March 17, 2000

Mr. Craig G. Anderson
Vice President, Operations ANO
Entergy Operations, Inc.
1448 S. R. 333
Russellville, AR 72801

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON PROBABILISTIC PORTION OF OPERATIONAL ASSESSMENT FOR STEAM GENERATOR TUBING FOR CYCLE 14 - ARKANSAS NUCLEAR ONE, UNIT 2 (TAC NO. MA1951)

Dear Mr. Anderson:

By letter dated June 2, 1999, Entergy Operations, Inc. (Entergy) submitted an operational assessment of steam generator tube integrity for Cycle 14 operation at Arkansas Nuclear One, Unit 2 (ANO-2). The ANO-2 steam generator operational assessment documented an evaluation performed by Entergy to justify continued operations until the planned fall 1999 mid-cycle outage to conduct steam generator tube inspections. Entergy performed a probabilistic evaluation to both deterministic and probabilistic acceptance criteria.

On June 28, 1999, representatives of the Nuclear Regulatory Commission (NRC) and Entergy met to discuss the operational assessment. At the conclusion of the meeting, the NRC stated that it will be requesting Entergy to submit additional information regarding various parameters and inputs used in the probabilistic evaluation. This information is needed for the NRC to independently verify the adequacy and accuracy of Entergy's predictive model.

In a letter dated October 18, 1999, the NRC requested additional information, to which Entergy responded by letter dated November 5, 1999. The October 18, 1999, request for additional information (RAI) focused on Entergy's deterministic evaluation and acceptance criteria presented in the June 2, 1999, operational assessment, and requested information to support the NRC's review of your most recent steam generator inspection (at that time) and your methodology used to predict future performance of steam generator tubes. The deterministic evaluation and acceptance criteria are still under review, and are not part of this request.

The NRC plans to review the probabilistic assessment methodology in greater detail to gain a better understanding of the methodology for generic purposes. Enclosed is the NRC's RAI.

This RAI has been discussed with Mr. John Dosa of your staff, and a response time frame of within 60 days from the date of this letter was agreed to. The staff appreciates your efforts in regard to this matter.

If circumstances should arise to which this date becomes unreasonable, please contact me at your earliest opportunity.

Sincerely,

/RA/

Thomas W. Alexion, Project Manager
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosure: RAI

cc w/encl: See next page

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Thomas W. Alexion, Project Manager
Project Directorate IV & Decommissioning
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Docket No. 50-368

Enclosure: RAI

cc w/encl: See next page

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* no substantive change to RAI input

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REQUEST FOR ADDITIONAL INFORMATION

REVIEW OF STEAM GENERATOR TUBE INTEGRITY

OPERATIONAL ASSESSMENT METHODOLOGY

AT ARKANSAS NUCLEAR ONE, UNIT 2

The Nuclear Regulatory Commission (NRC) staff has reviewed Entergy Operations, Inc. (the licensee) submittal dated June 2, 1999, and found that additional information is needed in the following areas to continue our independent assessment of the licensee's probabilistic assessment methodology.

Note: All questions relate to the operational assessment for axial flaws. Responses to the questions can be limited to addressing only axial flaws.

1. The probabilistic models for leakage and burst require several inputs. The licensee's June 2, 1999, letter discusses these inputs, and in some cases, provides related tables and/or figures. But, based on discussions that took place during the June 28, 1999, meeting, the staff is not clear whether the inputs, as described in the June 2 letter, are the exact inputs used for the licensee's Cycle 14 operational assessment. Therefore, clarification is requested for the input parameters, as follows:

   a. Provide the material strength distribution, in tabular format, that was utilized to describe the material strength distribution in the Cycle 14 operational assessment. Clarify if this information is the same as that found in Figure 4.0 of the June 2, 1999, letter.

   b. Provide the crack length distribution, in tabular format, that was utilized in the Cycle 14 operational assessment. Clarify how this information relates to Figures 4.4 and 4.5 of the June 2, 1999, letter.

   c. Provide the crack growth rate distribution, in tabular format, that was utilized in the Cycle 14 operational assessment. Clarify if this information is the same as that found in Figure 4.3 of the June 2, 1999, letter.

   d. Provide a table listing each of the steam generator inspections simulated as having been performed in the probabilistic operational assessment model and the cumulative effective full power years after each cycle. In addition, provide the probability of detection that was assumed in the model for each cycle (or half-cycle as the case may be).

2. Page 12 of the June 2, 1999, letter refers to a flaw initiation function. Provide details on the flaw initiation function and supporting information (e.g., the Weibull distribution or shape and scale) that was used for the Cycle 14 operational assessment.

Enclosure

3. Provide a table, similar to the one below, of all the axial flaws identified during the 2P99 mid-cycle inspection. Please indicate the source of the data (e.g., bobbin coil, rotating pancake coil, etc.).

Row	Column	Location	Length	Depth	Growth Rate

4. Provide the distribution of flaws that was predicted by the run-time model used to justify the timing of the 2P99 mid-cycle inspection as described in the June 2, 1999, letter. If the run-time model did not produce one single flaw distribution, the data can be summarized through a set of plots similar to Figure 4.11 in the June 2, 1999, letter, but without the "Observed" data. The plots should describe the frequency versus the number of detected defects for the categories described below:

   a. all flaws

   b. flaws greater than 5% through wall

   c. flaws greater than 10% through wall

   d. flaws greater than 20% through wall

   e. flaws greater than 40% through wall

   f. flaws greater than 60% through wall

   g. flaws greater than 80% through wall