



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

December 19, 2018

The Honorable Kristine L. Svinicki  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT:     REPORT ON THE SAFETY ASPECTS OF THE LICENSE RENEWAL  
                  APPLICATION FOR THE SEABROOK STATION, UNIT 1**

Dear Chairman Svinicki:

During the 659<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards (ACRS), December 6-7, 2018, we completed our review of the license renewal application (LRA) for the Seabrook Station, Unit 1 (Seabrook), and the final safety evaluation report prepared by the NRC staff. Our Plant License Renewal Subcommittee reviewed this matter during meetings on July 10, 2012, October 31, 2018, and November 15, 2018. During these reviews, we had the benefit of discussions with representatives of the staff and NextEra Energy Seabrook, LLC (NextEra). We also had the benefit of the referenced documents. This report fulfills the requirement of 10 CFR 54.25 that the ACRS review and report on all license renewal applications.

**CONCLUSION AND RECOMMENDATION**

1. The programs established and committed to by NextEra to manage age-related degradation provide reasonable assurance that Seabrook can be operated in accordance with its licensing basis for the period of extended operation without undue risk to the health and safety of the public.
  
2. NextEra's application for renewal of the operating license for Seabrook should be approved.

**BACKGROUND**

Seabrook is located in the town of Seabrook, Rockingham County, New Hampshire, on the western shore of Hampton Harbor, two miles west of the Atlantic Ocean. Seabrook is approximately two miles north of the Massachusetts state line and approximately 15 miles south of the Maine state line.

Seabrook is a single unit Westinghouse 4-loop pressurized water reactor with a General Electric turbine generator. Seabrook's licensed core power level is 3468 megawatts thermal with a net power output of approximately 1245 megawatts electric. A zero power license was granted to

the facility in October 1986 and a full power operating license was granted on March 15, 1990. Seabrook sought and received a modification to the expiration of the facility operating license to recapture the time licensed at zero percent power.

Originally two identical units were to be built on the site. Construction of Seabrook Station Unit 2 was effectively terminated in 1984 when it was approximately 25 percent complete and the construction permit subsequently expired in October 1988.

In this application NextEra requests renewal of the operating license for Seabrook (Facility Operating License NPF-86) for a period of 20 years beyond expiration of its current license. This would extend the operating license from midnight, March 15, 2030, to midnight, March 15, 2050.

## **DISCUSSION**

In preparation for life extension, NextEra completed improvements, upgrades, replacements, and modifications to numerous systems and components. These include vital batteries, vital inverters, generator step-up transformers, service water piping, incore detectors, process control single point vulnerability circuit cards, solid state protection system circuit cards, rod control motor/generator sets, and shutdown reactor coolant pump seals. The Mechanical Stress Improvement Process<sup>®</sup> was completed for all reactor vessel nozzles.

In its final safety evaluation report, the staff documented its review of the LRA and other information submitted by NextEra and obtained through staff audits and inspections at the plant site. The staff reviewed the completeness of the identification of structures, systems, and components that are within the scope of license renewal. The staff also reviewed the integrated plant assessment process; the identification of plausible aging mechanisms associated with passive, long-lived components; the adequacy of the Aging Management Programs (AMPs); and the identification and assessment of Time-Limited Aging Analyses (TLAAs).

The LRA identified the structures, systems, and components that fall within the scope of license renewal. While the original application was prepared in accordance with the Generic Aging Lessons Learned (GALL) Report, Revision 1, it was updated and it now demonstrates consistency with the Generic Aging Lessons Learned (GALL) Report, Revision 2, and justifies deviations to the specified approaches in that report. The Seabrook AMPs are implemented in accordance with appropriate elements of the requirements of 10 CFR Part 50, Appendix B, specifically corrective actions, confirmation process, and administrative controls. The Seabrook Quality Assurance Program applies to safety-related structures and components. In its review, the staff concluded that NextEra's quality assurance program application was adequate to ensure that LRA associated activities were performed in accordance with NextEra's license renewal program requirements.

NextEra will implement 44 AMPs for license renewal, comprised of 29 existing programs and 15 new programs. Of the 15 new programs, seven are consistent with the GALL Report, one is consistent with enhancement, two are consistent with allowed exceptions, one is consistent with enhancements and allowed exceptions, and four (Buried Piping and Tanks Inspection, 345 KV SF<sub>6</sub> Bus, Building Deformation Monitoring, Alkali-Silica Reaction (ASR) Monitoring) are plant specific. Of the 29 existing programs, eight are consistent with the GALL Report, 12 are consistent with enhancements, two are consistent with allowed exceptions, five are consistent with enhancements and allowed exceptions, and two (Nickel Alloy Nozzles and Penetrations,

Boral Monitoring) are plant-specific. The LRA includes five programs with allowed exceptions to the GALL Report. The programs with exceptions and enhancements are acceptable.

Two of the new plant specific AMPs focus on concrete degradation caused by ASR. The Building Deformation Monitoring Program and the Alkali-Silica Reaction (ASR) Monitoring Program address NextEra's approach to assess, monitor, and manage ASR. In a separate letter report dated December 14, 2018, we provide our specific findings and conclusions related to this issue.

The staff conducted license renewal audits and performed a license renewal inspection at Seabrook. The audits verified the appropriateness of the scoping and screening methodology for AMPs, the appropriateness of the aging management review, and the acceptability of the TLAAs. The staff audit report demonstrated the validity of its conclusion that the Seabrook Aging Management Program is mature. The NextEra organization is benefiting from their fleet approach that integrates lessons-learned from each facility. The license renewal inspection verified that the license renewal requirements are implemented appropriately. The audits and inspections were comprehensive and the corresponding reports are thorough.

Based on these audits, inspections, and the staff reviews, the staff concluded that NextEra has demonstrated that the effects of aging at Seabrook will be adequately managed so that the intended safety functions will be maintained consistent with its licensing basis for the period of extended operation, as required by 10 CFR 54.21(a)(3). The staff's review of the LRA identified no open or confirmatory items. We agree with the staff conclusion that there are no issues related to the matters described in 10 CFR 54.29(a)(1) and (a)(2) that preclude renewal of the operating license for Seabrook.

## **SUMMARY**

The programs established and committed to by NextEra to manage age-related degradation provide reasonable assurance that Seabrook can be operated in accordance with its licensing basis for the period of extended operation without undue risk to the health and safety of the public. The NextEra application for renewal of the operating license for Seabrook should be approved.

Member Riccardella did not participate in deliberations on this topic.

Sincerely,

/RA/

Michael Corradini  
Chairman

## **REFERENCES**

1. NextEra Energy Seabrook LLC, "Seabrook Station License Renewal Application," March 2016 (ML101590098, ML101590101, ML101590091).
2. U.S. Nuclear Regulatory Commission, "Safety Evaluation Report Related to the License Renewal of the Seabrook Station," September 28, 2018 (ML18254A294).

3. U.S. Nuclear Regulatory Commission, NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Revision 1, September 2005 (ML052110005).
4. U.S. Nuclear Regulatory Commission, NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Revision 2, December 2010 (ML103490041).
5. NextEra Energy Seabrook LLC, "Seabrook Station Updated Final Safety Analysis Report," Revision 18, October 27, 2017 (ML17310A361).
6. U.S. Nuclear Regulatory Commission, "NextEra Energy Seabrook - NRC License Renewal Inspection Report 05000443/2011007," May 23, 2011 (ML111360432).
7. U.S. Nuclear Regulatory Commission, "Audit Report Regarding the Seabrook Station License Renewal Application (TAC Number ME4028)," March 21, 2011 (ML110280424).
8. U.S. Nuclear Regulatory Commission, "Scoping and Screening Audit Report Regarding the Seabrook Station," February 4, 2011 (ML110270026).
9. U.S. Nuclear Regulatory Commission, NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," Revision 2, December 2010 (ML103490036).
10. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.188, "Standard Format and Content for Application to Renew Nuclear Power Plant Operating Licenses," Revision 1, September 2005 (ML082950585).

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