

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
BEFORE THE  
ATOMIC SAFETY AND LICENSING BOARD**

In the Matter of	)	
NextEra Energy Seabrook, L.L.C.	)	Docket No. 50-443-LR
(Seabrook Station, Unit 1)	)	
	)	August 27, 2012
	)	September 19, 2012

**FRIENDS OF THE COAST AND NEW ENGLAND COALITION’S MOTION  
(WITH SEPTEMBER 19, 2012 CORRECTIONS)  
FOR LEAVE TO FILE A NEW CONTENTION CONCERNING NEXTERA  
ENERGY SEABROOK’S AMENDMENT OF ITS AGING MANAGEMENT  
PROGRAM FOR SAFETY-RELATED CONCRETE STRUCTURES**

**I. INTRODUCTION**

Pursuant to 10 C.F.R. §§ 2.309(f)(1) and 2.309(f)(2), Friends of the Coast and New England Coalition (“Friends/NEC”), intervenors in the above captioned matter, seek leave to file a new contention which claims that the NextEra Energy Seabrook License Renewal Application Structures Monitoring Program Supplement-Alkali-Silica Reaction (“ASR”) Monitoring, (dated May 16, 2012 and provided to Friends/NEC in NRC Staff Disclosures, July 6, 2012) fails to demonstrate that the effects of aging on structures and components subject to an aging management review (AMR) are adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis (CLB) for the period of extended operation.

A license renewal applicant is required, pursuant to Part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants,” Section 21(a)(3), of Title 10 of the *Code of Federal Regulations* (10 CFR 54.21(a)(3)), to demonstrate that the effects

of aging on structures and components subject to an aging management review (AMR) are adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis (CLB) for the period of extended operation.

NextEra has failed, with respect to Seabrook Station, Unit 1 (“Seabrook Station”), concrete structures affected by alkali-silica reaction, to meet the aforesaid requirement.

## **II. FACTUAL BACKGROUND**

In June 2009, NextEra Energy Seabrook, LLC (“NextEra”) , while engaged in system, structure, and component walk-downs and otherwise preparing for a license renewal application at Seabrook Station, discovered that sections of concrete in (safety-related and other) structures subject to 10 CFR 50.54 aging management review (“AMR”) were substantially deteriorated.<sup>1</sup> NextEra took samples of the affected material and sent it out for analysis.

There is no evidence in the public record that NextEra completed a thorough extent of condition review or root cause analysis at that time<sup>2</sup>.

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<sup>1</sup> 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 "8" 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 "8" 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 "8" electrical tunnel and other structures were operable but degraded.

Page 1, Confirmatory Action Letter, Seabrook Station, Unit 1 - Information Related To Concrete Degradation Issues, May 16, 2012

<sup>2</sup> In May 2010, concrete testing was performed on the walls of the "B" Electrical Tunnel at el.-20'. Results of Penetration Resistance Testing (PRT) show an average concrete compressive strength of 5,340 psi while results of testing of core bores show an average compressive strength of 4,790 psi. A PRT performed in 1979 showed an average concrete compressive strength of 6,759 psi. Test cylinders that were cast during construction in 1975 showed an average strength of 6,120 psi. A comparison of the 2010 results to the 1979 results shows a 21.7 percent reduction in concrete compressive strength. The core samples taken in 2010 were also subjected to petrographic analysis for determination of any change in modulus of elasticity. The

Thus NextEra was operating in an unanalyzed condition affecting safety and one requiring per NUREG 1801, additional aging mechanism-specific time-limited aging analysis and/or an aging management plan as a prerequisite to filing a license renewal application.

It strains to credulity to accept that NextEra did not know from the get-go that it was dealing with Alkali Silica Reaction (“ASR”) and that it affected multiple structures that were contemporaneously examined as subject to AMR, including reactor containment, because this phenomena, well-described in concrete industry and research literature since the late 1930’s or early 40’s, has characteristic excrescences (surface deposits readily visible upon cursory examination) and multi-branched surface cracking; quite distinguishable from ordinary surface tension cracking or exterior chemical attack<sup>3</sup>.

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analysis shows the presence of Alkali Silica Reaction (ASR) and an indicated reduction in modulus of elasticity of approximately 47 percent.

The tests and samples are all associated with the "B" Electrical Tunnel Walls at el. -20'. They can be considered representative of the concrete condition at that specific location, only. A Prompt Operability Determination concluded that the areas of concrete on the "B" Electrical Tunnel affected by Alkali Silica Reaction have been reviewed and are in compliance with the applicable design code. Structural integrity of the "B" Electrical Tunnel is fully intact and all system, structures, and components housed within the tunnel are operable and capable of performing their design function.

2) The tests and samples described above are all associated with the "B" Electrical Tunnel Walls at el. -20'. They can be considered representative of the concrete condition at that specific location, only. That testing was conducted on the most highly susceptible area; that which had shown the highest degree of calcium deposits. An Extent of Condition Investigation is in progress for five additional potentially susceptible areas, including the Containment Enclosure Building. These additional data points will aid in the assessment of the extent of condition. [emphasis added]

Pp.41-42, December 17, 2010 SBK-L- 10204- Response to Request for Additional Information NextEra Energy Seabrook License Renewal Application Aging Management Programs, Response to (RAI) b.2.1.21.31-1

3 These indicators signal the chemical-physical processes underway; but give little information as to the extent, depth, rate of growth, or stage of progress of the processes. Portland Cement Association

P.48 ,PCI Concrete Technology and Codes. “The BEST ASR “Test” The most accurate test for determining deleterious ASR potential is Field History; Structures >15 years old?, Same aggregate?, Same cement/concrete alkali ?, Same SCMs (brand, type, amount)?, Same water content?, Same exposure conditions?”

ML12153A420[1] The Condition Survey and Evaluation of Hardened Concrete, Alkali-Aggregate Reactions ,Portland Cement Association (power point, undated)

More pointedly, the U.S. Nuclear Regulatory Commission describes alkali–silica aggregate reaction in a June 1987 study, NUREG/CR-4731, “Residual Life Assessment of Major Light Water Reactor Components”-Overview Volume I , (ML040230374):

*I. Chemical Reactions.*

A number of deleterious chemical reactions can produce concrete cracking. These generally are related to the concrete aggregate and include: alkali-aggregate reactions, cement-aggregate reactions, and the reaction of carbonate aggregates. Sulfate bearing waters also present problems, but by attack of the cement paste rather than involvement of the aggregate.

*a. Alkali-Aggregate Reactions.*, Cracking can occur as a result of expansive reactions between aggregates containing active silica and alkalis usually derived from cement. Problems with structures built since about 1950 have been significantly reduced through proper selection of aggregate materials (petrographic examination to identify potentially active materials), use of low alkali cements (<0.6qo equivalent NaO), and addition of pozzuolanic materials that restrict expansion.

*4.4.22 Environmental Degradation of Concrete. Page 42*

On May 25, 2010, NextEra filed its License Renewal Application for Seabrook<sup>4</sup>; the application makes no mention of the deteriorated concrete structure(s) or ASR. Here, Friends/NEC offers that NextEra was in violation of 10 CFR. 50.9:

**“10C.F.R.§50.9 Completeness and accuracy of information.** (a) Information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects.

(b) Each applicant or licensee shall notify the Commission of information identified by the applicant or licensee as having for the regulated activity a significant implication for public health and safety or common defense and security. An applicant or licensee violates this paragraph only if the applicant or licensee fails to notify the Commission of information that the applicant or licensee has identified as having a significant implication for public health and safety or common defense and security. Notification shall be provided to the Administrator of the appropriate Regional Office within two working days of identifying the information. This requirement is not applicable to information

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<sup>4</sup> NextEra Energy Seabrook, LLC letter SBK-L-10077, "Seabrook Station Application for Renewed Operating License," May 25, 2010. (Accession Number ML101590099)

which is already required to be provided to the Commission by other reporting or updating requirements. [52 FR 49372, Dec. 31, 1987]

In short, it is Friends/NEC's conclusion, based on the available evidence, that NextEra knew of the presence of deteriorated concrete, likely including the presence of ASR, and it's challenge to the structural integrity of AMR components before filing its application for license renewal and Friends/NEC further asserts that NextEra's decision to omit consideration of this known condition constitutes a material false statement<sup>5</sup>; subject to sanctions<sup>6</sup>.

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5 Intent to deceive is irrelevant in determining whether there has been a material false statement under Section 186.a. of the Atomic Energy Act; a deliberate effort to mislead the NRC, however, is relevant to the matter of sanctions, once a material false statement has been found. Consumers Power Co. (Midland Plant, Units 1 & 2) ALAB-691, 16 NRC 897, 915 (1982); The Regents of the Univ. of California (UCLA Research Reactor), LBP-84-22, 19 NRC 1383, 1387 (1984).

Liability of an applicant or licensee for a material false statement in violation of Section 186.a. of the Atomic Energy Act does not depend on whether the applicant or licensee knew of the falsity. Consumers Power Co. (Midland Plant, Units 1 & 2), ALAB-691, 16 NRC 897, 910 (1982), citing Virginia Elec. & Power Co. (North Anna Power Station, Units 1 & 2), CLI-76-22, 4 NRC 480 (1976), *aff'd sub nom.* Virginia Elec. & Power Co. v. NRC, 571 F.2d 1289 (4th Cir. 1978). Under Section 186.a. of the Atomic Energy Act, the test for materiality is whether the information is capable of influencing the decision-maker, not whether the decision-maker would, in fact, have relied on it. Determinations of materiality require careful, common sense judgments of the context in which information appears and the stage of the licensing process involved. Consumers Power Co. (Midland Plant, Units 1 & 2), ALAB-691, 16 NRC 897, 910 (1982), citing Virginia Elec. & Power Co. (North Anna Power Station, Units 1 & 2), CLI-76-22, 4 NRC 480 (1976), *aff'd sub nom.* Virginia Elec. & Power Co. v. NRC, 571 F.2d 1289 (4th Cir. 1978); Metro. Edison Co. (Three Mile Island Nuclear Station, Unit 1), ALAB-774, 19 NRC 1350, 1358 (1984); The Regents of the Univ. of California (UCLA Research Reactor), LBP-84-22, 19 NRC 1383, 1408-09 (1984); Randall C. Orem, D.O., CLI-93-14, 37 NRC 423, 427-29 (1993).

In Virginia Electric & Power Co. (North Anna Power Station, Units 1 & 2), ALAB-324, 3 NRC 347 (1976), *rev'd in part on other grounds*, 4 NRC 480 (1976), the Appeal Board held that:

(1) A statement may be "false" within the meaning of Section 186 even if it is made without knowledge of its falsity - i.e., *scienter* is not a necessary element of a false statement under Section 186.  
(2) Information is material under Section 186 if it would have a natural tendency or capability to influence the decision of the person or body to whom it is to be submitted - i.e., the information is material if a reasonable Staff member would consider it in reaching a conclusion. The information need not be relied upon in fact.

6 This is not a motion by Friends/NEC for sanctions. However, in as much as the omitted consideration of deteriorated or ASR-affected concrete may have deprived interested persons of their opportunity (60 days) and right to submit a request for hearing and/or a proposed contention on the topic, Friends/NEC offers that, should the Board take up this 10 C.F.R.50.9, A.E.A, Section 186 matter *sua sponte*, an appropriate sanction could be to order issuance of a Notice of Opportunity for a Hearing, etc. in the Matter of the Seabrook License Renewal Application.

On October 29, 2010, NextEra submitted its, Supplement to the Seabrook Station License Renewal Application, SBK-L-10179, supplementing information on degraded concrete structures only to the extent of adding a commitment to plan opportunistic inspection when considering excavation work that would expose inaccessible concrete.

Thus NextEra forgoes an opportunity to supply information withheld in its initial LRA. NextEra leaves the extent, effects, and location of ASR a mystery: providing no further information regarding ASR at Seabrook in this filing and NextEra makes no changes in the License Renewal Application resulting from the identification and investigation of ASR. Thus, NextEra makes no real attempt, other than an unadorned mention of a murky plan for opportunistic inspection of buried concrete, to correct or remedy its May 25, 2012 License Renewal Application omissions; constituting a second willful violation of 10.C.F.R.§50.9.

Friends/NEC is anxious that the circumstances of the delayed provision of information on concrete degradation and/or ASR in 10 CFR 54 reviewable structures and components at Seabrook, a legal and procedural concern, not overshadow Friends/NEC's more immediate and palpable concern that Next Era's proposed AMP for managing ASR affected structures is wholly inadequate for protecting public health and safety; and for maintaining Seabrook's original and current licensing basis throughout the proposed period of extended operation ("PEO").

Friends/NEC believes its duty to be done in informing the Atomic Safety and Licensing Board ("Board") and, by extension the NRC Staff, of this perceived transgression of regulations; Friends/NEC wishes to get on with discussion of the remaining factual background and then evaluating the merits of its proposed contention.

On December 17, 2010, NextEra submitted its Response to Request for Additional Information NextEra Energy Seabrook License Renewal Application Aging Management Programs - SBK-L- 10204 (ML103540534); incorporating several commitments to its proposed structure aging management program. This represents NextEra's first substantive description of the evaluation and condition of the ASR-affected structures in LRA review space.

On August 25, 2011, NextEra submitted its, First Annual Update to the Seabrook Station License Renewal Application (SBK-L-1 1173) (ML11241A142), providing a second but less illuminating mention of ASR in license renewal application space:

This update also includes a review of plant specific and industry operating experience for the same time period. Alkali Silica Reaction (ASR) has been identified as a new aging effect. This new aging effect is currently under review by NextEra Energy Seabrook. Enclosure 1 contains changes to the License Renewal Application as a result of the Annual Update review.

On May 16, 2012, NextEra filed its NextEra Energy Seabrook License Renewal Application Structures Monitoring Program Supplement-Alkali-Silica Reaction ("ASR") Monitoring, SBK-L-12101, together with references to (1) NextEra Energy Seabrook, LLC letter SBK-L-12061, "Seabrook Station Response to Request for Additional Information, NextEra Energy Seabrook License Renewal Application - Supplemental Response - Alkali Silica Reaction (ASR)", March 30, 2012 (Accession Number ML12094A364) and NextEra Energy Seabrook, LLC letter SBK-L-12088, "Supplemental Response- (RAI) Follow-up B.2.1.31-1, Item 1, NextEra Energy Seabrook License Renewal Application," April 18, 2012. (Accession Number ML 121 10A407), providing supplemental information related to staff RAIs regarding the ongoing analysis of Alkali-Silica Reaction [emphasis added].

In this Supplement are changes to the License Renewal Application (LRA) associated with management of cracking due to expansion and reaction with aggregates in concrete structures. The existing Structures Monitoring Program, B.2.1.31, has been augmented by a plant specific Alkali-Silica Reaction (ASR) Monitoring Program, B.2.1.3 IA.

It is the monitor program contained in this supplement with which Friends/NEC takes issue, however it is not the information provided in this supplement which is the “new, material” information upon which Friends/NEC bases its proposed contention. That information is contained in the transcript of an Advisory Committee on Reactor Safety (or Safeguards) (“ACRS”) meeting with NRC Staff and NextEra which was published in ADAMS and thus became available to Friends/NEC on July 26, 2012.

### **III. CONTENTION**

Pursuant to 10 C.F.R. §§ 2.309(f)(1) and 2.309(f)(2), a petition for leave to file a new contention must set forth with particularity the contention sought to be raised. For each contention, the petition must:

*(i) Provide a specific statement of the issue of law or fact to be raised or controverted.*

The NextEra Energy Seabrook License Renewal Application, as amended by the Structures Monitoring Program Supplement-Alkali-Silica Reaction (“ASR”) Monitoring, (dated May 16, 2012 and provided to Friends/NEC in NRC Staff Disclosures, July 6, 2012) fails to demonstrate as required by Part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants,” Section 21(a)(3), of Title 10 of the *Code of Federal Regulations* (10 CFR 54.21(a)(3)), that the effects of aging on structures and



components subject to an aging management review (AMR) are adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis (CLB) for the period of extended operation.

*(ii) Provide a brief explanation of the basis for the contention;*

**The Structures Monitoring Program Supplement – Alkali-Silica Reaction (“ASR”) Monitoring, and of a consequence, the LRA, as discussed below, fails in two ways:**

**First-The Proposed ASR Structures Monitoring Program is not a Functional Effective tool for AMP:**

1. The Structures Monitoring Program does not provide a baseline for all affected structures from which to register and monitor trending.
2. Visual inspection of surface indications alone is not adequate gauge the status of internal chemical processes, such as ASR. (see, footnote 3)
3. The proposed monitoring program makes no allowance for inspection of inaccessible or buried concrete save for opportunistic inspections which may never happen, or which are not necessarily biased toward areas and structures most likely to be severely affected. In the event that excavations and hence opportunistic inspections happen in lightly affected or non-affected areas, findings will be of little use in locating potential structural failures.
4. The proposed monitoring program makes no provision for monitoring ASR – aggravating factors , such as the moisture content, the presence of liquid water, the potential of chemically aggressive water, or the temperature of affected of susceptible concrete.

5. First field observations are to be done by untrained or minimally-trained personnel, who must make the first cut on what is reportable for further examination by a qualified professional engineer.
6. If this monitoring program is the AMP in its entirety it fails because there is no active component proposed to arrest, mitigate or manage the growth of ASR, such as a stringent de-watering program, waterproofing or waterproof membranes restoration, concrete cladding to restore surfaces, or chemical treatment, such as that using lithium compounds.

**Second; NextEra has not Developed Reliable Inventory and Analysis on Which to Base an ASR Monitoring Program or Aging Management Program for Affected Concrete Structures**

NextEra has formulated an AMP or ASR Monitoring Program only after three years of ongoing review of ASR at Seabrook. It appears to be not only ineffective, but less than minimal. What is more, it appears to be lacking adequate, rational, reliable basis.

1. NextEra has proposed intervals of inspection of sixth months but the interval appears nominal; not tied to any calculation of the rate of growth of ASR in any given set of locations.
2. NextEra has determined the extent to which concrete has degraded or lost its structural function by relying on testing measurements of a very limited number of samples for a very limited number of structural dynamics. This approach will not withstand technical or regulatory scrutiny. No AMP issuing from analysis known to be inadequate or faulty can provide the necessary assurance of adequate protection of public health and safety; and the CLB into the PEO. The conclusions

resulting from such stunted analysis regarding the remaining structural integrity of affected concrete and the rate of degradation ( ASR) aging at Seabrook are according to NRC technical staff (testifying at the July 10, 2012 ACRS Meeting on Seabrook) unsupportable. Friends/NEC relies on the NRC technical opinions expressed in the transcript of this meeting to flesh out the basis of its contention that the ASR monitoring plan/AMP is inadequate. Their testimony and accompanying presentation materials are new material information reflecting NRC Technical Staff's opinions expressed for the first time in an official NRC forum.

Abdul Sheikh, Office of Nuclear Reactor Regulation

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3 And the applicant has  
4 addressed most of these issues. But I would like to  
5 find out about the degradation of mechanical  
6 properties of concrete. There we have some  
7 difference of opinion with the applicant.  
8 The applicant has stated there is no  
9 change in the compressive strength of the concrete  
10 due to ASR but we have searched the literature also  
11 and we have found from among hundreds of appears  
12 there is a difference of opinion on this issue. And  
13 the consensus is that there is some reduction in  
14 compressive strength of concrete due to ASR. It  
15 depends on, you know, the type of structure and the  
16 confinement and what not. So it's not a blanket  
17 statement that the concrete compressive strength  
18 does not decrease.  
19 Secondly, we agree with the applicant  
20 that there is the reduction in tensile and shear  
21 strength and bond strength and elastic modulus of  
22 the concrete because they have -- the degradation is  
23 more pronounced.

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24 And also the major item which we have

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1 been fighting for the last so many months is our

2 opinion is that the original design was based on  
3 non-ASR concrete. In that non-ASR concrete the  
4 design codes provide an implicit relationship  
5 between the concrete compressive strength and the  
6 shear strength and the bond strength. For instance,  
7 if you have a compressive strength of 100 psi it  
8 tells you shear strength will be so much percentage  
9 of the compressive strength. Because of the  
10 cracking in the concrete the tensile strength  
11 obviously is -- because cracks is reduced  
12 appreciably more than the compressive strength.  
13 Similarly, the elastic modulus, similarly the shear  
14 strength which is a function of tensile strength.  
15 I would like to note here that based on  
16 our RAIs for the last 18 months the applicant has  
17 finally changed their approach on this issue. And  
18 applicant has finally concluded that the compressive  
19 strength results alone are not sufficient to manage  
20 the aging of the ASR.

The applicant has offered to opportunistically inspect inaccessible or buried concrete, but Mr. Sheikh gives a sense of scale; in the process pointing out how what NextEra proposes is dwarfed by the enormity of the problem:

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17 As we understand now there are 19  
18 structures which are affected by ASR based on the  
19 extended condition investigation performed by the  
20 applicant. Most of these structures are located  
21 below grade and they are subjected to about 30 to 40  
22 feet of groundwater. Some of these structures are  
23 exposed to about 80 feet of groundwater.

24 MR. BARTON: What was that? How many

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1 feet?

2 MR. SHEIKH: Eighty feet.

3 MR. BARTON: Eight zero?

4 MR. SHEIKH: Right.

5 MR. BARTON: Okay.

6 MR. SHEIKH: But now we understand today

7 that there are some structures which are above grade

8 and they also have ASR.

As Friends/NEC stated above, the applicant has yet to articulate a plan for active management of ASR, such as replacing failed waterproof membrane. There is no sign of a cost/benefit analysis for such an undertaking and worst, no sign that NextEra has even

considered it. It is Friends/NEC's position that NRC should reject any plan that includes operating a nuclear plant with safety-related concrete structures in a degraded condition with no consideration of mitigating actions for a 20-year PEO that doesn't commence for 20 years.

9 As the applicant stated the  
10 waterproofing membrane which was provided during  
11 construction on these walls is not functioning. And  
12 they don't -- Seabrook does not have a groundwater  
13 dewatering system which would prevent the ingress of  
14 water into the buildings

This avoidance follows a pattern of downplaying and understating really serious aging management issues.. The containment is the largest, most safety significant structure on site, yet NextEra waffled through evaluation until it could no longer be avoided. The containment's importance to accident mitigation and support of safety-related systems, structures,, and components is not reflected NextEra's one-size-fits-all ASR monitoring plan.

15 So, after the applicant found this  
16 problem in the electrical tunnel they went into the  
17 containment building. And let's go to the next  
18 slide, please. And as applicant also showed this  
19 picture in a different way, that there was about 6  
20 feet of water in this annular space which is 4 to 6  
21 inches wide.

22 Applicant has dewatered the area and you  
23 know, they have observed and confirmed that the ASR  
24 is present in the right side of the picture where

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1 I'm looking which is the containment enclosure  
2 building. So there is no difference of opinion as  
3 far as the containment enclosure building is  
4 concerned that there is ASR present.

5 However, we have been going at the area  
6 which is the left side of the picture which is the  
7 48-inch thick containment building. Initially the  
8 applicant stated that ASR is not present in the  
9 containment concrete. Recently in response to an  
10 RAI the applicant informed the staff that they have  
11 observed pattern cracking in the concrete in two  
12 areas of the containment that was exposed to  
13 groundwater.

14 Based on the walkdown information the  
15 applicant determined that the containment concrete  
16 may be indicative of ASR. This is the exact  
17 statement from their letter. However, the applicant  
18 has not performed any further reevaluation or  
19 petrographic examination to confirm whether ASR is

20 present in the containment or not.  
21 In addition, I am not aware of any  
22 evaluation the applicant has performed about the  
23 structural integrity of the containment building if  
24 there is ASR present. The reason for my concern is  
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1 that if ASR is present the concrete is going to be  
2 degraded and we need to know over the long term what  
3 is the effect of ASR on containment.

6 MR. SHEIKH: I don't know what the  
7 extent of the problem, especially the applicant  
8 position on different issues have evolved over time.  
9 As I explained. You know, initially we were told  
10 there's no cracking. Initially we were told there's  
11 no ASR. In the recent letter they said it could be  
12 indicative of ASR and they found two cracks. So I  
13 don't know the extent of the problem.  
14 We either need to confirm there is ASR.  
15 If there is ASR they have to go through the  
16 exercise to see what's the impact of it on the  
17 containment.

18 MEMBER ARMIJO: Will you require core  
19 samples and petrographic examination from the  
20 containment to be satisfied that there is or is not  
21 ASR?

22 MR. SHEIKH: Yes, either -- yes, that's  
23 one way of looking at it. Because -- or if like the  
24 applicant has already stated now recently that the  
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1 containment concrete may be indicative of ASR. If  
2 that is the case they have to demonstrate and do  
3 further work what is the impact of this ASR on  
4 containment concrete.

At this stage of submitting a petition for leave to file a new contention, the petitioner is required to provide only sufficient information to put the licensee on notice as to the nature of the petitioner's dispute. Friends/NEC believes that it has fulfilled that requirement.

*(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding;*

Friends/NEC has raised issues of compliance with Part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants,” Section 21(a)(3), of Title 10 of the *Code of Federal Regulations* (10 CFR 54.21(a)(3)), regarding an AMP for ASR , a condition , which as Friends/NEC asserted as a preface, should have been clearly stated in its original application. The ASLB has a duty to consider any significant safety issues that come before it from whatever source. This contention in no way raises issues outside of the scope of this proceeding.

*(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding;*

The NRC must find that the LRA is in full compliance with its rules and regulations governing license renewal. It cannot make such a finding absent aging management review of passive safety-related concrete components; and approval of any resulting time-limited-aging-analysis and/or aging management plan per NUREG-1801 as an expression of 10 C.F.R. §54. Friends/NEC has raised the issue of an inadequate AMP.

*(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor’s/petitioner’s position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue;*

Friends/NEC intends to rely on the documents and sources already identified in this petition; with heavy reliance on the cited ACRS transcript (ML12207040), and upon the full panoply of relevant documents cited in the NRC Staff’s periodic Disclosures. In addition, Friends/NEC intended to rely on a broad range of technical papers and manuals on concrete aging; many of which have been posted on ADAMS. Further, Friends/NEC intends to identify and retain an expert witness should its contention be accepted.

*(vi) In a proceeding other than one under 10 CFR 52.103, provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact. This information must include references to specific portions of the*

*application (including the applicant's environmental report and safety report) that the petitioner disputes and the supporting reasons for each dispute, or, if the petitioner believes that the application fails to contain information on a relevant matter as required by law, the identification of each failure and the supporting reasons for the petitioner's belief.*

This information has been provided in the preceding sections of this petition.

Friends/NEC specifically disputes the validity of the following Alkali Silica Reaction Monitoring Supplement to the LRA, noting in addition to the foregoing discussion that NextEra, which could not identify ASR without a laboratory test and over an initial period of fifteen months, now asserts that "ASR is s detected by visual observation of cracking on the surface of the concrete. The cracking is typically accompanied by the presence of moisture and efflorescence. Concrete affected by expansive ASR is typically characterized by a network or "pattern" of cracks." As stated above, Friends/NEC disagrees. ASR may be identified, but it not characterized in the sense of quantification or state of progress by visual examination.

#### A.2.1.31A ALKALI-SILICA REACTION (ASR) MONITORING

The Alkali-Silica Reaction (ASR) Monitoring Program manages cracking due to expansion and reaction with aggregates of concrete structures within the scope of license renewal. The program is consistent with the ten elements of an acceptable aging management program as described in NUREG-1800 Appendix A.1, Section A.1.2.3 and Table A.1-1.

The Structural Monitoring Program performs visual inspections of the concrete structures at Seabrook for indications of the presence of alkali-silica reaction (ASR). ASR is detected by visual observation of cracking on the surface of the concrete. The cracking is typically accompanied by the presence of moisture and efflorescence. Concrete affected by expansive ASR is typically characterized by a network or "pattern" of cracks. ASR involves the formation of an alkali-silica gel which expands when exposed to water. Microcracking due to ASR is generated through forces applied by the expanding aggregate particles and/or swelling of the alkali-silica gel within and around the boundaries of reacting aggregate particles. The ASR gel may exude from the crack forming white secondary deposits at the concrete surface. The gel also Enclosure 2 often causes a dark discoloration of the cement paste surrounding the crack at the concrete surface. If pattern or map cracking typical of concrete affected by ASR is identified, an evaluation will be performed to determine further actions.

To manage the aging effects of cracking due to expansion and reaction with aggregates in concrete structures, the existing Structures Monitoring Program, B.2.1.31, has been augmented by this plant specific Alkali-Silica Reaction (ASR) Monitoring Program, B.2.1.31A. The ASR Monitoring Program is structured



according to the guidelines in ACI 349.3R, "Structural Condition Assessment of Buildings."

ASR is detected by visual observation of cracking on the surface of the concrete. The cracking is typically accompanied by the presence of moisture and efflorescence. Monitoring of crack growth is used to assess the long term implications of ASR and specify monitoring intervals.

A Combined Cracking Index (CCI) and Individual Crack Width criteria are established as thresholds at which structural evaluation is necessary. The CCI represents the expansion along the entire perimeter of the 20-inch by 20-inch square. A CCI of less than the 1.0 mm/i and Individual Crack Width of less than 1.0 mm can be deemed acceptable with deficiencies. Deficiencies determined to be acceptable with further review are trended for evidence of further degradation. A CCI of 1.0 mm/im or greater, or an Individual Crack Width of 1.0 mm or greater requires structural evaluation.

The Alkali-Silica Reaction (ASR) Monitoring Program will monitor at least 20 locations that represent the highest CCI values recorded during the baseline inspections. Follow-up inspection of these locations will be performed at six month intervals.

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**Additional Criteria Under 10 C.F.R. § 309 (f) (2) Which May Apply to Late-Filed Contentions**

- (i) *The information upon which the amended or new contention is based was not previously available; and*
- (iii) *The amended or new contention has been submitted in a timely fashion based on the availability of the subsequent information.*

As stated above, the ACRS transcript, published July 26, 2012, is new material information that provides the basis for Friends/NEC dispute with NextEra. 30 Days from the time of its publication lapsed on Saturday, August 25, 2012. This petition is submitted on the following Monday, August 27, 2012, per 10 C.F.R. § 2.306 - Computation of Time.

- (ii) *The information upon which the amended or new contention is based is materially different than information previously available;*

The formally-stated opinions of NRC Staff technical experts, per the ACRS Transcript, were not previously available nor were any such material opinions previously provided to the Board and the parties.

#### IV. CONCLUSION

Friends/NEC believes that it has satisfied all of the conditions for admission of a new contention and now respectfully pleads to be allowed to represent the health and safety interests of its members and constituents in the matter of NextEra's flawed plan for monitoring alkali-silica reaction in safety-related concrete structures at the Seabrook nuclear station. For the reasons stated, Friends/NEC respectfully requests that the Atomic Safety and Licensing Board grant leave to file its contention.

#### V. CONSULTATION CERTIFICATION PURSUANT TO 10 C.F.R. § 2.323(b)

Representative for Friends/NEC, Raymond Shadis, hereby certifies that on July 9, 2012, we contacted counsel for the applicant and the NRC staff in an attempt to obtain their consent to an initial version of this Motion and on August 6, 2012, we contacted counsel for the applicant and the NRC Staff in an attempt to obtain their consent to this (final) version of this motion. . We did not however reach accord. Counsel for the applicant stated that NextEra would oppose the contention. Counsel for the NRC staff stated that a response would be forthcoming upon review of the entire contention.

Respectfully submitted this 26<sup>th</sup> day of August, 2012,

*Signed (electronically) by*

Raymond Shadis

*Representative of the Intervenors*

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
NextEra Energy, LLC	)	Docket Nos. 50-443
	)	
(Seabrook Station, Unit 1)	)	ASLBP No. 10-906-02-LR-
BD01	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing FRIENDS OF THE COAST AND NEW ENGLAND COALITION'S MOTION (WITH SEPTEMBER 19, 2012 CORRECTIONS) FOR LEAVE TO FILE A NEW CONTENTION CONCERNING NEXTERA ENERGY SEABROOK'S AMENDMENT OF ITS AGING MANAGEMENT PROGRAM FOR SAFETY-RELATED CONCRETE STRUCTURES, has been served upon the following by the Electronic Information Exchange, this 21st day of September, 2012:

**Executed in Accord with 10 CFR 2.304(d)**

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Coast  
and New England Coalition  
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