NRR-PMDAPEm Resource

From: Wiebe, Joel
Sent: Wednesday, April 11, 2012 1:07 PM
To: David Gullott; Joseph Bauer; Mitchel Mathews
Subject: Final RAIs Regarding Quad Cities, Unit 2 Relief Request I4R-19

REQUEST FOR ADDITIONAL INFORMATION REGARDING

QUAD CITIES NUCLEAR POWER STATION, UNIT 2

VESSEL PENETRATION RELIEF REQUEST NO. I4R-19

DOCKET NO. 50-265 (TAC NO. ME8347)

By letter dated April 6, 2011, Exelon Generation Company, the licensee for Quad Cities Nuclear Power Station, Unit 2, (Q2), submitted for staff review and approval a relief request for an instrument penetration repair.

In order to complete its review of the licensee's submittal, the Nuclear Regulatory Commission (NRC) staff requires a response to the following questions:

1. How has it been established that the flaw is not a threat to vessel integrity?

    a. Justify any assumptions regarding the nature of the flaw,
        i. Location,
        ii. Cause,
        iii. Extent;

    b. Justify lack of examination to even qualitatively describe flaw through direct observation,

    c. Justify the lack of examination to demonstrate the flaw/leak path is not through the vessel steel rather than the J-groove weld or nozzle.

2. Specify the ASME specifications to which the repair materials (nozzle, weld metal, etc.) adhere (SA-XXX, etc.).

3. Describe the steps of the proposed repair in detail, including the machining, preparation, and examinations.

4. Clarify why Code Case N-638-4 is acceptable for use on the Q2 RV, stated in the application as being made of SA-302, Grade B, when N-638-4 states "this Case shall not be used to repair SA-302, Grade B, unless…"

5. Specify the nature of the manual non-temper bead welding technique used to attach the new nozzle to the weld pad. Specifically,

    a. By which edition and addenda of the ASME Code will the procedure be qualified,

b. What filler material will be used,
c. Provide a discussion of the welding process,
d. Explain how the partial penetration surface put into the weld pad will be inspected to ensure that no flaws in the weld-pad will contact the non-temper bead manual welding material.

6. Discuss the potential of increased localized stresses on the reactor vessel shell at the nozzle penetration location when the weld pad is installed. Provide the dimensions of the planned weld pad: shape, thickness, width, and height.

7. Describe the pre and post-repair inspections and testing that will be performed as part of the repair process including the required demonstration for ultrasonic examination of the repaired volume required by condition (1) of Regulatory Guide 1.1.47 on Code Case N-638-4. Specifically,

    a. What examinations/inspections will be performed, reference specific ASME Code requirements under which the examinations will be performed,
    b. The nature of the examinations/inspections (PDI-qualified UT, ASME Section XXXX VT-1, etc.),
    c. What are the acceptance criteria, reference specific ASME Code requirements,
    d. It appears that the only examination for the installation of the weld pad is progressive penetrant testing. Discuss why a volumetric examination will not be performed on the weld pad as part of acceptance (pre-service) examination.

8. The proposed repair will result in a gap between the original and new nozzles inside the bore of the reactor vessel shell. The gap region may be susceptible to crevice or general corrosion affecting the reactor vessel shell and the new nozzle. Provide analysis to demonstrate that the corrosion of the shell will not affect the structural integrity of the new nozzle and the reactor vessel shell.

9. Application Section 5, Basis, (C) states that a flaw evaluation will be performed for one cycle of operation. The licensee stated that qualification beyond one cycle will be performed based on detailed residual stress analysis and fatigue crack growth analysis.

    a. Submit the one-cycle flaw evaluation,
    b. Deleted
    c. Discuss how the licensee can demonstrate the acceptability of the repair or the one cycle flaw evaluation without an examination, after one cycle of operation after the repair,
    d. Explain why the flaw evaluation requires two phases (i.e., one cycle calculation and beyond one cycle calculation),
    e. Confirm that flaw analysis will include or bound transient loads and conditions beyond normal operation,
    f. Specify what load conditions the flaw analysis bound.

10. Confirm that the design of the new nozzle prevents ejection from the reactor vessel shell under design conditions and that it satisfies the requirements of the ASME Code, Section III, NB-3200. Provide the projected date when the design analysis will be available for audit or inspection.

Hearing Identifier: NRR_PMDA
Email Number: 322

Mail Envelope Properties (F371D08C516DE74F81193E6D891DC4AF8E60AC2083)

Subject: Final RAIs Regarding Quad Cities, Unit 2 Relief Request I4R-19
Sent Date: 4/11/2012 1:07:09 PM
Received Date: 4/11/2012 1:07:00 PM
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Files	**Size**	**Date & Time**
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