LimerickNPEm Resource

From: Kuntz, Robert
Sent: Tuesday, May 01, 2012 2:26 PM
To: Anthony Z. Roisman; gfettus@nrdc.org
Cc: Smith, Maxwell; Kanatas, Catherine
Subject: FW: DRAFT Request for Information related to the Limerick license renewal application
Attachments: DRAFT TLAA 42 and 46 RAIs.docx

From: Kuntz, Robert
Sent: Tuesday, December 13, 2011 9:23 AM
To: 'Christopher.Wilson2@exeloncorp.com'
Subject: DRAFT Request for Information related to the Limerick license renewal application

Chris,

Attached is a DRAFT request for information related to the Limerick license renewal application. If Exelon would like clarification on the attached let me know and we can set up a teleconference.

Robert Kuntz
Sr. Project Manager
NRR/ADRO/DLR/RPB1
(301) 415-3733
robert.kuntz@nrc.gov

Hearing Identifier: Limerick_LR_NonPublic
Email Number: 220

Mail Envelope Properties (Robert.Kuntz@nrc.gov20120501142500)

Subject: FW: DRAFT Request for Information related to the Limerick license renewal application
Sent Date: 5/1/2012 2:25:48 PM
Received Date: 5/1/2012 2:25:00 PM
From: Kuntz, Robert

Created By: Robert.Kuntz@nrc.gov

Recipients:
"Smith, Maxwell" <Maxwell.Smith@nrc.gov>
Tracking Status: None
"Kanatas, Catherine" <Catherine.Kanatas@nrc.gov>
Tracking Status: None
"Anthony Z. Roisman" <aroisman@nationallegalscholars.com>
Tracking Status: None
"gfettus@nrdc.org" <gfettus@nrdc.org>
Tracking Status: None

Post Office:

Files	**Size**	**Date & Time**
MESSAGE	540	5/1/2012 2:25:00 PM
DRAFT TLAA 42 and 46 RAIs.docx	32081	

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

LIMERICK GENERATING STATION
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION

DRAI 4.2.6-01

Background

License renewal application (LRA) Table 4.2.6-1 (page 4-50) summarizes the pertinent parameters for Limerick Generating Station (LGS), Units 1 and 2 to estimate the probability of failure for the circumferential welds.

Issue

The values for fluence at 0T and shift in Reference Temperature $\Delta RT_{NDT(U)}$ (^{o}F) (without margin) do not agree with the corresponding values found in Tables 4.2.1-1 and 4.2.1-3 for fluence and Tables 4.2.3-1 and 4.2.3-3 for the temperature shift.

Request

Justify the fluence values in LRA Tables 4.2.3-1 and 4.2.3-3 in light of the apparent discrepancy discussed above.

DRAI 4.6.5-1

Background

LRA Section 4.6.5 describes the time-imiting aging analysis (TLAA) for the jet pump auxiliary spring wedge assemblies. The LRA states that the original design analysis included an evaluation for relaxation of bolt preload due to integrated neutron fluence over 40 years. The applicant determined that the analysis remains valid for the period of extended operation based on the use of Radiation Analysis Modeling Application (RAMA) fluence projections for the jet pump riser brace weld, RS-9 location, which are bounding for all locations on the jet pump, including where the auxiliary spring wedge assembly is installed. The LRA states that the RS-9 weld attaches the riser brace to the riser pipe, located at approximately the 304 inch elevation, while the auxiliary spring wedge assembly is located at approximately the 230 inch elevation, where the fluence values are lower.

Issue

The applicant did not provide sufficient information to describe how it determined the existing analysis is valid for the period of extended operation. Specifically, the staff's review identified the following issues.

(a) The RS-9 weld is located on the riser brace, which, according to LRA Table 2.3.1-3, is part of the jet pump assembly of the reactor vessel internals. The NRC staff approved use of RAMA for boiling water reactor pressure vessel fluence projection applications, but use of RAMA for reactor internals applications is subject to NRC staff review on a case-by-case basis. Therefore, it is not clear why use of RAMA is appropriate for

fluence projections on the RS-9 weld, because it is part of the reactor vessel internals, not the reactor pressure vessel.

(b) It's not clear why the fluence values at the location of the auxiliary spring wedge assembly are lower than the fluence values at the location of the RS-9 weld.

Request

1. Justify the use of RAMA for obtaining fluence projections at the location of the RS-9 weld.

2. Justify why the fluence values at the RS-9 weld location are bounding for all locations on the jet pump, including the location lower on the jet pump where the auxiliary spring wedge assembly is installed.

DRAI 4.6.6-1

Background

LRA Section 4.6.6 describes the TLAA evaluation of the jet pump restrainer bracket pad repair clamps. The LRA states that the original design analysis included an evaluation for the decrease in the clamping bolts' preload due to thermal and radiation-induced relaxation over 40 years. The LRA projected this analysis to the end of the period of extended operation. The projection is based on the assumption that the bolt preload will decrease 5 percent over 20 additional years of operation, the same decrease predicted over 40 years in the original design analysis.

Issue

The projection of this analysis relies on the assumption that the preload will decrease by 5 percent over an additional 20 years of operation; however, the LRA did not justify this assumption.

Request

Justify the assumption that the bolt preload will decrease by 5 percent over an additional 20 years of operation as a result of thermal and radiation-induced relaxation.

DRAI 4.6.6-2

Background

LRA Section 4.6.6 describes the applicant's TLAA evaluation of the jet pump restrainer bracket pad repair clamps. The LRA states that the original design analysis included an evaluation for fatigue, but it was determined that the fatigue usage would be insignificant because the stress amplitude for cyclic loads was well below the American Society of Mechanical Engineers (ASME) Code stress limit of 13,600 psi for 10^{11} cycles and less than the 10,000 psi lower limit considered for flow-induced vibration stress cycles.

Issue

The staff reviewed LRA Section 4.6.6 and determined that it includes separate analyses involving two aging effects: (1) decrease in preload due to thermal and radiation-induced

relaxation, and (2) fatigue. The applicant provided one disposition for LRA Section 4.6.6, stating that it projected the analysis to the end of the period of extended operation. However, for the evaluation of fatigue, it is not clear how the applicant projected the analysis because it did not describe changes to any parameters of the original analysis. Therefore, for its analysis of fatigue for the jet pump restrainer bracket pad repair clamps, the applicant has not provided a disposition in accordance with 10 CFR 54.21(c)(1).

Request

For the fatigue analysis of the jet pump restrainer bracket pad repair clamps, provide one of the demonstrations required by 10 CFR 54.21(c)(1):

- If demonstrating that the analysis remains valid for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(i), describe and justify why the analysis is bounding during the period of extended operation. Include in this demonstration the applicable materials and their properties, the value of the stress amplitude for cyclic loads, and the specific sources of the 13,600 and 10,000 psi stress limits to which the stress amplitude was compared.

- If demonstrating that the analysis has been projected to the end of the extended period of operation in accordance with 10 CFR 54.21(c)(1)(ii), describe and justify how the original analysis was revised.

- If demonstrating that the effects of aging on the intended function(s) will be adequately managed for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(iii), provide an aging management program and justify how it adequately manages fatigue.

DRAI 4.6.6-3

Background

LRA Section 4.6.6 describes the TLAA evaluation of the jet pump restrainer bracket pad repair clamps, and LRA Section A.4.6.6 provides a summary description of this TLAA for the UFSAR supplement. As discussed in RAI 4.6.6-2, the staff determined that LRA Section 4.6.6 describes separate analyses involving two aging effects: (1) decrease in preload due to thermal and radiation-induced relaxation, and (2) fatigue.

Issue

LRA Section A.4.6.6 describes the analysis for the decrease in preload, but it does not address the analysis for fatigue.

Request

Consistent with the response to RAI 4.6.6-2, provide for the UFSAR supplement a summary description of the TLAA evaluation for fatigue of the jet pump restrainer bracket pad repair clamps.

DRAI 4.6.9-1

Background

LRA Section 4.6.9 describes the TLAA evaluation of the jet pump slip joint repair clamps, which are subject to a loss of preload due to neutron fluence. The LRA states that the loss of preload will be managed through periodic inspections under the reactor vessel internals program. LRA Section B.2.1.9 describes the BWR vessel internals program as consistent, with enhancements, with GALL Report AMP XI.M9, "BWR Vessel Internals."

Issue

The staff reviewed GALL Report AMP XI.M9 and found that this aging management program does not manage loss of preload; therefore, it is not clear how the applicant's BWR vessel internals program will manage this aging effect.

Request

Specific to the jet pump slip joint repair clamp components subject to a loss of preload, address the following:

1. Describe the parameters that are monitored or inspected to detect the presence and extent of loss of preload. Justify how monitoring or inspecting these parameters will ensure that this aging effect is adequately managed.

2. Describe how loss of preload is detected or identified. Include in this description the method or technique, frequency, and timing of inspections, and provide justification, including references to any codes or standards, that these measures are adequate to detect loss of preload before loss of the jet pump slip joint repair clamps' intended function.

3. Describe the monitoring and trending activities and justify how they are used to predict the extent and rate of degradation so that corrective or mitigative actions can be taken or so that future inspections will occur before a loss of intended function.

4. Describe and justify the acceptance criteria for the jet pump slip joint repair clamp inspections for loss of preload, so that corrective actions are taken before loss of the components' intended function. In addition, describe and justify the corrective actions taken when the acceptance criteria are not met, such that a future recurrence is prevented.