

April 29, 2015

Mr. Jerald G. Head  
Senior Vice President, Regulatory Affairs  
GE Hitachi Nuclear Energy  
3901 Castle Hayne Road MC A-18  
Wilmington, NC 28401

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NUMBER 6  
RELATED TO CHAPTER 9 FOR GE-HITACHI NUCLEAR ENERGY  
ADVANCED BOILING-WATER REACTOR DESIGN CERTIFICATION RULE  
RENEWAL APPLICATION

Dear Mr. Head:

By letter dated December 7, 2010, GE Hitachi Nuclear Energy submitted for approval an application to renew the Advanced Boiling-Water Reactor design certification rule pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52. The U.S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on whether to grant the renewal application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. You are requested to respond within 30 days of the date of this letter.

If changes are needed to the design control document, the staff requests that the RAI response include the proposed wording changes. If you have any questions or comments concerning this matter, I can be reached at 301-415-4093 or by e-mail at [adrian.muniz@nrc.gov](mailto:adrian.muniz@nrc.gov).

Sincerely,

**/RA/**

Adrian Muñiz, Project Manager  
Licensing Branch 3  
Division of New Reactor Licensing  
Office of New Reactors

Docket No.: 052-45

eRAI Tracking No. 7665

Enclosure: Request for Additional Information

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**ADAMS Accession No.: ML15118A725**

**NRO-002**

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| DATE   | 4/1/15*   | 4/2/15*      | 4/29/15     | 4/29/15     |

\*Approval captured electronically in the electronic RAI system. \*\*via e-mail

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**Request for Additional Information 6**  
**Application Title: GEH ABWR DC Renewal**  
**Operating Company: GEH**  
**Docket No. 52-045**  
**Review Section: 09.05.01 - Fire Protection Program**

**QUESTION: 09.05.01-1**

On July 13, 1994, the U.S. Nuclear Regulatory Commission (NRC) issued the final design approval (FDA), along with the "Final Safety Evaluation Report [FSER] Related to the Certification of the Advanced Boiling Water Reactor Design" (NUREG-1503). On May 12, 1997, the NRC issued the final design certification rule (DCR) for the Advanced Boiling Water Reactor (ABWR) design in the Federal Register (62 FR 25800).

10 CFR 52.59(a) (2014) requires, in pertinent part, a finding of compliance with the regulations in effect at the time of original certification in order to issue a renewed design certification. In 1997, operating license Final Safety Analysis Reports (FSARs) were already required by 10 CFR 50.48(a) to include "[t]he means to limit fire damage to structures, systems, or components important to safety so that the capability to safely shut down the plant is ensured."

However, further developments in the area of fire protection have taken place since then. Based on results from the industry documented in the 2002 EPRI Report No. 1006961, "Spurious Actuation of Electrical Circuits Due to Cable Fires," and NRC fire tests conducted after the certification of the ABWR DCD, as documented in the 2006 NUREG/CR-6931, "Cable Response to Live Fire," (ADAMS Accession Nos. ML081190230, ML081190248, and ML081190261), the NRC staff's position is that fire-induced circuit failures can cause spurious actuations, including multiple spurious actuations, and that a plant's fire hazard analysis should account for these spurious actuations in assessing the plant's safe shutdown capability.

In SECY-08-0093, "Resolution of Issues Related to Fire-Induced Circuit Failures," dated June 30, 2008 (ADAMS Accession No. ML081370346), the Commission was informed of the NRC's staff approach to resolving issues concerning fire-induced circuit failures and multiple spurious actuations. This SECY paper included a clarification of fire-induced circuit fault requirements as well as a commitment to develop additional evaluation methods and publish them in the appropriate regulatory document. As stated in the SECY paper, for new reactor plants, the applicants must demonstrate that they have systematically identified possible multiple spurious actuation scenarios that could prevent safe shutdown and must describe their approach to addressing each scenario such that post-fire safe shutdown is ensured. On September 3, 2008, the Commission approved the approach described in SECY-08-0093 as documented in the staff requirements memorandum (SRM) on SECY-08-0093 (ADAMS Accession No. ML082470571).

Regulatory Guide (RG) 1.189, Revision 2, "Fire Protection for Nuclear Power Plants," provides guidance on the issue of multiple spurious actuations. RG 1.189 endorses Nuclear Energy Institute (NEI) 00-01, Revision 2, "Guidance for Post Fire Safe Shutdown Circuit Analysis," with several exceptions.

Enclosure

GEH-ABWR DCD Tier 2, Section 9.5.1, "Fire Protection System," does not contain a discussion on the effects of multiple spurious actuations due to a fire. Addressing multiple spurious actuations due to the effects of fire is necessary to ensure compliance with 10 CFR 50.48(a) (1997).

Therefore, in accordance with 10 CFR 52.59(a) (2014) and 10 CFR 50.48(a) (1997), the applicant is requested to perform an evaluation for the effects of multiple spurious actuations due to a fire that is consistent with NEI 00-01, Revision 2, as modified in RG 1.89, Revision 2, or if an alternative approach is used, justify how the alternative approach complies with NRC regulations.