



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

October 9, 2013

CAL No. 1-2012-002

Mr. Kevin Walsh
Site Vice President
Seabrook Nuclear Power Plant
NextEra Energy Seabrook, LLC
c/o Mr. Michael O'Keefe
P.O. Box 300
Seabrook, NH 03874

**SUBJECT: CLOSURE OF CONFIRMATORY ACTION LETTER 1-12-002, SEABROOK
STATION, UNIT 1**

Dear Mr. Walsh:

The purpose of this letter is to acknowledge the actions NextEra Energy Seabrook, LLC (NextEra) has taken in response to the Confirmatory Action Letter (CAL) (ADAMS Accession No. ML12125A172¹) issued to you by the U.S. Nuclear Regulatory Commission (NRC) on May 16, 2012. The NRC issued the CAL in response to the presence of an Alkali-Silica Reaction (ASR) and its impact on reinforced concrete structures at Seabrook Station (Seabrook), as described below.

In June 2009, NextEra identified potential degradation in below grade concrete structures at Seabrook. NextEra evaluated core samples from the structures and, in August 2010, confirmed ASR as the degradation mechanism. ASR is a chemical reaction in concrete, which occurs over time in the presence of water, between the alkaline cement paste and reactive non-crystalline silica that is found in some common coarse aggregates. In the presence of water, ASR forms a gel that expands, causing micro-cracks that can change the physical structural properties of the concrete. NextEra evaluated the impact of ASR on numerous Seismic Category I structures at Seabrook and completed prompt operability determinations for these components. NextEra concluded that, while all such structures were operable, several (such as the "B" electrical tunnel in the control building) were degraded.

At an April 23, 2012, public meeting with NextEra, NRC staff discussed their concerns with the long-term operability of the affected structures. Subsequently, by letters dated May 3 and May 10, 2012 (ML12125A022 and ML12131A479, respectively), NextEra described the actions it would take to address the degraded conditions as well as to ensure that Seabrook continued to meet its current licensing basis as a result of the ASR issue. Accordingly, the NRC issued the CAL to confirm the actions committed to by NextEra.

¹ Designation in parentheses refers to an Agencywide Documents Access and Management System (ADAMS) accession number. Most of the documents referenced in this letter are publicly-available using the accession number in ADAMS (exceptions to public availability are noted).

The NRC has verified that NextEra has satisfied the commitments contained in the CAL. Enclosed with this letter is a summary document listing: 1) the CAL commitments; 2) a description of the actions taken by NextEra to meet the commitments; and 3) a description of the actions taken by the NRC to verify that the commitments have been properly implemented. Although NRC review of the CAL items is complete, we will maintain a focused oversight of this non-conforming condition through scheduled inspection activities and retention of the NRC Technical Team established in response to this issue. As you are aware, the NRC is currently in the process of conducting a separate review of the ASR issue as part of Seabrook's license renewal process in accordance with 10 CFR Part 54. As such, certain aspects of the ASR issue addressed in the CAL may also have applicability to the license renewal review and require additional consideration and information beyond that discussed via this CAL closeout.

We understand that NextEra will continue to monitor ASR degradation at Seabrook and to collaborate with the Ferguson Structural Engineering Laboratory at the University of Texas at Austin to continue research and testing activities related to ASR. We further understand that NextEra will update its operability determinations for ASR-affected structures as more insights are gained from these activities. The NRC will continue its oversight of this issue until the completion of your testing program and the final resolution of the open operability determinations.

The NRC intended to discuss our basis for closing the CAL at a public meeting scheduled for October 9, 2013. Due to the government shutdown and associated suspension of all non-essential travel, the NRC had to cancel this meeting. The NRC still intends to conduct a public meeting on the ASR issue after the government returns to normal operations.

If you have any questions or comments, please contact James Trapp, Deputy Director, Division of Reactor Safety, Region I, at 610-337-5186. A copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room located at NRC Headquarters in Rockville, MD, and from ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

/RA/

William M. Dean
Regional Administrator

Enclosure:
Verification of Actions Taken in Response
to the NRC Confirmatory Action Letter
1-12-002, Dated May 16, 2012

Docket No. 50-443
License No. NPF-86

cc: Distribution via ListServ

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Distribution: See Next Page.

ADAMS ACCESSION NUMBER: **ML13274A670**

DOCUMENT NAME: G:\DRS\Seabrook Concrete\CAL Closure Information - 2013\CAL Closure Letter 08-28 Final.docx

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VERIFICATION OF ACTIONS TAKEN IN RESPONSE TO THE NRC CONFIRMATORY ACTION LETTER 1-12-002,
DATED MAY 16, 2012

Commitment 1:

Revise the prompt operability determination (POD) associated with AR 581434, 'Reduced Concrete Properties Below Grade in "B" Electrical Tunnel Exterior Wall,' by May 25, 2012. NextEra Energy Seabrook will notify the site NRC Resident Inspector upon completion of this action.

Actions Taken and NRC Conclusion:

NextEra completed the revised POD for the "B" Electrical Tunnel documented in AR 581434, Revision 2, on May 24, 2012. (*non-public due to proprietary information*)

NRC issued Inspection Report 05000443/20102009, dated December 3, 2012 (ML 12338A283), documenting the inspection team's review of the revised POD. The NRC concludes that NextEra has satisfactorily completed this commitment.

Commitment 2:

Submit the root cause for the organizational causes associated with the occurrence of ASR at Seabrook Station and related corrective actions by May 25, 2012.

Actions Taken and NRC Conclusion:

NextEra submitted a summary report, "Root Cause for the Organizational Causes Associated with the Occurrence of ASR at Seabrook Station," in a letter (ML 12151A396) to the NRC on May 24, 2012. NextEra submitted a revision to the root cause evaluation report (ML 13151A328) to include additional characterization of the second root cause and corrective actions on May 1, 2013.

NRC issued Inspection Report 05000443/20102009, dated December 3, 2012 (ML 12338A283), documenting its review of the initial root cause evaluation. After discussions with Seabrook staff, NextEra submitted a revision, which the NRC reviewed and documented in Inspection Report 05000443/20102010, dated August 9, 2013 (ML 13221A172). The NRC concludes that NextEra has satisfactorily completed this commitment.

VERIFICATION OF ACTIONS TAKEN IN RESPONSE TO THE NRC CONFIRMATORY ACTION LETTER 1-12-002,
DATED MAY 16, 2012

<p>Commitment 3:</p> <p>Submit the evaluation, "Impact of ASR on Concrete Structures and Attachments," (Foreign Print (FP) 100716) by May 25, 2012.</p>
<p>Actions Taken and NRC Conclusion:</p> <p>By letter dated May 24, 2012, NextEra submitted to the NRC for review Foreign Print (FP) 100716, "Interim Assessment: Impact of ASR on Concrete Structures," Revision 1.</p> <p>NRC issued Inspection Report 05000443/20102009, dated December 3, 2012 (ML 12338A283), documenting the inspection team's review of the evaluation. The NRC concludes that NextEra has satisfactorily completed this commitment.</p>
<p>Commitment 4:</p> <p>Submit the corrective action plan for the continued assessment of ASR in concrete structures at Seabrook Station including development of remedial actions to mitigate the impact of ASR, where warranted, by June 8, 2012.</p>
<p>Actions Taken and NRC Conclusion:</p> <p>NextEra submitted the integrated correction action plan, "ASR Project Corrective Action Plan," in a letter (ML12171A277) to the NRC on June 8, 2012. NextEra continued to implement and refine sections of the plan and provided an update in a letter to the NRC dated May 1, 2013 (ML13151A328).</p> <p>NRC issued Inspection Report 05000443/20102010, dated August 9, 2013 (ML 13221A172), documenting the inspection team's review of the corrective action plan. The NRC concludes that NextEra has satisfactorily completed this commitment.</p>

VERIFICATION OF ACTIONS TAKEN IN RESPONSE TO THE NRC CONFIRMATORY ACTION LETTER 1-12-002,
DATED MAY 16, 2012

Commitment 5:

Revise the POD associated with AR1664399, 'Reduced Concrete Modulus of Elasticity Below Grade in Containment Enclosure Building, RHR Equipment Vaults, EFW Pump House, and Diesel Generator Fuel Oil Storage Rooms,' by June 30, 2012. The expanded scope buildings will be included in this POD. NextEra Energy Seabrook will notify the site NRC Resident Inspector upon completion of this action.

Actions Taken and NRC Conclusion:

NextEra completed revised PODs for the Containment Enclosure Building, RHR Equipment Vaults, EFW Pump House, Diesel Generator Fuel Oil Storage Rooms, and other Category I structures as documented in AR 1664399, Revision 2, dated June 25, 2012. (*non-public due to proprietary information*)

NRC issued Inspection Report 05000443/20102009, dated December 3, 2012 (ML 12338A283), documenting the inspection team's review of the revised PODs to address extent of condition. The NRC concludes that NextEra has satisfactorily completed this commitment.

Commitment 6:

Complete short term aggregate expansion testing (ASTM C 1260 Mortar Bar Expansion Test) by June 30, 2012. Results will be available for NRC review approximately 30 days after testing is complete.

Actions Taken and NRC Conclusion:

NextEra completed the short term aggregate expansion testing and documented the results in SGH Report 120110-RPT-01, Revision 0, dated June 28, 2012. (*non-public due to proprietary information*)

NRC issued Inspection Report 05000443/20102009, dated December 3, 2012 (ML 12338A283), documenting the inspection team's review of the test results. The NRC concludes that NextEra satisfactorily completed this commitment.

VERIFICATION OF ACTIONS TAKEN IN RESPONSE TO THE NRC CONFIRMATORY ACTION LETTER 1-12-002,
DATED MAY 16, 2012

Commitment 7:

Complete long term aggregate expansion testing (ASTM C 1293 Concrete Prism Test) by June 30, 2013. Results will be available for NRC review approximately 30 days after testing is complete.

Actions Taken and NRC Conclusion:

NextEra submitted a letter (ML12362A323) to the NRC on December 13, 2012, requesting that this CAL commitment be deleted. NRC acknowledged and accepted the technical basis of NextEra's request in a revision to the CAL, dated January 14, 2013 (ML13014A555).

Commitment 8:

Submit the technical details of the testing planned at the contracted research and development facility by June 30, 2012.

Actions Taken and NRC Conclusion:

NextEra submitted a copy of the "Shear and Lap Splice Testing" program prepared by the Ferguson Structural Engineering Laboratory dated March 15, 2012, in a letter to the NRC dated June 21, 2012 (ML12179A282). Based upon the complexity of the information and NRC follow-up inspection activities, NextEra prepared a test program overview document and a detailed test specification to supplement the June 21, 2012 CAL response letter. NextEra submitted copies of these documents, "Seabrook Station - Specification for Shear and Reinforcement Anchorage Testing of ASR-Affected Reinforced Concrete" and "Approach for Shear and Reinforcement Testing of Concrete Affected by Alkali Silica Reaction," in a letter to the NRC dated May 1, 2013 (ML13151A328).

NRC issued Inspection Report 05000443/20102010, dated August 9, 2013 (ML13221A172) documenting the inspection team's review of the planned large scale testing program. The NRC concludes that NextEra has satisfactorily completed this commitment.

VERIFICATION OF ACTIONS TAKEN IN RESPONSE TO THE NRC CONFIRMATORY ACTION LETTER 1-12-002,
DATED MAY 16, 2012

Commitment 9:

Update the Maintenance Rule Structures Monitoring Program to include monitoring requirements for selected locations in areas that exhibit ASR by July 15, 2012. NextEra Energy Seabrook will notify the site NRC Resident Inspector upon completion of this action.

Actions Taken and NRC Conclusion:

NextEra issued Revision 2 to the Structural Engineering Standard 36180, "Structural Monitoring Program," effective July 12, 2012. Based upon discussions with NRC staff, NextEra issued Revision 3 to the Structural Monitoring Program on April 30, 2013, to include additional monitoring frequencies and periodic groundwater sampling. (*non-public due to proprietary information*)

NRC issued Inspection Report 05000443/20102010, dated August 9, 2013 (ML13221A172), documenting the inspection team's review of the updated Structures Monitoring Program. The NRC concludes that NextEra has satisfactorily completed this commitment.

Commitment 10:

Perform the initial six-month interval crack measurements and crack indexing at 20 locations in areas that exhibit the highest crack indices by July 15, 2012. Crack measurement will be performed at six-month intervals until a reliable trend of ASR progression is established. NextEra Energy Seabrook will notify the site NRC Resident Inspector upon completion of these periodic measurements.

Actions Taken and NRC Conclusion:

NextEra completed the initial six-month interval crack measurements as documented in FP 100738, "Measurements for ASR Crack Indexing on Concrete Structures," Revision 0, dated July 16, 2012. (*non-public due to proprietary information*). NRC review of Revision 2 to the Structures Monitoring Program and the second six-month crack measurement results, as documented in Inspection Report 05000443/2012010, dated August 9, 2013 (ML13221A172), identified that NextEra has included the six-month crack measurement commitment into the Seabrook Station Maintenance Rule required safety-related structures inspection and assessment program. NextEra plans to continue to take crack indexing measurement data until a reliable trend in ASR progression is established.

NRC issued Inspection Report 05000443/2012009 dated December 3, 2012 (ML12338A283), documented the inspection team's review of the crack index measurements and methodology. The NRC concludes that NextEra has satisfactorily completed this commitment.

VERIFICATION OF ACTIONS TAKEN IN RESPONSE TO THE NRC CONFIRMATORY ACTION LETTER 1-12-002,
DATED MAY 16, 2012

Commitment 11:

Complete the anchor test program by December 31, 2012. Results will be available for NRC review approximately 30 days after testing is complete.

Actions Taken and NRC Conclusion:

NextEra submitted a letter (ML12362A323) to the NRC on December 13, 2012, requesting that this CAL commitment be revised to reflect schedule challenges and to include wording similar to CAL Commitment 8. Specifically, the revised commitment reads "Submit technical details of the anchor test program planned at the contracted research and development facility by February 28, 2013." NextEra submitted a copy of the program, "Specifications for Strength Testing of Attachments in ASR-Affected Concrete" and "Anchor Test Program Overview," dated February 26, 2013, in a letter to the NRC dated February 28, 2013 (ML13088A218).

NRC acknowledged and accepted NextEra's request to revise the CAL in a letter dated January 14, 2013 (ML13014A555). NRC issued Inspection Report 05000443/20102010, dated August 9, 2013 (ML13221A172), documenting the inspection team's review of the anchor test program. The NRC concludes that NextEra has satisfactorily completed this commitment.