

Group 4

FOIA/PA NO: 2013-0332

**OFFICIAL RECORDS TO BE MADE
PUBLICLY AVAILABLE IN ADAMS**

Heater, Keith

From: Floyd, Niklas
Sent: Tuesday, September 17, 2013 12:59 AM
To: Heater, Keith
Subject: FOIA: Response to Request - Reg Process Outline - Seabrook ASR

From: Conte, Richard
Sent: Thursday, February 07, 2013 7:57 AM
To: Khanna, Meena
Cc: Murphy, Martin; Thomas, George; Floyd, Niklas; Chaudhary, Suresh; Cook, William; Trapp, James; Raymond, William
Subject: RE: Response to Request - Reg Process Outline - Seabrook ASR

Yes thanks but I appreciate George's attentiveness to the discussion yesterday and I think he is right. I revisited the words after the call

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I am happy with the guidance and approach on 5071(e) which the licensee is obligated to do based on the requested analysis that was a part of the CAL. Thanks for that insight.

From: Khanna, Meena
Sent: Wednesday, February 06, 2013 6:48 PM
To: Conte, Richard
Subject: RE: Response to Request - Reg Process Outline - Seabrook ASR

Rich, I will be meeting with George Thomas and Kamal Manoly and will update the 1 pager on the licensing outline regarding your 50.55a question..thanks.

From: Conte, Richard
Sent: Wednesday, February 06, 2013 12:11 PM
To: Lamb, John; Khanna, Meena
Cc: Trapp, James; Schroeder, Daniel; Dentel, Glenn; Cook, William; Raymond, William
Subject: RE: Response to Request - Reg Process Outline - Seabrook ASR

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From: Lamb, John
Sent: Wednesday, February 06, 2013 9:37 AM

To: Conte, Richard; Khanna, Meena
Cc: Trapp, James; Schroeder, Daniel; Dentel, Glenn; Cook, William; Raymond, William
Subject: RE: Response to Request - Reg Process Outline - Seabrook ASR

Rich,

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Cc: Lamb, John; Trapp, James; Schroeder, Daniel; Dentel, Glenn; Cook, William; Raymond, William
Subject: RE: Response to Request - Reg Process Outline - Seabrook ASR

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There also is no discussion on how this relates to operability determination guidance – defacto design change – and the problematic issue that two PODs of varying quality have traversed several operating cycles.

No email response desired – just heads up on my questions. We can discuss this PM.

From: Khanna, Meena
Sent: Tuesday, February 05, 2013 3:40 PM
To: Conte, Richard; Cook, William; Raymond, William
Cc: Lamb, John
Subject: RE: Response to Request - Reg Process Outline - Seabrook ASR
Importance: High

Rich, Bill, and Bill,

I apologize for the delay in getting back to you regarding your requests related to a regulatory process for the Seabrook ASR issue. We held a meeting with Harold Chernoff, whereby he provided us with some recommendations with regards to your questions, which are outlined in the attachment. We will discuss this at tomorrow's meeting and can address any questions as well. Pls share with any others, as appropriate.

Thanks.

Chaudhary, Suresh

From: Raymond, William
Sent: Tuesday, July 03, 2012 3:03 PM
To: Thomas, George; Sheikh, Abdul; Chaudhary, Suresh; Buford, Angela
Cc: Conte, Richard; Cook, William
Subject: Calculation C-S-1-10168

George,

Calculation C-S-1-10168, which updates the POD for the EOC buildings using the Interim Assessment assumptions on reduced shear and bond strength, is now posted to Certrec.

Bill

From: Raymond, William
Sent: Tuesday, July 03, 2012 2:43 PM
To: Thomas, George; Sheikh, Abdul; Conte, Richard; Cook, William; Chaudhary, Suresh
Cc: Buford, Angela
Subject: RE: Mortar Bar Testing and Results

Agree, George, the standards are silent on alkali exhaustion. In those areas that had been chronically wet to allow ASR to advance to the state it was found in 2010, NextEra had hoped (outside chance) that the tests would show the alkali had been exhausted and thus the reaction had reached (or was reaching) an end point. This hope was not realized.

From: Thomas, George
Sent: Tuesday, July 03, 2012 2:36 PM
To: Sheikh, Abdul; Raymond, William; Conte, Richard; Cook, William; Chaudhary, Suresh
Cc: Buford, Angela
Subject: RE: Mortar Bar Testing and Results

Another clarification of point #3 made by Bill: The C1260 and C1293 tests are meant specifically to detect/screen for aggregate reactivity only – for the Seabrook case it confirms that the aggregate is reactive and gives a qualitative assessment of residual reactivity by comparing results from the two types of samples used. These tests do not say anything about alkali exhaustion in the concrete..

From: Sheikh, Abdul
Sent: Tuesday, July 03, 2012 2:25 PM
To: Thomas, George; Raymond, William; Conte, Richard; Cook, William; Chaudhary, Suresh
Cc: Buford, Angela
Subject: RE: Mortar Bar Testing and Results

Bottom line on the test results is that there is a lot of expansion and reactivity left over the long term in the ASR affected concrete structures (cracked areas). This can continue with continuous ingress of ground water into the walls. The aggregates from the cracked area reached 0.10 limit in 7 days as compared to 5 days in the non cracked areas.

From: Thomas, George
Sent: Tuesday, July 03, 2012 1:17 PM
To: Raymond, William; Conte, Richard; Cook, William; Chaudhary, Suresh
Cc: Buford, Angela; Sheikh, Abdul
Subject: RE: Mortar Bar Testing and Results

Just a clarification/correction on Bill's email below: Reactive forms of silica needed for ASR comes from the aggregate. The alkalis (sodium hydroxide and potassium hydroxide) needed for ASR comes primarily from the cement. The

aggregate could also contribute to this. In addition, moisture is needed for the ASR gel to expand and cause cracking – this moisture could come from ground water, rain, snow, humidity in the atmosphere, and water in the concrete itself. For the below-grade structures at Seabrook, it is primarily coming from ground water.

From: Raymond, William
Sent: Tuesday, July 03, 2012 10:50 AM
To: Conte, Richard; Cook, William; Chaudhary, Suresh
Cc: Thomas, George; Buford, Angela; Sheikh, Abdul
Subject: RE: Mortar Bar Testing and Results

Rich,

The file on Certrec is the test report prepared by SGH in Mass. I am not aware of any other assessment NextEra's may have regarding the results.

I think it is premature to say much more at ACRS other than the tests are done, the results indicate the structural concrete is still reactive, and NRC staff review of the matter is in progress.

Bill Cook – look at the last bullet of the conclusions from the SGH report....

- "the nonreacted concrete cores show no evidence of ASR in the field because the conditions of exposure are not conducive to initiating and sustaining ASR within the hardened concrete at that location."

This just reaffirms that reactive concrete without water (moisture) will not degrade due to ASR. A Root Cause Evaluation which does not identify ground water as causal would "miss the mark," as would an engineering "mindset" that fails to deal with continued exposure to groundwater as a problem for the structures long term serviceability.

Quick answers to your questions:

- 1) The silica comes from the cement; the alkali comes from the aggregate. There is a question as to how much alkali can be contributed by the groundwater for in-place structures.
- 2) We can pursue this with NextEra. I think the ASTM C1260 limitations were that the tests could produce false negative results. I have not heard that they can produce false positive results. If the concrete grows, it is reactive. If it does not expand in 16 days maybe the concrete reaction rate is slow enough that the expansion cannot be measured in 16 days.
- 3) The conclusion one can reach from the ASTM C1260 results is that the alkali in the concrete has not been exhausted and there is an expectation that the structures would continue to degrade from ASR in the continued presence of water (moisture).
- 4) The test continues by leaving the specimens immersed in the water bath and periodically measuring the expansion to determine whether the reaction rate is changing or approaching an end point. The test can continue until the specimens disintegrate.

We can follow this up more with NextEra during the week of July 16th.

Bill

From: Conte, Richard
Sent: Tuesday, July 03, 2012 10:15 AM
To: Raymond, William; Cook, William
Cc: Thomas, George; Sheikh, Abdul; Auluck, Rajender; Marshall, Michael; Chaudhary, Suresh; Buford, Angela; Cartwright, William
Subject: RE: Mortar Bar Testing and Results

Added Abdul and a few others. What should we say at ACRS, most likely nothing since the CAL says the test will be completed by June 30 which I think they did AND test results will be available to NRC July 30. Is what that is on Certrec their evaluation of the test results????

I think we still need to reconcile the test limits with conclusions being brought forward by NextEra.

Perhaps our contractor can give a perspective on all this. Perhaps he should pursue something with NextEra.

The contractor seems to have had experience with core sampling and large scale testing. It appears he has ASR experience also

First obvious questions:

1. Where is the Silica coming from, aggregate or groundwater or both.
2. What are the limitations of the test, we have stated previously this ST test gives misleading results the negative ones or the positive ones.
3. If no quantitative results can be achieved from this test, is the only conclusion being the reaction continues because of a continuous supply of alkali and silica and water.
4. How does one continue with this short term test.

From: Raymond, William
Sent: Monday, July 02, 2012 4:03 PM
To: Buford, Angela
Cc: Conte, Richard; Thomas, George
Subject: Mortar Bar Testing and Results

Angela,

The mortar bar tests are described in FP100734 which has been posted to Certrec.

The tests were completed over a 16-day period per ASTM C1260.

The test samples consisted of mortar bars constructed from "recovered" aggregate taken from Seabrook structures.

The aggregates in **Mix A** samples were taken from cores removed from **structures impacted by ASR**.

The aggregates in **Mix B** samples were taken from cores removed from **non-ASR impacted structures**.

The test results after 16 days showed that samples from both mixes contain sufficient alkali for continued reactivity.

There is little difference in reactivity of the concrete in any of the structures.

The ASTM C1260 testing continues on the samples to determine if an end state can be observed.

The results are copied below for your convenience:

- The average percentage of expansion data (relative to the zero reading) for all of the test specimens exceeds the 0.1% limit provided as a guideline in ASTM C1260 that represents the threshold for determining if an aggregate source contains potentially deleteriously expansive ASR aggregate.
- The slope of the expansion curves for each aggregate type (reacted and nonreacted) remains positive with no indication of approaching a condition of near zero (flat-line) expansion rate.
- There is no indication that potential for continued reactivity of the aggregate in either the reacted or nonreacted structures has been substantially lessened during service.
- Based on the plotted test data, the nonreacted aggregate (Mix B) exceeded the 0.1% limit after 5 days of exposure, while the reacted aggregate series did not exceed the limit after 7 days of exposure.
- Both aggregate sources contain reactive aggregate capable of contributing to long-term expansion.
- The test results indicate that the nonreacted concrete cores show no evidence of ASR in the field because the conditions of exposure are not conducive to initiating and sustaining of ASR within the hardened concrete at that location.

Bill

Chaudhary, Suresh

From: Raymond, William
Sent: Tuesday, July 03, 2012 3:09 PM
To: Thomas, George
Cc: Buford, Angela; Sheikh, Abdul; Conte, Richard; Cook, William; Chaudhary, Suresh
Subject: RE: Mortar Bar Testing and Results

Got it, George. Thank you for the clarification.
Bill

From: Thomas, George
Sent: Tuesday, July 03, 2012 3:05 PM
To: Raymond, William
Cc: Buford, Angela; Sheikh, Abdul; Conte, Richard; Cook, William; Chaudhary, Suresh
Subject: RE: Mortar Bar Testing and Results

Bill, the C1260 and C1293 tests are meant to test only for potential aggregate reactivity and it is primarily the aggregates that were extracted from the cores. There are other tests for alkali content (water soluble alkali content test) and overall reactivity (expansion tests directly on cores removed). You can not get alkali exhaustion from the C1260 test where the test samples are itself actually immersed in NaOH solution (not water) at 100 F to accelerate the reaction – all it can achieve is exhaustion in aggregate reactivity.

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— Thanks.

Chaudhary, Suresh

From: Conte, Richard
Sent: Tuesday, March 26, 2013 11:45 AM
To: Dentel, Glenn; Buford, Angela; Jennerich, Matthew; McKenna, Philip; Raymond, William; Cook, William; Trapp, James
Cc: Screnci, Diane; Sheehan, Neil; Floyd, Niklas; Tiff, Doug; McNamara, Nancy; Chaudhary, Suresh
Subject: FW: Summary of Telephone Conference Call Held on March 13, 2013, Between the Office of Nuclear Reactor Regulation, Office of Nuclear Regulatory Research, and Region I Concerning the Licensing Approach Pertaining to the Seabrook Station, Unit 1 Alkali Sili

Wow this got processed fast. It should NOT get attention tomorrow night since it is NOT publicly available.

This kind of lays out the direction we are headed when the CAL is closed.

But you never know that it might come up, so we should be prepared to answer.

From: Lee, Erika
Sent: Monday, March 25, 2013 4:23 PM
To: RidsRgn1MailCenter Resource; RidsNrrPMSeabrook Resource; RidsNrrLAABaxter Resource; RidsNrrDorlLpl1-2 Resource; RidsNrrDorlDpr Resource; RidsOgcMailCenter Resource; RidsNrrDir Resource; Wentzel, Michael; Cunanan, Arthur; Morey, Dennis; McIntyre, David; Dacus, Eugene; Spencer, Michael; Raymond, William; Tiff, Doug; McNamara, Nancy; Sheehan, Neil; Screnci, Diane; Johnson, Jessica; Dentel, Glenn; McKenna, Philip; Jennerich, Matthew; Trapp, James; Conte, Richard; Cook, William
Subject: Summary of Telephone Conference Call Held on March 13, 2013, Between the Office of Nuclear Reactor Regulation, Office of Nuclear Regulatory Research, and Region I Concerning the Licensing Approach Pertaining to the Seabrook Station, Unit 1 Alkali Silica R

Date: March 20, 2013

Applicant: NextEra Energy Seabrook, LLC

Facility: Seabrook Station

Subject: Summary of Telephone Conference Call Held on March 13, 2013, Between the Office of Nuclear Reactor Regulation, Office of Nuclear Regulatory Research, and Region I Concerning the Licensing Approach Pertaining to the Seabrook Station, Unit 1 Alkali Silica Reaction Confirmatory Action Letter

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Erika Lee, Administrative Assistant
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Operating Reactor Licensing
Plant Licensing Branches LPL1-1 & LPL1-2
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