

From: Peter Tam
To: David Helker; Thomas Loomis
Date: 5/5/04 9:39AM
Subject: Draft Questions re. CRD Housing Roll Repair (**TAC MC1099**)

Tom, Dave:

This is regarding your request for approval for an alternative, dated 10/21/2004. Our reviewer, John Honcharik, would like to discuss the following draft questions with you:

1. Your October 21, 2003, submittal states that you have pursued an American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME) Section XI Code Case regarding roll-expansion repair of leaking control rod drive (CRD) and in-core penetrations. The ASME Section XI Focus Group on Welding and Special Repair Processes is further developing this Code Case. What are the differences between the proposed Code Case requirements, and the requirements that Oyster Creek intends to use for this outage? Why are these differences acceptable?
2. Describe your future plans and decision points in time with respect to implementing a permanent welded repair in accordance with the ASME Code should the Code Case accepting this as a permanent repair prove to be unsuccessful.
3. Describe in detail all of the inspections that will be performed on CRD housing penetrations 42-43 and 46-39 that were roll repaired. Currently, your October 21, 2003, submittal states that inspections will continue as discussed in References 4 and 5 of your submittal. However, these references only address the VT-2 visual examination for leakage. The NRC staff's prior approvals of this repair technique, dated October 18, 2002, specified ultrasonic test (UT) examinations of the CRD housings that were roll repaired when normal CRD maintenance activities make access to the housing inside diameter (ID) available, as stated in your letters dated January 19, 2001, and July 26, 2002. Provide a response which reaffirms that the statements made in your January 19, 2001, and July 26, 2002, letters will continue to apply. Finally, will the roll repaired CRD housing IDs be accessible during the R20 refueling outage to allow UT examination to verify cracking has not occurred in the repair during the past two cycles?
4. AmerGen letter 2130-02-20291, dated October 4, 2002, provided additional information to support the approval of the previous roll/expansion repair of the CRD stub tubes until the R20 refueling outage. Specifically, AmerGen stated in this letter that hydrogen injection had been increased to provide at least 0.5 ppm in the feedwater to meet the current criteria for intergranular stress corrosion cracking (IGSCC) mitigation and protection of the recirculation loop piping and the lower plenum down to the CRD stub tubes. Additionally, AmerGen stated that Oyster Creek had continued zinc injection concentration at approximately 7.0 ppb, and that primary system mitigation will be achieved with the Noble Metals Chemical Application planned for the R19 refueling outage. Has the primary system mitigation program been implemented in R19 refueling outage? Describe what mitigation and protection programs have been in place since refueling outage R19. Will these programs continue to refueling outage R21 to support the extension of the approval of the alternative repairs to this time?
5. Your October 21, 2003, submittal states that you intend to implement the roll-expansion repair technique as described in BWRVIP-17. As stated in an NRC letter dated March 13,

1998, from G. Lainas, NRC, to C. Terry, BWRVIP Chairman, the NRC staff has not endorsed BWRVIP-17 on a generic basis, and therefore we request the following additional information concerning the applicability of this report to Oyster Creek:

A. On the assumption that the concept of a non-zero reactor coolant pressure boundary (RCPB) leakage-rate is acceptably justified for Oyster Creek, provide justification why the leakage-rate limits specified in Tables 2-3 and 2-4 of BWRVIP-17 after subsequent re-roll/expansion repairs should not be the same as those triggering the initial roll/expansion repair.

B. Tables 2-3 and 2-4 of BWRVIP-17 specify that if a penetration housing has been rolled a second time, a contingency repair action will be implemented if the leakage-rate is found to exceed the specified limits in these tables. On the assumption that the concept of non-zero RCPB leakage-rate is acceptably justified for Oyster Creek, provide justification why a permanent repair (other than rolling) should not be implemented if the leakage-rate exceeds the initial roll/repair leakage-rate.

C. Table 2-4 of BWRVIP-17 states in a footnote that, "secondary signs of leakage, such as dried water stains or dried corrosion products around housings and penetrations, do not necessarily require corrective action. Repairs will be considered as part of preventative maintenance as long as the outage schedule permits." Discuss the action that will be taken to determine the source of these secondary signs of leakage and provide the justification for not requiring corrective action.

D. BWRVIP-17 recommends that the structural load-carrying capability of the CRD housing, and the prevention of its ejection under accident conditions, be evaluated on a plant-specific basis. Provide the Oyster Creek plant-specific analysis, which should include the following:

i. An evaluation of the bending stresses induced in the housing by the expansion of the rolled section of the housing through the gap between the outside radius of the housing and the inside radius of the stub tube.

ii. An evaluation of the effect of flow-induced vibration of the housing or the instrument nozzle on the integrity of the roll repair. Alternatively, provide the basis for not considering such flow-induced vibration as a loading condition on the roll repair.

E. BWRVIP-17 states that it has been demonstrated by test that control rod insertion capability is not significantly affected by the roll/expansion repair. However, the test fixture used to demonstrate this did not reflect the as-built configuration of a typical CRD housing. CRDs are generally installed on the reactor vessel head with their axes parallel to the axis of the reactor vessel, in a "hillside" configuration. Provide test-based verification that rod insertion ability will not be affected by a roll/expansion repair for CRD's mounted in a "hillside " configuration.

This e-mail aims solely to prepare you and others for the proposed conference call. It does not convey a formal NRC staff position, nor does it formally request for information. We will discuss the disposition of the above draft questions in the conference call.

Peter S. Tam, Senior Project Manager
Project Directorate I-1
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

e-mail: pst@nrc.gov Tel.: 301-415-1451

CC: John Honcharik

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From: Peter Tam

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JXH11 CC (John Honcharik)

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