## NRR-PMDAPEm Resource

**From:** Feintuch, Karl
**Sent:** Thursday, August 02, 2012 9:29 AM
**To:** 'Jack Gadzala'
**Cc:** 'Craig D Sly'; Cheruvenki, Ganesh
**Subject:** FW: ME7727 - Kewaunee - Draft Request for Additional Information Re: RVI components Inspection Plan - RAII-Cher-018 to -020
**Attachments:** ME7727 RAII-Cher-018 to -020 Re Guide Cards-1 Rev(3).docx

This version corrects a format error in the attachment included with the version sent Wednesday, August 01, 2012 4:05 PM ET. The corrected attachment contains "Rev(3)" at the end of the filename. Disregard files containing "Rev(2)" in the filename. The attachment was to duplicate the text of the email message below.

---

**From:** Feintuch, Karl [mailto:Karl.Feintuch@nrc.gov]
**Sent:** Wednesday, August 01, 2012 4:05 PM
**To:** Jack Gadzala (Generation - 4)
**Cc:** Craig D Sly (Generation - 6)
**Subject:** RE: ME7727 - Kewaunee - Draft Request for Additional Information Re: RVI components Inspection Plan - RAII-Cher-018 to -020

**DRAFT REQUEST FOR ADDITIONAL INFORMATION (RAI)**
**VERSION 2012-04-27**
**RELATED TO LICENSEE'S REACTOR VESSEL INTERNALS INSPECTION**
**PLAN REVIEW REQUEST**
**KEWAUNEE POWER STATION (TAC NO. ME7727)**
**DOCKET NO. 50-305**

## 1.0 INTRODUCTION

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). The NRC staff from the Vessel and Internals Integrity Branch (EVIB) has reviewed the inspection plan for the KPS's RVI components and reviewed supplements in response to previous Requests for Additional information (RAI) items and requests additional information from DEK as described below pertaining to CRGT guide cards.

## 2.0 REQUEST FOR INFORMATION ITEMS (RAII)

### 2.1 ME7727-RAII-EVIB-Cher-018-2012-08-01

(Follow-up Question to ME7727-RAII-EVIB-Cher-008-2012-05-09)

The licensee, in a letter dated June 28, 2012, provided a response to the NRC staff's question ME7727-RAII-EVIB-Cher-008-2012-05-09, which requested how the licensee determined to inspect six out of total population of 36 CRGT guide cards. Furthermore, the NRC staff requested that the licensee provide a brief summary of its methodology used in selecting the inspection sample for the CRGT guide cards. The licensee responded with the following aspects in its selection of the number of CRGT cards for inspection:
(a) most susceptible areas to experience aging degradation,
(b) high stress areas, and,
(c) plant-specific operating experience.-

In its response, the licensee stated that 20 % of the active CRG tubes with active drive rods (totaling 29) were inspected, and wear was observed in guide cards in all 29 CRGTs. The licensee stated that it used the guidance provided by Westinghouse topical report WCAP-17562-P, Revision 0, "Westinghouse Pressurized Water Reactor Internals Guide Tube Guide Card Wear Criteria." According to this report, the operation of the control tubes is not impaired by wear in excess of 85 % of the effective slot width opening for up to three adjacent guide plates in guide tube.

The NRC staff did not review this report. However, the licensee provided a summary of the guide card hole locations that are projected to experience wear up to 85 % within 20 effective full power years (EFPY).

After reviewing the information, the NRC staff determined that the licensee did not provide the following information, which would demonstrate that compliance with the WCAP-17562-P, Revision 0 guidelines is adequate in effectively managing the aging degradation in guide cards.

Therefore, the NRC staff requests that the licensee:
(1) describe how the criteria for maximum allowed wear was established;
(2) provide an explanation for the meaning of the numerical values listed under columns -*Constant Volumetric* and *Operation Curve* in Table B of the response to the NRC staff's question- ME7727-RAII-EVIB-Cher-008-2012-05-09;
(3) provide the methodology used to inspect the guide cards which includes removal of the drive rods from the upper internals and insert a comparator device down inside the CRGT and compare each guide card the existing conditions to the requirements of the WCAP-17562-P, Revision 0; and,
(4) confirm that WCAP-17562-P, Revision 0 is not included in the current design basis.

==========

**2.2 ME7727-RAII-EVIB-Cher-019-2012-08-01**
(Follow-up Question to ME7727-RAII-EVIB-Cher-001-2012-05-09—Action Item 1 of the NRC staff's SE)

The licensee in a letter dated June 28, 2012, provided a response to the NRC staff's question ME7727-RAII-EVIB-Cher-001-2012-05-09. The NRC staff reviewed the response and decided that the licensee did not adequately address the following issue:

A portion of NRC staff's question ME7727-RAII-EVIB-Cher-001-2012-05-09 reads as follows:

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:

*Describe the process used to verify that the RVI components at KPS are bounded by the assumptions regarding the variable (i.e., 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.*

*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:*

*(i) 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:*

1. *Lower Core Plate*
2. *Core Barrel Flange*
3. *Barrel-Former Bolts*
4. *Upper Core Barrel Welds*
5. *Lower Core Barrel Welds*
6. *Upper Core Plate Alignment Pins*

(1) The licensee did not provide the plant-specific values of neutron fluence (n/cm$^2$, E>1.0 MeV), temperature, stress, and materials for the aforementioned RVI components. An explanation is required as to how it was determined that the KPS values of neutron fluence, temperature, and, stress listed in Table A of the June 28, 2012, response to the subject (Cher-001) question fall within the same range as assumed for the "Typical Plant" of MRP-191.

(2) Was a neutron fluence analysis performed specifically for the KPS RVI? If so, provide the best estimate values for the sample components.

(3) Do the temperature ranges given for KPS represent fluid temperature only or the actual internal metal temperature of the components accounting for gamma heating effects?

==========

**2.3 ME7727-RAII-EVIB-Cher-020-2012-08-01**
(Follow-up Question to ME7727-RAII-EVIB-Cher-013-2012-05-09)

In its response dated June 28, 2012, the licensee stated that in lieu of revising the Inspection plan (addressed in AMP KLR-1309A), it will revise the RVI inspection plan that is included in Tables 1 and 2 of the December 12, 2011 submittal. The NRC staff does not agree with this disposition because the AMP KLR-1309A will not be consistent with the plant-specific application of MRP-227-A and this inconsistency can cause confusion among the inspectors.

(1) Therefore, the NRC staff requests that the licensee submit a corrected version of the AMP KLR-1309A.

**Hearing Identifier:** NRR_PMDA
**Email Number:** 434

**Mail Envelope Properties** (26E42474DB238C408C94990815A02F0996A50DEC77)

**Subject:** FW: ME7727 - Kewaunee - Draft Request for Additional Information Re: RVI components Inspection Plan - RAII-Cher-018 to -020
**Sent Date:** 8/2/2012 9:29:06 AM
**Received Date:** 8/2/2012 9:29:00 AM
**From:** Feintuch, Karl

**Created By:** Karl.Feintuch@nrc.gov

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

**Post Office:** HQCLSTR01.nrc.gov

| **Files** | **Size** | **Date & Time** | |
|---|---|---|---|
| MESSAGE | 7870 | 8/2/2012 9:29:00 AM | |
| ME7727 RAII-Cher-018 to -020 Re Guide Cards-1 Rev(3).docx | | | 26995 |

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

**DRAFT REQUEST FOR ADDITIONAL INFORMATION (RAI)**
**VERSION 2012-04-27**
**RELATED TO LICENSEE'S REACTOR VESSEL INTERNALS INSPECTION PLAN REVIEW REQUEST**
**KEWAUNEE POWER STATION (TAC NO. ME7727)**
**DOCKET NO. 50-305**

## 1.0 INTRODUCTION

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). The NRC staff from the Vessel and Internals Integrity Branch (EVIB) has reviewed the inspection plan for the KPS's RVI components and reviewed supplements in response to previous Requests for Additional information (RAI) items and requests additional information from DEK as described below pertaining to CRGT guide cards.

## 2.0 REQUEST FOR INFORMATION ITEMS (RAII)

### 2.1 ME7727-RAII-EVIB-Cher-018-2012-08-01

(Follow-up Question to ME7727-RAII-EVIB-Cher-008-2012-05-09)

The licensee, in a letter dated June 28, 2012, provided a response to the NRC staff's question ME7727-RAII-EVIB-Cher-008-2012-05-09, which requested how the licensee determined to inspect six out of total population of 36 CRGT guide cards. Furthermore, the NRC staff requested that the licensee provide a brief summary of its methodology used in selecting the inspection sample for the CRGT guide cards. The licensee responded with the following aspects in its selection of the number of CRGT cards for inspection:
(a) most susceptible areas to experience aging degradation,
(b) high stress areas, and,
(c) plant-specific operating experience.-

In its response, the licensee stated that 20 % of the active CRG tubes with active drive rods (totaling 29) were inspected, and wear was observed in guide cards in all 29 CRGTs. The licensee stated that it used the guidance provided by Westinghouse topical report WCAP-17562-P, Revision 0, "Westinghouse Pressurized Water Reactor Internals Guide Tube Guide Card Wear Criteria." According to this report, the operation of the control tubes is not impaired by wear in excess of 85 % of the effective slot width opening for up to three adjacent guide plates in guide tube.

The NRC staff did not review this report. However, the licensee provided a summary of the guide card hole locations that are projected to experience wear up to 85 % within 20 effective full power years (EFPY).

After reviewing the information, the NRC staff determined that the licensee did not provide the following information, which would demonstrate that compliance with the WCAP-17562-P, Revision 0 guidelines is adequate in effectively managing the aging degradation in guide cards.

Therefore, the NRC staff requests that the licensee:
(1) describe how the criteria for maximum allowed wear was established;
(2) provide an explanation for the meaning of the numerical values listed under columns - *Constant Volumetric* and *Operation Curve* in Table B of the response to the NRC staff's question- ME7727-RAII-EVIB-Cher-008-2012-05-09;
(3) provide the methodology used to inspect the guide cards which includes removal of the drive rods from the upper internals and insert a comparator device down inside the CRGT and compare each guide card the existing conditions to the requirements of the WCAP-17562-P, Revision 0; and,
(4) confirm that WCAP-17562-P, Revision 0 is not included in the current design basis.

==========

**2.2 ME7727-RAII-EVIB-Cher-019-2012-08-01**
(Follow-up Question to ME7727-RAII-EVIB-Cher-001-2012-05-09—Action Item 1 of the NRC staff's SE)

The licensee in a letter dated June 28, 2012, provided a response to the NRC staff's question ME7727-RAII-EVIB-Cher-001-2012-05-09. The NRC staff reviewed the response and decided that the licensee did not adequately address the following issue:

A portion of NRC staff's question ME7727-RAII-EVIB-Cher-001-2012-05-09 reads as follows:

> 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:
>
> > *Describe the process used to verify that the RVI components at KPS are bounded by the assumptions regarding the variable (i.e., 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.*
> > *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:*
> >
> > *(i) 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:*

1. *Lower Core Plate*
2. *Core Barrel Flange*
3. *Barrel-Former Bolts*
4. *Upper Core Barrel Welds*
5. *Lower Core Barrel Welds*
6. *Upper Core Plate Alignment Pins*

(1) The licensee did not provide the plant-specific values of neutron fluence (n/cm$^2$, E>1.0 MeV), temperature, stress, and materials for the aforementioned RVI components. An explanation is required as to how it was determined that the KPS values of neutron fluence, temperature, and, stress listed in Table A of the June 28, 2012, response to the subject (Cher-001) question fall within the same range as assumed for the "Typical Plant" of MRP-191.

(2) Was a neutron fluence analysis performed specifically for the KPS RVI? If so, provide the best estimate values for the sample components.

(3) Do the temperature ranges given for KPS represent fluid temperature only or the actual internal metal temperature of the components accounting for gamma heating effects?

==========

**2.3 ME7727-RAII-EVIB-Cher-020-2012-08-01**
(Follow-up Question to ME7727-RAII-EVIB-Cher-013-2012-05-09)

In its response dated June 28, 2012, the licensee stated that in lieu of revising the Inspection plan (addressed in AMP KLR-1309A), it will revise the RVI inspection plan that is included in Tables 1 and 2 of the December 12, 2011 submittal. The NRC staff does not agree with this disposition because the AMP KLR-1309A will not be consistent with the plant-specific application of MRP-227-A and this inconsistency can cause confusion among the inspectors.

(1) Therefore, the NRC staff requests that the licensee submit a corrected version of the AMP KLR-1309A.