



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I**
2100 Renaissance Boulevard
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

May 16, 2012

CAL No. 1-2012-002

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

**SUBJECT: CONFIRMATORY ACTION LETTER, SEABROOK STATION, UNIT 1 -
INFORMATION RELATED TO CONCRETE DEGRADATION ISSUES**

Dear Mr. Freeman:

This letter confirms recent commitments by NextEra Energy Seabrook, LLC (NextEra) in regard to planned actions for the degradation of concrete in certain structures due to an Alkali-Silica Reaction (ASR). The 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, the ASR forms a gel that expands, causing micro-cracks that can change the physical structural properties of the concrete. NextEra's completion of these commitments will ensure important information is provided to the NRC staff to determine if the licensee is taking adequate corrective actions for a significant condition adverse to quality.

In June 2009, NextEra initially identified concrete degradation of below grade concrete structures at Seabrook. In August 2010, NextEra completed core sample analyses for petrographic evaluation, compressive strength, and modulus of elasticity. These analyses identified a change in material properties due to ASR for the "B" electrical tunnel in the control building (CB), with reductions reported in the concrete compressive strength and modulus of elasticity from expected values. NextEra evaluated these parametric reductions to determine the impact on the design basis of the "B" electrical tunnel. By its process, the licensee performed both an immediate and a prompt operability determination and concluded that the "B" electrical tunnel was operable. As additional information was obtained, including observed degradation of other structures through an extent of condition review, later revisions of the operability determinations concluded that the "B" electrical tunnel and other structures were operable but degraded.

NRC expert review determined the ASR affected structures remained capable of performing their safety-related functions. This determination was based in part by the following:

1) conservative safety load factors in controlling load conditions and engineering conservatisms in design provide reasonable expectation that affected structures can perform their safety function, despite the current licensing and design bases design margin being reduced by the change of mechanical properties; 2) field walk-downs confirmed no visible indication of significant deformation, distortion, or displacement of structures, or rebar corrosion; 3) ASR identified limited to localized areas in the concrete walls; 4) progression of ASR degradation is occurring slowly based on existing operating experience and NextEra continues to monitor the affected structures.

By letters dated May 3 and May 10, 2012 (Agencywide Documents and Management System (ADAMS) Accession Numbers ML12125A022 and ML12131A479, respectively), you described the actions that you will be taking to address the degraded conditions as well as to ensure that Seabrook meets its current licensing basis as a result of the ASR issue. More specifically, it is our understanding that you will be establishing a bounding operability determination for all ASR-affected buildings as well as interim monitoring actions to ensure the degradation is effectively managed. The commitments addressed below are expected to be completed as indicated:

1. Revise the prompt operability determination (POD) associated with AR581434, '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.
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.
3. Submit the evaluation, "Impact of ASR on Concrete Structures and Attachments," (Foreign Print 100716) by May 25, 2012.
4. 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 affects of ASR, where warranted, by June 8, 2012.
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.
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.

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.
8. Submit the technical details of the testing planned at the contracted research and development facility by June 30, 2012.
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.
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.
11. Complete anchor test program by December 31, 2012. Results will be available for NRC review approximately 30 days after testing is complete.

Pursuant to Section 182 of the Atomic Energy Act, 42 U.S.C 2232 you are required to:

- 1) Notify me immediately if your understanding differs from that set forth above;
- 2) Notify me if for any reason you cannot complete any of the actions and commitments within the specified schedule and advise me in writing of your modified schedule in advance of the change; and,
- 3) Notify me in writing when you have completed all the actions and commitments addressed in this Confirmatory Action Letter (CAL).

Issuance of this CAL does not preclude issuance of an Order formalizing the above commitments or requiring other actions on the part of NextEra, nor does it preclude the NRC from taking enforcement action for violations of NRC requirements that may have prompted the issuance of this letter. Failure to take the actions as described in this CAL may also result in an Order if the NRC determines that failure to meet that action or action(s) would result in a loss of reasonable assurance of the protection of public health and safety or the common defense and security.

This CAL will remain in effect until the NRC has concluded that all actions listed above have been satisfactorily completed. We note that, regarding the ASR issue, license renewal is a separate licensing action before the Commission and the NRC may require the submittal of further information as part of the licensee renewal application review beyond that provided in response to this CAL.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

After reviewing your response, the NRC will determine whether further action is necessary to ensure compliance with regulatory requirements. If you have any questions, please contact Richard J. Conte at (610) 337-5183 or e-mail richard.conte@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'W. M. Dean', with a long horizontal line extending to the right.

William M. Dean
Regional Administrator

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

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Sincerely,

/RA/

William M. Dean
Regional Administrator

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DOCUMENT NAME: C:\Documents and Settings\gmp\My Documents\Seabrook ASR CAL.docx
ADAMS ACCESSION NUMBER: ML12125A172

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
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DATE	5/15/12	5/11/12	5/14/12	5/15/12	5/15/12

OFFICE	OGC	RI/RA	RI/DRS		
NAME	MSpencer/RJC/NLO	WDean	*CMiller		
DATE	5/15/12 see email	5/15/12	5/10/12		

*See previous concurrence

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