

ATTACHMENT 65001.A

INSPECTION OF THE AS-BUILT ATTRIBUTES FOR STRUCTURES, SYSTEMS, AND COMPONENTS (SSCs) ASSOCIATED WITH ITAAC

PROGRAM APPLICABILITY: 2503

65001.A-01 INSPECTION OBJECTIVES

This procedure provides guidance for inspecting structures, systems, and components (SSCs) to determine if they were constructed in accordance with the final design of the facility and meet the associated Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). Inspection of as-built characteristics generally requires verification of location, alignment, dimensions, and functionality, and may also involve direct measurements and sizing.

Corresponding technical inspection areas are addressed in the companion inspection procedure related to the planned inspection activity. Inspectors should use guidance contained in this inspection procedure and the applicable ITAAC matrix row inspection procedure to complete the inspection requirements for a given ITAAC.

- 01.01 To independently observe, review, or assess as-built SSCs to determine if their as-built configuration is in accordance with the final design of the facility and meet the associated ITAAC.
- 01.02 To determine that any differences between the as-built and as-designed SSCs were in accordance with approved modification or change procedures, have an adequate basis, and were appropriately dispositioned (documented).

65001.A-02 INSPECTION REQUIREMENTS

In order to inspect the as-built attributes of SSCs, inspectors may perform any one or more of the direct inspection techniques described in Section 03.01 of IP 65001. Inspectors should perform the activities listed in sections 02.01 through 02.04 of this inspection procedure to the extent practical. Where field inspection is not applicable or is insufficient to verify performance of the ITAAC, review licensee records to determine the adequacy of the documentation in providing objective evidence that the ITAAC has been met.

02.01 Observation of In-Process Installation Activities: Observe the installation of SSCs to determine whether the licensee has established adequate controls to ensure that the SSC was installed in accordance with the licensing basis. This includes the observation of the following activities:

- a. Pre-installation: Prior to the installation of an SSC, review the licensee's pre-installation inspections, checks, and similar activities to verify that the item and the installation area

conform to specified quality and technical requirements. Review pre-installation activities for the following attributes:

1. Identification: Verify that the identity of the item to be installed is in accordance with the latest approved-for-construction drawings, equipment lists, specifications, and established procedures.
2. Procedures: Verify that the latest approved-for-construction procedures, drawings, manuals, and other work instructions are available at the installation area.
3. Physical and Quality Condition: Review the installation work package to determine if the licensee has verified that the item(s) to be installed have met specified requirements and that the item's quality has been maintained. Specifically, the inspectors should verify that the item is not damaged prior to its installation and that all nonconformances associated with the item have been resolved.

b. Installation: Observe in-process installation activities to verify the following:

1. The applicable revisions of approved procedures, drawings, and instructions are being followed. Note: The inspectors should compare the versions of documents observed in the field to the documents in the licensee's controlled document management system.
2. Processes, materials, tools, and other equipment being used are qualified and approved in accordance with site procedures.
3. Personnel conducting work and quality assurance roles are qualified in accordance with site procedures.
4. The installation, inspection, and testing sequences are being maintained.
5. Nonconforming items are clearly identified, segregated, and dispositioned.
6. Any design changes or field modifications relevant to the work observed were properly controlled and processed in accordance with quality and technical requirements.
7. Inspection and test reports are current, accurate, and complete.
8. The item(s) were located, installed, assembled, or connected in accordance with the latest approved-for-construction drawings, manufacturer's instructions, and procedures.

c. Installation Acceptance Testing: Observe a sample of installation acceptance testing activities to determine if the activities were controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards,

specifications, and other special requirements. For example, acceptance testing activities may include: nondestructive examination activities (visual, surface, or volumetric examinations), surveying activities, torque tests, etc.

02.02 Installation Records Review: Compare a sample of final installation records (e.g., as-built drawings) with the actual installation to determine whether final facility documents reflect the as-built condition.

- a. Review a sample of as-built records to determine whether the records reflect the as-built facility and furnish documentary evidence that the applicable quality and technical requirements were met. This includes a review of records used to furnish documentary evidence that the SSC was constructed in accordance with the final design. Documents reviewed by the inspector may include: completed work packages, as-built inspection records (acceptance testing records), physical survey results, etc.
- b. If possible, perform a walk-down of the completed SSC associated with the records reviewed above to determine if the as-built SSC conforms to the final design, construction documents, and the records reviewed.
- c. For a sample of SSCs which were fabricated off-site and installed in a module, the inspectors should (1) review the as-built records, (2) perform an independent walk-down of the module to determine whether the as-built records adequately reflect the as-built SSC, (3) observe the receipt inspection performed by the licensee or their designated contractor, and (4) if possible, make an independent assessment / measurement as described in Section 02.03.

02.03 Independent Assessment / Measurement Inspection: Perform an independent inspection (walk-down, measurement, etc) to determine whether the critical attributes of as-built SSC conform to the final design. For example, the inspectors could measure the thickness of a structural wall, measure the thickness of a pipe, measure the relative location of a support, etc.

02.04 Review As-Built Deviations / Nonconformances:

- a. Review a sample of documents that were used to identify differences between the as-designed and as-built SSCs to determine if:
 - i. The difference, if not corrected to comply with the as-designed conditions, was properly documented and incorporated in the final as-built drawings.
 - A. Verify that this condition was properly evaluated, and that for those changes to the licensing basis that require NRC review (e.g. changes to Tier 2* or Tier 1 information), a License Amendment Request (LAR) has been submitted to the NRC, and NRC approval has been obtained via a Preliminary Amendment Request (PAR) approval or LAR approval.
 - B. Verify that any differences between documents used for construction and the corresponding document used for a design analysis were appropriately

reconciled with the design report by the person or organization responsible for the design.

- ii. The difference, if corrected to comply with the as-designed configuration, was completed and accepted by qualified personnel.
- b. Review applicable 10 CFR Parts 21 and 50.55(e) reports issued to the inspected facility for potential impact on the as-built SSC. Confirm corrective actions, as necessary, for satisfactory ITAAC completion.

65001.A-03 ADDITIONAL INSPECTION GUIDANCE

Specific guidance for the as-built inspection of different SSCs (electrical, mechanical, civil, structural, etc) is provided in the corresponding ITAAC matrix row inspection procedures.

The term “installation” is used through this procedure, but installation is also meant to include “assembly and erection.”

The definition of “as-built” is contained in the applicable Design Certification Document (DCD). For example, for AP-1000, the revision 19 DCD contains the following definition:

“As-built means the physical properties of a structure, system, or component following the completion of its installation or construction activities at its final location at the plant site. In cases where it is technically justifiable, determination of physical properties of the as-built structure, system, or component may be based on measurements, inspections, or tests that occur prior to installation, provided that subsequent fabrication, handling, installation, and testing does not alter the properties.”

03.01 Additional Guidance for Section 02.01, 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. (Reference 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. Repair or rework on any nonconforming items can be performed satisfactorily.
5. Nonconformances for adjacent items potentially impacting the items being installed have been dispositioned or controlled.

As appropriate, the inspectors should verify the following as-built attributes:

1. item identification
2. location and orientation of components
3. leveling and alignment
4. clearances and tolerances
5. tightness of connections and fastenings
6. fluid levels and pressures
7. absence of leakage
8. physical integrity
9. cleanliness
10. welding operations, including materials and process controls, adequate purging, and the removal of purge dams upon completion
11. adequacy of protective measures to ensure that the item will not be damaged during installation
12. adequacy of housekeeping, barriers, and protective equipment to ensure that items will not be damaged or contaminated as a result of adjacent construction activities

03.02 Additional Guidance for Section 02.02, Installation Records Review: For systems constructed in accordance with the American Society of Mechanical Engineers (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.

- a. If applicable, verify that a registered professional engineer (RPE) prepared and certified the ASME Code Design Report in accordance with ASME Code requirements.
- b. Verify that the ASME Code Design Report included the proper supporting documentation. For example, supporting documentation should include:
 1. certified ASME Code Section III Data Report forms,
 2. construction records (including construction drawings, deviations, repairs, etc.),
 3. records of walk-downs 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.),
 4. procurement documentation,
 5. fabrication records,
 6. receipt inspection records, and
 7. other documentation as applicable

65001.A-04 RESOURCE ESTIMATE

Under development.

65001.A-02-05 REFERENCES

1. Facility Final Safety Analysis Report (FSAR) and Design Control Document (DCD).
2. Inspection Procedure 35007, Quality Assurance Program Implementation During Construction and Pre-Construction Activities.
3. Inspection Procedure 36100, Implementation of 10 CFR Parts 21 and 50.55(e) Programs for Reporting Defects and Noncompliance.
4. ANSI/IEEE Std. 336-1985,1 IEEE Standard Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities.
5. ASME NQA-1, Subpart 2.5, "Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils, and Foundations for Nuclear Power Plants."
6. ASME NQA-1, SUBPART 2.8, "Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for Nuclear Power Plants."
7. NRC RG 1.215, GUIDANCE FOR ITAAC CLOSURE UNDER 10 CFR PART 52, Revision 1.

END

Attachment:
Revision History for IP 65001.A

Attachment 1 - Revision History for IP 65001.A

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment and Feedback Resolution Accession Number
	10/03/07 CN 07-030	Researched commitments for 4 years and found none. Initial issuance	N/A	N/A
N/A	ML13205A248 09/25/13 CN 13-023	Researched commitments for 4 years and found none. Complete re-write to address current inspection program policies.	N/A	N/A