



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

May 16, 2022

Ms. Patricia L. Skibbee
Board President
C-10 Research and Education Foundation
11 Chestnut Street
Amesbury, MA 01913

Dear Ms. Skibbee:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter dated March 22, 2022, in which you asked for responses to specific requests and questions about alkali-silica reaction at Seabrook Station, Unit No. 1 (Seabrook). Responses to your inquiries are enclosed.

I appreciate your letter and continued interest in the NRC's oversight at Seabrook. If you have additional questions or need more information, please contact Justin Poole, Project Manager, Office of Nuclear Reactor Regulation, at 301-415-2048 or Justin.Poole@nrc.gov.

Sincerely,

Christopher T. Hanson

Enclosure:
As stated

**U.S. Nuclear Regulatory Commission
Responses to Requests and Questions in the C-10 Research and Education Foundation
Letter Dated March 22, 2022**

In its March 22, 2022, letter, the C-10 Research and Education Foundation (C-10) made four requests for immediate action of the U.S. Nuclear Regulatory Commission (NRC). Those requests are quoted and responded to below.

Request I—ASR [Alkali-Silica Reaction] Inspection & Assessment by Experts

Within six months, the NRC will organize a team of independent, professionally qualified ASR experts using advanced scientific methods to initiate an assessment of the status of ASR at Seabrook Station including all relevant projections. The public deserves this action and it would be instructive for proposed remediation plans.

As referenced in C-10's March 22, 2022, letter, the NRC received a letter from Senators Markey and Warren requesting that the Advisory Committee on Reactor Safeguards (ACRS), an independent panel of experts established by statute that reports to the Commission, review the status of ASR at Seabrook Station, Unit No. 1 (Seabrook). In response to that letter, the NRC explained that due to the first-of-a-kind nature of ASR in the U.S. nuclear industry, the ACRS has been engaged on this issue since 2018. After being briefed on multiple occasions by members of the NRC staff and the Seabrook licensee staff, all with ASR expertise, the ACRS issued letters to the Commission indicating its support of the NRC staff's assessment of the ASR issue and issuance of a renewed license for Seabrook. Most recently, the NRC staff met with the ACRS on April 27, 2022, and provided an update on the status of ASR at Seabrook and on the Seabrook licensee's implementation of its ASR monitoring program since that program's establishment by license amendment in 2019. In its independent advisory capacity, the ACRS will continue to engage the NRC staff and others with ASR expertise on this issue as appropriate and advise the Commission accordingly.

Request II—Comprehensive and Defensible Inspections Including Mandated ASLB [Atomic Safety and Licensing Board] Conditions

An improved focus by the NRC on robust inspections and assessments on all aging issues at Seabrook Station emphasizing ASR sampling and demand computations. All ASR assessments should scientifically validate the estimated level of risk to the public and be published in NRC quarterly inspection reports.

The NRC continues to inspect Seabrook's implementation and oversight of its structures monitoring aging management programs, including its monitoring of ASR to ensure that issues are identified, managed, and corrected in a timely manner that supports the continued, safe operation of the plant. The NRC resident inspectors review entries into Seabrook's corrective action program each workday and perform routine walkdowns of the plant's concrete structures. Subject matter experts from the NRC's regional and headquarters offices with backgrounds in the fields of materials, concrete, and structures perform detailed inspections on a periodic basis (approximately every 6 months since 2013), focused on the Seabrook's performance to monitor ASR conditions, to verify structural capability, and to make modifications needed to meet the current licensing basis. The results of these inspections will continue to be published in publicly available NRC inspection reports.

Request III—Regulations and Regulatory Process

The development of ASR specific regulations and an efficient method for the public to effect regulations. In the interim, we reiterate our request for a reasonable NRC response deadline of 1 year or less to the current Petition for Rulemaking (PRM) process. In C-10's experience response times have exceeded eight years. The current regulatory structure and prolonged PRM process has allowed Seabrook Station to operate outside of its license conditions for more than a decade with impunity.

On November 26, 2019, the NRC completed a review of and denied C-10's previous petition for rulemaking and request that the NRC develop ASR-specific regulations. The NRC concluded that compliance with the existing regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," as well as the inspection and related activities under the NRC's Reactor Oversight Process, provide reasonable assurance that concrete degradation due to ASR, or other material-aging issues, will be managed such that affected safety-related structures at nuclear power plants will remain capable of performing their intended functions. Existing NRC regulations require licensees to monitor the performance and condition of safety-related structures and to address conditions adverse to quality (including significant degradation) in a manner sufficient to provide reasonable assurance that the intended safety functions will be maintained. Nevertheless, C-10 or any other interested parties may submit another petition for rulemaking in accordance with 10 CFR 2.802, "Petition for Rulemaking – Requirements for Filing," with any new justification that they may have for a proposed rule regarding ASR.

NextEra submitted a license amendment request in August 2016 to incorporate the monitoring of ASR into the Seabrook licensing basis. The license amendment request was granted, and the Seabrook license was amended in 2019 to include conditions addressing ASR. These license conditions were subsequently the subject of litigation before the ASLB, which found them to be appropriate with modifications. NRC inspections and the licensee's corrective action program ensure that the plant operates within its current licensing basis, including the ASR conditions in the Seabrook license.

Request IV—Deadlines & Enforcement Applied to Corrective Actions, etc.

The establishment of NRC deadlines (interim and final) for various tasks and enforcement actions including but not limited to: Corrective Actions, Remediation Plans for ASR, Structure Monitoring Program (SMP) issues and NCV/Green (non-cited violations) that require correction. The above [are] to include enforcement actions if deadlines are not met.

Licensees are required to take corrective actions to restore any nonconforming condition in a timely manner commensurate with the condition's safety significance and complexity. In the interim, licensees must continue to demonstrate acceptable performance of the structures through their operability determination processes and perform other actions such as enhanced monitoring. If warranted, the NRC may exercise its authority to take enforcement action if licensees do not meet NRC requirements.

In its March 22, 2022, letter, C-10 also asked two questions of the NRC. Those questions are quoted and responded to below.

Question 1: Please answer the following remediation questions posed at the 3/11/2022 meeting:

- a. Where is NextEra on the planning continuum for ASR remediation?
- b. Is sound remediation technologically possible?
- c. Does the NRC know the materials needed?
- d. Does the NRC know the estimated time to complete?
- e. Will the plan include material replacement/or reinforcement?
- f. Is remediation even realistic given the probable prohibitive costs?
- g. Will there be public hearings?
- h. Will the NRC impose interim and final remedial plan deadlines and hold NextEra to them?

The NRC is aware of NextEra's plans to remediate structures whose conditions are outside the licensing basis. The time, materials, and methods to implement these modifications vary and it will likely take several years to complete all remediation. These kinds of repairs are manageable and have already been performed in a few areas of the plant such as the containment enclosure ventilation area north wall and the containment enclosure building annulus missile shield. The NRC will review each of these modifications under the licensee's design change process. As public hearings are not required for modifications made under a licensee's design change process, there are no planned public hearings associated with the remediation plans. However, if any specific condition requires the amendment of the Seabrook license, then the NRC would publicly notice the related license amendment request and provide the public an opportunity to comment and to request a hearing.

Question 2: Please answer this ASR question originally posed at the 3/11/2022 meeting:

The following list contains the essential questions on Seabrook Station's ASR that citizens living in the EPZ want to know. Based upon the information provided to the NRC by NextEra and your own inspections and calculations will you confirm that the NRC knows the following information through December 31, 2021?

- a. The extent and status of ASR?
- b. The rate of ASR expansion?
- c. The remaining margins on the seven identified "critical safety structures?"
- d. The rate at which the margins are receding?
- e. Where Seabrook is on the ASR "curve?"

The NRC expends significant effort inspecting NextEra's implementation and oversight of its structures monitoring aging management programs, including its monitoring of ASR. The licensee has 28 structures under this program, with 6 of those being outside of the current licensing basis due to an element, or elements, in discrete locations within that structure that are beyond the acceptance criteria of the program. For those six structures, the licensee has performed detailed evaluations to confirm that they are able to perform their design safety functions. Additionally, the NRC continues to review periodic monitoring data and evaluations documented by the licensee to verify that the Seabrook structures affected by ASR are able to

perform their safety functions, as ASR continues to progress. The NRC-approved methodology to evaluate ASR at Seabrook includes requirements for applying load factors and other variables so that there is adequate margin designed into the structure. Each structure is unique in terms of its design and relative impact from ASR, however, as explained above, that impact is regularly monitored, evaluated, and remediated, as necessary, by the licensee and reviewed by the NRC.