

12

**Lehman, Bryce**

**From:** Conte, Richard (R)  
**Sent:** Saturday, November 05, 2011 9:34 AM  
**To:** Barkley, Richard; Morey, Dennis; Plasse, Richard; Spencer, Mary  
**Subject:** RE: Proposed Email to Ms. Grinnell

Some softer word choices and don't allude to budget process, if we need to do independent testing, we will.

With regard to concrete core sample testing, the licensee is conducting this testing using one of their contractors and the NRC staff is overseeing that work to ensure quality measures are applied. At this point the NRC staff does not see the need to do independent testing. We continue to review the licensee's sample selection process, as well as the contractor's test results, in the course of our review of the ASR issue.

---

**From:** Barkley, Richard (R)  
**Sent:** Friday, November 04, 2011 4:59 PM  
**To:** Morey, Dennis; Plasse, Richard; Spencer, Mary; Conte, Richard  
**Subject:** RE: Proposed Email to Ms. Grinnell

Dennis,

I'll indicate that "Task Interface Agreements are internal agency documents traditionally not released to the public; however, due to a Freedom of Information Act (FOIA) request for this document, and recent administration policy changes regarding withholding documents under FOIA, the subject TIA will be released publicly in the near future."

Regarding the concrete testing issue, I will indicate the following:

"With regard to concrete core sample testing, please note that the licensee is conducting this testing using one of their contractors. The NRC cannot take destructive test samples from a licensee facility, although the agency could have an NRC contractor performing testing on samples supplied by the licensee. At this time, the agency is neither planning nor budgeted to perform such tests. Rather the agency will review the licensee's sample selection process, as well as the contractor's test results, in the course of our review of the ASR issue."

Richard S. Barkley, PE  
Technical Communications Assistant

(610) 337-5065

(b)(6) (Cell)

9/13

---

**From:** Morey, Dennis (M)  
**Sent:** Friday, November 04, 2011 3:23 PM  
**To:** Plasse, Richard; Spencer, Mary; Barkley, Richard  
**Subject:** RE: Proposed Email to Ms. Grinnell

Richard,

Are we going to respond on the TIA issue in this letter? Also, Ms. Grinnell says that NRC is testing concrete; are we going to respond to that?

Thanks,

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 6  
FOIA- 2012-0119

E/3

## ***Dennis Morey***

---

**From:** Plasse, Richard  
**Sent:** Friday, November 04, 2011 3:05 PM  
**To:** Spencer, Mary; Morey, Dennis  
**Subject:** FW: Proposed Email to Ms. Grinnell

fyi

---

**From:** Barkley, Richard  
**Sent:** Friday, November 04, 2011 2:52 PM  
**To:** Raymond, William; Burritt, Arthur; Miller, Ed; Plasse, Richard; Conte, Richard  
**Subject:** Proposed Email to Ms. Grinnell

**See how this looks, and if there are any inaccuracies. Any other points I should address:**

Debbie,

I spoke with Bill Raymond, Ed Miller and Rick Plasse regarding your questions and various inquiries for information related to Seabrook Station. Here is what I have learned to date:

- 1) You made an inquiry regarding the Annual Effluent Release report for Seabrook for the last year. The issuance of that report was delayed, but it has since been received by the NRC and a copy was forwarded to you by Mr. Miller;
- 2) You asked for a copy of the OSART report. Please note that this document is not an NRC-prepared report, but rather one prepared by members working for the International Atomic Energy Agency in Vienna, Austria. We understand that this report is still in concurrence within the IAEA. While we expect to receive a copy of the document in the future, providing a copy of this document to the NRC is not a regulatory requirement. If the document is issued to the NRC, we'll see that the C-10 organization gets a copy;
- 3) You indicated that you are holding an educational forum on Seabrook's relicensing in November in Newburyport, MA. Given other agency commitments, we cannot personally support such a forum at this time, but will continue to meet with the public in the Seabrook Station area in the future; and,
- 4) You asked for a variety of documents related to the Alkali-Silica Reaction (ASR) noted in sections of concrete walls at Seabrook Station. At this time, we have publicly released all information submitted to the NRC on this subject.

With regard to the ASR issue, this issue remains under NRC review. As noted by the licensee in an August 11, 2011, letter to us (see excerpt below), the agency has a number of questions regarding the long-term aging management plan for this issue. The licensee has committed to provide a long-term plan, as well as its technical basis, by March of 2012. As a result, the issuance of a Safety Evaluation Report in this matter by the agency has been pushed back many months. As indicated at the Annual Assessment Meeting in June 2011, there is no indication that the ASR issue has rendered any structure at Seabrook Station incapable of performing its safety function at this time.

Your inquiries have suggested that the agency is holding a large amount of internal and licensee documentation in this matter, information which has not been released to the public. This is not the case. This issue is little different than any of the other technical issues under review by the agency in that we review the information publicly submitted by the licensee, and as necessary in the course of our follow-up inspections, review information in the possession of the licensee. Thus while the agency has unfettered access to such licensee records (e.g., concrete core sample test results, among others), these documents are not submitted to the NRC and thus not available for public review. As noted in our inspection reports, while all information we review is referenced in the report, almost all of the documents referenced remain in the possession of the licensee. As a point of reference, licensee document management systems contain literally millions of

documents dating back to the construction of the facility, documents which the agency accesses as necessary, but only a subset of which are formally submitted to the NRC.

When the licensee's future submittal(s) on this subject are received, we will ensure that the C-10 organization is readily provided copies. Mr. Plasse indicated that he recently received several licensee responses to other agency Requests for Additional Information (RAIs) – He will see that you get them shortly, although this information is also available in ADAMS.

With regard to past water intrusion at the facility, leakage into elevations of buildings below the water table are not an unexpected occurrence. Concrete is a somewhat porous material, even when it is several feet thick; thus water will tend to migrate through it unless it is very effectively sealed. (To make the containment building virtually leak-tight post-accident, it is provided with a steel inner liner as a vapor barrier. However, other buildings are not equipped with such barriers.) As you noted, the membrane barrier installed during construction of the Seabrook facility developed leaks over time, allowing water under hydrostatic pressure to come in contact with the concrete at certain locations.

Such water intrusion has traditionally not been a safety concern at a nuclear power plant as it has not been shown to cause degradation over time. Concrete in contact with water is a routine occurrence – Our nation's tunnels, underground concrete piping, and bridge pylons are typical examples. What is unique is the interaction of that water with the alkali materials in the concrete and the silica indigenous to the aggregate used at Seabrook Station, resulting in a reduction in the strength of the concrete to varying degrees. Thus while our inspectors have noted water intrusion in the past, it was only recently that the ASR issue was identified as a degradation problem at Seabrook Station.

Finally, you made mention to me regarding the extent of water intrusion at the facility, indicating that areas of the facility (including electrical cable areas) were flooded by this intrusion. The only area where significant amounts of standing water were found was in the annulus between the concrete containment and the concrete shield building. However, this narrow area (about 5 feet wide) does not contain any equipment at its bottom elevation; unfortunately, it also did not contain a sump pump, thus allowing water to accumulate there. In other areas where water has intruded, it drains to the normal building drainage system and is pumped out by sump pumps. Water has been found in some electrical manholes just below grade (but above the water table) at Seabrook Station, but this water intrusion comes from rainwater in-leakage; these manholes are routinely checked and pumped out as necessary.

I trust this covers your recent questions. Since my role in Region I is to deal with external parties such as yourself, and our licensing and inspection staff is quite busy, it would help if you used me as a single point of contact going forward to obtain the information you desire. Mr. Plasse and Mr. Miller have agreed to promptly keep mailing you information submitted by the licensee on this subject; your organization is already on the distribution list for outgoing correspondence from the NRC. I'll do my best to get your organization any information available to the public as promptly as possible.

One last point – Please note that legal hearings have been requested on the Seabrook Station license renewal application. At this point in time, five (5) issues are in contention. While I am free to share information with you on a range of subjects, the litigation process limits what information I can provide on any of the issues in contention.

Thank you for your patience and understanding in this matter!

## Request for Additional Information (RAI) Follow-up B.2.1.31-1:

### Background:

By letter dated April 14, 2011, the applicant responded to a staff RAI regarding concrete degradation due to groundwater in-leakage and the occurrence of Alkali-Silica Reaction (ASR) in the concrete. The applicant stated that an extent of condition investigation regarding the ASR degradation was on-going, along with the development of a long range aging management plan. The applicant explained that the plan would not be fully developed and implemented until December 2013. The applicant's response also listed several American Society for Testing and Materials (ASTM) standards that would be used to estimate the ASR reaction rate.

### Issue:

The applicant provided no specific information about the applicability of the original operability determination conducted when ASR was initially identified. The response also lacked specific information about what tests (laboratory and in-situ) would be conducted and when. The response also made no mention of how possible reductions in concrete shear strength were being estimated and addressed. In addition, the RAI response stated that cores were being taken in accordance with American Concrete Institute (ACI) 228.1R-03; however, it did not address the statistical validity and size of core samples taken or planned at each location.

### Request:

1. Explain if the current operability determination remains valid until the long term aging management plan is developed and implemented.

United States Nuclear Regulatory Commission Page 6 of 13  
SBK-L-11154/ Enclosure 1

2. Explain how the concrete tests and evaluations performed so far can be used to establish a trend in degradation of the affected structures until the long term aging management plan is implemented.

3. Provide detailed and comprehensive information regarding the planned approach to addressing ASR degradation throughout the site. The description of the actions planned to test, evaluate, and mitigate ASR in the RAI response do not provide sufficient details for the staff to determine if the aging of the structures will be adequately managed during the period of extended operation.

At a minimum include a discussion of the following:

- a. The locations where monitoring or sampling will be conducted, and how these results will be used to address other susceptible locations.
- b. The frequency of the monitoring and sampling to establish a trend in degradation of the structures and rate of ASR, and why the provided frequency is adequate.
- c. Detailed information about the planned in-situ monitoring or testing and laboratory testing. This should include the test method, frequency, and schedule.
- d. How the number of concrete samples taken or planned from each structure will ensure statistical validity.
- e. How the length of core samples taken or planned will account for variation of ASR across the wall thickness.

- f. How the extent of degradation/corrosion of rebars will be established in the ASR affected areas during the period of extended operation.
- g. How the reduction in load carrying capacity in the steel embedments and anchors be established in the ASR affected areas during the period of extended operation.
- h. How the results of the petrographic examination will be used to determine quantitative damage in concrete and rate of degradation for the period of extended operation.
- i. Plans, if any, for relative humidity and temperature measurements of affected concrete areas over the long term.
- j. Plans to perform stiffness damage tests to estimate the expansion attained to date in ASR affected concrete.
- k. How the current and future rate of expansion of concrete will be determined to ensure that bond between the rebar and concrete is effective over the long term.

1. How the results of concrete compressive strength and modulus of elasticity conducted so far will be adjusted to account for future degradation during the

United States Nuclear Regulatory Commission Page 7 of 13  
SBK-L- 11154/ Enclosure 1

period of extended operation.

2. Explain how the possibility of a reduction in shear strength capacity due to ASR degradation is being evaluated and addressed since core samples are not being used to establish the tensile strength of concrete. The response should include a discussion of how the possible reduction is being quantified and how the reduction is shown to be acceptable for the period of extended operation.

#### NextEra Energy Seabrook Response

1. The current operability determination is expected to remain valid but may require modification, as discussed below. A comprehensive plan to evaluate and address ASR concrete degradation, and develop and implement a long term monitoring plan is ongoing, (See Item 2 response below).

As required by 10 CFR § 54.30(a), if information / results are identified, that impact the current operability determination, they will be evaluated and addressed accordingly. If the reviews show that there is not reasonable assurance that during the current license term, concrete affected by Alkali Silica Reaction is in compliance with applicable design codes, then NextEra Energy Seabrook will take measures under its current license, as appropriate, to ensure that the intended function of those systems, structures or components will be maintained in accordance with the current licensing basis ("CLB") throughout the term of its current license. Thus, by regulation, compliance with the CLB must be maintained until the long term aging management plan is developed and implemented.

As noted in the current operability determination, the areas of concrete affected by Alkali Silica Reaction are in compliance with the applicable design codes stated in the CLB. Structural integrity of the affected structures is fully qualified and all system, structures, and components housed within the structures are capable of performing their design function. The long term effects of the ASR condition are being monitored by the Structures Monitoring Program and the status of the condition is included in the Structures Health Report which, reports the results of subsequent investigations and testing to the Plant Health Committee. Should the condition degrade further, a higher level of qualification analysis will be employed to

demonstrate that significant margin exists for operability.

2. Detailed and comprehensive information regarding the planned approach to addressing ASR degradation throughout the site will be included in an engineering, evaluation scheduled to complete in March 2012. The content of the evaluation will include: discussion of degradation mechanisms in concrete, identification of areas susceptible to ASR, progress of in-situ testing of concrete and impact on current licensing basis calculations and analyses, progress of lab testing to establish ASR degradation rates in concrete, and mitigation techniques. Specific questions presented in Follow-up RAI B.2.1.31-1, items 2 through 4, will be addressed in this evaluation. NextEra Energy Seabrook plans to update the structures monitoring program, as

United States Nuclear Regulatory Commission Page 8 of 13  
SBK-L- 11154/Enclosure 1

appropriate, to manage aging related to ASR in concrete structures based on the engineering evaluation results.

3. Discussion Items 3a through 31 will be addressed in the evaluation described in Item 2 above.

4. See Item 2 response above.

Richard S. Barkley, PE  
Technical Communications Assistant

(610) 337-5065

(b)(6) (Cell)

EX-6