



MEMORANDUM

TO: NDFC Members
FROM: Harry Judd
John Hart
DATE: October 20, 2016
RE: Recent media Reports Concerning Seabrook Station

There have been some reports in the media about the concrete problem at Seabrook recently. It directly relates to NextEra's ability to extend the operating life of the plant which impacts decommissioning funding so we thought a brief summary of what has been happening is warranted.

NextEra requested an amendment to the Seabrook Station operating license to include a monitoring program for the Alkali Silica Reaction ("ASR") condition at the facility. In an October 12, 2016, letter, the NRC informed the company that their review of the proposed amendment will not be completed until August 2018. Completion of that review and approval of the amendment is a prerequisite for the NRC to rule on the NextEra's 2010 request for a 20-year extension of its operating license (known as "license renewal"). So, we are probably into 2019 before a decision on license renewal by the NRC.

In 2010 NextEra submitted an application to the NRC to amend Seabrook Station's license to extend its operating life from 2030 to 2050. The NRC has approved such license renewal amendments that typically add 20 years to the operating life a nuclear power facility for most of the nation's nuclear plants. Although there have been some exceptions, the process from application to approval typically takes about two years. The roadblock for the Seabrook application was the discovery, shortly after the application was submitted, of micro cracks in many of their concrete structures. The cracking was determined to be produced by what is known as the Alkali Silica Reaction. ASR occurs when, in the presence of water, the alkali in cement reacts with silica found in many of the cement aggregates. A silica gel is then formed which expands over time causing cracking in the surrounding concrete. The water comes from the seepage of groundwater into the concrete. It is a known problem in the cement industry but it had not been seen in US nuclear power plants until Seabrook. The reaction progresses very slowly over time so without intervention it would get worse with age. Being an age-related problem, it is inextricably linked to Seabrook's license renewal. All license renewal applications must demonstrate to the regulators that they have an acceptable aging management program. Enough analysis (including subjecting a full scale model of a reinforced concrete section of the plant to accelerated aging and ASR at the University of Texas Ferguson Lab) has been done on the Seabrook ASR problem that the NRC is convinced that it is not a safety problem at this point but they will need to be convinced that NextEra

has a handle on the problem before moving forward on their application to operate beyond the expiration of their current license in 2030.

This brings us to the recent media reports about the NRC getting ready to assess whether Seabrook has a plan to adequately monitor ASR and some strong language from the NRC spokesman on the potential consequences if they don't. This stems from a separate license amendment that NextEra submitted to the NRC in August of this year detailing how they will incorporate an ASR Monitoring into their plant aging management program to support operations until 2050. Before the NRC will complete their review of the license renewal application, NextEra must get this ASR Monitoring program amendment approved. The NRC has estimated that their review of the latter will be completed in August 2018, provided there no unexpected complications arise during their review. If it is approved, the NRC will then complete their renewal application review which entails finalizing a safety evaluation report that encompasses all aspects of extended life including ASR, and required hearings before the Advisory Committee on Reactor Safeguards.

The ASR Monitoring Program that is being proposed is complex and first-of-a-kind to the NRC. NextEra's program basically involves mapping the deformations to buildings that have already occurred, developing a finite element model (FEM) of the undeformed building based on design drawings, and then inserting the ASR and other loads (overburden, creep, shrinkage, swelling and other normal loads) into the FEM model and observing if the FEM then predicts the actual deformation that has been observed for a particular building. This will provide an assessment of the predictive capability of the model. NextEra will then have to add the design basis accident loads (Loss-of-Coolant Accident, Seismic etc.) on top of these normal and ASR loads and ensure that acceptance criteria are still met.

Please contact either of us if you have any questions or would like more details on this issue.