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MAR 01 1988

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of) Docket No. 50-328
Tennessee Valley Authority)

SEQUOYAH NUCLEAR PLANT (SQN) - NRC BULLETIN 88-02, "RAPIDLY PROPAGATING FATIGUE CRACKS IN STEAM GENERATOR TUBES"

Enclosed is TVA's response to the subject bulletin for SQN unit 2. This information is provided in response to NRC's verbal request for SQN unit 2 results in advance of the scheduled date for responding to the bulletin.

TVA's position is that SQN unit 2 has no corrosion-induced denting at the upper tube support plate. TVA, however, has conservatively decided to implement an enhanced primary-to-secondary leak rate monitoring program for SQN unit 2.

Enclosure 1 provides a brief description of the enhanced primary-to-secondary leak rate monitoring program for SQN unit 2. The program will be implemented in accordance with NRC Bulletin 88-02. It will be in place by March 25, 1988, or before exceeding 50-percent power level, whichever occurs first. Enclosure 1 also describes TVA's program for developing long-term corrective action. The corrective action plan will be complete three months after startup from the SQN unit 2 cycle 3 refueling outage. Enclosure 2 contains TVA's commitments for SQN unit 2 with respect to NRC Bulletin 88-02.

If there are any questions concerning this response, please telephone D. L. Williams at (615) 632-7170.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley, Director
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Regulatory Affairs

Enclosures
cc: See page 2

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Enclosure 1

SQN Unit 2

Response to NRC Bulletin 88-02

The most recent steam generator eddy current examination was performed in August 1986 and included a total tube sample of 10.7 percent for upper tube support plate to tube intersections. The result of the data evaluation showed no evidence of tube support plate corrosion-induced denting at the upper tube support plate. A previous examination did identify magnetite from sludge deposits in a small number of upper support plate intersections. TVA's position is that SQN unit 2 has no corrosion-induced denting at the upper tube support plate. TVA, however, has conservatively decided to implement an enhanced primary-to-secondary leak rate monitoring program for SQN unit 2.

TVA is currently reviewing applicable procedures and monitoring equipment setpoints to implement the enhanced primary-to-secondary leak rate monitoring program. The subject program will be in accordance with the NRC recommendations in paragraph C.1 to reduce plant power level to 50 percent or less at least 5 hours before a tube rupture is predicted to occur based on the assumed time-dependent leakage curve given in figure 1 of NRC Bulletin 88-02. Further, all the NRC recommendations for leakage measurement and trending methods; time intervals between measurements; alarms and alarm setpoints; intermediate actions based on leak rates or receipt of alarms; administrative limits for commencing plant shutdown; and time limitations for (1) reducing power to less than 50 percent, and (2) shutdown to cold shutdown, will be considered. The subject program will be implemented by March 25, 1988, or before exceeding 50-percent power level, whichever occurs first.

TVA has established a program to perform a 100-percent eddy current examination of tube rows 7 through 12 on each of the SQN unit 2 steam generators at the next refueling outage. Row 23 will be scanned and used as a reference point to assist in the location of the antivibration bar (AVB). This quantity of inspection data is necessary to accurately determine the AVB penetration depth and pattern. The AVB data, SQN unit 2 specific plant operating history, system parameters, and steam generator maintenance and modification history will be supplied to Westinghouse for analysis. This analysis shall identify all nonsupported tubes potentially susceptible to rapidly propogating fatigue cracking. Based on the results of the Westinghouse analysis, TVA will establish an inspection and corrective actions program that will consider preventive plugging and stabilization of potentially susceptible tubes, hardware modifications, and/or operational changes to reduce stability ratios. If indication of upper tube support plate denting is found in any tube in rows 7 through 12 during the subject eddy current examination, an immediate analysis will be performed to determine if remedial action is necessary before return to service. A complete analysis and the long-term corrective action plan will be complete three months after startup from the SQN unit 2 cycle 3 refueling outage.

The AVB penetration depth and pattern used in the development of the corrective action plan will be determined by the following method. This method has been reviewed and accepted by Westinghouse for flow-induced vibration analysis. Eddy current data will be taken for all tubes in rows 7 through 12 and row 23 from the hot leg seventh tube support plate to the cold leg seven' ube support plate. The data will be analyzed to identify the location of _.l AVB signals for each U-bend. The number of signals identified can vary from eight maximum (where the tube is supported on each leg by both the upper and lower AVB, and the AVB bars on each side of the tubes are not aligned and produce separate eddy current examination signals) to a lesser number, dependent on alignment, location, and contact with the tube. These axial locations are measured from the center line of the hot and cold leg seventh tube support plates to the center line of the AVB signal. The numerical axial data is entered into a graphic display computer system, and data points for rows 7 through 12 and row 23 are plotted on a plan drawing for each tube column. The AVB is then drawn in through the eddy current examination signal locations using the design radius. The data points do not always match exactly because of probe slippage, drag, and small measurement errors. To establish the exact location of each AVB, the analyst must normalize the location based on the best fit to the data points and design geometry. This will result in a plot of the AVB through the data points for the intersected tubes. If the AVBs on each side of the tube are not aligned, it will result in two AVB plots. After a plot for each column is established, the adjacent column plots are compared to verify AVB location and to determine on which side of the tube the given AVB is located. Once it has been established where a given AVB is located, the AVB penetration depth can be projected to the apex of the adjacent tubes and then can be translated onto a tube map showing the exact penetration depth for each individual AVB.

An AVB may not penetrate far enough to provide fully effective lateral support for the adjacent tube. Westinghouse will conduct, based on analytical experience and model testing, an evaluation of each suspect tube to determine the quality of AVB support and the appropriate tube stability ratio.

Enclosure 2

List of Commitments

1. SQN unit 2 will implement an enhanced monitoring program for primary-to-secondary leak rate by March 25, 1988, or before exceeding 50-percent power level, whichever occurs first.

2. A long-term corrective action plan will be complete three months after startup from the SQN unit 2 cycle 3 refueling outage.