

Enclosure 1

MFN 16-065

**GEH's Response to NRC's Request for Additional
Information**

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NRC Request for Additional Information:

Attached please find the additional information required by the Draft NRC Review Guidelines for ABWR Certification Renewal which updates the DCD to address new high and medium USIs and GSIs, new Generic Letters and Bulletins issued after the ABWR design was certified and to update relevant domestic and international operating experience. The additional information includes the following:

- i. whether there is material new information with respect to technical resolutions to high and medium priority unresolved safety issues (USIs) and generic safety issues (GSIs) addressed in the original ABWR DCR, and if the ABWR DC Renewal applicant is proposing any change to the design as a result of the material new information;*
- ii. whether there are new USIs and GSIs created/identified since the ABWR design was certified and whether the applicant is proposing any change to the design as a result of any new USI and GSI, and if no changes are proposed, the bases for the renewal applicant's determination that no change to the design is necessary;*
- iii. whether there are new generic letters and bulletins issued after the ABWR design was certified and whether the applicant is proposing any changes to the design as a result of any new generic letter and bulletin, and if no changes are proposed, the bases for the applicant's determination that no change to the design is necessary;*
- iv. whether there is any relevant domestic and international operating experience that has been documented since the ABWR design was certified and whether the applicant is proposing any changes to the design as a result of this new information, and if no changes are proposed, the bases for the renewal applicant's determination that no change to the design is necessary.*

GE Response:

The guidance in RG 1.206, C.IV.8, Appendix B of NUREG-0933 was reviewed and items that are not a "Safety Priority Status" of "I" or "Note 3(a)" and have either a Blank or a TBD under "Future Plants' Effective Date" have been added to DCD Section 19B per Enclosure 2 markups.

As part of this review, Generic Issues and Human Factors issues which did not have a "Resolved" status in the Revision 4 (original approved) DCD were re-reviewed to confirm present NRC Priority and to verify that the Tier 2 subsection discussing the ABWR Resolution had not changed. The NRC Priority in many cases had been updated to "Resolved" after the ABWR had received certification. As the accepted ABWR Resolution was still valid, no changes were made to these issues.

As a result of the review of New Generic Safety Issue 193, the ECCS ITAACs had a requirement added to verify the as built separation between the ECCS system strainer and SRV quencher per Enclosure 2 markups.

Review of Applicable Operating Experience Information has been performed for potential ABWR DCD design issues. The interval for the domestic and international operating experience information records is between certification and the re-certification application. The review has

determined that GEH, by addressing the items previously identified by the USNRC staff ¹, the applicable operating experience information that impacts ABWR design has been encompassed.

The associated text in the ABWR DCD was modified to the time of the re-certification application and additional wording was added reflecting the reviews of international operating experience relating to ABWR design per Enclosure 2 Markups.

Impact on DCD of GEH Response:

The following ABWR DCD Revision 6 subsections, tables, and figures are revised as shown in the markups provided in Enclosure 2 as a result of this response:

Tier 1:

- Table 2.4.1: In Item 4c, a requirement has been added to confirm the vertical and horizontal separation between the SRV Quencher and the RHR suction strainer to prevent air and or steam intrusion.
- Table 2.4.2: In Item 3g, a requirement has been added to confirm the vertical and horizontal separation between the SRV Quencher and the HPCF suction strainer to prevent air and or steam intrusion.
- Table 2.4.4: In Item 3j, a requirement has been added to confirm the vertical and horizontal separation between the SRV Quencher and the RCIC suction strainer to prevent air and or steam intrusion.

Tier 2:

- The following New Generic Issues were added to 19B, "Resolution of Applicable Unresolved Safety Issues and Generic Safety Issues":

186	Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants
189	Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion during a Severe Accident
191	Assessment of Debris Accumulation on PWR Sump Performance
193	BWR ECCS Suction Concerns
199	Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States for Existing Plants
- The following subsections were added to 19B.2, "Issue, Acceptance Criteria and ABWR Resolution"

¹ Letter from David B. Matthews (USNRC) to Jerald G. Head (GEH), subject: GE-Hitachi Nuclear Energy – United States Advanced Boiling Water Reactor Design Certification Renewal Application, dated July 20, 2012 (ML12125A385)

- 19B.2.74 GSI-186: Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants
- 19B.2.75 GSI-189: Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion during a Severe Accident
- 19B.2.76 GSI-189: Assessment of Debris Accumulation on PWR Sump Performance
- 19B.2.77 GSI-193: BWR ECCS Suction Concerns
- 19B.2.78 GSI-199: Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States for Existing Plants

- The following Generic Letters were added to Table 1.8-22, "Experience Information Applicable to ABWR":

- 89-04s1 Guidance on Developing Acceptable Inservice Testing Programs
- 89-10s1 Generic Letter 89-10: Results of the Public Workshops
- 89-10s3 Generic Letter 89-10, Consideration of the Results of NRC-Sponsored Tests of Motor-Operated Valves
- 89-10s4 Generic Letter 89-10, Consideration of Valve Mispositioning in Boiling Water Reactors
- 89-10s5 Generic Letter 89-10, Inaccuracy of Motor-Operated Valve Diagnostic Equipment
- 89-10s6 Generic Letter 89-10, Information on Schedule and Grouping, and Staff Responses to Additional Public Questions
- 89-13s1 Service Water System Problems Affecting Safety-Related Equipment
- 91-15 Operating Experience Feedback Report, Solenoid-Operated Valve Problems at U.S. Reactors
- 92-01r1s1 Reactor Vessel Structural Integrity
- 92-08 Thermo-Lag 330-1 Fire Barriers
- 93-05 Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation
- 93-06 Research Results on Generic Safety Issue 106, 'Piping and the use of Highly Combustible Gases in Vital Areas"
- 93-08 Relocation of Technical Specification Tables of Instrument Response Time Limits
- 94-01 Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators
- 94-02 Long-Term Solutions and Upgrade of Interim Operating Recommendations for Thermal-Hydraulic Instabilities in BWRs
- 94-03 Intergranular Stress Corrosion Cracking of Core Shrouds in Boiling Water Reactors
- 95-07 Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves
- 95-10 Relocation of Selected Technical Specifications Requirements Related to Instrumentation
- 96-01 Testing of Safety-Related Logic Circuits

- 96-03 NRC Generic Letter 96-03: Relocation of the Pressure Temperature Limit Curves and Low Temperature Overpressure Protection System Limits
 - 96-04 Boraflex Degradation in Spent Fuel Pool Storage Racks
 - 96-05 Periodic Verification of Design-Basis Capability of Safety-Related Power-Operated Valves
 - 96-06 Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions
 - 96-06s1 Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions
 - 98-05 NRC Generic Letter 98-05: Boiling Water Reactor Licensees Use of the BWRVIP-05 Report to Request Relief from Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Shell Welds
 - 99-02 NRC Generic Letter 99-02: Laboratory Testing of Nuclear-Grade Activated Charcoal
 - 99-02er NRC Generic Letter 99-02 (Errata): Laboratory Testing of Nuclear-Grade Activated Charcoal
 - 03-01 Control Room Habitability
 - 06-02 Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power
 - 06-03 Potentially Nonconforming Hemyc and MT Fire Barrier Configurations
 - 07-01 Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients
 - 08-01 Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems
 - 16-01 Monitoring of Neutron-Absorbing Materials in Spent Fuel Pools
- The following IE Bulletins were added to Table 1.8-22, "Experience Information Applicable to ABWR":
 - 93-02 Debris Plugging of Emergency Core Cooling Suction Strainers
 - 93-02s1 Debris Plugging of Emergency Core Cooling Suction Strainers
 - 93-03 Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs
 - 94-01 Potential Fuel Pool Draindown Caused by Inadequate Maintenance Practices at Dresden Unit1
 - 95-02 Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode
 - 96-02 Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety-Related Equipment
 - 96-03 Potential Plugging of Emergency Core Cooling Suction Strainers by Debris in Boiling-Water Reactors

2005-02 Emergency Preparedness and Response Actions for Security-
Based Events

2011-01 Mitigating Strategies

- The text to section 1.8.3 was updated to remove references to hard copies (digital retrieval systems are now used) and to reflect that reviews of Applicable Experience Information have been updated to the time of the re-certification application. Additionally, additional wording was added reflecting the reviews of international operating experience relating to ABWR design.