



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

September 5, 2012

MEMORANDUM TO: R. W. Borchardt
Executive Director for Operations

THRU: Eric J. Leeds, Director */RA/*
Office of Nuclear Reactor Regulation

FROM: William M. Dean */RA David C. Lew for:/*
Regional Administrator
Region I

SUBJECT: REQUEST FOR DEVIATION FROM THE REACTOR
OVERSIGHT PROCESS ACTION MATRIX TO PROVIDE
INCREASED OVERSIGHT OF THE ALKALI-SILICA REACTION
ISSUE AT SEABROOK

This memorandum requests approval to deviate from the Reactor Oversight Process (ROP) to provide increased Nuclear Regulatory Commission (NRC) oversight of the Seabrook Nuclear Generating Station. Specifically, the staff requests to conduct additional inspections and assessments associated with the degradation of concrete due to alkali-silica reaction (ASR) in safety-related concrete structures at Seabrook. Although the ROP Action Matrix would not prescribe additional oversight based on the licensee's performance in this area, the staff believes that additional inspections (hours and samples) and assessments are needed to support the review of licensee commitments and planned large scale concrete specimen testing by the licensee, the development of staff technical guidance, and stakeholder communications and outreach activities.

Background

The Seabrook Nuclear Generating Station is the first nuclear power plant in the United States to identify ASR in safety-related reinforced concrete structures. ASR is a chemical reaction in concrete which occurs over time in the presence of moisture. Water, alkaline cement paste and reactive non-crystalline silica, common in some coarse aggregates, react to form a gel that expands, causing micro-cracks in the concrete matrix. In the continued presence of water, these micro-cracks expand and affect the material properties of the concrete and, in turn, may

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adversely impact the integrity of reinforced concrete structures. The existence of ASR at Seabrook has necessitated substantial review by NRC staff regarding current operability.

To date, the NRC inspection staff and subject matter experts have used the resource flexibility allowed in the ROP to closely monitor NextEra's actions to address ASR. On March 26, 2012, the NRC issued an Inspection Report (ML120480066), in which the staff concluded that there was reasonable assurance of operability of the Seabrook concrete structures affected by ASR. On April 23, 2012, the NRC conducted a management meeting with NextEra regarding the ASR issues at Seabrook. On May 16, 2012, the NRC issued a Confirmatory Action Letter (CAL) (ML1212A172) to confirm commitments made by NextEra during the management meeting to address ASR. On July 9, 2012, the Office of Nuclear Reactor Regulation (NRR) and Region I issued an ASR Working Group Charter (ML121250588). This working group was established to provide coordination and oversight of the onsite inspections, in-office technical reviews, development of guidance, and other evaluations and assessment activities associated with the Seabrook ASR issues. This working group includes representatives from the Division of License Renewal in NRR so that they are fully engaged in efforts to address ASR.

Deviation Basis

The NRC staff needs to more thoroughly understand the ASR phenomenon and its long term impact on reinforced concrete structures at Seabrook in order to confirm the continued ability of safety related structures to perform their function. While resources for CAL follow-up are typically provided for in the ROP, the nature of this "first-of-a-kind" issue warrants additional inspection and assessment beyond that normally allocated by the ROP. The additional inspection samples as well as inspection and assessment resources will be used to: 1) inspect NextEra's completed and planned actions associated with the eleven CAL items; 2) evaluate the quality and applicability of results from the licensee's proposed large-scale concrete specimen testing; 3) provide support for the development of staff technical guidance; and, 4) continue to support communications and outreach activities for stakeholders.

Planned Actions

The ASR Working Group will continue to coordinate and oversee inspection and technical reviews associated with Seabrook CAL items. The inspection staff, with headquarters support, will continue to inspect and assess the adequacy of NextEra's efforts to address ASR at Seabrook. In addition, the staff will continue to communicate and support outreach activities to key internal and external stakeholders. Also, the staff will assess the need for generic industry communications and guidance changes, as appropriate.

The estimated increase in the level of effort above the baseline inspection program associated with the Seabrook ASR issues is 1-2 FTE for the remainder of calendar year 2012 and an additional 1-2 FTE for calendar year 2013. Contractor expenditures for calendar year 2012 are expected to be \$65,000. Projections for calendar year 2013 are approximately \$32,500. These additional resources will be taken from resources already included in the Operating Reactors business line budget for fiscal year 2012 and the fiscal year 2013 budget request.

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PROCESS ACTION MATRIX TO PROVIDE INCREASED OVERSIGHT
OF THE ALKALI-SILICA REACTION ISSUE AT SEABROOK

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Seabrook Deviation Memo
Package ML12242A363
Memo ML12242A370
Daily Note ML12242A372
Comm Plan ML12242A374

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Non-Public Designation Category: MD 3.4 Non-Public B.1 (A.3 - A.7 or B.1)

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• Prior concurrence **OFFICIAL RECORD COPY** **By email