ATTACHMENT 65001.F

INSPECTION OF THE ITAAC-RELATED DESIGN AND FABRICATION REQUIREMENTS

PROGRAM APPLICABILITY: 2503

65001.F-01 INSPECTION OBJECTIVES

01.01 To verify that design and fabrication have been completed in accordance with applicable specifications, drawings, and approved procedures.

01.02 To determine whether licensee records establish an adequate basis for the acceptance of Inspection, Test, Analysis and Acceptance Criteria (ITAAC) with design and fabrication attributes.

01.03 To determine whether design and fabrication activities have been performed by qualified personnel.

01.04 To assess the implementation of the portion of the quality assurance (QA) program specific to design and fabrication activities and to assure problems are entered into the corrective action process.

65001.F-02 INSPECTION REQUIREMENTS AND GUIDANCE

This inspection is performed to demonstrate that materials, components, and systems are designed and fabricated in conformance with requirements in the facility license, applicable Codes and standards, licensing commitments, Final Safety Analysis Report (FSAR), and regulations. All dimensions and related tolerances of the components must be in accordance with design drawings and specifications.

“Design/Fabrication Requirements” includes specific ITAAC that refer to Codes and standards (e.g. American Society of Mechanical Engineers [ASME]) requirements for the fabrication of materials and components or discuss the adequacy of design by reference to analyses, calculations, bounding condition checks, functional assessments, engineering evaluations, and other design reports. Licensee reports that analyze the functional capabilities of the system and components should be reviewed to confirm compliance with the applicable documents including Codes and standards referred to in this paragraph.

02.01 Inspection Plan/Scoping. Review the ITAAC Matrix to determine the ITAAC residing in families along Column F for “Design and Fabrication Requirements.” The inspector may then select specific criteria based on or related to those ITAAC and the inherent characteristics of any engineering program to verify whether a program controlling design and fabrication activities for those ITAAC has been established and is being correctly implemented. For the selected ITAAC criteria or attributes, the inspector should verify that the design and fabrication inputs were correctly identified and documented, and that their

selection was reviewed and approved by the responsible engineering group.

Guidance: The selection of critical attributes for inspection should be a part of the planning stage of the inspection, and as such, should be detailed in the individual inspection plan prepared by the inspector. Critical attributes may be associated with the specific ITAAC details delineated in the ITAAC "inspections, tests, analyses" or in the "acceptance criteria." Where the acceptance criteria specify a verifiable attribute, it should be selected for inspection. The main purpose of this inspection procedure (IP) is to evaluate whether a program or a subprogram for the control of design and fabrication activities has been established and is being implemented in accordance with licensee procedures. That goal is partly verified by reviewing a sample of the design and fabrication activities associated with the ITAAC in column F of the matrix. It is also necessary to determine whether the program for controlling design and fabrication activities has the required characteristics of any engineering or design program.

Some critical attributes may not be clearly specified in the ITAAC table, but included by reference to fabrication or test Codes, and/or reference to requirements contained in the Design Control Document (DCD) or the FSAR. It is expected that the inspector will exercise judgement not only in the selection of the critical attributes, but also in determining how much inspection is necessary to confirm that the ITAAC have been satisfied.

In any case, the ITAAC, as they are written, should provide sufficient details for guidance in the selection of critical attributes and in establishing what needs to be inspected to verify adequate licensee completion, compliance, and acceptance.

02.02 Design Inspections. Conduct design inspections in accordance with the inspection plan, by performing selective inspections of analyses, calculations, bounding condition checks, functional assessments, engineering evaluations and other design reports, consistent with the safety significance and inspection resources, of the following areas:

a. Review the required documents, supplemental examination records, analyses, and ASME Code documentation to see that the N-stamp documentation is valid for the major components.

b. Verify that NQA-1 requirements are followed for parts identification and traceability during processing of the components.

c. Verify that the licensee has confirmed that the components conform to design drawings and that there are no fabrication deviations from design.

d. Verify whether all nonconforming conditions identified before completion of fabrication were appropriately resolved.

e. Verify whether the licensee, vendor and fabricator personnel have established an effective method for tracking, evaluating, and dispositioning changes or modifications to the component designs.

f. For selected design changes, verify whether the applicable documentation is complete and accurate, including relevant 10 CFR 50.59 or 72.48 evaluations.

g. Verify that each component's Design Specification and Design Report are certified by professional engineers competent in ASME Code requirements.

h. For components subject to industrial standards outside of the ASME Code, see Inspection Procedures for ITAAC rows (1) through (15). These will include references to industrial standards for seismic or environmental qualification, fire protection standards, etc.

Guidance: Design inputs are crucial to ensuring that design activities are carried out in a correct manner. They also provide a consistent basis for making design decisions, accomplishing design verification measures, and evaluating design changes. Consequently, design inputs must be identified and documented. The inspector should ensure that design inputs appropriately consider both normal operations and anticipated operational occurrences, maintenance, testing, external events and postulated accident conditions. With regard to accident conditions, the design must incorporate the expected environmental conditions into the specifications for the Structures, Systems, and Components (SSCs) that must function to mitigate the consequences of an accident. Any changes from approved design inputs and reasons for the changes must be identified, approved, documented and controlled. The purpose for performing these sample inspections of the work products (design inputs) of the program for design and fabrication activities is mainly to assess that program. The row procedures that interface with column F of the matrix will conduct a more in-depth review of those work products or design inputs.

Verify that design control and related activities (e.g. document control, special processes, or resolution of nonconforming conditions) are conducted under an approved QA/QC program. Review completed audits and fabrication reports, interview selected personnel, and/or review procedures. Review any related QA audits to determine whether corrective actions have been effectively implemented.

A licensee's QA/QC program should include an Inspection and Test Plan complete with hold points at critical stages of fabrication. The Plan, as well as the results, should be reviewed by a certified Level III visual inspector. A typical plan may include any of the following:

a. Qualifications: witness welder qualification testing;

b. Pre-Fabrication: review of drawings and specifications, determination of extent of NDE required, development or review of welding procedures and verification of adequate equipment;

c. Fabrication: ensure qualified fabrication personnel are used and that fabrication procedures are correctly followed, verify material test reports, visually inspect production weld quality and overall workmanship, examine bolting installation and performance of torque testing, audit of the fabricator's QC department - conducting inspections at both the fabricator's shop and at the erection site;

d. Post-Fabrication: confirm that the as-built dimensions match drawings and document variances for correct disposition, oversee NDE and verify results,

oversee coating inspections and verify results, inspect product shipping and receiving operations.

02.03 On-Site Fabrication Activities. The inspection requirements for on-site fabrication activities include the following that should be inspected:

a. Verify whether fabrication and procurement specifications are consistent with the design commitments and requirements documented in the SAR, and, as applicable, in the license and technical specifications.

b. Verify whether corrective actions for identified fabrication deficiencies have been implemented in a timeframe commensurate with their significance, and whether nonconformance reports documenting the deficiencies have been resolved.

c. Verify whether individuals performing the quality-related activities are trained and certified where required.

d. Verify whether materials, components and other equipment received by the fabricator meet design procurement specifications.

e. Review NDE procedures, NDE records of welds, NDE personnel qualifications, certification of NDE materials (penetrants, cleaners) used, etc.

f. Verify whether components are being fabricated per approved QA and 10 CFR Part 21 or 50.55(e) (as applicable) implementing procedures and meet fabrication specifications.

g. Verify whether supervision and quality control/assurance personnel perform appropriate oversight during fabrication activities.

h. Verify that requirements have been satisfied for preparation of certified material test reports for the various components, and that the records of all required examinations and tests are traceable by work control travelers to procedures and revisions to which they were performed.

i. The required electrical component characteristics, material, performance tests, environmental and seismic qualification tests, nondestructive tests, and other specification requirements were met or otherwise noted.

j. Check for foreign material exclusion controls.

k. Observe control of installation, use and removal of temporary services directly related to component fabrication.

l. Ensure that the contractor has established a program for ensuring that all craft, NDE, and inspection personnel associated with the installation of safety-related systems have been trained, or otherwise qualified to the work procedures involved.

Guidance: The inspection requirements/attributes listed in section 2.03 may be completed

by any of the following methods either individually or in combination.

a. The Authorized Nuclear Inspector (ANI) or the NRC can actually perform the inspection requirements at the vendor facility.

b. A NRC inspector can confirm that the ANI completed the requirements by a records review at either the vendor facility or the plant site.

c. For those inspection requirements/attributes not completed by the ANI, the NRC inspector can confirm that the requirements were met or completed by reviewing licensee surveillance reports or appropriate vendor records at the plant site. For any type of component fabricated by a particular vendor, only the fabrication of the prototype should be reviewed at the vendor facility, except if regional management decides otherwise, with all subsequent components of the same type and model considered to be validated by that initial review.

d. With regard to fabrication activities, the provisions of 10 CFR 21, "Reporting of Defects and Noncompliance," for reporting defects that could cause a substantial safety hazard should be implemented. Validate that the fabricators' personnel are familiar with the requirements of 10 CFR 21.

e. Fabrication specifications include, but are not limited to, component material specifications, fabrication techniques, examination techniques, and required dimensions and tolerances. Previously identified problems related to component fabrication include incomplete documentation of actual fabrication activities in fabrication traveler documents, i.e.: failure to explicitly state required critical component dimensions, such as minimum allowable wall thickness; failure to require verification of critical component dimensions using a specified non-destruction examination technique as required in the design documentation; design changes made outside the approved design change process; inadequate oversight fabrication activities by the licensee; and, fabrication of a component to a different safety classification than that shown in design specifications.

f. Comprehensive NRC inspection of component design and fabrication involves coordination of inspections to review engineering, safety assessments, welding, NDE, quality assurance, etc. Emphasis on inspection activities should be based on the overall scope, the safety significance of the activities and industrial experience.

02.04 Problem Identification and Resolution. The inspector should confirm that problems identified during the inspection are entered into the corrective action program in accordance with program requirements. The inspector may review licensee actions to address similar or related problems that were previously identified, in order to check the extent of condition and confirm the effectiveness of the licensee's corrective measures.

Guidance: This inspection is to assure that problems are entered into the applicable process to assure corrective actions appropriate to the circumstances are developed and prioritized. Inspections of Quality Assurance Program implementation, effectiveness of Problem Identification and Resolution, and Self-Assessment will be performed under the MC 2504 process.

65001.F-03 RESOURCE ESTIMATE

Inspection resources necessary to complete this inspection procedure are estimated to be 640 hours of direct inspection effort over the course of plant construction.

65001.F-04 REFERENCES

Facility Final Safety Analysis Report (FSAR) and Design Control Document (DCD)

IMC 2503 Appendix B Site Specific ITAAC Matrix

IMC 2503 Appendix C Site Specific ITAAC Sample Selection Process

IP 65100, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Matrix Inspections.

IP 35100, Implementation of Quality Assurance (QA) Program Described in the Final Safety Analysis Report (FSAR)

IP 40050, Identification and Resolution of Problems

Draft Regulatory Guide DG-1133, Design, Fabrication, and Materials Code Case Acceptability, ASME Section III

END

Attachment 1: Revision History for IP 65001.F

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Revision History for IP 65001.F

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	08/19/08 CN 08-024	Researched commitments for 4 years and found none. Initial issuance to support ITAAC inspections under 10CFR52.	N/A	N/A	N/A