

Mr. D. N. Morey  
 Vice President - Farley Project  
 Southern Nuclear Operating  
 Company, Inc.  
 Post Office Box 1295  
 Birmingham, Alabama 35201-1295

February 5, 1998

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING SOUTHERN  
 NUCLEAR OPERATING COMPANY'S "FARLEY UNIT 2 1996 ALTERNATE REPAIR  
 CRITERIA 90-DAY REPORT" - JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2  
 (TAC NO. M99839)

Dear Mr. Morey:

On March 7, 1997, the Unit 2, "90-Day Report" for the Joseph M. Farley Nuclear Plant was submitted, as required by the Technical Specifications, to implement Generic Letter (GL) 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking." In the report, you compared the predictions for accident leak rates at the end-of-cycle 11 (EOC-11) with calculations based on actual inspection results. You found the predicted accident leak rate was nonconservative with respect to the actual calculated leak rate although still within the site allowable leak rate limits. You attributed the nonconservative prediction to an unexpectedly high number of large, i.e., greater than two volt, indications and reported that indications in unplugged tubes often grew at rates much faster than the rest of the voltage population. Because the methodology used to predict the EOC-11 voltage distribution did not consider higher growth rates for indications in unplugged tubes, you obtained a nonconservative prediction of the EOC-11 voltage distribution. The nonconservative prediction of the voltage distribution in turn resulted in a nonconservative calculation of the accident leak rate.

The NRC staff has reviewed your submittal and has determined that additional information is required. The staff requires clarification to ensure conservative predictions were made for the current operating cycle (Cycle 12) at Farley Unit 2.

In order to maintain a timely review, it is requested that the information be provided as outlined in the enclosed RAI (within 30 days of receipt of this letter for the first question, and in the next 90-day report for the balance of the questions). For clarification regarding this request, please call me at (301) 415-2426.

Sincerely,

ORIGINAL SIGNED BY:

Jacob I. Zimmerman, Project Manager  
 Project Directorate II-2  
 Division of Reactor Projects - I/II  
 Office of Nuclear Reactor Regulation

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Docket Nos. 50-348 and 50-364

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Enclosure: Request for Additional Information

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 "Jacob I. Zimmerman".

Jacob I. Zimmerman, Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

ocket Nos. 50-348 and 5L 34

Enclosure: Request for Additional Information

cc w/encl: See next page

Joseph M. Farley Nuclear Plant

cc:

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## REQUEST FOR ADDITIONAL INFORMATION

To complete its review of the subject 90-day report, the staff requests that Southern Nuclear Operating Company (SNC) provide the response to Question 1 within 30 days, and answer the remaining questions in SNC's next 90-day report.

1. Submit the current accident leak rate assessment for the end-of-cycle 12 (EOC-12) at Farley Unit 2. Include specific references to any changes in the Bases from which this value was calculated as compared to the subject 90-day report (e.g., the indications included in the beginning-of-cycle population now includes "unusual outside diameter phase angle" indications (UOAs), the data base now includes the latest Farley Unit 2 tube pull result, etc.).
2. Discuss the various characteristics SNC has evaluated in an effort to understand the growth rate behavior of outside diameter stress corrosion cracking (ODSCC) located at the tube support plates (TSPs) in deplugged steam generator (SG) tubes. Include, at a minimum, in the response:
  - (a) the total number of deplugged tubes placed in service per SG. Include those tubes that have since been replugged.
  - (b) the cycle in which each tube was initially plugged, the cycle in which each tube was deplugged, and the cycle in which each tube was replugged. If a deplugged tube is still in service, so indicate. Include those tubes that were replugged without additional service time.
  - (c) for each deplugged tube with ODSCC located at the TSPs, provide the voltage of the ODSCC indication(s) prior to plugging, just after deplugging, and the most recent voltage measurement. Provide this information for all deplugged tubes, including those that have since been replugged and those that were replugged without additional service time.
  - (d) the location of the deplugged tubes in the SG (e.g., R56C115, first TSP).
  - (e) the appropriateness of using the growth rates of the ODSCC indications, during the time in which the tubes were plugged, to predict the growth rate behavior of the indication(s) when the tube was placed back into service.
3. The results of a sensitivity analysis on the projected tube leak rate and burst probability for EOC-12 are shown in Table 8-4 of the subject report. The staff requests clarification of the information shown in Table 8-4. There are four distributions: "Tubes in service Cycle 10," "Tubes deplugged EOC10," "All indications (Combined analysis)," and "All Indications (Based on EOC voltages)." For each distribution, clarify the growth rate distribution applied. Specify whether the distribution is from a composite or SG specific distribution. Specify whether the distribution is based on deplugged tubes, inservice tubes, or a combination of both.

Enclosure

4. The staff understands that for current EOC-12 predictions, SNC took into account the growth rate of unplugged tubes by "weighting" the two separate growth distributions (one growth rate distribution for inservice tubes and a second growth rate distribution for unplugged tubes) by the number of each type of indication returned to service. Benchmarking would provide an assessment of the weighted distribution methodology. Discuss SNC's benchmarking results; i.e., how did the EOC-11 actual distribution of voltages compare with the EOC-11 predictions made using the "weighted" distribution methodology? How did the EOC-12 actual distribution of voltages compare with the EOC-12 predictions made using the "weighted" distribution methodology?
5. For SG "C," the staff performed confirmatory tube burst and leak rate calculations using the standard Generic Letter (GL) 95-05 methodology. The staff obtained a burst value nearly identical to SNC's and obtained a leak rate value about 5% larger than SNC. The staff expected to obtain significantly different values, in a less conservative direction, from SNC because SNC calculated the burst and leak rate values using the more conservative "weighted" methodology as compared to the standard GL 95-05 methodology. In an effort to understand this apparent discrepancy, provide a more detailed discussion of the "weighted" methodology than is currently available in the 90-day report.
6. Discuss how UOAs contributed to the EOC-11 underprediction from the previous cycle. Discuss tube pull results, historical reviews, rotating pancake coil inspection results, etc., that support SNC's conclusion that UOAs need not be included as part of the indication population for implementation of the GL 95-05 voltage-based repair criteria.