

April 25, 2002

Mr. Michael A. Krupa
Director
Nuclear Safety & Licensing
Entergy Operations, Inc.
1340 Echelon Parkway
Jackson, MS 39213-8298

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2- REQUEST FOR ADDITIONAL
INFORMATION REGARDING PROPOSED ALTERNATIVE TO AMERICAN
SOCIETY OF MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL
CODE EXAMINATION REQUIREMENTS FOR REPAIRS PERFORMED ON
REACTOR VESSEL HEAD PENETRATIONS (TAC NO. MB4290)

Dear Mr. Krupa:

By letter dated March 4, 2002, and supplemented by letter dated April 4, 2002, you requested relief from performing examinations of base material weld repairs made to reactor pressure vessel (RPV) nozzles as required by American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI IWA-4331(a) and Section III NB-2539-4. Request No. W3-R&R-001, Revision 0, proposed to perform inspections of the outer bare metal surface of the RPV nozzle penetrations for evidence of leakage.

During the course of review of this request, the staff determined that additional information is necessary to complete our review. The enclosed request for additional information (RAI) was e-mailed to your licensing staff on April 15, 2002. Your staff agreed to respond within 30 days of the receipt of this RAI. If circumstances result in the need to revise the target date, please call me at the earliest opportunity.

Sincerely,

/RA/

N. Kalyanam, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosure: As stated

cc: See next page

REQUEST FOR ADDITIONAL INFORMATION
PROPOSED ALTERNATIVE TO ASME EXAMINATION REQUIREMENTS FOR
REPAIRS PERFORMED ON REACTOR VESSEL HEAD PENETRATIONS

ANO 2-R&R-001 REV. 0, TAC NO. MB4290

1. Page 10 discusses the potential problems associated with welding over trapped liquid penetrant medium.
 - a. According to EPRI Report GC-111050, any moisture on the surface of the component being welded will vaporize ahead of the welding process. The staff is unaware of studies performed on welding over entrapped liquid penetrant medium or of difficulties with chemical mixing of liquid penetrant constituents with Inconel weld material. Provide technical information on the effects of welding over liquid penetrant medium that is located in Section XI Code acceptable cracks.
 - b. PT not only provides information on the original crack, it also verifies the crack characterization and monitors for cracks resulting from the metal removal process. In the absence of a PT examination, discuss efforts for verifying crack characterization and monitoring crack generation from the metal removal process.
2. Page 10 states that "the repair weld region will be re-examined using the ultrasonic and eddy current examination methods to verify the as left flaw dimensions are still within the acceptance limits of IWB-3600." Discuss the demonstrations that were used to establish the reliability and effectiveness of the UT to detect and size cracks of different sizes prior to repair and after repair. Specifically, the orientation, kinds, types, number, ligaments, and characteristics of the flaws and the flaw locations in the mock-up. Be specific about the value each mock-up provided to the overall UT demonstration process. For instance, mock-ups used for calibration and instrumentation, for detecting circumferential inside surface PWSCC, or for sizing simulated PWSCC cracks beneath the weld.
 - a. Discuss the cold isostatic pressure - electric discharge machined (CIP EDM) notches used in the mock-ups. How was the acoustic characteristic determined and how does it compare to PWSCC? What is the average tip radius and tip radius standard deviation for the CIP EDM process.
 - b. Discuss the representativeness of the mock-up flaws to PWSCC originating from inside and outside surfaces of the CRDM.
 - c. Discuss the effects of different inside diameter weld thicknesses on the ability of UT examinations to detect and size the flaws below the repair weld. Discuss the capabilities of the UT to size cracks extending from the J-groove/CRDM interface and below the repair weld.

- d. Provide the technical justification, single-to-noise ratios showing the presence of different type/size flaws, layout of flaw locations in the mock-ups, calibrations, and UT procedure. Discuss the effectiveness detecting and measuring ligaments. The justification should contain sufficient detailed information for a third party UT expert to arrive at the same detection and characterization conclusions, i.e. digital images of qualification test data depicting flaw detection.

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