanges are installed and tracked by established administrative controls.
- The post-test valve lineup/system checklists are complete.

(d) Test Acceptance. Consider if overall test acceptance criteria have been met by:

- Visually examining a sample of all joints, connections, and regions of high stress, such as regions around openings and thickness transition sections.
- Visually examining a sample of the pumps and valves located within the test boundaries.
- Verifying that leakage from temporary seals or leakage permitted by the design specification is being directed away from the surface of the component to avoid masking leaks from other joints.
- Consider the preliminary test results to ensure that licensee's preliminary test evaluation is consistent with inspector's observations.
- Consider all test deficiencies, their resolution, and retest. Verify that all are reviewed by appropriate management.
- Consider data sheet entries for legibility, traceability, and permanence.

2. Pipe Supports & Restraints

Consider visual inspection of pipe supports and restraints on piping systems prior to construction test hydrostatic testing or operational test hot functional testing to verify that supports and restraints are in the proper configuration for the test. Visual inspections may include the following attributes:

(a) Dynamic piping supports (snubbers, shock suppressors, restraints, and vibration arresters).

- Hydraulic fluid in snubbers, shock suppressors, and restraints are at the proper level.
- Fluid leaks through seals or elsewhere are not evident.
- No evidence of deterioration, corrosion, physical damage, or deformation.
- Lubricants are applied wherever required.

- All required bolts, locking devices, nuts, and washers are installed. Fasteners should be tight, secure, and of the correct material and size.
- Support plates, extension rods, and connecting joints are not bent, deformed, loose, or otherwise out of specification.
- Connecting joints, moving parts, piston shafts, seals, etc. are free from arc strikes, weld spatter, paint, scoring, roughness, general corrosion, or other materials that may obstruct proper operation.
- Snubber position is at or near its predicted position and it is not near the limits in either extension or compression.

(b) Fixed piping support (hangers, brackets, clamps, braces, lugs, cradles, saddles, straps, turnbuckles, clevis and base supports).

- No evidence of deterioration and corrosion.
- Pipe supports, including associated equipment, are not deformed or loose.
- If pipe clamps are used to support vertical lines, shear lugs welded to the pipe are provided as specified.
- Springs in hangers are not obstructed by foreign material.
- Spring hangers provided with indicators show either "cold" or "hot" position, consistent with plant condition.
- Threaded connections are secured by locknuts, fasteners, cotter pins, or similar locking devices and conform to the as-built drawings.
- Sliding or rolling supports are provided with material and/or lubricants suitable for the environment and compatible with sliding contact surfaces.

(c) Component support structures (brackets, frames, and plates).

- Deformation is not present.
- Grooves, abrupt ridges, valleys, undercuts, cracks, discontinuities, or other detrimental indications that appear to exceed ASME Code limitations are not observed on welded surfaces. See the design and construction specifications for proper code references used.
- Visual inspection of installed pipe supports and seismic restraints in areas with continuing or expected additional construction activity, to ensure that equipment is being protected from damage.

Attachment 2: Revision History for IP 75001.03

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	ML26057A079 04/01/26 CN 26-011	Initial Issuance.	N/A	N/A