



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 19, 2016

Mr. Eric McCartney  
Site Vice President  
Seabrook Station  
NextEra Energy  
626 Lafayette Rd.  
Seabrook, NH 03874

SUBJECT: SEABROOK STATION, UNIT NO. 1 – SUPPLEMENTAL INFORMATION  
NEEDED FOR ACCEPTANCE OF REQUESTED LICENSING ACTION  
RE: ALKALI-SILICA REACTION (CAC NO. MF8260)

Dear Mr. McCartney:

By letter dated August 1, 2016, NextEra Energy Seabrook, LLC (NextEra) submitted a license amendment request for the Seabrook Station, Unit No. 1. The proposed amendment would revise the Seabrook Updated Final Safety Analysis Report to include methods for analyzing seismic Category I structures with concrete affected by an alkali-silica reaction. The purpose of this letter is to provide the results of the U.S. Nuclear Regulatory Commission (NRC) staff's acceptance review of this amendment request. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Consistent with Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), an amendment to the license (including the technical specifications) must fully describe the changes requested, and following, as far as applicable, the form prescribed for original applications. Section 50.34 of 10 CFR addresses the content of technical information required. This section stipulates that the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

The NRC staff has reviewed your application and concluded that the information delineated in the enclosure to this letter is necessary to enable the staff to make an independent assessment regarding the acceptability of the proposed amendment in terms of regulatory requirements and the protection of public health and safety and the environment.

In order to make the application complete, the NRC staff requests that NextEra supplement the application to address the information requested in the enclosure by October 3, 2016. This will enable the NRC staff to begin its detailed technical review. If the information responsive to the NRC staff's request is not received by the above date, the application will not be accepted for review pursuant to 10 CFR 2.101, and the NRC will cease its review activities associated with the application. If the application is subsequently accepted for review, you will be advised of any further information needed to support the staff's detailed technical review by separate correspondence.

E. McCartney

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The information requested and associated timeframe in this letter were discussed with Mr. Ken Browne of your staff on September 14, 2016.

If you have any questions, please contact me at (301) 415-2048 or [Justin.Poole@nrc.gov](mailto:Justin.Poole@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'JP', with a long horizontal flourish extending to the right.

Justin C. Poole, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:  
Supplemental Information Needed

cc w/enclosure: Distribution via Listserv

SUPPLEMENTAL INFORMATION NEEDED  
AMENDMENT REQUEST REGARDING ALKALI-SILICA REACTION  
NEXTERA ENERGY SEABROOK, LLC  
SEABROOK STATION, UNIT NO. 1  
DOCKET NO. 50-443

**Background**

By letter dated August 1, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16216A240), NextEra Energy Seabrook, LLC (NextEra) submitted a license amendment request (LAR) to revise its current licensing basis to adopt a methodology for the analysis of seismic Category I structures with concrete affected by alkali-silica reaction (ASR). The proposed amendment would revise the Seabrook Updated Final Safety Analysis Report (UFSAR) to include new methods for analyzing seismic Category I structures with concrete affected by ASR.

As discussed in Section 4.3.8.2, Guidance for Changing from One Method of Evaluation to Another," of Nuclear Energy Institute (NEI) 96-07, Revision 1, "Guidelines for 10 CFR 50.59 Implementation," as endorsed by U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments" (ADAMS Accession No. ML003759710), when a licensee is requesting approval of a specific analysis for a specific application, a thorough understanding of the terms, conditions, and limitations relating to the application of the methodology is essential. This information is usually documented in the original license application or license amendment request.

The NRC staff has reviewed the LAR and concluded that the following information is necessary to enable the staff to make an independent assessment regarding the acceptability of the proposed amendment in terms of regulatory requirements and the protection of public health and safety and the environment.

1. Section 3.5.1 of Enclosure 1 to the August 1, 2016, letter notes that NextEra will use an empirical correlation developed via testing to correlate concrete elastic modulus measurements with the through-thickness expansion to date. This correlation is a unique, first-of-a-kind approach and is necessary for the proposed monitoring program to be effective. The staff needs additional information on the technical basis for the correlation.

Provide the technical basis for the correlation between concrete elastic modulus and through-thickness expansion. Include enough data from the testing for the staff to make a decision on the adequacy of the correlation.

Enclosure

2. Section 3.3 of Enclosure 1 proposes a “building deformation assessment” process to evaluate ASR impacts on each of the seismic Category I structures listed in UFSAR Section 3.8.4.1. This method is a first-of-a-kind, complex analysis, that has not been previously reviewed by the NRC or by a consensus industry group. Therefore, in order to have a thorough understanding of the methodology, the staff needs to review at least one detailed demonstration of the process to provide reasonable assurance that the approach is appropriate and repeatable.

Provide a demonstration of the building deformation assessment process being applied to a structure affected by ASR. The demonstration should include a structure that has gone through the entire process (i.e., through Stage Three).

3. Section 3.3 of Enclosure 1 notes that the concrete backfill may apply pressure to adjacent structures; however, no explanation is provided regarding how this pressure will be estimated.

Explain how the pressure from concrete backfill is determined. Also include an explanation of how external pressure due to concrete expansion will be determined for the case of two adjacent concrete structures.

4. It is not clear to the NRC staff whether you are requesting approval to change your licensing basis to Regulatory Guide (RG) 1.92, Revision 3, “Combining Modal Responses and Spatial Components in Seismic Response Analysis,” specifically changing from the square-root of sum-of-squares method to use the alternate 100-40-40 approach. If so, provide a detailed explanation or example demonstrating how you are meeting the guidance in RG 1.92, Revision 3.

5. Minimal information is provided about the ASR deformation program, and especially, how the status of the existing structures will be quantified. Section 3.3.2 notes that existing data will be reviewed, but no explanation is provided regarding how much data is necessary to determine whether a structure is impacted by ASR deformation (e.g., how many locations will be monitored, how recent the inspection data will be, what specific indications will be looked for when reviewing existing data).

Provide a more detailed summary of the ASR deformation program. Include a detailed discussion of what will be looked at during the field data review and how deformations and strains will be conservatively estimated. The discussion should explain how monitoring elements will be determined, how it will be determined that existing data is representative of the structure, and how it will be determined that enough data has been collected to properly estimate the demands on the structure. In addition, an example of applying the initial screening process to an existing structure is needed that highlights the generic portions of the process and explains how they will be repeated for other structures.

E. McCartney

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The information requested and associated timeframe in this letter were discussed with Mr. Ken Browne of your staff on September 14, 2016.

If you have any questions, please contact me at (301) 415-2048 or [Justin.Poole@nrc.gov](mailto:Justin.Poole@nrc.gov).

Sincerely,

*/RA/*

Justin C. Poole, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:  
Supplemental Information Needed

cc w/enclosure: Distribution via Listserv

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**ADAMS Accession No.: ML16258A022**

\*by e-mail dated

OFFICE	NRR/DORL/LPL1-2/PM	NRR/DORL/LPL1-2/LA	NRR/DE/EMCB/BC(A)*
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DATE	9/16/2016	9/15/2016	9/8/2016
OFFICE	NRR/DORL/LPL1-2/BC	NRR/DORL/LPL1-2/PM	
NAME	DBroaddus	JPoole	
DATE	9/19/2016	9/19/2016	

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