

**From:** [Thadani, Mohan](#)  
**To:** [Harding Jr., Thomas](#)  
**Cc:** [Alley, David](#); [Sheng, Simon](#)  
**Subject:** Gina: TAC NOS. ME8000 and ME8001-Relief Requests ISI-07 and ISI-08-Regarding BMI  
**Date:** Monday, June 25, 2012 10:56:00 AM  
**Attachments:** [image001.png](#)

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Tom:

The NRC staff is reviewing the requests ISI-07 and ISI-08 for relief pursuant to 10 CFR 50.55a, regarding reactor pressure vessel closure head penetration nozzle examinations for R.E. Ginna, during its fifth Inservice Inspection interval. The NRC staff has identified a need for following additional information required to facilitate the continuation of review of the relief requests.

Please provide your response to the following request promptly to facilitate the completion of the NRC staff's review in time to support your requested schedule for NRC response.

REQUEST FOR ADDITIONAL INFORMATION BY  
THE OFFICE OF NUCLEAR REACTOR REGULATION  
REQUEST FOR RELIEF FROM REQUIREMENTS FOR  
EXAMINATION OF REACTOR VESSEL HEAD PENETRATION NOZZLES  
R. E. GINNA NUCLEAR POWER PLANT, LLC  
R. E. GINNA NUCLEAR POWER PLANT  
DOCKET NO. 50-244

RAI-1

The May 24, 2012, submittal did not provide information on axial stresses for the control rod drive mechanism (CRDM) penetration nozzles on the basis that the hoop stresses are limiting. As indicated in Pacific Northwest National Laboratory (PNNL) Report 17763, "Final Report – Inspection Limit Confirmation for Upper Head Penetration Nozzle Cracking," dated August of 2008, this basis is not always true. Case 12 of Figure 9, Case 61 of Figure 11, and Cases 87, 88, 89 of Figure 13 of the PNNL report all indicated that the axial stresses are more limiting than the hoop stresses. When you study the above quoted figures in the PNNL report, please note that, for axial stresses, the longer distance from the triple point to where the stress drops to 20 ksi means that a longer portion of the penetration nozzle is at stresses greater than 20 ksi.

Please provide additional plant-specific information on axial stresses to substantiate your claim that the hoop stresses are limiting.

RAI-2

The licensee used a deterministic fracture mechanics analysis to justify the alternative examination coverage for penetration nozzle number 35. However, the proposed coverage of 0.2 inch is not sufficient to tolerate the uncertainties in the calculated residual stresses and the determination of the assumed crack length. The staff also has a concern with the proposed crack growth rate for Alloy 690 CRDM material (discussed in RAI-3). Hence, the NRC staff requests the licensee provide the basis for not performing a surface examination of the lower portion of each penetration nozzle necessary to meet the inspection requirements of 10 CFR 50.55a(g)(6)(ii)(D) and consider changing the regulatory basis of the relief request from 10 CFR 50.55a(a)(3)(i) to 10 CFR 50.55a(a)(3)(ii). Up to date, all similar relief requests were granted under 10 CFR 50.55a(a)(3)(ii), because the NRC staff finds insufficient basis to grant relief under 10 CFR 50.55a(a)(3)(i), considering that surface examinations could be performed on each penetration nozzle to meet the current inspection requirements.

### RAI-3

- The licensee used a crack growth rate with an improvement factor of 100 over Alloy 600 for Alloy 690 materials in its fracture mechanics analyses. The May 24, 2012, submittal states that NUREG/CR-7103, Volume 2, "Pacific Northwest National Laboratory Investigation of Stress Corrosion Cracking [SCC] in Nickel-Base Alloys," indicated similar crack growth results except for high levels of cold work. However, the NUREG states, "Representative [Alloy] 690 CRDM plant materials were studied to investigate the SCC crack-growth response in the as-received TT [thermally treated] and several modified conditions." To ensure that the plant-specific Alloy 690 material for the CRDMs did not receive significant cold work which is "representative" according to the NUREG, please provide your estimate of the cold work for the Ginna CRDM penetrations based on the fabrication and installation record of the Ginna CRDM penetrations to support that the Ginna CRDM penetrations did not receive significant cold work.

### RAI-4

- Since the May 24, 2012, submittal did not specify the examination frequency, the staff assumed that the examination frequency of ASME Code Case N-729-1 will be followed. Please provide EFPYs operated so far for the Ginna CRDM penetration nozzles and specify the time for the next examination based on (1) whether prior examinations have identified flaws and (2) whether the amount of cold work requested in RAI-3 allows you to consider the plant-specific Alloy 690 material as PWSCC resistant. Please note that if insignificant cold work cannot be demonstrated for the Ginna CRDM penetration nozzles, the nozzles' classification of Item No. B4.40 of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code Code Case N-729-1, "Alternative Examination Requirements for PWR [pressurized water reactor] Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds," may not be justified.

If there are any questions, please contact me.

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