LimerickNPEm Resource

From: Kuntz, Robert
Sent: Tuesday, May 01, 2012 2:28 PM
To: Anthony Z. Roisman; gfettus@nrdc.org
Cc: Smith, Maxwell; Kanatas, Catherine
Subject: FW: DRAFT Request for Additional Information
Attachments: DRAFT RARB AMP Audit RAIs.docx

From: Kuntz, Robert
Sent: Tuesday, November 15, 2011 9:06 AM
To: 'Christopher.Wilson2@exeloncorp.com'
Subject: DRAFT Request for Additional Information

Chris,

Attached is a DRAFT request for information. If Exelon would like clarification on the attached RAI let me know and we can set up a teleconference.

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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>
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Tracking Status: None

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Options
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LIMERICK GENERATING STATION
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION

DRAI B.2.1.4-1

Background
The license renewal application (LRA), Section B.2.1.4, states that the boiling water reactor (BWR) Vessel Inside Diameter (ID) Attachment Welds Program is an existing condition monitoring program that manages the effects of cracking of reactor vessel internal attachment welds. The program also manages the effects of loss of material due to wear of the steam dryer support brackets. The LRA states that the program incorporates the inspection and evaluation recommendations of BWR Vessels Internal Program (BWRVIP)-48-A. The Generic Aging Lessons Learned (GALL) Report aging management program (AMP) XI.M4 indicates that the program is focused on managing the effects of cracking.

Issue
During its audit, the staff noted that the applicant manages the effects of loss of material due to wear of the steam dryer support brackets by using a VT-3 inspection as part of the BWR Vessel ID Attachment Welds Program. The staff noted that loss of material is not addressed in GALL Report AMP XI.M4 or BWRVIP-48-A. Therefore, it is not clear to the staff whether the VT-3 inspection is an appropriate and effective inspection method to identify loss of material of the steam dryer support brackets.

The staff noted that since BWRVIP-48-A does not manage loss of material, the applicant has not identified the acceptance criteria for the inspections of steam dryer support brackets and associated corrective actions if the acceptance criteria are not met. Furthermore, the staff noted that the applicant's plant-specific implementation procedure for the BWR Vessel ID Attachment Welds Program does not include the inspection of steam dryer support brackets.

Request
1) Justify that a VT-3 inspection is an appropriate and effective inspection method to identify loss of material due to wear for the steam dryer support brackets.

2) Identify the acceptance criteria for the inspection of the steam dryer support brackets and justify that it ensures the intended functions of these components are maintained. Describe and justify the associated corrective actions if the acceptance criteria are not met.

3) Confirm that the implementation procedure for this program has been revised to include the use of a VT-3 inspection, and the associated acceptance criteria and corrective actions for the steam dryer support brackets.

4) Revise Updated Final Safety Analysis Report (UFSAR) Supplement in LRA Section A.2.1.4 to include a description of how this program manages the effects of loss of material due to wear of the steam dryer support brackets.

DRAI B.2.1.7-1

Background
GALL Report AMP XI.M7 states that NUREG-0313, Revision 2 and NRC Generic Letter (GL) 88-01 delineate the guidance for selection of resistant materials and processes that provide resistance to inter granular stress corrosion cracking (IGSCC) such as solution heat treatment and stress improvement processes. LRA Section B.2.1.7 states that this program implements the program delineated in NUREG-0313, Revision 2, GL 88-01 and it's Supplement 1.

During the audit, the staff noted that the applicant's inservice inspection program plan indicates that the following welds of Limerick Generating Station (LGS) Units 1 and 2 are made of Alloy 182 with Alloy 182 weld butter: (1) recirculation outlet nozzle to safe end welds for Loops A and B, (2) jet pump instrumentation nozzle to safe end welds for Loops A and B, and (3) control rod drive retune nozzle to cap welds. Based on the guidance in GL 88-01, Attachment A, "Staff Position on Materials," the Alloy 182 welds of LGS Units 1 and 2 are not resistant to IGSCC.

In addition, the applicant's inservice inspection program plan described above indicates that ultrasonic examinations of Alloy 182 reactor pressure vessel nozzle to safe end welds (i.e., welds incorporating Alloy 182 welds and/or weld butters) at several BWR facilities have resulted in the detection of cracking, which appears to have initiated as IGSCC in the Alloy 182 weld butter.

During the audit of the onsite documentation, the staff noted that the onsite documentation indicates that the Alloy 182 welds of LGS Unit 1 are categorized to IGSCC Category C, consistent with the GL 88-01 guidance that Alloy 182 is not a resistant material (Category A). By contrast, the absence of the LGS Unit 2 Alloy 182 welds in the applicant's list for the IGSCC Category-B-through-G welds suggests that these welds are categorized to IGSCC Category A (resistant material).

Issue
The IGSCC categories of the welds in the BWR Stress Corrosion Cracking Program are used to determine the inspection extent and frequency in accordance with GL 88-01 and BWRVIP-75-A. However, the applicant's program basis document and onsite documentation indicate that the Alloy 182 welds of LGS Unit 2 are categorized to IGSCC Category A (resistant material), which is inconsistent with GL 88-01. The staff found a need to further clarify the following items regarding the Alloy 182 welds of LGS Unit 2: (1) the proper IGSCC categories of these welds, (2) the basis of the applicant's categorization of these welds, and (3) consistency of the applicant's categorization with GL 88-01 and the IGSCC categorization of the LGS Unit 1 Alloy 182 welds.

Request
1) Describe the IGSCC categories of the LGS Unit 2 Alloy 182 welds listed in the inservice inspection plan.

2) Provide the basis for the IGSCC categorization of the LGS Unit 2 Alloy 182 welds. As part of the response, if any of these LGS Unit 2 Alloy 182 welds is categorized as Category A, further clarify why the welds are categorized as IGSCC resistant welds, inconsistent with GL 88-01 and the weld categorization of the LGS Unit 1 Alloy 182 welds to IGSCC Category C.

DRAI B.2.1.8-1

Background
The "parameters monitored/inspected" program element of GALL Report AMP XI.M8, "BWR Penetrations," states that the program manages the effects of cracking due to stress corrosion cracking (SCC) and IGSCC of the BWR instrumentation nozzles, control rod drive (CRD) housing and incore-monitoring housing (ICMH) penetrations, and BWR standby liquid control (SLC) nozzles/Core ΔP nozzles. The GALL Report also states that the program accomplishes this through inspection for cracks in accordance with the guidelines of BWRVIP-49-A, BWRVIP 47-A or BWRVIP-27-A, and the requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI, Table IWB 2500-1.

The BWR Penetrations Program basis document states that the program monitors the effects of cracking due to SCC and IGSCC by performing inspections of the instrumentation nozzles and CRD housing and incore-monitoring housing penetrations as part of the inservice Inspection program. The program basis document also states that currently, BWRVIP-47-A does not require additional inspections of the CRD housing and incore-monitoring housing penetrations.

Section 3.2.5, "Other Inspections," of BWRVIP-47-A indicates that the BWRVIP has determined that removing or dismantling of internal components for the purpose of performing inspections is not warranted to assure safe operation; however, on occasion, utilities may have access to the lower plenum due to maintenance activities not part of normal refueling outage activities. BWRVIP-47-A also states that in such cases, utilities will perform a visual inspection to the extent practical and the results of the inspection will be reported to the BWRVIP, who will report these results to the NRC.

In addition, the NRC's final safety evaluation of BWRVIP-47, as enclosed in NRC letter dated October 13, 1999, indicates that by letter dated June 1, 1999, the BWRVIP stated that in addition, as access is provided for components in the lower plenum region, visual examination will be performed to the extent practical. The staff noted that this response of the BWRVIP is consistent with the guidance in Section 3.2.5, "Other Inspections," of BWRVIP-47-A.

Issue
In contrast with the guidance in Section BWRVIP-47-A, the applicant's program does not require additional inspections for the lower head penetrations (including stub tubes and their associated welds). In addition, it is not clear to the staff whether or not the results of the inspections performed in accordance with Section 3.2.5 of BWRVIP-47-A are consistent with the applicant's conclusion that the aging effects will be adequately managed.

Request

1) Justify why the "parameters monitored/inspected" program element of the BWR Penetrations program indicates that BWRVIP-47-A does not require additional inspections for the CRD housing and incore-monitoring housing penetrations (including the stub tubes and their associated welds) in addition to the requirements of ASME Code Section XI.

   If it cannot be justified, revise the program basis document, consistent with BWRVIP-47 A, and describe the revision made to the program basis document.

2) Describe and discuss, if any, the results of the inspections performed in accordance with Section 3.2.5 of BWRVIP-47-A in order to confirm that the inspection results are consistent with the conclusion that the aging effects will be adequately managed.

DRAI B.2.1.8-2

Background

The "parameters monitored/inspected" program element of GALL Report AMP XI.M8, "BWR Penetrations" states that the program manages the effects of cracking due to SCC and IGSCC of the BWR instrumentation nozzles, control rod drive (CRD) housing and incore-monitoring housing (ICMH) penetrations, and BWR standby liquid control (SLC) nozzles/Core ΔP nozzles. The GALL Report also states that the program accomplishes this by inspection for cracks in accordance with the guidelines of approved BWRVIP-49-A, BWRVIP-47-A or BWRVIP-27-A and the requirements of the ASME Code, Section XI, Table IWB 2500-1.

BWRVIP-47-A, which is referenced in LRA Section B.2.1.8 for the applicant's BWR Penetrations Program, includes the CRD stud tubes welded to the reactor head lower head. Section 3.2, "BWRVIP Inspection Guidelines," of BWRVIP-47-A indicates that if there is bottom head access as a result of normal refueling outage activities, ASME Code, Section XI, requires that visual inspection of accessible areas in the region be performed.

The LGS onsite procedure indicates that on April 30, 2008, the NRC approved an in-service inspection program relief request. The approval for the relief request authorized the use of the BWRVIP Inspection and Evaluation Guidelines in lieu of ASME Code required inspections and flaw evaluations for ASME Code, Section XI, B-N-1 and B-N-2 category components. More specifically, the LGS onsite procedure indicates that the relief request is applied to ASME Code, Section XI, B-N-2, Item Number B13.30 for the interior attachments beyond the beltline includes "CRD stub tube to vessel attachments (inaccessible)." This procedure also indicates that the relief request is applied to ASME Code, Section XI, B-N-2 Item Number B13.40 for integrally welded core support structures includes "CRD Housing to stub tube welds (inaccessible)."

The LGS inspection results describe the previous results of the VT-1 and VT-3 inspections for the CRD stub tube to vessel welds and stub tube to housing welds. Furthermore, the staff noted that Attachment 1 to the NRC safety evaluation, dated April 30, 2008, of the applicant's relief request indicates that BWRVIP-47-A is not included in the authorized alternative BWRVIP reports for the relief of the requirements of ASME Code Item Numbers B13.30 and B13.40. The staff also noted that the CRD stub tubes or related welds are not listed as components for which applicant's relief request was approved in the staff's safety evaluation.

Issue
The applicant's procedure indicates that the NRC approval for a relief request allows the use of the BWRVIP guidance in lieu of the requirements of ASME Code Section XI, Table IWB-2500-1, Item Numbers B13.30 and B13.40. The procedure also indicates that the CRD stub tubes or related welds are the components, for which the relief request was approved to use the BWRVIP guidance.

By contrast, Attachment 1 to the staff's safety evaluation, dated April 30, 2008, of the relief request does not list CRD stub tubes or related welds for which the relief request was approved. Therefore, the staff needs to further clarify why the applicant's implementing procedure related to the BWR Penetrations Program includes this discrepancy with respect to the staff evaluation of the applicant's relief request. In addition, the staff needs further clarification about when the CRD stub tube to vessel attachments and CRD housing to stub tube welds are accessible for inspections.

Request
Justify why the implementing procedure for the BWR Penetrations Program has the aforementioned discrepancy with respect to the staff's evaluation of the applicant's relief request.

In addition, as part of the response, clarify when the CRD stub tube to vessel welds and stub tube to housing welds are accessible for inspections.

DRAI B.2.1.24-1

Background
GALL Report AMP XI.M35, "One-Time Inspection of ASME Code Class 1 Small Bore-Piping," provides specific guidance regarding sampling for small-bore piping inspections. Based on the LGS plant-specific operating experience, the GALL Report recommends that inspection sampling should include ten percent of the weld population or a maximum of 25 welds of each type (e.g., butt welds and socket welds) using a methodology to select the most susceptible and risk-significant welds.

The license renewal application (LRA) Section B.2.1.24, "One-Time Inspection of ASME Code Class 1 Small-Bore Piping," provides specific sample size as recommended by GALL Report AMP XI.M35 for ASME Code Class 1 small-bore piping.

Issue
The LRA states that 25 socket welds will be volumetrically examined at each unit. However, the LRA further stated that the number of welds examined represents "38 percent of the high and medium consequence ranked socket welds." It is not clear to the staff how this percentage was calculated. In addition, the staff is not clear on the total population of ASME Code Class 1 butt welds and socket welds at each unit that is within the scope of the program.

Request
Describe the total population of Class 1 butt welds and socket welds at each unit that are within the scope of the program. In addition, clarify the inspection sample size for socket welds in terms of the percentage of the weld population. Consistent with this response revise the UFSAR supplement.

DRAI B.2.1.24-2

Background
Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LR), Revision 2, Table 3.0-1 addresses the content of the UFSAR supplement summary description for GALL AMP XI.M35. The table states that, "Should evidence of cracking be revealed by a one-time inspection, periodic inspection is also proposed, as managed by a plant-specific AMP."

Issue
LRA Section B.2.1.24 states that the One-Time Inspection of ASME Code Class 1 Small-Bore Piping program includes controls to implement an alternate plant-specific periodic inspection program should evidence of ASME Code Class 1 small-bore piping cracking be revealed by the examinations performed as part of the program. However, the applicant's UFSAR supplement for the program, as described in LRA Section A1.24, does not include any statement regarding corrective actions to be taken in the event that evidence of cracking is revealed by the program.

Request
Amend the UFSAR supplement for the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program to reflect that, if evidence of cracking is revealed by the program, periodic inspections will be initiated under a plant-specific AMP.

DRAI B.3.1-1

Background
LRA Section 4.3.1 states that each transient projection was trended to determine if recent rates of occurrence could be higher than the overall average rate of occurrence and the trending shows that recent transient occurrence rates are bounded by the average occurrence rates. Therefore, in order to assure that this conclusion and basis remains valid, the Fatigue Monitoring Program will be used to monitor and track transient cycle occurrences through the end of the period of extended operation to ensure that these limits are not exceeded.

The time-limited aging analysis (TLAA) evaluations in LRA Sections 4.3.4, 4.3.5, 4.6.5 and 4.6.7 are dispositioned in accordance with 10 CFR 54.21(c)(1)(i), the analysis remains valid for the period of extended operation, and rely on the 60-year projections that were discussed in LRA Section 4.3.1.

The "monitoring and trending" program element of GALL Report AMP X.M1 recommends that trending is assessed to ensure that the fatigue usage factor remains below the design limit during the period of extended operation.

Issue
During its audit, the staff noted that the "monitoring and trending" program element of the LRA AMP states that the Fatigue Monitoring Program will continue to monitor and track transient cycles against the cycle limits throughout the period of extended operation to assure that the 60-year projections are valid.

The staff noted that the use of 60-year projections to demonstrate an analysis remains valid for the period of extended operation is consistent with the SRP-LR; however it is not clear to the staff if the validity of these analyses will be confirmed if the Fatigue Monitoring Program determines that a transient cycle count reaches a cycle limit.

Request
Confirm that implementing procedures or corrective actions of the Fatigue Monitoring Program ensures that the TLAAs, that rely on 60-year projections and disposition in accordance with 10 CFR 54.21(c)(1)(i), will be evaluated if a cycle count reaches a cycle limit.

If not, justify that the 60-year projections can be relied upon to disposition these TLAAs in accordance with 10 CFR 54.21(c)(1)(i).