

Sheehan, Neil

From: Conte, Richard *RD*
Sent: Monday, January 23, 2012 4:59 PM
To: Chaudhary, Suresh; Modes, Michael; Raymond, William; Sheikh, Abdul; Thomas, George; Shaikh, Atif
Cc: Auluck, Rajender; Burritt, Arthur; Khanna, Meena; Cline, Leonard; Cruz, Holly; Ferrer, Nathaniel; Lamb, John; Lehman, Bryce; Manoly, Kamal; Morey, Dennis; Murphy, Martin; Plasse, Richard; Sakai, Stacie; Wrona, David; Cunanan, Arthur; Screnci, Diane; Sheehan, Neil; Tift, Doug; McNamara, Nancy
Subject: Seabrook ASR Report Standalone
Attachments: 20120210 050443_2011010 Seabrook ASR Standalone.docx; Seabrook ASR Commissioners Brief Slides_ Rev9.ppt

Addressees are the inspector/reviewers. I need a concurrence review. Possible outcomes are:

1. You decline review
2. You would concur or concur with edits (provide by track changes if possible or email description)
3. You plan to invoke the agency non-concurrence or other disagreement process and would like to verbally discuss before doing so.
4. Your Division or branch in NRR has no technical objections to issuing the report.

Note I need a list of key references.

Need these answers to the above by COB Jan 27 (VY team members have to Monday noon Jan 30, 2011.

The concurrence process will start early next week. For sure I will need a no technical objections review from DE (lead) and DORL and DLR. We will also need NLO from OGC in light of the hearing.

I would like to conference at 300pm on Tuesday Jan 31, 2011 with Holly Cruz and George Thomas wrt reasonable date for TIA issuance. The report and TIA must go out simultaneously one morning at 1000am for immediate release in ADAMS.

Also attached is the latest brief of two commissioner as to what we told them as to no immediate safety concerns. This is for Dennis, Arthur and Dave who may be briefing a New Hampshire Senator later this week

Rich Conte, EB-1 Branch Chief, Region I

(610) 337-5183 (Office)

(b)(6) (NRC cell)

EX 5

(23 pages)

Seabrook Concrete Degradation

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Alkali Silica Reaction

NRC Staff Briefing to
Commissioner Svinicki

and

Commissioner Apostolakis

June 15, 2011

Agenda

- Overview of degradation mechanism
- Background and problem summary
- Current status
- Licensee actions
- NRC staff assessment and actions
- Summary

Overview of Alkali-Silica Reaction (ASR)

- Occurs over time in concrete between alkaline cement paste and reactive non-crystalline silica found in common coarse aggregates
- Requires susceptible aggregate, alkali content in Portland cement, and adequate moisture
- Forms a gel that expands and causes microcrack network
- Changes mechanical properties of concrete

Background

- June 2009 - Licensee begins walkdowns as part of license renewal application preparation; identified extensive cracking of concrete in different plant areas in association with known groundwater infiltration
- April to June 2010 - Licensee tests concrete including penetration resistance testing and 12 concrete cores from affected areas in 'B' Electric Tunnel which showed significant reduction in compressive strength and modulus of elasticity
- August 2010 - Petrographic examination of concrete cores confirmed presence of ASR
- September 2010 - Licensee completes initial operability determination concluding Control Building is operable

Background (Cont.)

- September 2010 - Licensee issues a design change package to reflect the reduction in strength and modulus of elasticity in the plant licensing basis
- October 2010 – During license renewal audit, NRC staff identified 6 feet of water in containment annulus region
 - When water removed, patterned cracking indicative of ASR identified on both primary containment and containment enclosure building
- May 2011 - Licensee takes concrete cores from 5 additional areas
 - Results of core testing are pending

Problem Summary

- Below-grade concrete structures experiencing groundwater infiltration
- Aging management review found degraded conditions in below-grade areas for several structures
- Degradation mechanism identified as or suspected to be ASR
- First nuclear plant in U.S. to experience ASR

Current Status

- Licensee continuing to evaluate the other affected buildings
- NRC ensuring adequacy of licensee's operability determination
- Quarterly resident report issued May 12, 2011
 - NCV (green) on failure to adequately monitor the Control Building for the recently discovered degradation
 - NCV (green) on failure to include transition buildings as in-scope structures in Maintenance Rule monitoring program
 - Licensing basis not exceeded based on licensee's current operability determination
- License Renewal Inspection report issued May 23, 2011
 - Report noted that the aging management review for the ASR issue is incomplete
- DE, DLR, DORL and Region I are working together to successfully resolve this issue with respect to Parts 50 and 54

Licensee's Current Operability Determination

- Structural integrity of the Control Building remains intact
- All systems and components housed within the building are operable and capable of performing their design functions
- ASR has resulted in reduction of elastic modulus of concrete and compressive strength in portions of below grade walls

Licensee Ongoing Actions

- Extent of Condition and Root Cause Review
 - Operability determination on other buildings by June 2011
 - Apparent cause review for the NCVs
 - Root cause evaluation related to ASR issue
 - Periodic operability assessments as information is developed
- Developing a comprehensive test and evaluation plan to manage ASR
 - This is not a near-term solution (2-year time-frame)

Current Staff Assessment

- Based on staff's review of licensee's current operability determination, the staff found that the degradation from the ASR has no apparent immediate safety concern because:
 - Although there was degradation, there is still significant margin between the strength available and strength needed
 - Consistent with existing non-nuclear operating experience with ASR, the degradation at Seabrook appears to be occurring slowly
 - The licensee's schedule for developing and implementing corrective actions would address the issue well in advance of the degradation reaching unacceptable levels

NRC Staff Ongoing Actions (Seabrook Specific)

- This issue is currently tracked as an Open Item in the upcoming license renewal SER
- The staff is continuing to review and challenge the licensee's current operability determination
 - The staff is engaging the licensee to better understand the effect of ASR on the plant structures to ensure functionality (Part 50) and to manage aging effects (Part 54)
- Licensee is performing an extent of condition review for other structures

NRC Staff Ongoing Actions (Generic)

- Generic communication (IN) is being prepared to inform other licensees about the ASR potential in plants with groundwater leakage (expected issuance next quarter)
- Operating Experience group has issued an internal communication and continues to follow the issue for generic applicability
- Staff continues to better understand ASR with regard to nuclear applications

Summary

- Degradation from ASR in Seabrook's concrete structures has no apparent immediate safety concern; Updated operability determinations are ongoing
- The staff continues to better understand and evaluate the effect of ASR on Seabrook's concrete structures for both functionality and aging effects
- ASR issue may impact Seabrook Station license renewal schedule