



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

March 3, 2023

Ms. Sarah Abramson  
Executive Director  
C-10 Research & Education Foundation, Inc.  
11 Chestnut Street  
Amesbury, MA 01913

Dear Ms. Abramson:

I am writing in response to your petition dated October 4, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22278A133), addressed to the U.S. Nuclear Regulatory Commission (NRC) Executive Director for Operations (EDO). The NRC EDO referred your petition to the Office of Nuclear Reactor Regulation for review in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 2.206, "Requests for action under this subpart." In the petition, you requested that the NRC take enforcement action against NextEra Energy by issuing an Order related to NextEra Energy Seabrook, LLC to hasten compliance with terms and conditions documented in Seabrook Station, Unit No. 1 (Seabrook) Operating License Amendment No. 159 (ML18204A291). In requesting this action, you assert that the NextEra monitoring of the Seabrook safety-related concrete structures affected by Alkali-Silica Reaction (ASR) is not adequate to support the protection of public health and safety. The bases provided in your request point to the findings in NRC-issued inspection reports dating back to 2021 for which you document the following concerns:

1. ...it is not clear that NextEra is following the established protocols and therefore it is not clear that the risks to public health and safety are being adequately and legally managed at this time.
2. Thus far, the NRC has assessed NextEra's non-compliances with concrete degradation regulatory requirements as having little safety significance.... The NRC's assessment – however valid it may be for the specific non-compliances – lacks relevance for protection of public health and safety into the future... C-10 is not patient enough to wait for a safety-related structure to collapse and for NRC to issue a greater-than-green finding to NextEra for its failures to comply with ASR-related regulatory requirements.
3. ...a determination that ASR has not compromised necessary safety margins for concrete structures today may not bound conditions throughout the period of extended operation.
4. Had the NRC inspected and examined every aspect of the ASR-related regulatory requirements imposed by the license amendment issued March 11, 2019, then the few findings of non-compliance would provide meaningful insights into concrete degradation at Seabrook. The NRC's findings from the small subset of ASR-related requirements it has

examined indicate that NextEra has not complied with its legal obligations, with the clear implication that non-compliances among the many areas not examined by the NRC.... Of the only two ASR-related samples examined by the NRC so far in 2022, non-compliances were identified 100 percent of the time. There is absolutely no evidence of fact suggesting, yet alone proving, that these non-compliances are the worst examples of the adverse consequences from NextEra not complying with ASR-related regulatory requirements.

5. The ROP [Reactor Oversight Process] alone does not ensure that NextEra's efforts to achieve and sustain compliance with ASR-related regulatory requirements will be sufficiently timely and effective. Recent actions taken by NRC outside of the ROP strongly suggest that the Order sought by C-10 is consistent with these actions: ...The ROP by itself provided the NRC with insufficient means of ensuring the identified shortcomings were corrected in a timely and effective manner. Consequently, the NRC supplemented its ROP efforts with plant-specific actions tailored to restore compliance with regulatory requirements....

Consistent with NRC Management Directive 8.11, "Review Process for 10 CFR 2.206 Petitions" (ML18296A043), the NRC established a petition review board (PRB) to evaluate your petition. The PRB includes NRC staff who are knowledgeable of the NRC inspection process and nuclear structures. In evaluating your petition, the PRB reviewed NRC's records regarding the issues you raised in your petition.

On November 17, 2022, the petition manager informed you by e-mail (ML22321A252) of the PRB's initial assessment that your petition does not meet the criteria in Management Directive 8.11, Directive Handbook Section III.C.1(a) for accepting petitions because the supporting facts presented in the petition are not sufficient to warrant further inquiry. The November 17, 2022, e-mail included the following responses to the five concerns in your petition as listed above.

1. As an appropriate response to the NRC's oversight findings, the licensee has already entered the findings from the NRC inspections into its Corrective Action Program, and corrective actions are in progress to achieve compliance.
2. The significance determination process used by the NRC staff in assessing the safety significance of the Seabrook inspection findings is consistent with the NRC's inspection and enforcement policy and guidance, which are consistent or aligned with the agency's mission to provide reasonable assurance of adequate protection of public health and safety. The NRC would proceed with appropriate additional enforcement action if the licensee is not able to provide an adequate demonstration that a non-conforming structure or component remains capable of performing its function. Furthermore, the affected structures at Seabrook are, and will continue to be, monitored and managed in a manner that provides reasonable assurance that they remain capable of performing their functions and there is no concern of an immediate catastrophic failure to the structures based on the current information and slow progression of the ASR.
3. As discussed during the Atomic Safety and Licensing Board hearing conducted in September 2019 (Transcript: ML19312B609) subsequent to the issuance of Seabrook License Amendment No. 159, the licensee's methodology for

monitoring and managing ASR at the site is not a predictive approach through the end of the period of extended operation, but rather a periodic condition monitoring approach of structure-specific threshold monitoring parameters. Results of the monitoring are evaluated using the approved methodology and findings, or non-conformances, if any, are addressed in the licensee's corrective action program in a manner that provides reasonable assurance that the affected structures or components remain capable of performing their intended functions.

4. The NRC's inspection samples under the ROP [Reactor Oversight Program] since 2020 have covered the majority of the ASR-affected, safety-related structures at the site for which evaluations in accordance with Seabrook License Amendment No.159 methodology were completed. Observed findings, if any, have been documented in the corresponding inspection reports. NRC inspection findings are followed up in subsequent inspections under the ROP to ensure adequate resolution. Failure of the licensee to achieve conformance could result in additional enforcement action, if appropriate, commensurate with the safety significance.
5. The four precedent examples, cited by C-10, of past escalated enforcement actions taken by the NRC in the form of Confirmatory Orders resulted from the Reactor Oversight Process or the Allegations Process, and three of the examples involved willful or deliberate wrongdoing by the licensee. These Confirmatory Orders were a direct result of existing NRC processes (the ROP or Allegations Process). Therefore, C-10's claim that the ROP alone does not provide the NRC with sufficient means of ensuring the identified shortcomings are corrected in a timely and effective manner, appears to be a misunderstanding of the ROP process.

Also in the November 17, 2022, e-mail the petition manager offered you an opportunity to meet with the PRB to clarify or supplement your petition with information for the PRB to consider before the PRB makes a final determination. On December 13, 2022, you provided a supplement to your petition (ML22349A106). On December 14, 2022, a transcribed virtual public meeting was held (ML23009B136) between you and the PRB and you provided a written version of your response to the initial assessment (ML22350A103). The response included the following additional questions and concerns to supplement the requested enforcement actions in your petition:

6. How else can we get more information than what is made publicly available?
7. ...how would the performance [petition] review board suggest we meet the 2.206 threshold?
8. The standard for regulation across most federal agencies is that the best available control technology be used to mitigate public safety and health risks. Does the NRC feel that their regulation and enforcement on ASR fits well within those guidelines?
9. And if the NRC found it prudent to require a list of measurement and mitigation measures once ASR is identified, than [then] it believes that ASR poses a risk to operability and safety of that structure, therefore it would be rational to believe

that the NRC would want to know every structure that has ASR so that those measures can be taken at all of them.

10. To this day, the licensee nor the NRC has contracted an independent ASR scientific expert to collaborate on compliance measures.
11. ...the cooling tower as [is] identified as having ASR and that once measured it was near the allowable threshold. It is our understanding that the inspectors identified this area, why and how was this missed by the plant staff?
12. C-10 and Dr. Saouma submitted letters [to the ACRS] containing specific requests and the associated evidence to support them in June.... I have selected excerpts from those documents which are [sic] to our petition.
  - a. What kind of analysis was performed prior to installing bolts and braces? And was it performed by those with ASR expertise?
  - b. Aren't you concerned that by constraining the expansion along one direction, you are simply reorienting it in the orthogonal ones (with a combined ~33% increase)?
  - c. Could there be a point were too many of these localized patches (i.e., Band-Aids) become alarming. If so, is it quantified?"
  - d. What is the experience, peer reviewed papers written by those "very smart" people.
  - e. Has the code (using the ANSYS engineering software presumably) been validated for ASR? If so, is there such a public documentation?
  - f. Would NextEra agree to perform a validation of their studies by analyzing (and reporting) a battery of 10 benchmark problems given in reference (and addressed by researchers in the US, Canada, France, and Japan.

The additional concerns have been considered in the PRB's final determination regarding whether the petition meets the criteria for consideration under 10 CFR 2.206. PRB responses to concerns 9 and 11 are included below as both concerns include potential new issues with ASR at Seabrook that relate to the petition request. The NRC staff's response to questions/concerns 6, 7, 8, 10 and 12 are included in the enclosed table.

#### PRB Response to Concern 9

The NRC staff's position is that every structure at Seabrook is currently able to perform its safety function, including those which are affected by ASR. Seabrook has identified/considered all Seismic Category 1 (safety-related) and some non-Category 1 structures as affected by ASR and accordingly included each for ASR/Building Deformation monitoring in its Structures Monitoring Program (SMP). All safety-related structures are being monitored for structural degradation and to ensure responsive action is taken before the intended safety function is impacted. The NRC staff continue to monitor the licensee's implementation of the SMP and the structures as part of our baseline inspection program.

#### PRB Response to Concern 11

The service water cooling tower (SWCT) was among the seismic Category 1 structures included by the licensee as ASR-affected in the SMP and being monitored for ASR progression. The

2022 Seabrook third quarter integrated inspection report (05000443/2022003, ML22304A100) notes that the licensee's service water cooling tower ASR inspection results indicated monitoring parameters were nearing the threshold limits. NRC inspectors did not identify this issue; however, they reviewed the licensee's operability and functionality assessment and verified that the impacted structure continues to remain functional. Separate from the above and as indicated in NRC inspection report 05000443/2021-002 (ML21222A126, also cited on page 7 of the C-10 petition), the inspectors had also previously inspected the SWCT among several other structures in 2021 and had identified at that time a green finding (cited in the C-10 petition) for several structures including the SWCT that, while the evaluations were technically adequate to show the structures remained functional, the evaluation needed to account for the future progression of ASR to demonstrate there is reasonable assurance the structures would remain functional to the next periodic ASR-related inspection.

### Conclusion

The PRB's final determination is that your petition, as supplemented, does not meet the criteria in Management Directive 8.11, Directive Handbook Section III.C.1(b)(ii) criteria for consideration under 10 CFR 2.206 because the issues raised have previously been the subject of a facility-specific or generic NRC staff review, and none of the three listed circumstances apply. The primary safety concerns in your petition relate to the current state of non-compliance with the current licensing basis of ASR-affected safety structures, the timeliness of any remedial action taken by NextEra to restore compliance, and if and why any additional ASR affected structures have not been identified. Currently, the ASR at Seabrook is being monitored by NextEra and overseen by the NRC staff as part of the ROP. Where the NRC staff considers enforcement action warranted, enforcement action will be taken consistent with NRC regulations and enforcement policy. Monitoring of ASR-affected structures and all other safety structures will continue for the plant's service life, including the period of extended operation, such that intended functions are maintained consistent with the plant's licensing basis.

The regulations in 10 CFR 2.206 provide an opportunity for the public to petition the NRC to take enforcement-related action, and, while the PRB determined that the issues raised have previously been the subject of a facility-specific or generic NRC staff review, the NRC understands that this process takes time, resources, and energy by petitioners. Accordingly, I thank you for taking the time to raise your concerns.

Sincerely,

Michele M. Sampson, Deputy Director  
Division of Engineering and External Hazards  
Office of Nuclear Reactor Regulation

Enclosure:  
Petition Concern Table

10 CFR 2.206 Petition from C-10 Regarding Seabrook ASR  
NRC Staff Response to Petitioner Questions/Concerns

#	Petitioner Concerns	NRC Staff Response
6	How else can we get more information than what is made publicly available?	<p>For information in the NRC's possession: Members of the public may request records from the NRC by submitting Freedom of Information Act (FOIA) requests. The NRC provides requested agency records that are not exempt from public disclosure to the FOIA requester. NRC's regulations on public records are found in <a href="#">10 CFR Part 9</a> of the <i>Code of Federal Regulations</i> (10 CFR).</p> <p>More information about the NRC's processing of the FOIA can be found here: <a href="https://www.nrc.gov/reading-rm/foia/foia-privacy.html">https://www.nrc.gov/reading-rm/foia/foia-privacy.html</a></p>
7	...how would the performance [petition] review board suggest we meet the 2.206 threshold?	Each 10 CFR 2.206 petition is evaluated on its own merits by the NRC staff. A petition would generally need to include actionable information regarding a safety, security, or compliance issue that the NRC is not aware of for the petition to be accepted for further NRC staff review.
8	The standard for regulation across most Federal agencies is that the best available control technology be used to mitigate public safety and health risks. Does the NRC feel that their regulation and enforcement on ASR fits well within those guidelines?	When the NRC staff makes a safety finding, such as in Seabrook License Amendment No. 159, Safety Evaluation Section 7.0 (ML18204A291), the NRC staff generally concludes that the approved action provides reasonable assurance of adequate protection of the public health and safety. The NRC staff's previous and ongoing review of ASR at Seabrook has determined that the licensee actions provide reasonable assurance that public safety is being maintained.
10	To this day, the licensee nor the NRC has contracted an independent ASR scientific expert to collaborate on compliance measures.	There is no requirement or basis in the regulations for the NRC or licensee to contract an independent ASR scientific expert. However, while developing its response to Seabrook ASR findings, NextEra worked with experts at the University of Texas-Austin, MPR Associates, and Simpson Gumpertz and Heger (SGH). Since approval of License Amendment No. 159, based on information from NRC's continued ROP

#	Petitioner Concerns	NRC Staff Response
		<p>inspection samples at the plant, SGH has continued its involvement with Seabrook.</p> <p>During its review of the Seabrook ASR license amendment request, the NRC staff obtained support from Brookhaven National Laboratory.</p> <p>The qualifications of the NextEra staff and consultants as well as the NRC staff who provided testimony as expert opinion witnesses at the 2019 ASLB Hearing on the Seabrook ASR issue were included as part of the Hearing record and were discussed during the hearing as indicated in the transcript.</p>
12	<p>C-10 and Dr. Saouma submitted letters [to the ACRS] containing specific requests and the associated evidence to support them in June.</p> <ol style="list-style-type: none"> <li>a. What kind of analysis was performed prior to installing bolts and braces? And was it performed by those with ASR expertise?</li> <li>b. Aren't you concerned that by constraining the expansion along one direction, you are simply reorienting it in the orthogonal ones (with a combined ~33% increase)?</li> <li>c. Could there be a point were too many of these localized patches (i.e., Band-Aids) become alarming. If so, is it quantified?</li> <li>d. What is the experience, peer reviewed papers written by those "very smart" people.</li> <li>e. Has the code (using the ANSYS engineering software presumably) been validated for ASR? If so, is there such a public documentation?</li> <li>f. Would NextEra agree to perform a validation of their studies by analyzing (and reporting) a battery of 10 benchmark problems given in reference (and addressed by researchers in the US, Canada, France, and Japan).</li> </ol>	<p>The response to concern #10 describes expertise contracted by both NextEra and the NRC staff. A description of computer programs used for structural finite element analysis at Seabrook is included in the NRC Staff's Safety Evaluation dated March 11, 2019, for License Amendment No.159.</p> <p>The NRC is continuing to review the licensee's proposed and implemented corrective actions as part of our oversight program.</p> <p>Regarding concern 12.f – The NRC staff cannot respond for NextEra.</p>

SUBJECT: OEDO-22-00419 - 2.206 PETITION FOR SEABROOK STATION STRUCTURAL CONCRETE CONCERNS (EPID L-2022-CRS-0000) DATED MARCH 3, 2023

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**ADAMS Accession Nos.: ML22278A131 (Package); ML23020A100 (Letter)**

**NRR-106**

OFFICE	NRR/DORL/LPL1/PM	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/LA	NRR/DEX/ESEB/SE
NAME	JKim	PBuckberg	RButler	GThomas
DATE	1/20/2023	1/23/2023	1/24/2023	1/31/2023
OFFICE	NRR/DEX/ESEB/SE	R1/DORS/PB2/PE	RES/DE	OGC – NLO
NAME	BLEhman	SElkhiamy	JPires	SKirkwood
DATE	1/31/2023	1/31/2023	1/31/2023	2/6/2023
OFFICE	NRR/DORL/LPL2-2/BC	NRR/DORL/DD	NRR/DEX/DD	NRR/D
NAME	DWrona	JHeisserer	MSampson	AVeil (MKing for)
DATE	2/8/2023	2/10/2023	2/22/2023	3/2/2023
OFFICE	NRR/DEX/DD			
NAME	MSampson			
DATE	3/3/2023			

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