Davis-BesseNPEm Resource

From: CuadradoDeJesus, Samuel
Sent: Monday, July 11, 2011 2:47 PM
To: 'custerc@firstenergycorp.com'
Cc: 'dorts@firstenergycorp.com'
Subject: Teleconference request on D-RAIs
Attachments: Letdown cooler replacement RAI -1.docx; DB RAI AMR TRP 101 SCC - Mintz_Min SG RAI 7-8-2011 v65 Tube-to-tubesheet Welds.docx

Cliff:

Attached are 2 D-RAIs our staff would like to discuss. Can we have a teleconference next Wednesday?

Regards,

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Recipients:
"'dorts@firstenergycorp.com'" <dorts@firstenergycorp.com>
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Files	**Size**	**Date & Time**
MESSAGE	390	7/11/2011 2:47:00 PM
Letdown cooler replacement RAI -1.docx	20813	
DB RAI AMR TRP 101 SCC - Mintz_Min SG RAI 7-8-2011 v65 Tube-to-tubesheet Welds.docx	22495	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
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RAI 2.3.3.18-3

Background

LRA Section 2.3.3.18, "Makeup and Purification System," states that the letdown coolers, designated as DB-E25-1 and -2, are not subject to aging management review because these components are periodically replaced and evaluated as short-lived components. Since these are normally long-lived passive components subject to aging management review, the staff issued RAI 2.3.3.18-2 requesting the basis for the replacement frequency and the circumstances surrounding the need to replace these heat exchangers.

In its response dated June 3, 2011, Davis-Besse stated that the cooler replacement frequency is based on a qualified life from plant-specific operating experience, and is scheduled approximately every 14 years. The response also stated that the cooler design "has a tendency to develop leaks" after 14 to 16 years. The response further stated that the need to replace the coolers was attributed to fatigue cracking due to flow-induced vibration, and that an extent of condition review determined that the design of these coolers is unique and no other similar heat exchangers are installed at Davis-Besse.

Issue

As previously noted in RAI 2.3.3.18-2, if the frequency is based on qualified life, then information should be provided to demonstrate that the cooler's intended function is being maintained consistent with the current licensing basis, at the point in time immediately prior to replacement. The staff notes that in accordance with SRP-LR Section A.1.2.3.4, an aging management approach based solely on detecting component failures is not considered an effective program. The staff also notes that in accordance with USAR Section 3.9.2, and Table 3.9-2, the letdown coolers are safety-related components constructed to the ASME Code, Section III, Class 3.

In addition, the staff notes that, if the design of the cooler results in "a tendency to develop leaks after…14 to 16 years," then each heat exchanger would have only been replaced twice, so far, at Davis-Besse. With the relatively limited operating experience and the limited number of data points, the ability to reasonably predict the life of the coolers appears to have a large degree of uncertainty. In addition, as noted in RAI 2.3.3.18-2, previous LRAs for other sites have attributed the fatigue cracking problem in these letdown coolers to be associated with specific operational transients, and, if a similar phenomenon is occurring at Davis-Besse, then a predicted life may need to consider transients in addition to operational time.

Request

1) Provide a summary of Davis-Besse's operating experience associated with the letdown coolers, including occurrences of tube leakage and past replacements for each cooler. Consider including the circumstances how the associated leakage from the reactor coolant system into the component cooling water system was detected, and the approximate magnitude(s) of the leakage.

2) Provide a summary of any past evaluations of the cause(s) for previous tube leakage, including how leakage was determined to be from fatigue cracks due to flow-induced vibration, and the degree and extent of the cracking identified. Include information regarding the role any

operational transients may have played in causing previous tube leakage or how it was concluded that operational transients need not be considered.

3) Provide the information that determined the cooler's intended function is being maintained consistent with current licensing basis, at the point in time immediately prior to replacement.

RAI 3.1.2.2.16-1

Background

GALL Report, Rev. 2, item IV.D2.RP-185 recommends using GALL AMP XI.M2, "Water Chemistry" and a plant-specific program to manage cracking due to primary water stress corrosion cracking (PWSCC) of steam generator tube-to-tubesheet welds made of nickel alloy. GALL Report, Rev. 2, item IV.D2.RP-185 also recommends that a plant-specific program should be evaluated to confirm the effectiveness of the water chemistry program and to ensure cracking is not occurring. Consistently, SRP-LR, Rev. 2, Section 3.1.2.2.11, item 2 states that cracking due to PWSCC could occur in steam generator nickel alloy tube-to-tubesheet welds exposed to reactor coolant. The SRP-LR, Rev. 2 also states that unless the NRC has approved a redefinition of the pressure boundary in which the tube-to-tubesheet weld is no longer included, the effectiveness of the primary water chemistry program should be verified to ensure cracking is not occurring.

By contrast, the applicant's AMR items for the steam generator components, which are described in LRA Table 3.1.2-4, do not clearly address how the applicant manages the cracking due to PWSCC of steam generator tube-to-tubesheet welds exposed to reactor coolant.

Issue

The staff found a need to clarify how the applicant manages cracking due to PWSCC of steam generator tube-to-tubesheet welds in comparison with the GALL Report and SRP-LR.

Request

1. If the applicant plans to replace the steam generators prior to the period of extended operation, provide the following information.

   (a) Describe the materials to be used for the fabrication of the new steam generator tubes, tubesheet cladding and tube-to-tubesheet welds. If any of the tubes, tubesheet cladding, and weld filler metal (if applicable) is Alloy 600 or one of its associated weld metals such the material is susceptible to PWSCC, discuss how cracking due to PWSCC of the tube-to-tubesheet welds will be managed for the period of extended operation.

   If the materials are determined not to be susceptible to PWSCC, confirm whether or not the applicant will continue to evaluate the plant-specific and industry operating experience related to PWSCC of the tube-to-tubesheet welds so that necessary corrective actions will be identified and performed to adequately manage the aging effect of the components.

   (b) In addition, if the operating experience indicates that the tube-to-tubesheet welds of the steam generators have experienced PWSCC and the applicant proposes a one-time inspection to manage the aging effect of the replacement tube-to-tubesheet welds, justify why the one-time inspection is adequate to manage the aging effect of the replacement components in view that

the existing components to be replaced have experienced cracking due to PWSCC under the given water chemistry conditions.

2. Provide the following information regarding the aging management method that the applicant will use if the steam generators are not replaced prior to the period of extended operation.

   (a) Describe the aging management method that the applicant will use to manage cracking due to PWSCC of the tube-to-tubesheet welds if the steam generators are not replaced prior to the period of extended operation. As part of the applicant's response, describe the materials of the current steam generator tubes, tubesheet cladding and tube-to-tubesheet welds, and determine whether or not any of the tubes, tubesheet cladding, and weld filler metals (if applicable) is susceptible to PWSCC.

   If the materials are determined not to be susceptible to PWSCC, confirm whether or not the applicant will continue to evaluate the plant-specific and industry operating experience related to PWSCC of the tube-to-tubesheet welds so that necessary corrective actions will be identified and performed to adequately manage the aging effect of the components.

   (b) In addition, if the operating experience indicates that the tube-to-tubesheet welds have experienced PWSCC and the applicant proposes a one-time inspection to manage the aging effect of the tube-to-tubesheet welds, justify why the one-time inspection is adequate to manage the aging effect of the components that have already experienced cracking due to PWSCC under the given water chemistry conditions.