

September 12, 1995

Mr. Jerry W. Yelverton  
Vice President, Operations ANO  
Entergy Operations, Inc.  
1448 S. R. 333  
Russellville, AR 72801

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR GENERIC LETTER 95-03  
ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 (ANO-1 & 2) (TAC NOS. M92220  
AND M92221)

Dear Mr. Yelverton:

On April 28, 1995, the U.S. Nuclear Regulatory Commission issued Generic Letter (GL) 95-03 "Circumferential Cracking of Steam Generator Tubes" which requested addressees to evaluate recent operating experience related to circumferential cracking, justify continued operation until the next scheduled steam generator tube inspections, and to develop plans for the next steam generator tube inspections. The staff has reviewed the response provided by Entergy Operations, Inc. for ANO-1 & 2. As a result of the review of your response, the staff has identified areas for which additional information and/or clarification is needed. The enclosure to this letter contains the information needed for the staff to complete its review of your response to GL 95-03.

This request is within the original 350 hour reporting burden for information collection covered by the Office of Management and Budget clearance number 3150-0011. Please respond within 30 days.

Sincerely,

ORIGINAL SIGNED BY:

George Kalman, Senior Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket Nos. 50-313 and 50-368

Enclosure: As stated

cc w/encl: See next page

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

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Sincerely,

A handwritten signature in cursive script that reads "George Kalman".

George Kalman, Senior Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket Nos. 50-313 and 50-368

Enclosure: As stated

cc w/encl: See next page

Mr. Jerry W. Yelverton  
Entergy Operations, Inc.

Arkansas Nuclear One, Units 1 & 2

cc:

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County Judge of Pope County  
Pope County Courthouse  
Russellville, AR 72801

## Request for Additional Information

### ANO-1

1. Discuss the design differences between the ANO-1 steam generators and the generic design information provided in the B&W Owners Group response, if any.
2. Dented regions including dented tube support plates

In the Electric Power Research Institute (EPRI) report NP-6201 "PWR Steam Generator Examination Guidelines: Revision 3", dated November 1992, it indicated that B&W plants have experienced denting at tube support plates and in the lower tubesheet. Circumferential indications have been observed at dented areas in recirculating steam generators. If denting has been observed at ANO-1 and it is a location susceptible to circumferential cracking, please submit the information requested in Generic Letter (GL) 95-03 per the guidance contained in the GL. If a voltage threshold is used for determining the threshold for examining dents, provide the calibration procedure used (e.g., 4.0 volts on 4-20% through-wall ASME holes at 550/130 mix).

EPRI report NP-6201 indicates that the fifteenth tube support plate contains both broached holes and drilled holes. The drilled holes being prone to denting. Please clarify whether all of the tube support plates are of the broached hole designs or whether a number of them contain drilled holes. Discuss whether denting has been limited to the drilled hole locations, if applicable, or if it has been observed at other support plate intersections (i.e., broached holes).

3. Expansion transition examinations

Provide the number of tubes currently in service that were re-rolled after the furnace stress relief.

Clarify the inspections performed during the last outage at the expansion transition region. Address the probe used and the number of tubes inspected.

Provide the criteria to be used for determining whether expansion of the inspections for expansion transition indications is necessary.

4. Lane/Wedge Region

Clarify the inspection scope in the lane/wedge region during the last steam generator tube inspections (including the probe type and number, ((and/or percentage)) of tubes inspected).

Provide the criteria to be used for determining whether the expanded inspection scope around any identified indications adjacent to the sleeved lane/wedge region is bounded.

5. Recently, several tubes have been pulled from B&W once through steam generators (OTSGs). Discuss any analyses performed on these pulled tubes for monitoring the development of circumferential cracking. For example, discuss the destructive and non-destructive examinations performed on these pulled tubes in the laboratory at the expansion transition area.
6. Clarify whether the inspection method to be used at ANO-1 is qualified for the detection of circumferential cracks per Appendix H of EPRI report NP-6201 or whether a site specific qualification program will be used. If using site specific qualification procedures, state the differences and provide the justification for these criteria including a discussion of pulled tube data to support the detectability of circumferential cracks in the field.
7. Discuss the number and types of sleeves used at ANO-1 along with their installation dates (i.e., month/year).

#### ANO-2

1. The following areas have been identified as being susceptible to circumferential cracking:
  - a. Expansion transition circumferential cracking
  - b. Small radius U-bend circumferential cracking
  - c. Dented location (including dented TSP) circumferential cracking
  - d. Sleeve joint circumferential cracking

In your response, area b was not specifically addressed, although it was indicated that circumferential cracking has also been observed in the U-bend region of a retired Combustion Engineering steam generator. In addition, recirculating steam generators designed by another vendor have experienced circumferential cracking in the U-bend portion of tubes with small radius U-bends. Please submit the information requested in Generic Letter (GL) 95-03 per the guidance contained in the GL for this area (and any other area susceptible to circumferential cracking). The staff realizes that some of the above areas may not have been addressed since they may not be applicable to your plant; however, the staff requests that you clarify this (e.g., no sleeves are installed; therefore, the plant is not susceptible to sleeve joint circumferential cracking).

In your response, it was indicated that dented locations (specifically dented support plate locations) are susceptible to circumferential cracking and that some of these locations were examined during the prior inspection outage. Discuss the criteria used for determining which dents were examined. If a voltage threshold was used for determining the threshold for examining dents,

provide the calibration procedure used (e.g., 4.0 volts on 4-20% through-wall ASME holes at 550/130 mix). In addition, clarify the past inspection scope and your future inspection plans for dented locations.

2. It was indicated that sleeves are installed at ANO-2. Please discuss the types of sleeves installed at ANO-2.