



50-348/364

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

January 9, 1998

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RELATED TO THE USE OF A
SMALLER DIAMETER PROBE WHEN IMPLEMENTING GENERIC LETTER
95-05 - JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2
(TAC NO. M99840)

Dear Mr. Morey:

On March 7, 1997, you submitted the Joseph M. Farley Nuclear Plant, Unit 2, "90 Day Report" 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." As part of the submittal, you requested that the staff review the use of a smaller diameter bobbin coil eddy current probe when implementing GL 95-05. Section 10 of your report summarized the qualification test results for the smaller diameter probe.

Currently, GL 95-05 requires the use of a 0.720-inch diameter probe for plants with 7/8-inch diameter steam generator (SG) tubes such as Farley, Units 1 and 2. However, Section 3.c.7 of Attachment 1 of GL 95-05 allows the use of smaller diameter probes to inspect tubes where it is impractical to use a nominal size probe (i.e., the 0.720-inch diameter probe) provided the probe and associated procedure have been demonstrated on a statistically significant basis to give an equivalent voltage response and detection capability when compared to the nominal-size probe, subject to NRC staff approval.

On November 10, 1997, you provided the details of the testing performed at Farley, Unit 2, to demonstrate the acceptability of the smaller diameter eddy current probe in a report titled, "Farley Unit 2 Small Bobbin Probe (0.640") Qualification Test Report." You also stated in the November 10 letter that the qualification of the smaller diameter probe should be considered generic in nature and applicable to other plants with 7/8-inch diameter SG tubes and that acceptability of the 0.640-inch diameter probe automatically qualifies probes with diameters ranging in size from 0.640 inch to 0.720 inch. In addition, you stated your intention to use the smaller diameter bobbin coil eddy current probe on both Farley units.

The staff has reviewed your submittal and determined that additional information is required. The enclosure identifies the requested additional information needed.

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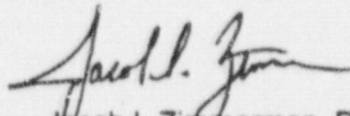


D. N. Morey

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In order to maintain a timely review, it is requested that the information be provided within 30 days of receipt of this letter. If you require any clarification regarding this request, please call me at (301) 415-2426.

Sincerely,



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

Docket Nos. 50-348 and 50-364

Enclosure: Request for Additional Information

cc w/encl: See next page

D. N. Morey

-2-

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ORIGINAL SIGNED BY:

Jacob I. Zimmerman, Project Manager
Project Directorate II-2
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REQUEST FOR ADDITIONAL INFORMATION

USE OF A SMALLER DIAMETER PROBE

WHEN IMPLEMENTING GENERIC LETTER 95-05

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

Nondestructive Examination (NDE) UNCERTAINTY

Relative to a nominal-size probe, the 0.640-inch probe may introduce more NDE uncertainty due to its smaller size; this is due primarily to an increase in probe wobble that results in a degraded signal-to-noise ratio.

1. As discussed in GL 95-05, eddy current voltage measurement uncertainty stems primarily from two sources: (1) voltage response variability due primarily to probe wear, and (2) voltage measurement variability among data analysts. These uncertainties have been quantified based on testing performed with nominal-size probes and are currently used by licensees in the prediction of the end-of-cycle (EOC) voltage distribution in the implementation of GL 95-05. Discuss how the smaller diameter bobbin coil eddy current probe differs from the nominal-size probe with respect to the voltage response variability and the voltage measurement variability. Provide the quantitative basis for concluding the current values of the mean and standard deviation for probe wear and analyst uncertainty are acceptable to use when predicting the EOC voltage distribution if some of the beginning-of-cycle (BOC) voltage values were obtained using a smaller diameter bobbin coil eddy current probe.
2. Discuss how other aspects related to controlling NDE uncertainty, such as the probe variability criteria and the noise criteria in the data analysis procedures, should be modified from current practice to minimize these sources of NDE uncertainty.

PROBABILITY OF DETECTION (POD)

As a point of clarification, the staff notes the POD results are based on a comparison with the nominal-size probe, not with metallurgical results. Thus, the statement that the smaller diameter probe POD meets or exceeds the Electric Power Research Institute's Appendix H requirements is not accurate because the accuracy of the nominal-size probe is itself subject to uncertainty.

3. To demonstrate a POD of at least 80% at a 90% confidence level, Southern Nuclear evaluated only indications confirmed with a rotating pancake coil (RPC). Provide the technical justification for not including indications that were either not RPC inspected or not RPC confirmed. Include a reevaluation of the POD performance of the smaller diameter probe using all indications, regardless of RPC results, voltage or classification (e.g., potential indications (PIs), unusual OD phase angle indications (UOAs), and indications not reportable (INRs)).

4. The staff noted that supporting data from the spring 1994 Cook, Unit 1, and Farley, Unit 1, inspection results were not discussed in the submittal. Reevaluate the POD performance of the smaller diameter probe using the data from all three plants.

REPORTING REQUIREMENTS

Additional reporting requirements in the 90-Day Reports may be appropriate to provide confidence that if the use of a smaller diameter probe results in missing or under sizing a number of indications and/or results in a nonconservative estimation of the NDE uncertainty models, that these conditions will be identified.

5. Discuss the appropriateness of additional reporting requirements in the GL 95-50 90-day report such as the following: If any significant differences exist between the actual and the predicted EOC voltage distributions (e.g., number of indications, size of largest indications, distribution of indications, etc.), the root cause should be evaluated and reported to the NRC. The effects of using a smaller diameter probe should be explicitly considered in this evaluation. If use of a smaller diameter probe is determined to be one of the factors for the difference, actions should be taken to prevent recurrence.

MISCELLANEOUS

6. Referring to page 6 of the report submitted November 10, 1997, the number of indications discussed in Section 4.0 that refer to Table 4 do not correspond with the number of indications listed in Table 4. Provide corrected text and/or a corrected Table 4.
7. Provide the specific circumstances under which the smaller diameter probe would be employed for dispositioning tubes in accordance with GL 95-05. How many tubes and associated tube support plate intersections currently match those circumstances at Farley, Units 1 and 2?
8. Provide Reference 1 of SG-97-01-002 for staff review.