

**From:** Guzman, Richard  
**Sent:** Tuesday, August 06, 2013 6:40 AM  
**To:** 'Couture III, Philip'  
**Subject:** Request for Additional Information - Relief Requests ISI-04 dated March 27, 2013 - BVM 13-018 (TAC No. MF1195)

Phil,

The NRC staff has reviewed the information provided in the subject relief request letter dated March 27, 2013 (BVM 13-018), and has determined that additional information is needed to support its review. Shown below is the NRC staff's request for additional information (RAI) questions. To support the staff's timely review, we request that you provide a formal response by September 20, 2013. Please contact me if you have any questions.

REQUEST FOR ADDITIONAL INFORMATION  
RELATED TO RELIEF REQUEST ISI-04  
ENTERGY NUCLEAR OPERATIONS INC.,  
DOCKET NO.: 50-271

By letter dated March 27, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13092A204), Entergy Nuclear Operations Inc. (the licensee), submitted Relief Request ISI-04 for its Vermont Yankee Nuclear Power Station (VYNPS). The licensee proposed to use Boiling Water Reactor Vessel Internal Program (BWRVIP) guidelines as an alternative to certain requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) for in-service inspection (ISI) of reactor vessel internal (RVI) components. The NRC staff has reviewed the information the licensee provided that supports the proposed relief request and has determined that additional information as indicated below is needed to complete its review:

**RAI-1:**

The NRC staff requests that the licensee confirm that there are no furnace-sensitized stainless steel vessel attachment welds associated with the RVI components at VYNPS. It is requested that the licensee provide an explanation regarding the type of inspection program and any additional augmented inspection program that are implemented for any existing furnace-sensitized stainless steel attachment weld at VYNPS.

**RAI-2:**

The NRC staff requests the licensee confirm that it will comply with the inspection requirements specified in the following BWRVIP reports:

BWRVIP-49-A, BWRVIP Instrument Penetration Inspection and Flaw Evaluation Guidelines"

BWRVIP-75-A, BWRVIP Technical Basis for Revision to Generic Letter 88-01 Inspection Schedules"

BWRVIP-138, Revision 1, "BWRVIP Updated Jet Pump 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:**

Top guide grid beams are prone to irradiation-assisted stress corrosion cracking (IASCC) when they are exposed to a neutron fluence value greater than  $5 \times 10^{20}$  n/cm<sup>2</sup> ( $E > 1$  MeV). Top guide grid beams could be exposed to a neutron fluence value greater than this threshold value where by the probability of multiple failures of top guide grid beams is enhanced. Therefore, the NRC staff requests that the licensee provide the method of inspection and inspection frequency for the top guide grid beams that may potentially be exposed to a neutron fluence value greater than the threshold value during the fifth ISI interval. The NRC staff issued a safety evaluation for the VYNPS's license renewal application (LRA) which is included in NUREG-1907, "Safety Evaluation Report Related to the License Renewal of Vermont Yankee Nuclear Power Station." License renewal Commitment 2 in Appendix A of NUREG-1907, states that 15 percent of top guide locations will be inspected using the enhanced visual technique (EVT-1) within first eighteen years of the period of extended operation. Explain how this commitment will be met during the period of extended operation? The NRC staff notes that topical report BWRVIP-183, "BWRVIP, Top Guide Grid Beam Inspection and Flaw Evaluation" was developed by the BWRVIP to provide additional inspection guidelines for the top guide grid beams. The NRC staff requests that the licensee confirm that it will comply with the guidelines of this report.

**RAI-5:**

The NRC staff requests the licensee to identify whether there are any 182 welds and/or any furnace sensitized welds inside the VYNPS's reactor vessel. Indicate the type of inspections that have been performed thus far on these welds, and if applicable, provide a summary (e.g., a table) with the inspection results for these type of welds at VYNPS.

**RAI-6:**

In Attachment 2 of the March 27, 2013, submittal the licensee lists previous inspection history of the RVI components at VYNPS. Based on its review, the NRC staff requests the licensee to address the following areas:

Core Shroud - Please confirm that previous inspections were performed on the core shroud components that are most susceptible to intergranular stress corrosion cracking (IGSCC), IASCC and irradiation embrittlement. Since portions of the core shroud components would be exposed to a higher neutron fluence value during the fifth ISI interval, the NRC staff requests that the licensee confirm that it will inspect all the locations of the core shroud components that are susceptible to IASCC in accordance with the requirements of the BWRVIP-76, Revision 1, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines."

Core Plate - When exposed to a higher neutron fluence value, core plate hold down bolts are susceptible to loss of preload due to radiation induced stress relaxation. The licensee is requested to confirm that it will inspect the core plate

hold down bolts during the fifth ISI interval in accordance with the BWRVIP-25, "BWRVIP Core Plate Inspection and Flaw Evaluation Guidelines," report.

Core Spray - Please provide a brief summary of technical bases used for selecting the targeted circumferential welds for re-inspections during the previous outages. Confirm that creviced and non-L grade stainless steel base metals and the associated welds were included in the targeted circumferential weld population. Furthermore, the NRC staff requests that the licensee provide a brief summary of the area of the inspection coverage of these targeted circumferential welds.

In-Core Housing - Since some dry tubes at VYNPS were replaced due to cracking issues, the NRC staff requests that the licensee address the following issues: (a) confirm that the most susceptible materials (i.e.; 182 welds or any furnace sensitized welds or non-L grade stainless steel base metals and welds with or without any crevice), are inspected per the guidelines addressed in Section 3.0 of the BWRVIP-47-A; (b) provide the licensee's inspection strategy when cracking is observed in the dry tubes during the fifth ISI interval.

**RAI-7:**

Dissimilar Welds per BWRVIP-75-A inspection criteria: The operating experience reported on August 17, 2012, in a License Event Report (LER) 50-387/2012-007-00 (ADAMS Accession No. ML12230A169), indicated that synergistic effects of vibratory fatigue (caused by flow perturbations) and IGSCC caused a leakage in a chemical decontamination pipe (dead leg, branch connection) to the reactor recirculation suction pump of an operating BWR. The NRC staff requests the licensee to identify welds (in its inspection plan per the BWRVIP-75-A report) that are not scheduled for inspection that conform to the similar attributes (vibratory fatigue, IGSCC, dead leg, branch connection, etc.) of the failed weld described in the LER. The licensee is requested to provide an explanation as to why it was not selected for examination in the inspection program.

**RAI-8:**

Please provide information regarding which of the following methods of mitigation techniques are used at VYNPS: hydrogen water chemistry (HWC), combination of HWC and classical noble chemical addition (NMCA), or on-line NMCA plus HWC. Confirm that electrochemical potential (ECP) is measured frequently to ensure the adequacy of the mitigation.

**RAI-9:**

On June 8, 2009, General Electric-Hitachi (GEH) issued Safety Communication (SC) 09-01, "Annulus Pressurization Loads Evaluation," related to Annulus Pressurization (AP) loads, also referenced as "New Loads," and the corresponding stresses on the RPV, internals, and containment structures. The NRC staff is also aware of three other related GEH SCs, namely SC 09-03, Revision 1, related to core shroud recirculation line break loads, SC 11-07 related to a new load combination, and SC 12-20 related to acoustic load errors, all of which were recently issued on June 10, 2013.

These four GE SCs indicate that there is a potential for the loads acting on the reactor vessel internals (RVI) components to increase when corrections are made to the methodology used to

calculate RVI loads. Identify whether these four SCs have been addressed for VYNPS and whether the resulting loads have been incorporated into all relevant VY internal flaw evaluations and inspection strategies.