

February 2, 2017

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 1
RELATED TO ENVIRONMENTAL ASSESSMENT 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 45 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 301-415-0673 or by e-mail at mallecia.sutton@nrc.gov.

Sincerely,

/RA/

Mallecia Sutton, Project Manager
Licensing Branch 3
Division of New Reactor Licensing
Office of New Reactors

Docket No.: 052-45

eRAI Tracking Nos. 8721

Enclosure: Request for Additional Information

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NUMBER 1
RELATED TO ENVIRONMENTAL ASSESSMENT FOR GE-HITACHI
NUCLEAR ENERGY ADVANCED BOILING-WATER REACTOR DESIGN
CERTIFICATION RULE RENEWAL APPLICATION DATED
FEBRUARY 2, 2017.

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NRO-002

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NAME	MSutton	SGreen**	JDonoghue
DATE	2/2/17	2/2/17	2/2/17

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

OFFICIAL RECORD COPY

Request for Additional Information EA-1-8721

Issue Date: 02/01/2017

Application Title: GEH ABWR DC Renewal

Operating Company: GEH

Docket No. 52-045

Review Section: 01.05 - Other Regulatory Considerations

Application Section: Supplemental Environmental Report

QUESTIONS

01.05-2

Regulatory Basis

The design certification renewal application for the U.S. Advanced Boiling Water Reactor (ABWR) is a regulatory action subject to Subpart A of 10 CFR Part 51, which requires NRC staff to prepare an environmental assessment (EA). Accordingly, the NRC staff must determine in the EA whether design changes made during renewal render a severe accident mitigation design alternative (SAMDA) previously rejected in the earlier environmental assessment to become cost beneficial, or results in the identification of new SAMDAs along with the bases for not incorporating new SAMDAs in the design certification. Additionally, the staff must consider new and potentially significant information as part of the SAMDA evaluations (Ref. 1).

Background

In the applicant's revised supplemental Environmental Report (ER) for the ABWR design certification renewal dated August 22, 2016 [Enclosure 2 of Ref. 2], General Electric Hitachi (GEH) included information that none of the design changes submitted as part of the ABWR design certification renewal have an impact on the ABWR severe accident risk. GEH also provided a discussion of the staff's final EA for the ABWR design certification which determined there were not any cost-beneficial SAMDAs. GEH states on page 6 of the supplemental ER [Enclosure 2 of Ref. 2]:

In the EA for the design certification, the NRC concluded that, based on review of the SAMDA assessment, that the evaluation provides a sufficient basis to conclude that there is reasonable assurance that the ABWR design will not exclude SAMDAs for a future facility that would have been cost beneficial had they been considered as part of the original design certification application.

and on page 10 of the supplemental ER [Enclosure 2 of Ref. 2]:

Furthermore, the bases for the previously analyzed SAMDAs are not changed and new SAMDAs need not be considered and SAMDAs that were previously rejected in the environmental assessment for the ABWR (Reference 2), or otherwise considered (Reference 1), did not become cost beneficial due to the design changes.

However, in assessing the information supporting the conclusions in the supplemental ER [Ref. 2] and the ABWR design certification final EA [Ref. 3], the staff has found that the analysis performed by GEH [Ref. 4] differs from the methodology the staff used in Section 3.5 of the ABWR design certification final EA.

Further, the GEH application does not address relevant new or additional information that came about subsequent to original ABWR design certification. Examples of relevant new or additional information include NEI 05-01A (Ref. 5); updated guidance for cost-benefit analysis (e.g., NUREG/BR-0058, Rev. 2 to NUREG/BR-0058, Rev. 4); and parameter values as applied in the original ABWR design certification SAMDA submittal or in the ABWR design certification final EA (e.g., the \$3,000 per person-rem supplemental allowance for offsite property as described in NUREG/CR-6349 and inclusion of the total risk from seismic events). The staff is seeking to determine whether the new or additional information could result in previously analyzed SAMDAs becoming cost beneficial or lead to the identification of SAMDAs not previously considered that are cost beneficial.

Question

To complete its EA, particularly the SAMDA analysis, the staff requests that GEH provide supplemental analysis that:

Determines whether any of the BWR SAMA candidates in Table 13 of NEI 05-01A (Ref. 5) are applicable to the ABWR design certification and cost-beneficial, including the basis as to why a SAMA from Table 13 potentially does or does not need to be incorporated.

Include in the response all technical support documents and other appropriate reference material that support the provided information necessary to complete an independent assessment of the analysis.

References

1. U.S. Nuclear Regulatory Commission. CLI-13-07. In the Matter of Exelon Generation Co., LLC (Limerick Generating Station, Units 1 & 2), Nuclear Reg. Rep. (CCH) ¶ 31674 (N.R.C. Oct. 31, 2013)
2. Jerald G. Head, GE Hitachi Nuclear Energy, letter to U.S. Nuclear Regulatory Commission. Subject: GE-Hitachi Nuclear Energy Advanced Boiling Water Reactor Design Certification Rule Renewal Application – Revised Supplement to ABWR Design Certification Environmental Report. August 22, 2016. Enclosures 1 and 2. ADAMS accession package number ML16235A415.
3. U.S. Nuclear Regulatory Commission. SECY-96-077, Certification of Two Evolutionary Designs, Attachment 2, April 15, 1996. ADAMS accession number ML003708129.
4. J.F. Quirt, General Electric, letter to R.W. Borchardt, U.S. Nuclear Regulatory Commission titled “NEPA/SAMDA Submittal for the ABWR” dated December 21, 1994 which transmitted “Technical Support Document for the ABWR”, 25A5680, Attachment A. ADAMS accession number ML100210563.
5. Nuclear Energy Institute. *Severe Accident Mitigation Alternatives (SAMA) Analysis: Guidance Document*. November 2005. Washington D.C. ADAMS accession number ML060530203.

01.05-3

Regulatory Basis

The design certification renewal application for the U.S. Advanced Boiling Water Reactor (ABWR) is a regulatory action subject to Subpart A of 10 CFR Part 51, which requires NRC staff to prepare an environmental assessment (EA). Accordingly, the NRC staff must determine in the EA whether design changes made during renewal render a severe accident mitigation design alternative (SAMDA) previously rejected in the earlier environmental assessment to become cost beneficial, or results in the identification of new SAMDAs along with the bases for not incorporating new SAMDAs in the design certification. Additionally, the staff must consider new and potentially significant information as part of the SAMDA evaluations (Ref. 1).

Background

In the applicant's revised supplemental Environmental Report (ER) for the ABWR design certification renewal dated August 22, 2016 [Enclosure 2 of Ref. 2], General Electric Hitachi (GEH) included information that none of the design changes submitted as part of the ABWR design certification renewal have an impact on the ABWR severe accident risk. GEH also provided a discussion of the staff's final EA for the ABWR design certification which determined there were not any cost-beneficial SAMDAs. GEH states on page 6 of the supplemental ER [Enclosure 2 of Ref. 2]:

In the EA for the design certification, the NRC concluded that, based on review of the SAMDA assessment, that the evaluation provides a sufficient basis to conclude that there is reasonable assurance that the ABWR design will not exclude SAMDAs for a future facility that would have been cost beneficial had they been considered as part of the original design certification application.

and on page 10 of the supplemental ER [Enclosure 2 of Ref. 2]:

Furthermore, the bases for the previously analyzed SAMDAs are not changed and new SAMDAs need not be considered and SAMDAs that were previously rejected in the environmental assessment for the ABWR (Reference 2), or otherwise considered (Reference 1), did not become cost beneficial due to the design changes.

However, in assessing the information supporting the conclusions in the supplemental ER [Ref. 2] and the ABWR design certification final EA [Ref. 3], the staff has found that the analysis performed by GEH [Ref. 4] differs from the methodology the staff used in Section 3.5 of the ABWR design certification final EA.

Further, the GEH application does not address relevant new or additional information that came about subsequent to original ABWR design certification. Examples of relevant new or additional information include NEI 05-01A (Ref. 5); updated guidance for cost-benefit analysis (e.g., NUREG/BR-0058, Rev. 2 to NUREG/BR-0058, Rev. 4); and parameter values as applied in the original ABWR design certification SAMDA submittal or in the ABWR design certification final EA (e.g., the \$3,000 per person-rem supplemental allowance for offsite property as described in NUREG/CR-6349 and inclusion of the total risk from seismic events). The staff is seeking to determine whether the new or additional information could result in previously analyzed SAMDAs becoming cost beneficial or lead to the identification of SAMDAs not previously considered that are cost beneficial.

Question

To complete its EA, particularly the SAMDA analysis, the staff requests that GEH provide supplemental analysis that:

Determines whether new or additional information for a cost-benefit analysis based on NUREG/BR-0058 Revision 4 and NUREG/BR-0184 either renders a SAMDA previously rejected in the ABWR design certification final EA to become cost beneficial, or results in the identification of new SAMDAs that are cost beneficial.

Include in the response all technical support documents and other appropriate reference material that support the provided information necessary to complete an independent assessment of the analysis.

References

1. U.S. Nuclear Regulatory Commission. CLI-13-07. In the Matter of Exelon Generation Co., LLC (Limerick Generating Station, Units 1 & 2), Nuclear Reg. Rep. (CCH) ¶¶ 31674 (N.R.C. Oct. 31, 2013)
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4. J.F. Quirt, General Electric, letter to R.W. Borchardt, U.S. Nuclear Regulatory Commission titled “NEPA/SAMDA Submittal for the ABWR” dated December 21, 1994 which transmitted “Technical Support Document for the ABWR”, 25A5680, Attachment A. ADAMS accession number ML100210563.
5. Nuclear Energy Institute. *Severe Accident Mitigation Alternatives (SAMA) Analysis: Guidance Document*. November 2005. Washington D.C. ADAMS accession number ML060530203.

01.05-4

Regulatory Basis

The design certification renewal application for the U.S. Advanced Boiling Water Reactor (ABWR) is a regulatory action subject to Subpart A of 10 CFR Part 51, which requires NRC staff to prepare an environmental assessment (EA). Accordingly, the NRC staff must determine in the EA whether design changes made during renewal render a severe accident mitigation design alternative (SAMDA) previously rejected in the earlier environmental assessment to become cost beneficial, or results in the identification of new SAMDAs along with the bases for not incorporating new SAMDAs in the design certification. Additionally, the staff must consider new and potentially significant information as part of the SAMDA evaluations (Ref. 1).

Background

In the applicant's revised supplemental Environmental Report (ER) for the ABWR design certification renewal dated August 22, 2016 [Enclosure 2 of Ref. 2], General Electric Hitachi (GEH) included information that none of the design changes submitted as part of the ABWR design certification renewal have an impact on the ABWR severe accident risk. GEH also provided a discussion of the staff's final EA for the ABWR design certification which determined there were not any cost-beneficial SAMDAs. GEH states on page 6 of the supplemental ER [Enclosure 2 of Ref. 2]:

In the EA for the design certification, the NRC concluded that, based on review of the SAMDA assessment, that the evaluation provides a sufficient basis to conclude that there is reasonable assurance that the ABWR design will not exclude SAMDAs for a future facility that would have been cost beneficial had they been considered as part of the original design certification application.

and on page 10 of the supplemental ER [Enclosure 2 of Ref. 2]:

Furthermore, the bases for the previously analyzed SAMDAs are not changed and new SAMDAs need not be considered and SAMDAs that were previously rejected in the environmental assessment for the ABWR (Reference 2), or otherwise considered (Reference 1), did not become cost beneficial due to the design changes.

However, in assessing the information supporting the conclusions in the supplemental ER [Ref. 2] and the ABWR design certification final EA [Ref. 3], the staff has found that the analysis performed by GEH [Ref. 4] differs from the methodology the staff used in Section 3.5 of the ABWR design certification final EA.

Further, the GEH application does not address relevant new or additional information that came about subsequent to original ABWR design certification. Examples of relevant new or additional information include NEI 05-01A (Ref. 5); updated guidance for cost-benefit analysis (e.g., NUREG/BR-0058, Rev. 2 to NUREG/BR-0058, Rev. 4); and parameter values as applied in the original ABWR design certification SAMDA submittal or in the ABWR design certification final EA (e.g., the \$3,000 per person-rem supplemental allowance for offsite property as described in NUREG/CR-6349 and inclusion of the total risk from seismic events). The staff is seeking to determine whether the new or additional information could result in previously analyzed SAMDAs becoming cost beneficial or lead to the identification of SAMDAs not previously considered that are cost beneficial.

Questions

To complete its EA, particularly the SAMDA analysis, the staff requests that GEH provide supplemental analysis that:

Provides for each of the SAMDAs in Table 4 updated cost estimates of SAMDAs evaluated for the ABWR certified design (Ref. 4) and the percentage of total risk each can account for if implemented and the basis for each percentage. If any SAMAs from Table 13 of NEI 05-01A are included, provide the same information.

Include in the response all technical support documents and other appropriate reference material that support the provided information necessary to complete an independent assessment of the analysis.

References

1. U.S. Nuclear Regulatory Commission. CLI-13-07. In the Matter of Exelon Generation Co., LLC (Limerick Generating Station, Units 1 & 2), Nuclear Reg. Rep. (CCH) ¶¶ 31674 (N.R.C. Oct. 31, 2013)
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