

ATTACHMENT 65001.25

INSPECTION OF HUMAN FACTORS ENGINEERING DESIGN VERIFICATION DESIGN ACCEPTANCE CRITERIA (DAC)-RELATED ITAAC

PROGRAM APPLICABILITY: 2503

65001.25-01 INSPECTION OBJECTIVES

01.01 To confirm by inspection that the combined license (COL) holder (licensee) has implemented a Human Factors Engineering (HFE) design verification for the main control room (MCR), training simulator design, remote shutdown workstation (RSW) and local control stations in accordance with the NRC approved HFE design verification implementation plan. The inspection will be used to support an NRC finding as to whether the HFE design verification implementation and results meet the acceptance criteria as stated in the associated HFE Design Verification Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Design Commitments.

65001.25-02 INSPECTION REQUIREMENTS AND GUIDANCE

02.01 Background. Inspection of ITAAC associated with a COL is intended to support the Commission finding stipulated in 10 CFR Part 52.103(g), specifically that the ITAAC acceptance criteria in the combined license have been met, and that the facility has been designed and built to conform to the licensing basis. The Commission policy for Design Acceptance Criteria (DAC), as defined in SECY-92-053, allows a licensee to provide HFE design process milestones as ITAAC. The HFE DAC-related ITAAC are inspected as the development process for the HFE design progresses and the licensee completes the ITAAC throughout the facility post-COL (construction) phase.

An HFE program, such as that described in NUREG-0711, provides the structure for ensuring that the HFE aspects of a plant are developed, designed, and evaluated using a structured, disciplined analysis based on accepted HFE principles. Verification and Validation (V&V) evaluations are the part of an HFE program which comprehensively determine whether the design conforms to HFE design principles and if it enables plant personnel to successfully perform tasks that support plant safety and operational goals. Design Verification is one component of V&V which aims to verify that the licensee's Human System Interface (HSI) inventory follows accepted and approved HFE design specifications and that the HSIs have been constructed to support operator tasks as defined by the Task Analysis. The HFE Design Verification is an important element of the licensee's Design Verification process that deals specifically with applying appropriate design specifications during the design process.

The HFE Design Verification process is comprised of several important activities, including, but not limited to: selection of appropriate design specifications, implementing a general verification methodology, identifying design specification discrepancies, and tracking design discrepancies through resolution. A complete description can be found in NUREG-0711.

HFE Design Verification inspection confirms that the licensee has verified that the characteristics of the HSIs and the environment in which they will be used conform to HFE design specifications.

Licensees should have defined the point in their process in which it is appropriate to complete the HFE Design Verification activities and documented this within their implementation plan. In some cases HFE Design Verification activities may be initiated upon completed elements, while in others it may be more appropriate to compare the as-built configuration within the environment it will be installed. It is important that the licensee follows the process included in the NRC approved implementation plan. The NRC inspector should, however, complete the inspection on the as-built design as much as possible in either the MCR, training simulator, or at the RSW. A subsequent inspection will verify that the training simulator matches the MCR verifying that it is a suitable substitute for the MCR for HFE Design Verification.

02.02 Inspection Requirements and Guidance.

a. General Inspection Requirements.

The licensee's commitments regarding implementation of the HFE Design Verification process are contained in the HFE Design Verification Implementation Plan provided as part of the Design Certification Document and is included by reference in the COL. COL applicants that do not reference a DC must provide an implementation plan. The objective of this inspection is to verify that the licensee has implemented an HFE Design Verification process in accordance with the commitments contained in the approved implementation plan.

The general methodology for the inspection should verify that the results of the HFE Design Verification process have been properly documented in the HFE Design Verification Results Summary Report consistent with the commitments in Human Factors Engineering Design Verification Plan. This inspection should be conducted when the complete results summary report needed to fulfill the HFE Design Verification ITAAC is made available.

Secondly, the inspector should compare the licensee's results summary report and supporting documentation. These documents should demonstrate that the licensee has reviewed all the HSIs included in the licensee's approved implementation plan. Additionally, the documents should indicate that the licensee has verified the HSIs conform to the relevant HFE design specifications. Any HSIs that do not conform should have been entered into the licensee's Human Engineering Discrepancy (HED) process.

Lastly, the inspector should confirm that a sample of the HSIs conform to the design guidance by comparing the as-built HSIs and environments to the appropriate design specifications as indicated in the licensee's HFE Design Verification Implementation Plan. Any HSIs that do not conform to specifications should already be documented in the licensee tracking system. Any deviations from design specifications that are not appropriately documented and dispositioned by the licensee should be documented and included in the inspection report.

Task Support Verification, HED Resolution, and Integrated Systems Validation Inspections may occur shortly after, or concurrently with the current inspection. Results of this inspection can be used to focus the other V&V inspections. In most cases the inspection activities for these other inspections will not be complete at the time of this inspection and informal communication may be preferred. The inspector responsible for completing this procedure should be familiar with the other inspections.

The HFE Design Verification inspection may occur concurrently with the Task Support Verification Inspection.

Elements of this inspection are related to HED Resolution inspection activities. Issues or findings that arise during this inspection may be useful to target areas of special interest during the HED resolution inspection (see NUREG-0711, Revision 2, Section 11.4.4).

Results of the HFE Design Verification inspection may also be useful to the inspector conducting the Integrated System Validation inspection. Some dynamic capabilities of systems may not be accessible to the inspector at the time of this inspection. The inspector responsible for Integrated System Validation however will have the ability to observe HSIs being used dynamically.

Inspection activities should be coordinated through the Division of Construction Inspection in Region II.

Specific Guidance. Gather pertinent information such as applicable design guidance (e.g. style guides, standards, etc.) and information about the licensee independent reviewers prior to the inspection when possible. In some cases these documents may be proprietary and may need to be reviewed onsite. The inspector should consider the availability of these documents while planning the inspection.

Discuss inspection planning and scheduling issues with the Division of Construction Inspection and/or the Office of New Reactors (NRO) HFE technical experts. For example:

- Determine status of previous NRC inspection findings that may inform this inspection (such as the Task Support Verification inspection or HFE Design Verification inspections from previous COLs).
- Identify and review licensee responses to applicable Generic Bulletins, Regulatory Issue Summaries and Information Notices issued since Design Certification approval to verify licensee compliance.

Contact the licensee for information needed to prepare the inspection plan, for example:

- Licensee planned activities and schedule (used to focus inspection, minimize interference with licensee operations, and determine inspection sample).

- Availability of reports and supplemental documents needed to complete the inspection (documents specific to certified designs can be found in the corresponding appendix)
 - Identify the bases for selection of specific individuals who performed independent review activities as part of the licensee’s HFE Design Verification program Implementation Plan.
 - Availability of licensee personnel during the period tentatively scheduled for the inspection.
 - Changes to the HFE V&V program since any previous NRC inspection (e.g., policy, personnel, program description, and implementing documents) or approval of the Implementation Plan.
- b. Requirements for Performance of Inspection. The inspection will be performed in accordance with this Inspection Procedure and the associated design specific appendix. Adjustments to the inspection plan will be communicated to the Division of Construction Inspection (RII) to minimize impact to the licensee and to assist in revising inspection planning efforts accordingly.

Specific Guidance. Inspectors should refer to the appendices of this document for specific guidance regarding various plant designs.

- c. Requirements for Inspection Reporting. An inspection report and any findings will be prepared and approved in accordance with Inspection Manual Chapter 0613 “Documenting 10 CFR Part 52 Construction Inspections”.

Specific Guidance. No specific guidance.

65001.25-03 RESOURCE ESTIMATE

The total estimated time to complete this inspection for one COL licensee is approximately 80 staff hours. This inspection may occur concurrently with the Task Support Verification inspection and portions of the HED Resolution inspection.

65001.25-04 REFERENCES

1. 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants.”
2. Inspection Manual Chapter 0613, “Documenting 10 CFR Part 52 Construction Inspections.”
3. NUREG-0711, Rev 2, “Human Factors Engineering Program Review Model,” February, 2004.

4. SECY-92-053 "Use of Design Acceptance Criteria During 10 CFR Part 52 Design Certification Reviews."

65001.22-05 PROCEDURE COMPLETION

Implementation of this IP is complete when the planned sample of attributes for the specified appendices has been completed.

Appendix 1

Inspection Guide for AP1000 Human Factors Engineering Design Verification Plan/Issue Resolution Verification

Appendix 1 contains proprietary information and is therefore not publicly available. NRC staff may access Appendix 1 by clicking [here](#) or through the Agencywide Documents Access and Management System (ADAMS) (ADAMS Accession No. M13014A198.)

END

Attachment 1 - Revision History for IP 65001.25

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
N/A	ML13014A198 02/14/13 CN 13-005	Initial issuance. To confirm by inspection that the combined license (COL) holder (licensee) has implemented a Human Factors Engineering (HFE) design verification for the main control room (MCR), training simulator design, remote shutdown workstation (RSW) and local control stations in accordance with the NRC approved HFE design verification implementation plan. The inspection will be used to support an NRC finding as to whether the HFE design verification implementation and results meet the acceptance criteria as stated in the associated HFE Design Verification Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Design Commitments.	N/A	ML13014A202