SeabrookNPEm Resource

From: Plasse, Richard
Sent: Thursday, December 09, 2010 8:43 AM
To: Cliche, Richard
Subject: additional draft RAIs
Attachments: RAI 4.docx

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Subject: additional draft RAIs
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Created By: Richard.Plasse@nrc.gov

Recipients:
"Cliche, Richard" <Richard.Cliche@fpl.com>
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Priority: Standard
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dRAI 4.2.2-1

Background
The Seabrook LRA Tables 4.2.2-1 and 4.2.3-1 include data for the extended beltline materials (included the upper, intermediate, and lower shells of the reactor pressure vessel (RPV) and the associated welds). The NRC's Reactor Vessel Integrity Database (RVID) does not contain information for the upper shell, the upper shell axial welds, and the upper-to-intermediate shell circumferential weld of the Seabrook RPV.

Request
Discuss the procedures that you used to determine the chemistry data, initial reference temperature (RT_{NDT}), margins and initial upper shelf energy (USE) values for the extended beltline materials to demonstrate that you have applied consistent approaches in determining the above mentioned material information for all of the extended beltline materials.

dRAI 4.7.2-1

Background
The applicant is relying on the fatigue crack growth analysis in WCAP-14535-A, "Topical Report on Reactor Coolant Pump Flywheel Inspection Elimination," (ADAMS Legacy Library Accession #9601290404) as the TLAA for the reactor coolant pump (RCP) flywheels. The staff verified that the NRC endorsed the methodology and results in this WCAP report for use in a safety evaluation (SE) dated September 12, 1996 (ADAMS Legacy Library Accession #9609230010). However, in the conclusion section of the SE (Section 4.0), the staff concluded that the inspections of the flywheels should be performed even if all of the recommendations of Regulatory Guide 1.14, Revision 1, "Reactor Coolant Pump Flywheel Integrity," were met and that the inspections of the RCP flywheels should not be completely eliminated.

Issue
The applicant has not clearly linked the operating experience at Seabrook with the fatigue crack growth analysis in WCAP-14535-A. Plus, it is not clear from the TLAA discussion whether the applicant intends to be consistent with the position taken in the staff's SE of September 12, 1996 and continue the inservice inspection (ISI) of the RCP flywheels during the period of extended operation, or whether the applicant is proposing to discontinue the ISI of the RCP flywheels during the period of extended operation.

Request
1. Discuss the past examination results for the RCP flywheels at Seabrook and how those results justify the use of the WCAP-14535-A.

2. Clarify whether the applicant intends to continue the ISI of the RCP flywheels consistent the NRC's SE on WCAP-14535, dated September 12, 1996. If ISI will be performed during the period of extended operation, the staff also requests the applicant to justify what type of inspections will be performed on the RCP flywheels during the period of extended operation and the frequency that will be used for the inspections. Otherwise, the applicant is requested to justify its basis for discontinuing the ISI of the RCP flywheels if the ISI will be discontinued during the period of extended operation.

dRAI 3.3.2.3.4-1

Background

In LRA Tables 3.3.2-4 and 3.3.2-26 the applicant stated that for polymer (PVC) piping, piping components and piping elements, filter housings, and valve bodies exposed to an internal raw water environment located in the chlorination and plant floor drains systems, there is no aging effect and no AMP is proposed. The AMR line items cite generic note F and a plant-specific note, "Unlike metals, Polymers do not display corrosion rates. Rather than depending on an oxide layer for protection, they depend on chemical resistance to the environment to which they are exposed. The plastic is either completely resistant to the environment or it deteriorates. Therefore, acceptability for the use of Polymers within a given environment is a design driven criterion. Once the appropriate material is chosen, the system will have no aging effects. This is consistent with plant operating experience." LRA Table 3.0-1 defines raw water and states that it may contain contaminants including oil and boric acid, depending on the location, as well as originally treated water that is not monitored by a chemistry program.

Issue

The staff noted that it is possible that the polymeric components could be exposed to an environment of raw water that includes contaminants (e.g., high concentrations of chlorine, certain compositions of lubricating oils) that could potentially have an aging effect of cracking, blistering and loss of material due to the environment. In particular:

1. The staff believes that PVC is subject to minor to moderate attack when in a chlorine environment. The staff does not have sufficient plant-specific data to determine that this environment will not cause aging effects in the PVC components in the chlorination systems.
2. LRA Section 2.3.3.26 states that the plant floor drain system is designed to pass the runoff from the fire water system; however, these drains could contain floor runoff during normal operation. The staff does not have sufficient plant specific data to determine what potentially harmful chemical compounds flow through this piping. In particular, the staff does know the composition of lubricating oils in plant equipment that could contain compounds that will cause aging effects in PVC components.

Request

1. State why there is no aging effect requiring management for PVC components in the chlorination system due to the environment containing high concentrations of chlorine.
2. State whether the plant floor drain PVC components are exposed to chemical compounds (e.g., certain compositions of lubricating oil) that would result in an aging effect requiring management and if they are, propose an aging management program to manage the aging effect.

dRAI 3.3.2.3.29-1

Background

LRA Table 3.3.2-29, states that titanium piping, fittings and heat exchanger components exposed to either raw water (external), closed cycle cooling water (internal), or air with borated water leakage are only susceptible to either reduction of heat transfer, or there is no aging effect. The plant-specific note 3 states that titanium has superior resistance to general, pitting, crevice and microbiologically influenced corrosion in both air and water environments due to a protective oxide film. The plant-specific note 4 states that titanium does not have any aging effects in air with borated water leakage. However, titanium

in raw water (e.g. seawater) can undergo crevice corrosion at certain chloride levels and temperatures. In addition, depending on the type of titanium and the specific environment, titanium is known to be susceptible to cracking.

Issue

It is not clear to the staff how the applicant ruled out cracking or loss of material as aging effects for the various titanium components.

Request

Justify the exclusion of additional aging effects, including cracking and loss of material, for the titanium piping, fittings, and heat exchanger components. Specifically, provide information on the type of titanium alloy and its susceptibility to aging effects. If it is determined that additional aging effects need to be considered during the period of extended operation, describe how these aging issues will be managed.