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U.S. Nuclear Regulatory Commission

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Subject: **General Electric Hitachi Nuclear Energy (GEH) Response to NRC, "REQUEST FOR ADDITIONAL INFORMATION RELATED TO ADVANCED BOILING-WATER REACTOR LICENSING TOPICAL REPORT (TAC NO. MD4631)"**

References: NRC to GE Letter, G. Wunder to T. O'Neill, dated July 24, 2007, "REQUEST FOR ADDITIONAL INFORMATION RELATED TO ADVANCED BOILING-WATER REACTOR LICENSING TOPICAL REPORT (TAC NO. MD4631)"

GE Letter MFN 07-035, T. O'Neill to Document Control Desk, dated January 19, 2007, "Submittal of Licensing Topical Report NEDO-33297, "Advanced Boiling Water Reactor (ABWR) Procedures Development Plan"

Enclosure 1 in this letter contains GEH's response to the subject NRC RAIs. GEH requests closure of the RAIs based on the supplemental information and approval of the requested amendment to the ABWR certified design material.

The ABWR Procedures Development Plan (PDP) LTR was provided to respond to a COL License Information Item in the ABWR DCD Tier 2 Section 13.5.3 instructing applicants to generate a plant operations procedures development plan. GEH believes that all applicants would benefit from following a standardized procedures development plan. The LTR promotes standardization of the licensing basis for the ABWR plant procedures.

Add: G F Wunder TOIO
ME Tonacci
NRO

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GEH will revise LTR NEDO-33297 within 45 days after receipt of NRC approval of response to the PDP RAIs. Proposed changes to the LTR to resolve the RAI are identified in the RAI response.

If you have any questions about the information provided here, or during the course of your reviews, please contact me at 910-602-1885.

Sincerely,



Joseph A. Savage
Project Manager, ABWR Licensing

JAS/mkg/bar

Enclosure 1: Response to NRC Request for Additional Information Related to ABWR Design Certification Application Licensing Topical Report NEDO-33297, "Advanced Boiling Water Reactor (ABWR) Procedures Development." Plan" – RAIs -1 through -9.

cc:	BE Brown	GEH (Wilmington w/o enclosure)
	GF Wunder	NRC (w/ enclosure)
	ME Tonacci	NRC (w/ enclosure)
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		eDRF 0000-0061-9949

ENCLOSURE 1

MFN 07-481

Response to NRC Request for

Additional Information

Related to ABWR Design Certification Application

**Licensing Topical Report (LTR)
NEDO-33297 "Advanced Boiling Water Reactor (ABWR)
Procedures Development Plan"**

RAIs 1 through 9

RAI-1

The reference section of NEDO-33297 references NUREG-0800 Sections 13.5.1 – 1981 and 13.5.2 - 1985. Both sections have been updated. What are the plans for using the updated versions?

GEH Response

NEDO 33297 was prepared in support of the ABWR certified design and referenced the NUREGs that were used as a basis for the certified design. GEH has performed reviews of the later revisions of the guidance documents and determined that no significant difference between the LTR and the latest NRC guidance exists. However, to increase regulatory certainty for GEH customers, a revised LTR incorporating the latest guidance will be submitted for NRC approval. Proposed revisions to the LTR are identified in the responses to the RAI-2 and -3.

RAI-2

SRP 13.5.1.1, Section III, "Review Procedures", includes a review of the program for the development of administrative procedures to ensure application of accepted human factors principles and practices for the design of the operating procedures. In order to complete our review, please identify when the Section 3.1(3) and 3.2(3) guidelines and the Section 3.1(4) and 3.2(4) procedures will be submitted for review?

GEH Response

As stated in Reg. Guide 1.206, Section 13.5, "In general, the FSAR is not expected to include detailed written procedures. The FSAR should provide a brief description of the nature and content of the procedures and a schedule for the preparation of appropriate written administrative procedures ..."

NEDO-33297, Sections 3.1(4) and section 3.2(4), requires that for sites that do not have existing units or corporate guidelines, procedures will be prepared and issued six months prior to the commencement of the Preoperational Test Program.

In order to provide a similar requirement for sites with existing procedures the LTR will be revised. The following changes (underlined text) will be incorporated into the LTR:

3.1.3 Administrative procedures will be issued six months prior to the commencement of the Preoperational Test Program

3.1.4 These procedures will be issued six months prior to the commencement of the Preoperational Test Program

LTR Impact

NEDO-33297 will be revised as noted in the response to RAI-2.

RAI-3

NEDO-33297, Section 3.1(1) provides an administrative procedure description/definition. Please identify where comparable descriptions/definitions can be found for those procedures listed in the remaining sections?

GEH Response

Descriptions and definitions for Maintenance and Other Procedures are contained in 3.2(1). The descriptions for Operating Procedures and Emergency Operating Procedures were contained in 4.5 through 4.8. Section 4.9 provided the descriptions for Emergency Operating Procedures.

In order to provide consistency within the plan, the following new sections will be added to provide descriptions/definitions in one location in the report. The following changes (underlined text) will be incorporated into the LTR:

3.3(1) Plant operating procedures include the following sub-classifications:

- Integrated Operating Procedures (IOP) provide instruction to sequentially coordinate the operation of individual systems to support plant operation. IOP's are identified in section 4.4.
- System Operating Procedures (SOP) provide instructions for energizing, filling, venting, draining, starting up, shutting down, changing modes of operation, returning to service following testing (if not contained in the applicable testing procedure), and other instructions appropriate for individual system operation. SOPs are identified in section 4.5.
- Abnormal Operating Procedures (AOP) are procedures that provide guidance for actions to be taken during specific events. Examples of such events are provided in section 4.7.
- Alarm (Anunciator) Response Procedures (ARP) provides operator guidance on action to be taken during off-normal or alarm conditions (indicated by audio alarm and visual display) that require operator action in the Main Control Room. These are discussed in section 4.6.
- Surveillance Test Procedures (STP) provide step-by-step instruction for each surveillance test, inspection, or calibration required by

Technical Specifications. Examples of topics covered by surveillance test procedures are listed in section 4.8.

3.4(1) Emergency Operating Procedures are procedures that provide operator guidance for restoring and maintaining the reactor in a safe condition with any or all of the principal process variables for the reactor or containment initially outside of limits, regardless of cause. Section 4.9 provides the procedure titles for ABWR EOPs. ABWR will utilize the approved Emergency Procedure Guidelines (EPG) as found in Chapter 18 of the Design Control Documents Tier 2.

LTR Impact

NEDO-33297 will be revised as noted in the response to RAI-3.

RAI-4

SRP 13.5.2.1, Section III, "Review Procedures," includes a review of the program for the development and implementation of the operating procedures. In order to complete our review, please identify when the operating procedures program, as described in NEDO-33297, Section 3.3, will be submitted for review?

GEH Response

The Procedures Development Plan provides the requirements to be implemented by each COL Applicant to establish an operating procedures program. This program will be implemented through the following:

- a. Administrative Procedures (as discussed in LTR Section 3.3) to include site specific responsibilities and requirements for the following evolutions
 - Procedure preparation
 - Procedure review and approval
 - Temporary changes to procedures
 - Temporary procedures
 - Periodic Review and improvement
- b. Integrated Site Schedule to provide time frames for when procedures will be available and coordination of site activities.
- c. Procedure Writers guides to provide guidance for formatting and implement Human Factors requirements for procedure preparation
- d. Interfaces with the Human Factors Engineering Program

Administrative Procedures, Integrated Site Schedule, and the Procedures Writers Guides will be available for review 6 months prior to commencement of the Preoperational Test Program. The Human Factors Engineering Program is discussed in Section 18 of the FSAR.

LTR Impact

No changes to the LTR will be made as a result of this RAI response.

RAI-5

SRP 13.5.2.1, Section III, "Review Procedures," includes a review of the program for the development and implementation of the EOPs. In order to complete our review, please identify when the details of the EOP program, including the writer's guide, the plant specific technical guidelines, the EPG deviation document, revision, etc., as described in NEDO-33297, Section 3.4 will be submitted for review?

GEH Response

As discussed in Section 3.4 of the LTR, the Emergency Operating Procedures (EOPs) will be available to support human factors evaluations (HFE) and to support Operator Training. As discussed in the LTR, in order for EOPs to be created, the following documents must be generated.

- a. Plant Specific Technical Guidelines (PSTGs) based on analysis of transients and accidents that are specific to a site plant design and operating philosophy.
- b. PSTG/EPG difference document identifying any significant deviations from the approved EPGs (including identification of additional equipment beyond that identified in the approved guidelines), along with all necessary engineering evaluations or analyses to support the adequacy of each deviation.
- c. Site-specific calculations to support generation of the curves and limits utilized in the EOPs.
- d. EOP Writers Guide providing the guidance for designing flowcharts and provide standardized guidance on generating the EOPs.

These documents are generated prior to drafting the EOP and will be available 90 days prior to EOP issuance. The sequencing and actual dates for these documents will be included in the Integrated Site Schedule as discussed in the response to RAI-4.

LTR Impact

No changes to the LTR will be made as a result of this RAI response.

RAI-6

NEDO-33297, Section 3.4 (9) states that the EOPs “be completed in time to support the Plant Operations Training Program.” Please describe when the EOPs will be completed relative to when the COL is issued and the start of the Plant Operations Training Program.

GEH Response

The sequencing and actual dates for when the procedures will be available relative to the issuance of the COL is dependent on the COL Applicants site schedule. This information will be included in the Integrated Site Schedule as discussed in the response to RAI- 4. The description of the operations training programs will be specified in Chapter 13.2 of each applicant’s FSAR.

LTR Impact

No changes to the LTR will be made as a result of this RAI response.

RAI-7

NEDO-33297, Section 3.5 (4) states that the operating procedures will “be completed in time to support the Plant Operations Training Program.” Please describe when the operating procedures will be completed relative to when the COL is issued and the start of the Plant Operations Training Program.

GEH Response

The sequencing and actual dates for when the procedures will be available relative to the issuance of the COL is dependent on the COL Applicants site schedule. This information will be included in the Integrated Site Schedule as discussed in the response to RAI-4. The description of the operations training program will be specified in Chapter 13.2 of each applicant’s FSAR.

LTR Impact

No changes to the LTR will be made as a result of this RAI response.

Enclosure 1

RAI-8

What standards will be employed in the design of Video Display Unit screens for electronically displayed procedures?

GEH Response

The ABWR design provides the capability to view plant operating procedures on designated Video Display Units (VDU). These displays are text only and provide no controls or dynamic information. In order to maintain consistency between the appearance of the electronically displayed procedures and the hard copy versions, electronically displayed procedures will utilize the same font, and style identified in the Procedure Writers Guide for that particular site. An exception can be made if the VDU vendor software cannot generate a particular font, or as a result of human factors evaluation. VDU screen development will be described in Chapter 18 of each applicant's FSAR.

LTR Impact

No changes to the LTR will be made as a result of this RAI response.

RAI-9

Several systems listed in either ANSI/ANS-3.2-1982, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants or Regulatory Guide 1.33, Quality Assurance Program Requirements (Operation), Revision 2, 1978 (hydrogen recombiner, auto-blowdown, and the axial and radial flux systems), are not included in NEDO-33297. Have these systems been identified as not needing procedures?

GEH Response

The systems identified were not included for the following reasons:

- a. The Hydrogen Recombiner System is being removed from the ABWR design as described in NEDO-33330P "Advanced Boiling Water Reactor (ABWR) Hydrogen Recombiner Requirements Elimination", dated May 2007.
- b. The Automatic Depressurization System (ADS) that is listed in 4.4(8) is the ABWR equivalent to the "Auto-Blowdown" System
- c. The Neutron Monitoring System that is listed in 4.4(25) is the ABWR equivalent to the "Axial and Radial Flux System".

LTR Impact

No changes to the LTR will be made as a result of this RAI response.