

## **NRR-PMDAPEm Resource**

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**From:** Wang, Alan  
**Sent:** Thursday, December 26, 2013 2:20 PM  
**To:** SEITER, JEFFERY ALAN; Ward, Steven  
**Cc:** Burkhardt, Janet  
**Subject:** Grand Gulf Nuclear Station Request for Additional Information Regarding BWRVIP Relief Request (TAC ME2357)

Jeff and Steve,

By letter dated June 27, 2013, Entergy Operations Inc., (the licensee) submitted its third ten year interval inservice inspection (ISI) program plan Relief Request for Grand Gulf Nuclear Station (GGNS), Unit 1. The licensee's submittal proposes to use various Boiling Water Reactor Vessel and Internals Project guidelines as an alternative to certain requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code for ISI of reactor vessel internal (RVI) components. The US Nuclear Regulatory Commission (NRC) staff has determined that the following additional information is needed to complete its assessment of the subject relief request:

### **RAI-1**

The NRC staff requests that the licensee identify whether there are any furnace-sensitized stainless steel vessel attachment welds associated with the RVI components in GGNS. It is requested that the licensee provide an explanation regarding the type of inspection program and any additional augmented inspection programs that are implemented for any existing furnace-sensitized stainless steel attachment welds in GGNS.

### **RAI-2**

Since the following BWRVIP reports are used by the BWR licensees, the staff requests that GGNS should either include or provide an explanation for not including the following BWRVIP reports in Section 5.0 of its submittal dated June 27, 2013.

BWRVIP-138, "BWRVIP Updated Jet Pump Beam Inspection and Flaw Evaluation."

BWRVIP-139, "BWR Vessel Internals Project, Steam Dryer Inspection and Flaw Evaluation Guidelines."

BWRVIP-183, "BWR Vessel Internals Project, Top Guide Grid Beam Inspection and Flaw Evaluation Guidelines."

### **RAI-3**

The NRC staff requests that the licensee confirm whether NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking", will be used for the inspection of feedwater sparger tee welds and feedwater sparger piping brackets.

**RAI-4**

Since Inconel182 welds are more prone to intergranular stress corrosion cracking (IGSCC) than the austenitic stainless steel 308/316 welds, the staff requests that the licensee provide information how this aging degradation is effectively monitored in identifying the extent of aging degradation in these welds in a timely manner.

## (5) RAI-5

The NRC Staff reviewed the previous inspection results for the various RVI components that are addressed in the Attachment 3 of the licensee's June 27, 2013 submittal and determined that additional information is required on the extent of aging degradation in the most susceptible areas of the weld connections in the following RVI components:

### a) Top Guide-

Section 8.1 in BWRVIP-183 states that top guide rim areas and the grid beam cells are prone to irradiation assisted stress corrosion cracking (IASCC). If the top guide grid beam cells and rim areas at GGNS are exposed to a fluence value greater than  $5 \times 10^{20}$  n/cm<sup>21</sup> during the third ISI interval, consistent with guidelines addressed in Section 8.1.2 of BWRVIP-183, inspections of the grid beam cells and rim areas containing the welds and heat affected zone should be performed every 6 years. Confirm that such inspections will be performed.

### b) Core Spray and Core Spray Spargers-

The licensee reported that during the refueling outages from 2005-2010, all creviced welds and 25% of the remaining welds were inspected and no indications were found. With respect to the examinations of these welds, the staff requests that the licensee provide the following information: (1) the number of these welds that have Type 304 stainless steel material, (2) the number of these welds that have Type 304L stainless steel material, and, (3) the approximate area of inspection coverage. The licensee stated that during the 2012 outage an indication was discovered in P8A weld. The staff requests that the licensee provide a brief summary of the supporting analyses showing how this finding was dispositioned in the licensee's Corrective Action Program.

### c) LPCI Coupling-

During the refueling outages from 1996-2007, loose part concern at 141<sup>0</sup> azimuth location was identified. The staff requests the licensee to provide a brief summary on: (1) how this issue was resolved, and, (2) future corrective action plans. The staff requests that the licensee provide the following information: (1) the number of the welds that have Type 304 stainless steel material with a creviced weld geometry, (2) the number of the welds that have Type 304L stainless steel material with a creviced weld geometry, (3) the approximate area of inspection coverage and, (4) the number of Inconel182 welds in the inspected population.

### d) Other RVI Components:

Provide information for the number of Inconel 182 welds that have been inspected during past outages in the following RVI components and the approximate area of inspection coverage.

(a) jet pumps; (b) in-core dry tubes; and (c) CRD housings

Both in-core dry tubes and CRD housings are addressed in BWRVIP-47-A "BWR Lower Plenum Inspection and Flaw Evaluation Guidelines."

### e) Dry Tubes:

During the 2010 outage, the licensee identified indications in four dry tubes (addressed in BWRVIP-47-A). The staff requests that the licensee provide information on the type of material e.g., austenitic stainless steel type 304 or 304L or Inconel 600, that was used in these tubes. Provide a brief summary of the supporting analysis showing how this finding was dispositioned in the licensee's Corrective Action Program.

## RAI-6

To assess the effectiveness of GGNS's implementation of hydrogen water chemistry (HWC) or HWC in conjunction with noble metal chemical addition (NMCA), the NRC staff requests that the licensee provide the following information:

- a) Measurement of electrochemical potential (ECP) of stainless steel material that represents a typical RVI component. ECP measurement should be made when HWC or HWC and NMCA method is used.
- b) Measurement of the amount of platinum deposit on a stainless coupon if HWC and NMCA method is used.

**RAI-7**

Editorial correction: Please revise the reference from Figure 3-3 to Figures 2-2 to 2-5 in "shroud horizontal welds" item in Table 1, page 7 of the submittal dated June 27, 2013.

This RAI was discussed with Mr. Steven Ward on December 18, 2013, and it was agreed that a response would be provided within 30 days of receipt of this email. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-1445 or via e-mail at [Alan.Wang@nrc.gov](mailto:Alan.Wang@nrc.gov).

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