March 5, 2008

MEMORANDUM TO: Belkys Sosa, Chief
ESBWR/ABWR Project Branch 2
Division of New Reactor Licensing
Office of New Reactors

FROM: Mark E. Tonacci, Senior Project Manager **/RA/**
ESBWR/ABWR Project Branch 2
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: ADVANCED BOILING WATER REACTOR TOPICAL REPORT STATUS UPON SUSPENSION OF REVIEWS

GE-Hitachi Nuclear Energy Americas LLC (GEH) has submitted 13 Advanced Boiling Water Reactor licensing topical reports (TRs) for the U.S. Nuclear Regulatory Commission's (NRC) review and approval, as shown in Enclosure 1. GEH requested approval of the TRs in advance of combined operating license application submittals, and to address an anticipated ABWR design control document amendment, NRC Docket No. 52-001.

GEH advised the NRC staff in October 2007, that they were temporarily suspending technical support for review of these reports. Because of the long duration of the suspended support, the NRC staff sent a letter to GEH on January 31, 2008 (ADAMS Accession Number ML080280256) notifying them that further review on the TRs would be stopped unless they confirmed their desire to move forward within 30 days.

Since GEH has not responded to the January 31, 2008 letter, the NRC staff is in the process of bringing to a conclusion the work that was in progress. The staff's review of these TRs is in various stages of completion. The purpose of this memorandum is to identify where work stopped on each TR as an aid should the staff resume the review at a later date. As such, this memorandum identifies requests for additional information (RAIs) and draft safety evaluations as shown in the enclosures. Many, but not all, of the RAIs were very preliminary in that they were sent to the project manager but never forwarded to GEH because GEH was no longer supporting the review. The enclosures capture the NRC's staff issues and GEH's responses in essentially original form with little editing of the work because the tasks are incomplete.

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In addition, there may be additional RAIs that the NRC staff has not generated because the work was stopped prematurely.

Should you have any questions, please do not hesitate to contact me.

Docket No. 52-001

Enclosures:
As stated

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Docket No. 52-001

Enclosures:
As stated

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ADAMS ACCESSION NO.: ML080560347 **NRO-002**

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DATE	3/4/08	3/4/08	3/5/08

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ENCLOSURE 1
GEH TOPICAL REPORT STATUS

GEH Topical Report	NRC TAC	Review Status
NEDE-33299P, "Advanced Boiling Water Reactor (ABWR) with Alternative RCIC Turbine-Pump Design"	MD4025	See Enclosures 2, 3, and 4. Also, draft safety evaluations prepared by W. Wang (ML073300580) and by T. Scarbough (available from the author).
NEDO-33297, "Advanced Boiling Water Reactor (ABWR) Procedures Development Plan"	MD4631	See Enclosure 5 and ML072500371.
NEDO-33305, "Advanced Boiling Water Reactor (ABWR) Startup Administrative Manual"	MD4632	See Enclosure 6.
NEDO-33328, "Advanced Boiling Water Reactor (ABWR) APRM Oscillation Monitoring Logic"	MD5247	See Enclosure 7.
NEDO-33316, "Advanced Boiling Water Reactor (ABWR) Vibration Assessment Program in compliance with The United States Nuclear Regulatory Commission Regulatory Guide 1.20"	MD5444	See Enclosure 8.
NEDO-33315P, "Advanced Boiling Water Reactor (ABWR) Reactor Pressure Vessel Material Surveillance Program" Revision 1	MD5421	See Enclosure 9.
NEDO-33325, "Advanced Boiling Water Reactor (ABWR) Common Equipment and Structures"	MD5443	See Enclosure 10.
NEDO-33310, "Advanced Boiling Water Reactor (ABWR) Startup Test Specification"	MD5420	See Enclosure 11.
NEDO-33335, "Plant Medium Voltage Electrical System Design"	MD5680	See Enclosure 12.
NEDE-33330P, "Hydrogen Recombiner Requirements Elimination" Revision 1	MD5681	See Enclosure 13.
NEDO-33321, "Advanced Boiling Water Reactor (ABWR) Life Cycle Management"	MD5682	See Enclosure 14.
NEDO-33336, "Advanced Boiling Water Reactor (ABWR)	MD5975	See Enclosure 15.

GEH Topical Report	NRC TAC	Review Status
Stability Evaluation”		
NEDO-33372, “Advanced Boiling Water Reactor (ABWR) Containment Analysis”	MD6738	See Enclosure 16.

ENCLOSURE 2
FORMAL RESPONSE FROM GEH TO
REQUEST FOR ADDITIONAL INFORMATION
GE LICENSING TOPICAL REPORT NEDE-33299P
"ADVANCED BOILING WATER REACTOR (ABWR) WITH ALTERNATIVE RCIC TURBINE-PUMP DESIGN"

NRC RAI-1

The current Reactor Core Isolation Cooling (RCIC)/High Pressure Coolant Injection (HPCI) Terry turbine design used in the operating plants was tested with water for durability and reliability. Were similar tests already performed for the proposed design? If not, does GEH plan to perform similar tests?

GEH Response

Vendor testing has been performed on the alternate pump assembly to demonstrate operational performance and resistance to conditions the assembly might experience. For example, the alternate RCIC turbine-pump was designed and proven by testing to be capable of surviving water slugs in the steam inlet. During vendor contract at the Sizewell B facility, a variety of testing including water slug ingestion tests were carried out to demonstrate the unit could survive undamaged and function correctly following a water slug both on start up and during running at full rated speed. Volumes of liquid water were injected into the turbine inlet under full steam pressure; the unit performance was checked before and after each slug test and remained unchanged. Post test-trip examination confirmed that no damage had been sustained. The alternate design is a highly reliable assembly.

LTR Impact

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

NRC RAI-2

On Page 7 of NEDE-33299, it is stated that "The RCIC system has been shown to comply with General Design Criteria (GDC) 2, 17, 35, 36, and 37 in Tier 2 Section 5.4.6.1." It is further stated that the changes proposed in this LTR will have no effect on GEH's evaluation of GDC compliance. However, in the Standard Review Plan (SRP) and Final SE Section 5.4.6, the RCIC is evaluated for conformance with the GDC 4, 5, 29, 33, 34, and 54. Has the RCIC system been evaluated against these criteria?

GEH Response

The proposed changes to the RCIC system design are in full compliance with applicable GDC requirements. The bases for compliance with the following GDC referenced in the RAI is as follows:

GDC 4: NUREG-1503, "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design" discussed how the original Terry-Turbine is protected against pipe whip inside and outside of containment as required in GDC 4. GEH review of system intended functions determined the alternate RCIC turbine-pump system design meets the same criteria.

GDC 5: Although STP 3 and 4 is a dual unit BWR site; Reactor Core Isolation Cooling (RCIC) equipment will not be shared between units. Each unit will have it's own dedicated equipment. Therefore, GEH review of system intended functions determined GDC 5 does not apply

GDC 29 and 34: The RCIC System meets GDC 29 and 34 because it is designed to perform its function without any AC power and, in conjunction with the high-pressure core flooder system, is designed to ensure an extremely high probability of accomplishing its safety function. NUREG-1503 discussed how the original Terry-Turbine met these GDCs. GEH's review of system intended functions determined the alternate RCIC turbine-pump system design meets the same criteria.

GDC 33: The RCIC System is used to supply reactor coolant makeup for small leaks. Therefore, GDC 33 is satisfied. NUREG-1503 discussed how the original Terry-Turbine met GDC 33. GEH review of system intended functions determined the alternate RCIC turbine-pump design meets the same criteria.

GDC 54: The containment leakage requirements are discussed in Subsection 6.2.6 of NUREG-1503; containment isolation criteria is discussed in Subsection 6.2.4 of NUREG-1503; and functional design and heat removal requirements of the containment are discussed in Subsections 6.2.1 through 6.2.3 of NUREG-1503. GEH review of system intended functions determined the proposed departures for the RCIC System are consistent with GDC 54.

LTR Impact

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

NRC RAI-3

Design Control Document (DCD) Tier 1, Page 2.4.4-2 (at the second paragraph) stated that the RCIC flow rate is achieved within 29 seconds of receipt of the system initial signal. This statement was not marked for the change in NEDE-33299. Confirm this statement is still applicable to the new design. If it is not applicable, the DCD Tier 1 needs to be modified. Provide the impact due to this difference on the safety analysis.

GEH Response

The 29 seconds response time for achieving the flow rating of the RCIC system is a design basis requirement for the US ABWR. This requirement remains valid for the alternate turbine-pump design. The alternate RCIC turbine-pump design will actually meet the full rated flow in approximately 10 seconds. DCD Tier 1 performance requirements for the RCIC system remain applicable.

LTR Impact

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

NRC RAI-4

Are there any changes in the RCIC preoperational testing and initial startup test program? If there are testing changes, provide the detail.

GEH Response

The alternate RCIC turbine-pump design is a factory built self contained unitized assembly, that is ready as a 'plug in' unit for the certified design and steam connections. The preoperational and initial startup test scope will be similar to the previous design, except for some reduced test scopes due to the simplified design features of the alternate design. Since the alternate turbine-pump design will not have any vacuum tank, barometric condenser or bypass steam injection, the test scope will be reduced accordingly.

LTR Impact

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

NRC RAI-5

Please provide a flow pressure curve similar to the Tier 2 in Figure 6.3-5 for the proposed design.

GEH Response

Figure 6.3-5 is an analytical curve of the RCIC system pressure versus RCIC system flow, developed for the purpose of reactor coolant system loss of coolant accident (LOCA) analysis. Since the alternate RCIC system design performance requirements are not revised, Figure 6.3-5 remains applicable to the alternate turbine-pump design and performance requirements. The alternate turbine-pump design easily meets the flow pressure curve requirement.

LTR Impact

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

ENCLOSURE 3
INFORMAL AND PRELIMINARY QUESTIONS AND GEH RESPONSES
FOR GE LICENSING TOPICAL REPORT NEDE-33299P
"ADVANCED BOILING WATER REACTOR (ABWR) WITH ALTERNATIVE RCIC TURBINE-PUMP DESIGN"

Question 1 (EMB, R. McNally):

Section 3.0 of NEDE-33299 states that the design control document (DCD) design identifies the Reactor Core Isolation Cooling (RCIC) turbine as non-safety. This statement does not appear to be correct as DCD Table 3.2-1 identifies the RCIC turbine as Safety Class 2, Quality Assurance Requirement B and Seismic Category I. Therefore it would appear that both the existing and alternate turbines are actually safety-related. Please explain the basis for this statement or modify the NEDE report as required.

GEH Response:

Weir Pump & Turbine assembly is safety related Safety Class 2. NEDE-33299 will be corrected to reflect this classification.

LTR Impact:

The LTR will be revised.

Question 2 (EMB, R. McNally):

Section 3.0 of NEDE-33299 describes the alternate RCIC pump/turbine design, but it is not clear if the alternate pump/turbine design actually replaces the existing DCD design or if the alternate design is an option to the approved DCD design.

- Please clarify if this alternate design replaces the existing DCD design or if the alternate design is an option to the existing design described in the approved DCD.
- If the existing turbine design with no Quality Group designation remains an option to the alternate design, please clarify if this represents an exception to RG 1.26 and include the technical justification for this exception for the existing turbine.

GEH Response:

The Weir Pump & Turbine assembly design is presented as an alternate to the design reflected in the ABWR DCD Revision 4. Combine operating license (COL) applicants will determine whether to implement the alternate design proposed by GEH.

However, if the current DCD design is used, then it must be designated as safety class 2 and quality group per the RG 1.26. GEH is committed to the implementation of RG 1.26. There should not be any exception to RG 1.26.

LTR Impact:

Revision of the LTR is not required.

ENCLOSURE 4
INFORMAL AND PRELIMINARY QUESTIONS AND PARTIAL GEH RESPONSES FOR GE LICENSING TOPICAL REPORT NEDE-33299P "ADVANCED BOILING WATER REACTOR (ABWR) WITH ALTERNATIVE RCIC TURBINE-PUMP DESIGN"

Question 1 (ICE2, S. Rhow):

The DCD does not specify the type of turbine or pump to be used in the RCIC, and the RCIC. GEH determined an alternate turbine-pump supported by a monoblock, which does not need all of the supporting functions and components certified in the DCD. To ensure timely startup while reducing risk of overspeed trip and a pressure spike in the steam supply line, the DCD design specified a small DC-powered motor-operated valve (MOV). Explain why the proposed change to delete supporting component does not require the bypass valve. Also, provide a description of the power supply systems and control circuits to DC powered MOV.

Question 2 (ICE2, S. Rhow):

The selection of the new turbine-pump design results in changes in the I&C and electric power supply system (AC and DC). Appendix A, "Electronic Trip," in NEDE-33299 states on page A-5 that the electronic trip operates independently from the mechanical trip. The operation of the electronic trip is by means of a signal from the electronic tachometer, or a manual pushbutton, either of which will open the solenoid valve which causes the stop valve to close. The staff needs clarification regarding the power supply and control circuitry for the solenoid valve and the electronic trip system.

GEH Response:

GEH Engineering has evaluated the staff's request for clarification regarding the power supply and control circuitry for the solenoid valve and the electronic trip system.

The alternate RCIC turbine-pump circutry uses 125 VDC with 600 watts power source for the solenoid valve and 24 VDC for the electronic over-speed trip system with over speed trip setting at 115% of maximim rated speed for normal operation.

Question 3 (unsure which reviewer asked this):

At the RCIC discussion last Thursday, August 2, 2007, there was a question regarding the "meter valve" qualification. Has GEH had an opportunity to check into this??

GEH Response

The "meter valve", a mechanical spring operated valve, is an integral part of the turbine over-speed trip gear mechanism. The turbine-pump assembly was dynamically qualified in accordance with IEEE 344 requirements. The qualification testing included demonstration of the startup capability as well as operability during those dynamic loading conditions.

In addition, the "meter valve" was analyzed in accordance with the ASME Code Section III, 1989 Edition, Subsection NC-3900 criteria, regarding pressure boundary and structural integrity requirements.

ENCLOSURE 5
INFORMAL AND PRELIMINARY QUESTIONS FOR LICENSING TOPICAL REPORT NEDE-33297 "ADVANCED BOILING WATER REACTOR (ABWR) PROCEDURES DEVELOPMENT PLAN"

(COLP, R. Pelton)

The staff wishes to discuss concerns similar to those discussed in Enclosure 10 regarding the inability to close some portions of the COL Action Item until after the COL is issued.

ENCLOSURE 6
INFORMAL AND PRELIMINARY
REQUEST FOR ADDITIONAL INFORMATION
GEH ENERGY TOPICAL REPORT NEDO-33305, REVISION 0,
"ADVANCED BOILING WATER REACTOR (ABWR)
STARTUP ADMINISTRATIVE MANUAL"

(CQVB, F. Talbot)

The staff reviewed GEH's Response to the Nuclear Regulatory Commission (NRC) Request for Additional Information (RAIs) related to GE's Advanced Boiling Water BWR Licensing Topical Report (LTR)-NEDO 33305, "Advanced Boiling Water Reactor Startup Administrative Manual," dated July 16, 2007. The staff found that the GEH response adequately addressed RAIs 1, 4, 5, 6, 8, 10, 11, and 12. However, more information is still needed to resolve RAI-2, 3, 9 and 13 before the CQVB staff can complete its review of NEDO-33305. The staff's evaluation of GEH's response to RAI-2, 3, 9 and 13 is provided below along with requests for additional information needed to resolve these RAIs.

RAI-2

Section 14.2.1.1 of NUREG-1503, "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor (ABWR) Design," dated July 1994, states that construction tests will be performed to demonstrate that components and systems are correctly installed and operational. These tests include, but are not limited to; flushing and cleaning, hydrostatic testing, initial calibration of instrumentation, checks of electrical wiring and equipment, valve testing, and initial energization and operation of equipment and systems. Completion of the construction test phase ensures that systems are ready for preoperational testing.

Section 14.2.4 of NUREG-1503 states that the startup administrative manual will describe the controls in place that will ensure the as-tested status of each system is known and track modifications, including retest requirements, deemed necessary for systems undergoing or already having completed specified testing.

Section B of RG 1.68, "Initial Test Programs for Water Cooled Nuclear Power Plants," Revision 3, states that administrative controls to govern the development and conduct of the initial test program should (a) provide for orderly turnover of plant systems and components from construction forces or other preliminary checkout groups to the preoperational testing group, and (b) ensure that general prerequisites (such as completion of construction, construction or preliminary tests, and inspections) are satisfied prior to preoperational and/or startup tests of individual systems or components. In addition, administrative controls should be established to ensure adequate retesting of systems or design features that are returned to construction custody, maintained, or modified during or following preoperational testing.

Section II.3.B.ii of SRP Section 14.2 states that applicants should establish administrative controls to ensure that the designated construction-related inspections and tests are completed before preoperational testing begins.

Section II.3.E.v of SRP Section 14.2 states that the applicant should include provisions to ensure that retesting required for modifications or maintenance remains in compliance with inspections, tests, analyses, and acceptance criteria requirements.

Section 14.2.3 of the ABWR Standard Safety Analysis Report (SSAR), Revision 9, states that the startup administrative manual will delineate how determinations of operability and availability will be authorized.

The staff requests that GEH Energy describe the administrative controls that will ensure that (1) the designated construction-related inspections and tests are completed before preoperational testing begins, (2) adequate retesting of systems, structures, and components (SSCs) that are returned to construction custody, maintained, or modified during the preoperational and initial startup test programs, and (3) determinations of operability and availability are properly tracked and authorized.

GEH's RESPONSE TO RAI-2

GEH will augment the description of administrative controls in Revision 0 of NEDO-33305. Additional discussions of system turnover, when system control is returned to Construction and how status of operability and availability are tracked and approved will be provided. The following changes (underlined text) will be incorporated into LTR Section 5.3.3:

During the Construction Test Phase, systems, subsystems, and equipment are completed and turned over from Construction in on orderly and well-coordinated manner. Guidelines will be *established* in a site specific Startup Administrative Procedure *to define the boundary and interface between related system/subsystem and used to generate boundary scope documents, for example, marked up Piping and Instrument Diagrams {P&IDs), Electrical Schematic Diagrams, etc. for scheduling and subsequent development of component and system turnover packages.* The System Turnover Procedure will include requirements for the following:

- Documentation of inspections performed by the startup organization (e.g. highlighted drawings showing areas inspected)
- Results of construction testing
- The designated construction-related inspections and tests are completed before preoperational testing begins. Any open items are evaluated for acceptability of commencing preoperational testing
- Plans are developed and implemented for correction of adverse conditions and open items, and means exist for tracking such conditions and items

The following changes (underlined text) will be incorporated into LTR Section 5.3.3.2:

Systems turned over from Construction usually require additional work other than normal testing. This additional work could include incorporation of required design changes, completion of outstanding construction exceptions, repair and/or replacement of damaged equipment, replacement of consumable materials/components, and maintenance of equipment.

Additionally, during performance of preoperational testing it may become necessary to return system control to construction to repair or modify the system to correct new problems. To *cover these circumstances, a Startup Work Request (SWR) is used by Operations to request materials services, manpower support and/or job/requests from Construction until the end of the Startup Test Phase of the Initial Test Program.*

This work will be administered by a Startup Administrative Procedure which will include direction for:

- Means of releasing control of systems and or components to construction.
- Methods used for documenting actual work performed and determining impact on testing
- Identification of required testing to restore the system to operability status, and to identify tests to be re-performed based on the impact of the work performed.
- Determinations of operability and availability are properly tracked and authorized.

LTR Impact

NEDO-33305 will be revised as noted in the response to RAI-2.

STAFF EVALUATION OF GEH RESPONSE TO RAI-2

The staff found that GEH's response addressed the three (3) requested items in RAI-2, except, in accordance with Section II.3.E.v of SRP Section 14.2, GEH should add information to NEDO-33305 to ensure that retesting required for modifications or maintenance remains in compliance with inspections, tests, analyses, and acceptance criteria (ITAAC) requirements. This information may be added to NEDO-33305, Page 26, Item 3, Criteria.

RAI-3

Section 14.2.3 of the ABWR SSAR states that test procedures will be reviewed by the startup coordinating group.

Section 14.2.2.3(1) of the ABWR SSAR states that the General Electric site manager reviews and approves all test procedures and changes.

Section 14.2.4 of NUREG-1503 states that the startup administrative manual will define the review and approval process for both initial procedures and subsequent changes.

Section 5.3.3.4 of NEDO-33305 states that the Test Director prepares and processes a Test Procedure Change Notice (TPCN) as discussed in Section 6.3.1 of this document. Section 6.3.1 states that the Test Director will process the TPCN for review and approval.

Section 6.2 of NEDO-33305 states that the original draft of each test procedure is prepared by the designated organizations and is subject to a formal review and approval process and that following the initial preparations, test procedure drafts are processed through a formal review and approval cycle.

The staff requests that GEH describe the formal review and approval process/cycle to be used for preoperational and initial startup test procedures and subsequent changes that are made after final approval. This description should address if the formal review and approval process for TPCNs (Section 6.3.1 of NEDO-33305) is different than the review and approval process for procedure changes (Section 6.3.2 of NEDO-33305). The staff requests that GEH explain why it is acceptable to specify different review and approval processes for TPCNs and procedure changes if separate review processes are specified. This explanation should focus on technical content versus the size (small or large) of the TPCN or change.

GEH's RESPONSE TO RAI-3

Section 6.2 of the LTR describes processes for initial review and approval of test procedures. Section 6.3 describes the processes permitted to modify procedures after initial approval. The LTR description includes requirements for how to process the procedure changes. Test procedure changes are processed either as a procedure revision (Section 6.3.2); or as a procedure correction, when appropriate. Corrections are processed based on the significance of the impact upon conduct of testing. Minor corrections may be processed without interruption of the SSC testing. A major correction to the procedure requires suspension of the testing processes until all of the TPCN required review and approvals are obtained.

Procedure corrections are processed in accordance with both Sections 5.3.3.4 and 6.3.1. Common industry practice and precedent is to permit minor test procedure corrections based on approval of senior plant staff on shift at the time the correction is needed.

The Test Director, who is responsible for test preparations and performance, is the originator for any corrections deemed necessary and the steps necessary for approval of the changes. Corrections may consist of marked changes to the official test copy of the test procedure. The official test copy of the procedure remains the controlling document for SSC testing. The Test Director must obtain independent review and approval from a licensed SRO (or equivalent person/position if identified in site procedure) before a minor change is effective. The Test Director and the SRO reviews provide appropriate administrative control of the correction process. In summary, we believe that the LTR appropriately describes the process for controlling changes to test procedures. GEH will add a new section to the LTR to discuss TPCNs. The following changes (underlined text) will be incorporated into LTR Section 6.3.1:

6.3.1 TPCNs

For minor changes to a test procedure, a TPCN may be used.

The intent of the TPCN is to provide a capability to change procedures when a full revision is not iustified. These changes can be annotations of existing pages or with the addition of supplemental pages. Each sheet must be signed by the Test Director and a licensed SRO (or person authorized by site specific administrative procedure). Normally, the change should only affect several pages. There are two types of TPCNs.

A minor TPCN addresses changes that do not change intent. Examples of these changes include:

- Correcting obvious typographical errors
- Providing steps for temporary suspension of testing and for documenting steps to be taken to restart testing.
- Steps which are re-performed to document testing following correction of a problem
- Waive pre-requisites that are obviously not applicable to a given test section
- Provide additional steps/clarifications needed to perform a given test step

A minor TPCN can be initiated by the Test Director, then must be reviewed by a licensed SRO (or person authorized by procedure) before it can be implemented. Testing can continue at this point, however the TPCN is then routed for additional review by the startup staff (Organization responsible for the procedure being changed, Startup Manager, JTG/PORC).

A Major TPCN is one that does change intent. Examples of these changes include:

- To modify the test procedure during its final review,
- Change test prerequisites,
- Change the procedure testing sequence,
- To delete/add test instructions,
- To change test acceptance criteria.

A Major TPCN must be reviewed and approved in the same manner as the original procedure. This approval must be obtained prior to implementation.

During the test program, the Test Director will prepare TPCN on procedures for which he is responsible, log the TPCN on a Test Procedure Change Notice Log (Figure 6) and process the TPCN for review and approval. Depending on the nature of the TPCN, interruption of associated testing in order to process the TPCN may be required. TPCNs that change the intent of the test or for which the change is not documented in the text of the procedure require interruption of testing for review and approval of the TPCN prior to performance of associated testing. TPCNs that preserve the intent of the test and for which the change is documented in the text of the procedure may be reviewed and approved after performance of associated testing. In either event, TPCNs are implemented in the same manner as test procedures.

LTR Impact

NEDO-33305 will be revised as noted in the response to RAI-3.

STAFF EVALUATION OF GEH'S RESPONSE TO RAI-3

The staff found that GEH's response and changes to NEDO-33305, Section 6.3.1, TPCNs, adequately addresses RAI-3 for the review and approval processes for minor and major changes in test procedure change notices (TPCNs). This adequately resolved this part of RAI-3.

However, GEH must also address a 50.59 like process for major TPCNs for Part 52 plants. In accordance with 50.59(c)(1), a licensee may make changes to test procedures as described in the FSAR without obtaining a license amendment only if, the change to the technical

specifications (TS) incorporated in the license is not required, and if the change, test or experiment does not meet any of the criteria in 50.59(c)(2).

For major TPCNs, GEH should add a requirement to either Section 6.3.1 or Section 6.3.2 for COLs to evaluate and obtain a license amendment if it is revealed that a major TPCN requires a change to the TS in accordance with 10 CFR 50.59(c)(1) and meets any one of eight criteria in 10 CFR 50.59(c)(2)(i) through (viii).

For additional information on 50.59 like change processes that affect the ABWR, refer to NRC Federal Register Notice (FRN), Licensees, Certifications and Approvals, dated August 28, 2007, Appendix A to Part 52, Rulemaking for the U.S. Advanced Boiling Water Reactor, Section

VIII, Processes for Changes and Departures, Sub-sections VIII.5a, VIII.5b, VIII.5.c, VIII.5d, VIII.5e and VIII.5f, Pages 49546 through 49547.

RAI-9

Section 14.2.13.1 of NUREG-1503 states that the ABWR design control document addresses SSCs within the scope of the ABWR standard plant design and that it is the responsibility of the applicant to address site-specific SSCs that are not in the scope of the ABWR standard plant design.

Section A of RG 1.68 states that the scope of the initial test program is not limited solely to safety-related SSCs. Consequently, this guide specifies the scope of plant SSCs to be tested to satisfy the requirements of GDC 1, “Quality Standards and Records” (as specified in Appendix A to 10 CFR Part 50), as well as the quality assurance criteria set forth in Appendix B to 10 CFR Part 50.

The staff requests that GEH describe the preoperational and initial startup test requirements for (1) SSCs that are not within the scope of the ABWR standard plant design, and (2) any nonsafety-related SSCs to be included in the preoperational and initial startup test programs (for example, the scope of the reliability assurance program could include non-safety-related SSCs).

GEH RESPONSE TO RAI-9

The preoperational and initial startup test requirements for SSCs that are not within the scope of the ABWR standard plant design are considered site-specific features and are not specifically included in the scope of the ABWR Startup Administrative Manual (SAM). However, the framework for implementing administrative controls and conduct of testing may be applied to any plant system. Each licensee will determine the applicability of the ABWR Sam to those SSCs.

Testing requirements for non-safety SSCs within the scope of the ABWR standard plant design are provided in ABWR DCD Tier 2, Section 14.2. Testing requirements for the non-safety SSCs that are not within the scope of the standard plant design will be provided by the COL application are appropriate.

STAFF EVALUATION OF GEH RESPONSE TO RAI-9

The staff found that GEH did not address non-safety-related SSCs to be included in the preoperational and initial startup test programs (for example, the scope of the reliability assurance program could include non-safety-related SSCs that are important to safety). The staff also found that the NEDO-33305, ABWR Startup Administrative Manual (SAM), Page 2, Section 2.3, Regulations and Regulatory Requirements, states, in part, that:

> The basis of the regulatory guide is provided in 10 CFR 50 (Section 50.34 and Appendix B). These two items specifically apply to testing of structures, systems and components **important to safety** i.e., sufficient testing to provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.

The staff determined that the first sentence should be revised to state

> The basis ~~of the~~ for these regulatory ~~guide~~ requirements is provided in 10CFR50 (Section 50.34 and Appendix B)

The staff also determined that the above SAM Section 2.3 should be revised to address non-safety-related SSCs that are important to safety. Examples of non-safety-related SSCs that are important to safety include the fire protection system, environmental qualification (EQ) of electrical equipment important to safety, the alternate rod injection system used to mitigate anticipated transients without scram, and non-safety related station blackout power sources (e.g., combustion turbine generators) used to meet the station blackout rule.

In addition, the staff found that GEH should add the following CFR rules (e.g., 10 CFR 50.48, 10 CFR 50.49, 10 CFR 50.62) to LTR-NEDO-33305, Section 2.3.1, U.S. Code of Federal Regulations (CFR). The list of CFR rules should also include any other rules that apply to non-safety-related SSCs that are important to safety.

RAI-13

Section B of RG 1.68 states that each new applicant for an advanced plant should identify all new first-of-a-kind tests in the given plant. The staff requests that GEH identify any new first-of-a-kind tests.

GEH RESPONSE TO RAI-13

Consistent with the guidance provided in RG 1.68 Section A.6, testing of any first-of-a-kind systems outside the scope of the ABWR standard design will be identified in Section 14.2 of each applicant's COLA.

LTR Impact

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

STAFF EVALUATION OF GEH RESPONSE TO RAI-13

As stated in the original RAI-13, RG 1.68, Revision 3, requires each new applicant for an advanced plant to identify all new first-of-a-kind (FOAK) tests. In GE's response to RAI-13, it indicated that "testing of any new FOAK systems outside the scope of the ABWR standard design will be identified in Section 14.2 of each applicant's COLA." While this statement is true, it did not respond to the staff's question.

The staff requests that GE provide new FOAK tests for those SSCs within the scope of the ABWR standard design. For example, as identified in the South Texas Project (STP) COLA FSAR Section 14.2S.2, "First of a Kind Systems," the reactor recirculation and control rod drive systems require preoperational and startup FOAK tests. These systems, among others that require FOAK tests, are within the scope of the ABWR design certification. In order to effectively complete the staff's review of this topical report, the staff requests that GE identify new FOAK tests for SSCs within the scope of the ABWR standard design in LTR-NEDO-33305.

ENCLOSURE 7
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION
ABWR LICENSING TOPICAL REPORT (LTR) NEDO-33328
"ADVANCED BOILING WATER REACTOR (ABWR) APRM OSCILLATION MONITORING LOGIC"

(ICE2, E. Eagle)

1) Question RAI-B1. Section 2.1 states that if the automatic Oscillation Power Range Monitor (OPRM) trip function should become inoperable, a Backup Stability Protection (BSP) methodology will be implemented with Technical Specifications (TS). What type of failure modes of the OPRM are potentially possible and how will these be indicated to the operator? [Basis: IEEE 7-4.3.2, Section 5.5.3, concerning "Fault detection and self-diagnostics" and IEEE 603, Section 5.8, "Information Displays"].

2) Question RAI-B2. Section 2.2.3 states the OPRM utilizes the same set of Local Power Range Monitor (LPRM) signals as used by its associated Average Power Range Monitor (APRM). Signal conditioning, filtering, averaging, normalization, and summation are also performed. Please provide a detailed description of any changes to these functions from those described in the approved ABWR Design Control Document (DCD). This should include any changes to these functions involving order, whether perform within the OPRM or outside, with what component, and how they are accomplished. Do the LPRM signals coming to the OPRM depend on any signal conditioning of the LPRM signals going to the APRM? [Basis: The ABWR has a design certification which includes OPRM, however if significant changes have occurred, the OPRM will need to be re-checked against IEEE 603 and 7-4.3.2 and other SRP guidance].

3) Question RAI-B3. Section 2.2.3 indicates the LPRM signals assigned an OPRM cell are summed and averaged. How does this summing and averaging account for one or more failed LPRM? [Basis: IEEE 7-4.3.2, Section 5.5.3, concerning "Fault detection and self-diagnostics" and IEEE 603 Section 5.8, "Information Displays"].

4) Question RAI-B4. Figures 3 through 6 are labeled, "OPRM Assignments (Channel X)", [where X is the Channel number, A, B, C, or D respectively]. The OPRM cell is represented by the small circle with the arrows pointing outward from the small circle. The large circles are assumed to represent the LPRMs. Please provide a legend that identifies all numbers and symbols for these figures. [Basis: document must be readable and understandable to be able to apply the acceptance criteria].

5) Question RAI-B5. Please describe any indicators or alarms provided by the OPRM or other related Instrumentation and Control systems that provide a warning to the operator that the unit is approaching an instability zone before the OPRM actually activates. [Basis: IEEE 7-4.3.2, Section 5.5.3, concerning "Fault detection and self-diagnostics" and IEEE 603, Section 5.8, "Information Displays"].

6) Question RAI-B6. The guidance for reviewers emphasizes verification of digital Instrumentation and controls (I&C) testing. Section 2.2.7 states each OPRM channel can be tested individually for operability of its trip function by introducing test signals. Please describe this test function in further detail including the type of signals, where injected, manual verses any self-test, and general test requirements as bypass status. [Basis: IEEE 7-4.3.2, Section 5.5.3, concerning “Fault detection and self-diagnostics”].

7) Question RAI-B7. Appendix A presents ABWR DCD significant Tier 2 Marked Changes. Pages A2, A3, A4, and A5 imply that only the marked constants are changed by this LTR and that the actual logic of the trip algorithms remains the same as found in the NRC approved ABWR DCD. Please confirm this; otherwise provide details of the revised logic of the trip algorithms including both diagrams and descriptions of the change from the ABWR DCD version ? [Basis: The ABWR has a design certification which includes OPRM, however if significant changes have occurred, the OPRM will need to be re-checked against IEEE 603 and 7-4.3.2 and other SRP guidance].

8) Question RAI-B8. Appendix A presents ABWR DCD significant Tier 2 Marked Changes. Pages A6, A7, and A8 are intended to provide information concerning the trip and voting functions, but are illegible. These pages imply there are possible changes from the approved ABWR DCD that require separate, but similar logic for the OPRM trip and voting functions. Please provide legible logic diagrams and supporting descriptions that will allow an independent determination of the OPRM trip and voting functions. [Basis: document must be readable and understandable to be able to apply the acceptance criteria].

ENCLOSURE 8
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION
ABWR LICENSING TOPICAL REPORT (LTR) NEDO-33316
"ADVANCED BOILING WATER REACTOR (ABWR) VIBRATION ASSESSMENT PROGRAM"

Question 1 (EMB2, J. Rajan):

According to the ABWR Design Control Document (DCD), during Initial startup testing vibration measurements are made during reactor startup at conditions up to 100 percent of rated flow and power. Balanced, unbalanced, and transient conditions of recirculation system operation are evaluated. The primary purpose of this series is to verify the anticipated effect of two-phase flow on the vibration response of internals.

The combined license (COL) applicant will be expected to address flow-induced vibration effects on other reactor internals components during NRC staff review of its COL application in accordance with 10 CFR Part 50, Appendix A, General Design Criteria 1, 2 and 4; and described in ABWR Design Control Document (DCD) Section 3.9.2, "Dynamic Testing and Analysis," and Section 3.9.3, "ASME Code Classes 1, 2, and 3 Components, Component Supports, and Core Support Structures."

Provide the following with respect to the tests and measurements during Initial startup tests

- A description of the overall steam dryer structural integrity demonstration approach
- Technical descriptions of all test and analytical methods to be employed
- Documentation of the validation of each test or analytical method
- Justification of the bias and random uncertainties associated with each test or analytical method
- Methods used for demonstrating steam dryer structural integrity shall include as applicable:
- A screening methodology for assessing the potential for high level acoustic excitation in the main steam lines at conditions up to100 percent of rated flow and power.
- A technique for defining the dynamic pressure loading on the steam dryer based on MSL pressure measurements derived from either pressure transducers or strain gauges
- A technique for defining the dynamic pressure loading on the steam dryer using MSL data obtained while sequentially closing MSIVs
- A finite element modeling methodology for defining steam dryer stresses at conditions up to100 percent of rated flow and power.

Question 2 (CIB2, T. Scarbrough):

GEH Licensing Topical Report (LTR) NEDO-33316 (Revision 0, April 2007), "Advanced Boiling Water Reactor (ABWR) Vibration Assessment Program in compliance with The United States Nuclear Regulatory Commission Regulatory Guide 1.20," references Regulatory Guide (RG) 1.20 (Revision 2, May 1976), "Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Initial Startup Testing." The NRC issued Revision 3 to RG 1.20 in March, 2007, to provide updated guidance for combined license (COL) and power uprate applicants in addressing potential adverse flow effects in vibration assessment programs based on recent operating experience at current nuclear power plants. For example, Revision 3 to RG 1.20, Section C.3.1.2, specifies that the vibration

measurement program related to the evaluation of potential adverse flow effects from pressure fluctuations and vibrations should not be omitted for non-prototype plants. This updated provision in RG 1.20 is based on the dependency of the occurrence of acoustic resonance phenomena in plant systems on the as-built configuration, dimensions, and installation, including welding methods. In light of the reference in NEDO-33316 to the May 1976 version of RG 1.20, GEH is requested to discuss the evaluation of potential adverse flow effects resulting from hydrodynamic and acoustic loading on nuclear power plant components in the ABWR vibration assessment program.

ENCLOSURE 9
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION
ABWR LICENSING TOPICAL REPORT (LTR) NEDO-33315
"ADVANCED BOILING WATER REACTOR (ABWR) REACTOR PRESSURE VESSEL MATERIAL SURVEILLANCE PROGRAM" REVISION 1

(CIB2, A. Black)

Based on a preliminary review of the submitted information, NRC staff will need additional information to complete its review of the topical report NEDO-33315, "ABWR Reactor Pressure Vessel Material Surveillance Program." The following items will need additional review by the staff and may need additional information from the applicant:

- the expected peak fluence for the reactor vessel at end-of-life
- the basis for the number of capsules using ASTM E185-82 criteria
- how the capsule lead factors were calculated
- the process to be used to obtain material samples for the capsules
- detailed information about the location of the capsule holders

ENCLOSURE 10
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION
ABWR LICENSING TOPICAL REPORT (LTR) NEDO-33325
"ADVANCED BOILING WATER REACTOR (ABWR) COMMON EQUIPMENT AND STRUCTURES"

(SBPB, C. Li)

1. In Section 3.3 of NEDO-33325, it states that a common makeup water preparation system (MWP) will be employed to supply water to the makeup water condensate system (MUWC) and makeup water purification system of both units. Section 9.2.9 of ABWR DCD tier 2 indicates that the MUWC supplies water from condensate storage tank (CST) for removal of decay heat during station blackout (SBO).

- Demonstrate that sharing of the MWP will not significantly impair the ability to cooldown the units in case of SBO.
- Since SBO is one of the most significant contributors to the core damage frequency for ABWR, discuss the effects, if any, of sharing the MWP to the overall core damage frequency.

(RSAC, S. Tammara)

2. The bulk hydrogen gas storage facility will be located at least 100m from any safety-related building or structure to prevent damage to safety-related equipment to prevent damage to safety-related equipment due to fire or explosion at the facility.

- Please provide the basis and approach for the determination of 100m distance.
- What is the total maximum quantity of hydrogen gas stored at any given time?

ENCLOSURE 11
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION FOR GENERAL ELECTRIC STANDARD LICENSING TOPICAL REPORT (LTR) - NEDO-33310, "ADVANCED BOILING WATER REACTOR STARTUP TEST SPECIFICATION"

(CQVB, F. Talbot)

By a letter dated April 26, 2007, GEH submitted LTR-NEDO-33310, "Advanced Boiling Water Reactor (ABWR) Startup Test Specification, Revision 0," dated April 26, 2007, for NRC review and approval. GEH submitted this document to request the NRC staff generic review and approval of this test specification to address South Texas Project (STP) COL and Design Certification Document (DCD) ABWR Combined License (COL) Action Item 14.2.13.2-(1). However, the NRC staff has reviewed LTR-NEDO-33310 and now concludes that COL action item 14.2.13.2-(1) cannot be resolved completely until after the COL is issued. In the ABWR DCD, COL Action Item 14.2.13.2(4) further states that:

> The COL applicant will provide the following for NRC review: (4) the approved preoperational test procedures approximately 60 days before their intended use and startup test procedures approximately 60 days before fuel loading (Subsection 14.2.3).

The NRC staff also determined that COL Action Item 14.2.13.2-(4) cannot be resolved until after the COL is issued.

LTR-NEDO-33310 outlines the process that is currently being used by GEH to develop test specifications and draft procedures, and provides a list of test specifications and test procedures to be provided in draft form by GEH to the prospective COL applicant. However, LTR-NEDO 33310 does not include all of the actual test specifications and none of the test procedures for NRC review and approval. LTR-33310 documents the development process for the preparation of 42 different test specifications. LTR-33310 does not include site-specific tests specifications for some systems (e.g., electrical switchyard and equipment, emergency service water system, site security system, personnel monitors and radiation survey instruments and the automatic load dispatcher control system). In addition, the test procedures cannot be completed until after the COL is issued. Therefore, the NRO staff request that GEH withdraw its submittal of LTR-NEDO-33310 so that the COL holder can complete the test specifications and test procedures.

COL Action Items 14.2.13.2-(1) and (4) calls for the actual submittal of test specifications and test procedures by a COL Holder to NRC onsite inspectors for review and approval before as-built systems and plant features are tested in the field. As described in Section 14.2 of the Standard Review Plan, the COL Holder is responsible for submitting a startup administrative manual that contains the administrative procedures and requirements that will govern the activities associated with the conduct of the plant initial test program. This manual should include the process used to develop, review, and approve test specifications and test procedures, including organizational units or personnel that are involved in performing these activities and their respective responsibilities. Involvement of the COL Holder is an intrinsic prerequisite to ensure adequate review and approval of test specifications and test procedures.

The NRC staff has concluded that the test specifications and draft preoperational and startup test procedures will be completed by the COL Holder. However, the process outlined in NEDO-33310 for closure of COL Action Item 14.2.13.2-(1) and (4) is inconsistent with corresponding guidance in Section C.III.4, "Combined License Action or Information Items," of Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants."

Based upon the above, the NRC inspection staff will need to review the actual test specifications and test procedures for each system to verify that preoperational and startup test specifications and test procedures are acceptable before these COL Action Items can be categorized as closed. Accordingly, the closure of COL Action Item 14.2.13.2-(1) and (4) will be subject to the NRC's construction inspection program to allow for the necessary plant as-built inspections and walkdowns.

Further, since the initial test program extends through to the start of commercial operation of the facility, a COL Applicant could propose to subsume COL Action Items 14.2.13.2-(1) and (4) under the license condition that will be in place to authorize low-power and power ascension testing. On this basis, the NRC staff has concluded that COL Action Items 14.2.13.2-(1) and (4) cannot be closed until after the issuance of the COL.

ENCLOSURE 12
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION FOR GENERAL ELECTRIC STANDARD LICENSING TOPICAL REPORT (LTR) - NEDO-33335, "PLANT MEDIUM VOLTAGE ELECTRICAL SYSTEM DESIGN"

(EEB, A. Pal)

1. The NRC staff notes that the system voltage for the operation of Class 1E loads have been changed from 6.9 kV to 4.16 kV. In this regard, please provide a discussion as to how this voltage change would impact motors, cables, protective devices, switchgear, load centers, and other equipment as applicable. Also, describe how motor sizing, acceleration time, torque requirement, cable sizing would still be compatible with the pump loads.

2. Please provide the following calculations (assumptions and results) supporting the adequacy of the 4.16 kV medium voltage for safety-related buses: load flow analysis (bus and load terminal voltages), short circuit analysis, equipment sizing studies, protective relay setting and coordination, motor starting. A separate set of calculations should be performed for each available connection to offsite power supply, onsite power supply, and alternate ac power supply. Also, provide the emergency diesel generator loading calculations.

3. Identify the analytical software and its version used to perform calculations identified in RAI 2 and provide an electronic copy of the model of the electrical distribution system and a single line diagram with component data that formed the basis for the analysis.

4. Provide an analysis to determine the minimum required voltages at the safety-related buses needed to power safety-related loads at all onsite system distribution levels, considering maximum unit steady-state and transient loads for events, such as a unit trip, loss-of-coolant accident, startup or shutdown.

ENCLOSURE 13
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION FOR GENERAL ELECTRIC STANDARD LICENSING TOPICAL REPORT (LTR) - NEDO-33330, "HYDROGEN RECOMBINER REQUIREMENTS ELIMINATION" REVISION 1

(SBCV, R. Goel)

ABWR RAI Section 6.2.5:

The applicant provided licensing topical report (LTR) NEDO-33330, "Advanced Boiling Water Reactor (ABWR) Hydrogen Recombiner Requirements Elimination," to the NRC staff to address the COL information item associated with this section. The LTR describes a generic change to the ABWR design certification involving deletion of the hydrogen recombiners and relaxation of the safety classification of hydrogen and oxygen monitors from safety-related to non-safety-related. The applicant also proposed to delete the TS requirements for primary containment oxygen concentration.

The staff finds that primary containment oxygen concentration is required to stay in the TS. When 10 CFR 50.44, "Combustible Gas Control in Containment," was revised in 2003, the staff issued a subsequent model safety evaluation for implementation of the revised rule through the Consolidation Line Item Improvement Process (ADAMS Accession No. ML 032600597, September 12, 2003). The model SE states, on Page 13, that "...requirements for primary containment oxygen concentration will be retained in TS for plant designs with an inerted containment."

This position is described in Attachment 5 to SECY 02-0080 supporting the staff's position that oxygen monitoring cannot be removed from the technical specifications for the ABWR.

ENCLOSURE 14
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION FOR GENERAL ELECTRIC STANDARD LICENSING TOPICAL REPORT (LTR) - NEDO-33321, "ADVANCED BOILING WATER REACTOR (ABWR) LIFE CYCLE MANAGEMENT"

(NGE2, M. Tonacci; CIB2, K. Hoffman)

This topical report attempts to address COL information item 1.1a for plant design and aging management. There are references in the DCD to NUREG/CR 4731, Residual Life Assessment of Major Light Water Reactor Components and NUREG/CR 5314, Life Assessment Procedures for Major LWR Components. However, the staff has found that both of these references appear to be obsolete. The need for the applicant to address life cycle management seems to have been addressed in the years since certification of the DCD in 1997 by license renewal rulemaking in 10CFR Part 54. In that light, this COL information item may be addressed more effectively than was described in the topical report. Discussion between the staff and the vendor should ensue to determine what needs to be done.

ENCLOSURE 15
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION FOR GENERAL ELECTRIC STANDARD LICENSING TOPICAL REPORT (LTR) - NEDO-33336, "ADVANCED BOILING WATER REACTOR (ABWR) STABILITY"

(ICE2, E. Eagle)

1) Question RAI-B1. Both in Table 5, "Parameters used in the Statistical HCOM Determination", on Page 19 and in Appendix B, Table 1, "ABWR Information for Stability Option II Application", information is presented on hardware and instrument delay times. This information includes four items that made up the "Total Scram Delay (msec) sum of a, b, c, and d"; where a. is the response time of OPRM hardware, b. the response time of the RPS, c. the CRD delay to start of rod motion, and d. time to insert control rods two feet into the core at minimum tech spec speed. Please provide the source and/or basis for these times.

2) Question RAI-B2. In Appendix B, Figures 1 through 4, labeled, "OPRM Assignments (Channel X) for ABWR", [where X is the Channel number, A, B, C, or D respectively]. The OPRM cell is represented by the small circle with the arrows pointing outward from the small circle. The large circles are assumed to represent the LPRMs. Please provide a legend that identifies all numbers and symbols for these figures. [Basis: document must be readable and understandable to be able to apply the acceptance criteria].

ENCLOSURE 16
INFORMAL AND PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION FOR GENERAL ELECTRIC STANDARD LICENSING TOPICAL REPORT (LTR) - NEDO-33372, "ADVANCED BOILING WATER REACTOR (ABWR) CONTAINMENT ANALYSIS"

(SBCV, A. Drozd)

Regarding suppression pool hydrodynamic loads methodology, there appears to be enough information to perform the review and no requests for additional information are expected.

Regarding the review of the containment analyses, the review was suspended in the middle of checking the provided containment data vs. MELCOR model developed by the Office of Research. It is expected that there will be several questions regarding the selection of some of the input parameters.