

NRR-PMDAPEm Resource

From: Feintuch, Karl
Sent: Wednesday, March 28, 2012 10:46 AM
To: Jack Gadzala; Craig D Sly
Cc: Cheruvenki, Ganesh
Subject: FW: ME7277 - Kewaunee - Review of RVI Inspection Plan RAI Set 1 of 2 (Rev1)
Attachments: ME7277 RAI set 1 of 2 (Rev1) MRP-227-A Verify Bounding Conditions.docx

=====*Explanation of changes resulting in RAI (Rev1)*=====

Rev1 differs from the original by:

- 1 - Correcting a typo on the TAC number: ME7277 is the correct number
- 2 - Changing text that refers to a third RAI item, which is incorrect. The last paragraph in the message, which follows a quoted paragraph, is part of the second RAI item.

===== *Begin Rev1 DRAFT REQUEST FOR ADDITIONAL INFORMATION (RAI)* =====

DRAFT REQUEST FOR ADDITIONAL INFORMATION (RAI)
RELATED TO LICENSEE'S REACTOR VESSEL INTERNALS INSPECTION
PLAN REVIEW REQUEST
KEWAUNEE POWER STATION (TAC NO. ME7277)
DOCKET NO. 50-305

1.0 SCOPE

By letter dated December 12, 2011, Dominion Energy Kewaunee, Inc. (DEK, the licensee), submitted an inspection plan for the reactor vessel internals (RVI) components at Kewaunee Power Station (KPS). In its e-mail submittal dated March 19, 2012, the licensee submitted the Technical Report KLR-1309A, "License Renewal Project, Aging Management Program, ASME Section XI, In-service Inspection, Subsection IWB, IWC, and IWD, Reactor Vessel Internals Inspection, Kewaunee Power Station," to the NRC staff for review. Pursuant to the license renewal commitments items 1 and 2 addressed in Chapter 15, Table 15.7.1, "License Renewal Commitments," of the Updated Final Safety Evaluation Report (UFSAR), the licensee requested that the NRC staff review and approve the subject inspection plan.

The NRC staff from the Vessel and Internals Integrity Branch (EVIB) has reviewed the inspection plan for the KPS's RVI components and requests additional information from DEK as described in Section 2.0 below.

The RAI items in Section 2.0 are a first set of two sets of RAI items. As soon as practical, the EVIB reviewer requests a clarification conference call to: (1) address licensee questions and need for clarification; and (2) enable finalization of the second set of RAI items.

The first set of RAI items is structured into 2 items (identified as RAI1). Each item is assigned a tracking number in the format:

[TAC] – RAI1 – [Technical Branch] – [Primary Reviewer] – [Serial #] – [requested by year-month-day {nominally 30 days pending confirmation}]. For this request the assigned tracking numbers are listed in Section 2.0 below.

2.0 REQUEST FOR ADDITIONAL INFORMATION (RAI)

This request consists of two items:

ME7277-RAI1-EVIB-Cher-001-2012-04-27

ME7277-RAI1-EVIB-Cher-002-2012-04-27

Within these tracking numbers:

EVIB = Vessel and Internals Integrity Branch

Cher = Reviewer Cheruvenki

00n = 001, 002 and 003 corresponding to the RAI shown below.

2012-04-27 = April 27, 2012, which is subject to confirmation with DEK that the referenced items (RAI) are clear to enable response.

In your response please associate this tracking number and the RAI that follow (items Cher-001 and Cher-002) with each of your answers.

(A) RAI-1 (ME7277-RAI-EVIB-Cher-001-2012-04-27)

Applicant/Licensee Action Item 1 from the NRC staff's final SE of MRP-227-A, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines," requires that applicants/licensees submit an evaluation that demonstrates that their plant is bounded by the assumptions regarding plant design and operating history that were made in the failure modes, effects and consequences analyses (FMECA) and functionality analyses for reactors of their design.

KPS's response to Applicant/Licensee Action Item 1 in the RVI inspection plan addresses the core loading assumptions (switch to a low-leakage core) and operational (base loaded plant) aspects of design and operation that are mentioned in MRP-227-A, Section 2.4. An additional assumption listed in Section 2.4 of MRP-227-A is that there have been no design changes to the RVI beyond those identified in general industry guidance or recommended by the original vendors. Section 2.4 of MRP-227-A indicated that these assumptions are considered to represent any U.S PWR operating plant provided that these three assumptions are met, given the information on design and operation known to the MRP as of May 2007.

MRP-191, Revision 0, "Materials Reliability Program: Screening, Categorization and Ranking of Reactor Internals of Westinghouse and Combustion Engineering PWR [pressurized water reactor] Designs," (proprietary document, not available to the public), documents the screening for susceptibility to aging effects, the FMECA results, and the categorization and ranking of the RVI components. In addition to the assumptions listed in Section 2.4 of MRP-227-A, MRP-191 documents additional assumptions that were used. In particular, neutron fluence range, temperature, and material grade for each generic component of the Westinghouse design internals were used for input to the screening process. These values were determined based on an "expert elicitation" process. Stress values were not explicitly tabulated, but were recorded as either above the stress threshold (>30 ksi) or not based on the expert interviews.

MRP-232, Revision 0, "Materials Reliability Program: Aging Management Strategies for Westinghouse and Combustion Engineering PWR Internals," (proprietary document, not available to the public) reported more specific stress, temperature and neutron fluence values based on finite element analyses for selected high consequence of failure components identified in MRP-191.

The EPRI-MRP did not verify that the values of fluence, temperature, stress, and material, documented in MRP-191 and MRP-232 were bounding for all individual plants, and in fact MRP-227 states, "These evaluations were based on representative configurations and operational histories, which were generally conservative, but not necessarily bounding in every parameter."

The NRC staff expects that the licensee should have access to design information enabling verification that the material for each RVI component is bounded by the design assumptions of the MRP. In this context, the NRC staff requests that the licensee provide the following information:

- 1) To provide reasonable assurance that the RVI components are bounded by assumptions in the FMECA and functionality analyses supporting the development of MRP-227-A, the licensee is requested to respond to either part a) or part b) of this RAI:
 - a) Provide the plant-specific values of neutron fluence (n/cm^2 , $E>1.0$ MeV), temperature, stress, and materials for a sample of RVI components. The components selected should represent a range of

neutron fluences, and temperatures. This information should identify whether the stress is greater or less than 30 ksi. Values of neutron fluence and temperature may be estimated or analytical values. The values should be the peak values of each parameter for each component (e.g., peak end-of-life value for fluence). Provide the method used to estimate the values, or describe the analysis method. An acceptable sample of components is:

- i) Lower Core Plate
 - ii) Core Barrel Flange
 - iii) Barrel-Former Bolts
 - iv) Upper Core Barrel Welds
 - v) Lower Core Barrel Welds
 - vi) Upper Core Plate Alignment Pins
- b) If the sample verification approach in Part a) is not used, describe the process used to verify that the RVI components at KPS are bounded by the assumptions regarding the neutron fluence, temperature, stress values, and materials that were made for each component in the FMECA and functionality analyses supporting the development of MRP-227-A.
- 2) If there are any components at KPS not bounded by assumptions regarding neutron fluence, temperature, stress or material used in the development of MRP-227-A, describe how the differences were addressed in the plant-specific RVI Inspection Plan. The NRC staff requests that the licensee, as a part of its demonstration, discuss whether there would be any changes to the screening, categorization, FMECA process and functionality analyses if the plant-specific variables (the neutron fluence, temperature, stress values, plant-specific operating experience, and materials) are used. This evaluation should address whether additional aging mechanisms would become applicable to the component.
- 3) For any non-bounded components, determine if any changes to the inspection requirements of MRP-227-A are needed. Provide plant-specific inspection requirements or an alternate aging management program, as appropriate. If no changes to the inspection requirements are proposed, provide a justification for the adequacy of the existing MRP-227-A inspections for the unbounded components.
- 4) In its e-mail submittal dated March 19, 2012, the licensee submitted the Technical Report KLR-1309A, to the NRC staff for review. On page 13 of the KLR-1309A report, the licensee stated that as a part of design change, it installed flexure less inserts. The NRC staff requests that the licensee provide the following information with regard to this design change.
- (a) Reason for installing the flexure less inserts, (b) Type of material used, and information regarding the material selection, (c) Operating experience with respect to any degradation (observed so far) of the flexure less inserts, and (d) If the flexure less inserts were installed after May 2007, provide an assessment of the impact of this installation on the recommendations of the RVI Inspection Plan. Provide plant-specific inspection requirements if necessary for the affected components.

(B) RAI-2 (ME7277-RAII-EVIB-Cher-002-2012-04-27)

Applicant/Licensee Action Item 2, Section 3.2.5.2, from the NRC staff's final SE of MRP-227, Rev.1, requires the following:

“Consistent with the requirements addressed in 10 CFR 54.4, each applicant/licensee is responsible for identifying which RVI components are within the scope of license renewal (LR) for its facility. Applicants/licensees shall review the information in Tables 4-1 and 4-2 in MRP-189, Revision 1, “Materials Reliability Program: Screening, Categorization, and Ranking of

B&W-Designed PWR Internals,” and Tables 4-4 and 4-5 in MRP-191 and identify whether these tables contain all of the RVI components that are within the scope of LR for their facilities in accordance with 10 CFR 54.4. If the tables do not identify all the RVI components that are within the scope of LR for its facility, the applicant or licensee shall identify the missing component(s) and propose any necessary modifications to the program defined in MRP-227-A, as modified by this SE, when submitting its plant-specific AMP such that the effects of aging on the missing component(s) will be managed for the period of extended operation.”

On page 5, license action item-2 of its submittal dated December 12, 2011, the licensee stated that Westinghouse classified various RVI components based on their susceptibility to aging degradation. The NRC staff requests that the licensee confirm that Westinghouse complied with the aforementioned requirement in its entirety while performing scoping and screening for the license renewal for the KPS.

===== *End Rev1 DRAFT REQUEST FOR ADDITIONAL INFORMATION (RAI)* =====

Hearing Identifier: NRR_PMDA
Email Number: 310

Mail Envelope Properties (Karl.Feintuch@nrc.gov20120328104500)

Subject: FW: ME7277 - Kewaunee - Review of RVI Inspection Plan RAI Set 1 of 2 (Rev1)
Sent Date: 3/28/2012 10:45:39 AM
Received Date: 3/28/2012 10:45:00 AM
From: Feintuch, Karl

Created By: Karl.Feintuch@nrc.gov

Recipients:

"Cheruvenci, Ganesh" <Ganesh.Cheruvenci@nrc.gov>
Tracking Status: None
"Jack Gadzala" <jack.gadzala@dom.com>
Tracking Status: None
"Craig D Sly" <craig.d.sly@dom.com>
Tracking Status: None

Post Office:

Files	Size	Date & Time	
MESSAGE	11370	3/28/2012 10:45:00 AM	
ME7277 RAI set 1 of 2 (Rev1) MRP-227-A Verify Bounding Conditions.docx			29949

Options

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

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