

March 18, 2008

MEMORANDUM TO: Mohammed A. Shuaibi, Chief
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

FROM: Richard Rasmussen, Chief **/RA/**
Construction Inspection and Allegation Branch
Division of Construction Inspection
& Operational Programs
Office of New Reactors

SUBJECT: SAFETY EVALUATION REPORT INPUT WITH OPEN ITEMS FOR
TIER 1 "INSPECTIONS, TESTS, ANALYSIS, and ACCEPTANCE
CRITERIA (ITAAC)" ON THE ESBWR DESIGN CONTROL
DOCUMENT REVISION 4 REVIEW, FOR RAI 14.3-343.

The Construction Inspection and Allegation Branch (CCIB), Division of Construction Inspection and Operational Programs, Office of New Reactors, has prepared input for Tier 1, "Inspections, Tests, Analysis and Acceptance Criteria", for the safety evaluation report with open items (SER/OI) on the Design Certification application for the Economic Simplified Boiling Water Reactor (ESBWR).

This SER/OI input is based on NRC staff review of Revision 4 to the ESBWR Design Control Document (DCD) and responses from GE-Hitachi Nuclear Energy Americas LLC (GE-H) to selected requests for additional information (RAIs) by the Nuclear Regulatory Commission staff.

In the enclosed SER/OI input, CCIB indicates an open item where the RAI has not been resolved at this time.

Docket No: 52-010

Enclosure:
As stated

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DCIP/CCIB INPUT FOR THE GEH ESBWR
SAFETY EVALUATION WITH OPEN ITEMS
TIER 1, "INSPECTIONS, TESTS, ANALYSIS AND ACCEPTANCE CRITERIA (ITAAC)"

Tier 1 ITAAC

Introduction

This section of the safety evaluation report (SER) provides the staff's review of the ITAAC of the General Electric-Hitachi (GEH) Economic Simplified Boiling Water Reactor (ESBWR) as part of the design certification review being conducted by the U.S. Nuclear Regulatory Commission (NRC) under 10 CFR Part 52. This review is being conducted in accordance with Chapter 14, ITAAC, of the Standard Review Plan (NUREG-0800). Section 14.3 states:

- This standard review plan (SRP) section provides guidance to staff responsible for reviewing inspections, tests, analyses, and acceptance criteria (ITAAC) for design certification (DC) and combined license (COL) applications under 10 CFR Part 52.

The ESBWR review was accomplished and documented using the guidance provided and experience with previous DC reviews.

Regulatory Criteria

The NRC staff reviewed the ITAAC table in Revision 4 of the design control document (DCD) for the ESBWR design in accordance with Chapter 14, of the Standard Review Plan (NUREG-0800). Specifically, Section 14.3, states:

For a DC application, the review of ITAAC includes the applicant's justification that compliance with the interface requirements is verifiable through ITAAC and the method to be used for verification.

The review covers the overall scope of the ITAAC. For a DC application the ITAAC cover the complete design and the interface requirements.

It goes on to state;

Requirements

Acceptance criteria are based on meeting the relevant requirements of the following Commission regulations:

1. 10 CFR 52.17(b)(3), requires that an ESP application proposing complete and integrated emergency plans contain ITAAC and that an ESP application proposing major features of the emergency plans may contain ITAAC.

2. 10 CFR 52.47(b)(1), which requires that a DC application contain the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and should operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations;

3. 10 CFR 52.47(a)(26), which requires that a DC application contain justification that compliance with the interface requirements of paragraph (a)(25) of this section is verifiable through inspections, tests, or analyses. The method to be used for verification of interface requirements should be included as part of the proposed ITAAC required by paragraph (b)(1) of this section.

The staff's acceptance of the ITAAC is based on the ITAAC meeting the relevant requirements of the regulations, and that it demonstrates compliance with the design commitment.

Summary of Technical Information

The ESBWR documents reviewed included:

- ESBWR Design Control Document Tier 1, Chapter 2 & 3, ITAAC
- GEH Nuclear Energy, MFN08-086 Supplement 2, Enclosure 1, List of RAI Response to NRC Request for Additional Information, Letter No. 126 Related to ESBWR Design Certification Application, RAI numbers 14.3-343.

Staff Evaluation

GEH documents were reviewed using the general guidance provided in NUREG-0800, Standard Review Plan, Chapter 14 .3 ITAAC.

- The results are organized according to the RAI Number identified above.

14.3-343

RAI 14.3-343 questioned the relationship between the Design Commitment (DC), Inspection Tests and Analysis (ITA) and the Acceptance Criteria (AC) of Table 3.4-1 Item 1. Specifically it observed that the DC contains two commitments but the ITA and AC only verify one of them. It requested that the ITA and the AC be revised to include appropriate means to verify the DC element "...containment of airborne materials..."

In its response GEH agreed and proposed a revision to the ITA and the AC.

The proposed revision to the ITA specifies IEEE-338, "STANDARD CRITERIA FOR PERIODIC SURVEILLANCE TESTING OF NUCLEAR POWER GENERATING STATION SAFETY SYSTEMS." This standard specifies the requirements a test procedure must address to demonstrate the operational capability by periodic testing. It speaks to the preferred control signal input methods that will most fully demonstrate operability. It does not address performance measures that are required of post maintenance and post modification testing. That is the type of testing which is required to demonstrate "containment of airborne materials." Additionally, the placement of the test procedure at the end of a bulleted list of items that "Calculations will consider:" appears to be inappropriate.

The AC revision states, "A test report documents that isolation dampers close within the designated time frame and limit leakage to a rate below the design assumed leakage rate." Placement of this requirement for a report at the end of a bulleted list of items that, "Calculation of radioactive airborne concentration demonstrates:" seems inappropriate.

It is requested that GEH provide an appropriate testing standard to govern the necessary testing to demonstrate the performance assumed for containment of the radioactive particles, and provide an acceptable leakage rate or an indicator to where that information is located.

This remains an OPEN ITEM.

Conclusions

This review verified that the applicant has revised the ITAAC in response to RAI Item 14.3-343.

Item number 14.3-343 is continued as an OPEN ITEM.