



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

August 31, 2018

MEMORANDUM TO: Ho K. Nieh, Director
Office of Nuclear Reactor Regulation

FROM: David C. Lew, Regional Administrator /RA/
Region I

SUBJECT: SEABROOK STATION, UNIT NO. 1 – LICENSE RENEWAL
APPLICATION

By letter dated May 25, 2010, NextEra Energy, LLC (NextEra) submitted an application pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," to renew the operating license for the Seabrook Station (Seabrook), Unit 1, nuclear facility. With close coordination and support from your staff in the Division of Materials and License Renewal, we completed the inspections at Seabrook in accordance with the guidance in Inspection Manual Chapter 2516, "Policy and Guidance for the License Renewal Inspection Program," and Inspection Procedure (IP) 71002, "License Renewal Inspection." Our inspections further included substantial additional reviews related to NextEra's actions to address the effects of Alkali Silica Reaction (ASR) in Seabrook reinforced concrete structures. The enclosure to this letter provides references to our inspection reports.

An NRC inspection team completed reviews at Seabrook in March 2011 in accordance with IP 71002 to evaluate whether NextEra staff properly identified as in-scope non-safety-related systems, structures, and components and whether aging management programs would adequately manage the effects of aging with documentation in an auditable and retrievable form. The team reviewed a sample of 19 aging management programs that involved enhancements to existing programs and development of new programs. The inspectors noted, at that time, NextEra was developing programs to manage the aging effects of ASR on Seabrook concrete structures and that additional NRC inspection was warranted once these programs were finalized. The team determined that, with the exception of the ASR issue, the inspection results support a conclusion of reasonable assurance with respect to NextEra managing the effects of aging in the systems, structures, and components as identified in the Seabrook, Unit 1 license renewal application. These conclusions are documented in Inspection Report 05000443/2011007, dated May 23, 2011 (ML111360432).

The Seabrook ASR Issue Technical Team (SAITT) was established in July 2012, consisting of Region I and Headquarters staff, to coordinate inspection and technical review activities. From 2013 to present, NRC inspectors completed reviews approximately every six months to evaluate NextEra's activities to monitor Seabrook structures affected by ASR to ensure structural

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capability is maintained under the current license. These reviews have provided insights into NextEra's development and implementation of aging management programs credited to manage the effects of ASR as described in their license renewal application. Our inspections included visits to the Ferguson Structural Engineering Laboratory at the University of Texas – Austin to observe NextEra's testing of large-scale ASR-affected specimens and to ensure appropriate quality assurance standards were followed. Our inspections at Seabrook assessed structural monitoring activities related to the effects of ASR including crack indexing, groundwater ingress chemistry monitoring, and programs to address building deformation resulting from the effects of ASR. Some of these inspections involved findings of very low safety significance which were corrected by NextEra as verified by subsequent NRC inspections.

In consultation with the SAITT, NRC Region I determined NextEra's aging management programs to address the effects of ASR were developed such that a follow-up license renewal inspection could be conducted at Seabrook. NRC inspectors with specialties in structural and material engineering completed this inspection in accordance with IP 71002 in June 2018 and documented the results in Inspection Report 05000443/2018010, dated August 10, 2018 (ML18222A292). The inspectors determined that NextEra adequately performed scoping and screening of structures, systems, and components as required in NRC regulations 10 CFR 54.4(a) and 54.21, respectively; established aging management programs for structures and components affected by ASR as described in their license renewal application; and provided documentation supporting the application that was in an auditable and retrievable form. Overall, the inspection results support the conclusion that there is reasonable assurance that the effects of aging due to ASR in the Seabrook systems, structures, and components will be managed through implementation of these programs as described in the application for a renewed license.

Based on the results of the 2011 inspection, we determined that the applicant's aging management programs and activities, other than those related to ASR, have been or will be completed in substantial agreement with docketed commitments and regulatory requirements associated with the license renewal of Seabrook. Based on the results of the 2018 inspection focused on the aging management of ASR, we determined the programs have been established and are being implemented in accordance with the license renewal application currently under review by the NRC Office of Nuclear Reactor Regulation. Within the above inspection scope, NextEra demonstrated the capability to manage the effects of aging during the period of extended operation. Therefore, we conclude that there is reasonable assurance that the applicant's aging management programs provide an adequate foundation for renewing the Seabrook license for an additional 20 years.

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

Enclosure:
ASR Inspection History

SUBJECT: SEABROOK STATION, UNIT 1 – LICENSE RENEWAL APPLICATION DATED AUGUST 31, 2018

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DOCUMENT NAME: G:\DRS\Engineering Branch 1\-- Floyd\SB License Renewal RA Memo_Rev 8-29-2018B.docx

Non-Public Designation Category: MD 3.4 Non-Public B.1 (A.3 - A.7 or B.1)

ADAMS ACCESSION NUMBER: ML18243A452

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| <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 | |
| OFFICE | RI/DRS | RI/DRP | RI/DRS | RI/DRS | RI/ORA |
| NAME | NFloyd/ | FBower/ | MGray/ | JYerokun/ | DLew/ |
| DATE | 08/28/2018 | 08/28/2018 | 08/30/2018 | 08/30/2018 | 08/31/2018 |

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ASR Inspection History

| Date | Subject | ML# | Report No. |
|-------------|--|-----------------------------|-------------------|
| 11/01/2010 | NRC Integrated Inspection Report | ML103050447 | 05000443/2010004 |
| 05/12/2011 | NRC Integrated Inspection Report | ML111330689 | 05000443/2011002 |
| 05/23/2011 | License Renewal Inspection Report | ML111360432 | 05000443/2011007 |
| 08/12/2011 | NRC Integrated Inspection Report | ML112241543 | 05000443/2011003 |
| 03/26/2012 | ASR Issue in Safety Related Structures | ML120480066 | 05000443/2011010 |
| 01/30/2014 | NRC Integrated Inspection Report | ML14030A509 | 05000443/2013005 |
| 05/06/2014 | NRC Integrated Inspection Report | ML14127A376 | 05000443/2014002 |
| 08/05/2014 | NRC Integrated Inspection Report | ML14212A458 | 05000443/2014003 |
| 02/06/2015 | NRC Integrated Inspection Report | ML15037A172 | 05000443/2014005 |
| 08/05/2015 | NRC Integrated Inspection Report | ML15217A256 | 05000443/2015002 |
| 02/12/2016 | NRC Integrated Inspection Report | ML16043A391 | 05000443/2015004 |
| 05/06/2016 | ASR Effects on Safety-Related Concrete Structures and NOV | ML16127A155 | 05000443/2016008 |
| 08/05/2016 | NRC Integrated Inspection Report | ML16218A455 | 05000443/2016002 |
| 02/08/2017 | NRC Integrated Inspection Report | ML17040A220 | 05000443/2016004 |
| 08/14/2017 | NRC Integrated Inspection Report | ML17227A018 | 05000443/2017002 |
| 02/12/2018 | NRC Integrated Inspection Report | ML18043A821 | 05000443/2017004 |
| 05/14/2018 | NRC Integrated Inspection Report | ML18134A222 | 05000443/2018001 |
| 08/10/2018 | Follow-up of ASR Open Item License Renewal Inspection Report | ML18222A292 | 05000443/2018011 |