SeabrookNPEm Resource

From: Plasse, Richard
Sent: Thursday, January 06, 2011 11:02 AM
To: Cliche, Richard
Subject: Draft RAI set 9
Attachments: RAI Set 9 Misc.doc

Rick,
Here is the latest DRAFT set of RAIs.
Rick

Hearing Identifier: Seabrook_License_Renewal_NonPublic
Email Number: 2240

Mail Envelope Properties (Richard.Plasse@nrc.gov20110106110100)

Subject: Draft RAI set 9
Sent Date: 1/6/2011 11:01:33 AM
Received Date: 1/6/2011 11:01:00 AM
From: Plasse, Richard

Created By: Richard.Plasse@nrc.gov

Recipients:
"Cliche, Richard" <Richard.Cliche@fpl.com>
Tracking Status: None

Post Office:

Files	**Size**	**Date & Time**
MESSAGE	56	1/6/2011 11:01:00 AM
RAI Set 9 Misc.doc	61950	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Seabrook Station
License Renewal Application
Request for Additional Information Set 9

DRAFT

RAI B.2.1.21-2

Background:

The Selective Leaching of Materials Program description in LRA Section B.2.1.21 states that the applicant's program is a new program that manages the aging effects of loss of material due to selective leaching in components made of gray cast iron and copper alloys with greater 15 percent zinc that are exposed to a raw water, brackish water, treated water (including closed cycle cooling), or ground water environment. LRA Tables 3.4.2-1 and 3.4.2-3 list filter housings and valve bodies made of gray cast iron and copper alloy greater than 15 percent zinc that are exposed to the steam (internal) environment and rely on the Selective Leaching of Materials Program to manage loss of material.

Issue:

The environment of steam (internal) is not listed in the program description of B.2.1.21 Selective Leaching of Material Program. While the staff believes that the inspection methodologies of the AMP will detect selective leaching due to exposure to steam, it is not clear to the staff whether the AMR line items are correct or the AMP description is correct in regard to the steam environment.

Request
State whether LRA Tables 3.4.2-1 and 3.4.2-3 where steam (internal) is identified as an environment for components made of gray cast iron and copper alloys are correct, or whether LRA Section B.2.1.21 where steam is not included as an environment for the Selective Leaching of Materials Program, is correct, and revise the LRA accordingly.

RAI B.2.1.21-2

Background:

Exception 1 of LRA Section B.2.1.21 Selective Leaching of Materials Program states, in part, that the applicant would deploy additional examination methods that become available to the nuclear industry to determine if selective leaching is occurring on the surfaces of components.

Issue:

The staff does not have sufficient details on (a) how the applicant will evaluate the process that might become available such as, limitations on its use, and (b) how the process would be qualified in order to detect selective leaching of the components, and as such, cannot determine the acceptability of the process.

Request:

State how the new process will be evaluated and qualified in order to be able to detect selective leaching of material on the surfaces in components made of gray cast iron and copper alloys greater than 15 percent zinc exposed to environments of interest.

RAI 3.3.1.61-1

Background:

LRA Table 3.3.1, item 3.3.1-61, addresses elastomer fire barrier penetration seals exposed to air-outdoor or air-indoor uncontrolled which are being managed for increased hardness, shrinkage, and loss of strength due to weathering. The GALL Report recommends GALL AMP XI.M26, "Fire Protection" Program to ensure that these aging effects are adequately managed for fire barrier elastomer seals. The associated AMR line items cite generic note A when they are managed by the Fire Protection Program and generic note E when they are managed by the Structures Monitoring Program. The components which cite generic note E and do not have a corresponding line item being managed by the Fire Protection Program are not fire barriers, but other types of elastomer seals, such as pressure or flood barriers.

Issue:

The staff noted that non-fire barrier elastomer seals may be constructed of materials that are subject to hardening and loss of strength due to exposure to ultraviolet light, radiation, or ozone. The staff also noted that if these elastomer seals are subject to hardening and loss of strength and exposed to ultraviolet light, radiation, or ozone, tactile examination techniques, such as scratching, bending, folding, stretching or pressing, should be performed in conjunction with visual examinations to manage the effects of aging. The applicant's Structures Monitoring Program does not include tactile examination techniques.

Request:

(1) State whether the non-fire barrier elastomer seals being managed for aging by the Structures Monitoring Program are subject to hardening and loss of strength due to exposure to ultraviolet light, radiation, or ozone; and

(2) If the materials are subject to hardening and loss of strength and exposed to these aging effects, state how the Structures Monitoring Program is adequate to manage aging for these components.

RAI 3.4.2.2-1

Background:

In LRA Table 3.4.1, items 3.4.1-8 and 3.4.1-31, the applicant stated that fouling is not an aging mechanism leading to loss of material in steel piping, piping components, piping elements, and heat exchanger components exposed to raw water because the raw water is associated with potable water from the town of Seabrook. The staff noted that the water from the town of Seabrook is extracted from wells and is chlorinated with sodium hypochlorite or calcium hypochlorite and, in wells with high iron and manganese, treated with polyphosphate to reduce plumbing fixture staining, Seabrook Water Department, "2009 Annual Report to Consumers on Water Quality." The GALL Report Section IX.F states that fouling can occur due biological activity and the deposition of sediment, silt, dust, and corrosion products.

Issue:

The staff noted that the water from the town of Seabrook used in the auxiliary steam condensate and auxiliary steam heating systems is not chemistry controlled on-site to ensure that the levels of additives are sufficient to prevent biological activity and deposition of iron and manganese mineral deposits. The staff also noted that the town of Seabrook does not guarantee the levels of water constituents at the present or during the period of the applicant's extended operation. The staff further noted that fouling by the deposition of sediment, silt, dust, and corrosion products is not precluded by the use of potable water.

Request:

State why the use of potable water from the town of Seabrook excludes fouling as an aging mechanism.

RAI 3.5.2.2.1.7-1

Background:

LRA Section 3.5.2.2.1.7, which is associated with LRA Table 3.5.1, item 3.5.1-10, addresses cracking due to stress corrosion cracking in stainless steel penetration sleeves, penetration bellows, and dissimilar metal welds. The applicant stated that its AMR results concluded that cracking due to stress corrosion cracking is not an aging effect requiring management for these components because both high temperature (> 140 °F) and an aggressive environment, which are needed for stress corrosion cracking to initiate, are not simultaneously present for any of the components. The applicant also stated that reviews of plant-specific operating experience did not identify any stress corrosion cracking of these components.

In contrast, LRA Table 3.5.2-2 for containment structures indicates that stainless steel penetration components and bellows (mechanical penetration flued heads, electrical penetration assembly, fuel transfer tube bellows and stainless steel shielding) are exposed to air indoor uncontrolled and are subject to cracking due to stress corrosion cracking in a consistent manner that GALL Report Vol. 2, item II.A3-2 identifies the aging effect of the components. LRA Table 3.5.2-2 also indicates that the applicant proposes the ASME Section XI, Subsection IWE Program to manage the aging effect for these components. In comparison, GALL Report Vol. 2, item II.A3-2 recommends the ASME Section XI, Subsection IWE Program, 10 CFR Part 50, Appendix J Program and augmented inspection to detect and manage the aging effect. The staff further noted that LRA Table 3.5.2-2 contains line items indicating that air with borated water leakage is an applicable environment for the stainless steel components.

Issue:

The staff noted that the applicant's aging management review results described in LRA Table 3.5.2-2 are in conflict with the applicant's claim described in LRA Section 3.5.2.2.1.7 and LRA Table 3.5.1, item 3.5.1-10, that cracking due to stress corrosion cracking is not applicable for the stainless steel penetration components and bellows. The staff also found a need to further clarify whether the plant-specific environment of air with borated water leakage is conducive to stress corrosion cracking and whether the applicant's proposed program is adequate to detect and manage the aging effect.

Request:

1) Provide the technical basis for claiming that an aggressive environment that could contribute to stress corrosion cracking is not present for the stainless steel penetration components and bellows. As part of the response, provide the plant-specific operating experience of the borated water leaks including the leakage source, time periods of the water leaks and corrective actions. In addition, clarify whether the air with borated water leakage environment is conducive to stress corrosion cracking of the components taking into account the potential for leaked water contamination at the component surface as described in LRA Table 3.0-2.

2) Resolve the conflict between the aging management review results described in LRA Section 3.5.2.2.1.7 and LRA Table 3.5.2-2 and clarify whether cracking due to stress corrosion cracking is applicable for the stainless steel penetration components and bellows.

3) If cracking due to stress corrosion cracking is applicable for the stainless steel penetration components or bellows as described in LRA Table 3.5.2-2, justify why the AMSE Section XI, Subsection IWE Program alone, without the 10 CFR Part 50, Appendix J Program and augmented inspection recommended in the GALL Report, is adequate to detect and manage the aging effect.

RAI 4.7.5-1

Background:

1. In LRA section 4.7.5 the applicant stated that the fatigue analysis for the design of the three fuel transfer tube bellows is based on the consideration of 20 occurrences of the Operating Basis Earthquake (OBE).

   The applicant's UFSAR Section 3.8 states that the bellows were designed to withstand the following conditions:

   - 400 OBE cycles
   - 1 accident cycle (LOCA)
   - 160 pressure test cycles
   - 1000 temperature cycles

2. In LRA Appendix A, section A.2.4.5.4 of the LRA the applicant states that the fatigue analysis for each of the three bellows is based on the consideration of 20 occurrences of the OBE, each occurrence having 20 cycles of maximum response. The applicant further states that it is projected that 1 OBE would occur in 60 years of operation but further states that the number of occurrences projected for 60 years is below the design limit of 5 occurrences of 10 cycles.

Issue:

1. The staff compared the original design cycles listed in the UFSAR to the ones listed in the LRA section 4.7.5 and is concerned that the LRA only includes fatigue analysis for OBE cycles and does not address the one accident cycle, 160 pressure test cycles, and 1000 temperature cycles that were included in the original fatigue design of the fuel transfer tube bellows.

2. The staff reviewed appendix A of the LRA and is unclear as to the number of OBE design cycles included in the fuel transfer tube bellows design. LRA appendix A states that the applicant included 20 occurrences of the OBE at 20 cycles each and then subsequently states that the design limit of 5 occurrences of 10 cycles. The staff reviewed the applicant's FSAR and could not find information to confirm that the applicant used a design limit of 5 OBE occurrences at 10 cycles.

Request:

In order to complete its review, the staff needs the following information:

1. Request that the applicant provide information to show that all considerations included in the original fatigue design are addressed for the period of extended operation.

2. Request that the applicant verify the number of OBE cycles used for the fatigue analysis of the fuel transfer tube bellows design and resolve discrepancy between the FSAR and the LRA with regards to number of OBE occurrences used in the original fatigue analysis.