November 21, 2003

MEMORANDUM FOR: Robert A. Gramm, Section Chief
Project Directorate Section IV-1
Division of Licensing Project Management

FROM: A. Louise Lund, Section Chief ***/RA/***
Steam Generator Integrity & Chemical Engineering
Materials and Chemical Engineering Branch
Division of Engineering

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - ARKANSAS NUCLEAR ONE - UNIT 1 ONCE THROUGH STEAM GENERATOR INSERVICE INSPECTION REPORT (TAC MB7282)

By letter dated January 17, 2003, Entergy Operations, Inc. (the licensee) submitted its steam generator (SG) tube inspection report for the Arkansas Nuclear One - Unit 1 (ANO-1) seventeenth refueling outage (1R17). This report is the so called 90-day report required by plant technical specification 5.6.7.a.

The Materials and Chemical Engineering Branch has reviewed the licensee's report and has prepared the attached Request for Additional Information (RAI). The staff needs the requested information to complete its review.

Docket No.: 50-313

Attachment: As Stated

CONTACT: Emmett Murphy, EMCB/DE
301-415-2710

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REQUEST FOR ADDITIONAL INFORMATION
STEAM GENERATOR INSPECTION REPORT FOR
ARKANSAS NUCLEAR ONE - UNIT 1

Reference: Letter (1CAN010301) dated January 17, 2003 from Sherrie R. Cotton, Entergy Operations, Inc. to NRC transmitting the 1R17 Once Through Steam Generator Inservice Inspection 90 Day Report.

1. In Table 2.1 of the referenced report, volumetric indications are reported at the lower re-roll transitions. What is your assessment concerning the defect mechanism and cause of these indications? Were these indications present during previous inspections or are they new indications? If these volumetric indications are potentially intergranular attack (IGA) related, why are these indications considered a separate population from those indications labeled in Table 2.1 as "volumetric IGA indications in the UTS" which you have shown are not exhibiting growth at the present time?

2. In Table 2.1, please provide a breakdown of "upper roll/transition cracking" in terms of number of axial and circumferential indications. Similarly, please provide a breakdown of "re-roll cracking - Upper Transition (OPB)" and "re-roll cracking - other re-roll indications within the pressure boundary" in terms of the number of axial, circumferential, and volumetric indications."

3. Table 3.1 refers to "TSP cracking circumferential" for which 0.025 gallon per minute (gpm) leakage is projected for the end of the current operating cycle. Table 2.1 makes no mention of this circumferential cracking mechanism at the tube support plates, nor is there any discussion of this mechanism in the report. Were any circumferential indications identified during 1R17, apart from those at the tube ends, tube hard rolls, or tube re-rolls? If so, provide the number, size, and location of these circumferential indications.

4. Tables 2.3 and 2.4 report the condition monitoring leakage estimates for the upper tubesheet tube end cracking (TEC). Table 2.9 reports the condition monitoring leakage estimates for upper tubesheet IGA. Were there other mechanisms that also contributed to total condition monitoring estimate of accident induced leakage? If so, what were the contributions from these other mechanisms? What was the condition monitoring estimate of total accident induced leak rate from all mechanisms?

5. The January 17, 2003 letter reports that the calculated maximum total best estimate LBLOCA leakage is 1.87 gpm. Describe the basis by which this leakage was determined to be acceptable; i.e., that this best estimate leakage would not result in a significant increase of radionuclide release (e.g., in excess of 10 CFR 100 limits). In addition, please provide a summary of the assessment performed for the circumferential cracks found during 1R17 in the original tube-to-tubesheet rolls, tube-to-tubesheet re-roll repairs, and heat affected zones of seal welds to establish their contribution to the calculated 1.87 gpm leakage.

ATTACHMENT