



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

October 13, 2016

Mr. Eric McCartney  
Site Vice President  
NextEra Energy Seabrook, LLC  
P.O. Box 300  
Seabrook, NH 03874

SUBJECT: REGULATORY AUDIT PLAN - ALKALI SILICA REACTION AGING  
MANAGEMENT PROGRAM, REGARDING SEABROOK STATION, UNIT 1,  
LICENSE RENEWAL APPLICATION REVIEW (CAC NO. ME4028)

Dear Mr. McCartney:

By letter, dated May 25, 2010, NextEra Energy Seabrook, LLC submitted an application for renewal of operating license No. NPF-86 for the Seabrook Station, Unit 1. The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants."

The staff plans to conduct its regulatory audit of the Alkali-Silica Reaction Aging Management Program (AMP) during the week of October 24, 2016, in accordance with the enclosed regulatory audit plan. This audit was discussed with Mr. Kenneth Browne and Mr. Edward Carley of your staff. If you have any questions, please contact me by telephone at 301- 415-3617 or by e-mail at [Tam.Tran@nrc.gov](mailto:Tam.Tran@nrc.gov).

Sincerely,

*/RA/*

Tam Tran, Project Manager  
Projects Branch 1  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:  
Audit Plan

cc w/encl: Listserv

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Letter to E. McCartney from T. Tran Dated October 13, 2016

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## **Audit Plan**

# **Alkali-Silica Reaction Aging Management Program Review for the Seabrook Station, Unit 1 License Renewal Application**

OCTOBER 24, 2016

**Division of License Renewal  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission**

ENCLOSURE

## **Alkali-Silica Reaction Aging Management Program Audit Plan Seabrook Station, Unit 1**

### **1. Background**

By letter dated May 25, 2010, NextEra Energy Seabrook (NextEra or the applicant) submitted to the U.S. Nuclear Regulatory Commission (NRC or the staff) its application for renewal of its operating license for Seabrook Station, Unit 1 (Seabrook). The applicant requested renewal of the operating license for an additional 20 years beyond the current 40-year license, which expires on March 15, 2030. In its letter dated May 16, 2012, the applicant supplemented its application to include a plant-specific Alkali-Silica Reaction (ASR) Monitoring program to manage the effects of aging due to ASR. The NRC staff conducted audits of the plant-specific ASR Monitoring program in November 2013 and October 2015. On April 28, 2016, the staff and NextEra conducted a public meeting to discuss submittal expectations associated with staff's review of ASR aging management programs (AMPs), and NextEra subsequently submitted a revision to the license renewal application (LRA) regarding the ASR Monitoring Program. This revision was submitted to the NRC by letter dated August 9, 2016, and included a revised LRA Appendix B, Section B.2.1.31A, "Alkali-Silica Reaction (ASR) Monitoring AMP" and a new LRA Section B.2.1.31B, "Building Deformation Aging Management Program."

Staff from the Office of Nuclear Reactor Regulation will conduct a regulatory audit, in accordance with LIC-111 "Regulatory Audit," to (1) gain a better understanding of revisions to the applicant's ASR Monitoring AMP and (2) review supporting documentation and technical bases information for the applicant's new Building Deformation AMP. These programs were submitted for the staff's review related to Open Item OI 3.0.3.2.18-1 in the safety evaluation report with open items (ADAMS Accession No. ML12160A374). Consistent with LIC-111, an Audit Summary will be provided to NextEra within 90 days following the audit.

### **2. Regulatory Audit Bases**

License renewal requirements are specified in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." 10 CFR 54.17, "Filing of Application," requires applicants for renewed licenses to send written correspondence to the NRC. 10 CFR 54.37, "Additional Records and Record Keeping Requirements," requires that license renewal applicants maintain documents demonstrating compliance with the requirements of 10 CFR Part 54 in auditable and retrievable form. During review of an LRA, there may be supporting information retained as records under 10 CFR 54.37 that, although may not necessarily be required to be submitted as part of the LRA, provide additional information and technical bases for the submitted information, and therefore the staff may determine an audit is necessary. Staff guidance is provided in NUREG-1800, Revision 2, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), dated December 2010, and in NUREG-1801, Revision 2, "Generic Aging Lessons Learned (GALL) Report," dated December 2010.

### 3. Regulatory Audit Scope and Methodology

The scope of this audit is to examine the applicant's supporting documentation for LRA AMPs B.2.1.31A and B.2.1.31B. These plant-specific AMPs will be evaluated for the 10 program elements in accordance with the guidance provided in SRP-LR Appendix A.1 "Aging Management Review Branch Technical Position RLSB-1." The SRP-LR states that an applicant can choose to establish one or more plant-specific AMPs. It is incumbent on the applicant to ensure that the plant program contains adequate descriptions and depth of bases for all 10 elements of the AMP.

During this audit, the staff will examine the applicant's program basis documents and related references for the AMPs, review supporting calculations and evaluations, conduct related walkdowns as needed, and interview applicant representatives to obtain additional clarification related to the AMP. The staff will also assess whether it needs additional information to be submitted to the NRC in support of the AMPs.

The scope of this audit includes the following tasks (i.e., audit needs) to support the staff's review of adequacy of the ASR Monitoring Program and new Building Deformation Program. The audit will include an entrance meeting (introductions and review of scheduling of breakout sessions, document review, and walkdowns) and an exit meeting to discuss any outstanding issues.

- Review of ASR Monitoring Program implementation to date, including review of associated procedures and crack measurement results to-date. This review consists of document review, interviews with cognizant personnel, and walkdown of areas that have installed extensometers in accordance with the program.
- Review of operating experience related to ASR-related macro cracking and building deformation in the residual heat removal and core spray equipment vault and methodology/plans for aging management. This review consists of document review and interviews with cognizant personnel, as well as walkdown of the affected area.
- Review of operating experience related to ASR-related seismic gap reduction and methodology/plans for aging management of containment and containment enclosure building (CEB). This review consists of document review and interviews with cognizant personnel, as well as walkdown of the affected area.
- Review of operating experience related to ASR-related macro cracking and building deformation in the fuel storage building and methodology/plans for aging management. This review consists of document review and interviews with cognizant personnel, as well as walkdown of the affected area.
- If available and applicable, review of a complete analysis that has followed the ASR AMP methodology, including finite element analysis input and results; and consideration of the three-stage evaluation process approach to building deformation analysis (e.g. CEB). This review consists of document review and interviews with cognizant personnel.

(The Seabrook LRA indicated that computational analysis (e.g., computer simulation) will be used to manage the ASR AMP. NextEra will inform the staff early whether or not

these analyses are available for review so that staff may arrange for appropriate reviewer(s) to be available for this review during the audit.)

- Review of calculations, evaluations, analyses, procedures, and any supporting information related to the determination of internal strain and/or external loads contributing to the “Sa” ASR factor that will be added to finite element models of structures affected by building deformation. In addition, information regarding if, when, and how the “Sa” factor would be recalculated. This review consists of document review and interview with cognizant personnel.
- Demonstration of how the AMP takes into account irreversible plastic deformation of rebar consistent with the current licensing basis. This review consists of document reviews and interview with cognizant personnel.
- Methodology and results of the stage 1 “susceptibility analysis” process. This review consists of document review and interviews with cognizant personnel.

Based on the results of the audit, staff will identify what, if any, information would need to be submitted on the docket subsequent to the audit, as supplements to the LRA or response to the request for additional information. This will be discussed during the exit meeting.

#### 4. Special Requests

For a successful outcome, the staff requests that:

- (1) at least one hard copy of relevant materials be available to the staff in addition to electronic files
- (2) availability of a projector to facilitate information exchange to the entire group (when such exchange is necessary)
- (3) availability of cognizant technical staff for interview and walkdown
- (4) internet access (not necessary to allow access to NextEra/Seabrook internal sites)
- (5) reviewing staff be granted unescorted access for feasibility and efficiency of access to working area, not necessarily to perform unescorted walkdowns, and consistent with site requirements.

#### 5. Team Assignments

NRC staff participation is projected as follows (some deletions, additions, or substitutions may occur on an as-needed basis):

<b>Area of Review</b>	<b>Assigned Auditor</b>
Project Manager	Tam Tran
Technical Lead	Angela Buford, Structural Engineer
Technical Reviewer	George Thomas, Senior Structural Engineer
Technical Reviewer	Bryce Lehman, Structural Engineer
Management	Benjamin Beasley, Acting Deputy Director
Management	Brian Wittick, Branch Chief

## **6. Logistics**

The audit will be conducted on location at the Seabrook site, with rooms and space to be provided by NextEra. Working hours are from 8:00 am to 4:30 pm. Further daily logistics items or revisions will be coordinated with the Seabrook project manager (and appropriate Seabrook management) during a daily debrief, as necessary.