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R.J. Adney
Site Vice President
Sequoyah Nuclear Plant

November 6, 1995

U.S. Nuclear Regulatory Commission
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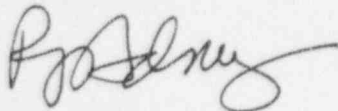
Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT (SQN) UNIT 1 -
DOCKET NO. 50-327 - FACILITY OPERATING LICENSES DPR-77 - LICENSEE EVENT
REPORT (LER) 50-327/95014

The enclosed LER provides details concerning the apparent failure to properly identify a
steam generator tube that was determined to exceed the technical specifications (TS)
plugging limit.

This condition is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as an
operation prohibited by technical specifications.

Sincerely,



R. J. Adney

Enclosure
cc: See page 2

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Enclosure

cc (Enclosure):

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)
Sequoyah Nuclear Plant (SQN), Units 1 and 2

DOCKET NUMBER (2)
05000327

PAGE (3)
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TITLE (4) Failure to Properly Identify and Plug a Steam Generator (S/G) Tube that was Determined to Exceed the Technical Specification Plugging Limit

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
05	09	93	95	014	00	11	06	95	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)	0	20.402(b)			20.405(c)			50.73(a)(2)(iv)		73.71(b)
		20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(v)		73.71(c)
		20.405(a)(1)(ii)			50.36(c)(2)			50.73(a)(2)(vii)		OTHER
		20.405(a)(1)(iii)			X 50.73(a)(2)(i)			50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)		
20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)				

LICENSEE CONTACT FOR THIS LER (12)

NAME
J.W. Proffitt, Compliance Licensing Engineer

TELEPHONE NUMBER (Include Area Code)
(423) 843-6651

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYS TEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE.) NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 5, 1995, during the performance of S/G tube analysis, it was determined that during the Unit 1 Cycle 6 refueling outage, an indication on the S/G No.3, Row 11, Column 71 tube at the first tube support plate was not properly dispositioned. This resulted in the failure to plug a tube that was subsequently determined to exceed the technical specification plugging limit. The cause of the failure to correctly diagnose the indication in 1993 was determined to be the result of a misjudgement on the part of both the primary and secondary analyst with regard to this indication. Both the primary and secondary analysts have been provided feedback in regard to the misdiagnosed tube. The performance database has been updated to include dented intersections with flaws. No other corrective actions are considered necessary. TVA will continue to follow the resolution of industry-identified issues in S/G eddy-current testing and integrate these lessons learned as appropriate.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

I. PLANT CONDITIONS

Unit 1 was in the Cycle 7 refueling outage with the core off-loaded.

II. DESCRIPTION OF EVENT

A. Event

On October 5, 1995, during the performance of steam generator (S/G) tube analysis, it was discovered that during the Unit 1 Cycle 6 (U1C6) refueling outage, an indication at a tube support plate intersection on the S/G No.3, Row 11, Column 71 tube appeared not to have been properly dispositioned. This resulted in the failure to plug a tube that was subsequently determined to exceed the Technical Specification 3/4.4.5 plugging limit of 40 percent of the nominal tube wall thickness.

B. Inoperable Structures, Components, or Systems that Contributed to the Event

None.

C. Dates and Approximate Times of Major Occurrences

May 9, 1993 The primary and secondary analysts dispositioned S/G 3, Row 11, Column 71 indication as no detectable degradation.

September 30, 1995 S/G 3, Row 11, Column 71 was field tested with a bobbin probe and determined to have a crack that was characterized as near through-wall.

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October 5, 1995

A review of previous test results determined that an indication was present in the U1C6 data at the subject intersection. This indication was determined to exceed the criteria for plugging the tube.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

As a result of identifying a pluggable indication during the Unit 1 Cycle 7 (U1C7) refueling outage, a review of previous data was performed. It was determined that the indication was incorrectly diagnosed during the U1C6 refueling outage.

F. Operator Actions

No operator action was required.

G. Safety System Responses

No safety system response was required.

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of this condition was the failure to properly identify and disposition eddy current data during Unit 1 Cycle 6 S/G eddy-current surveillance testing.

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B. Root Cause

The root cause of the failure to correctly diagnose the indication in 1993 was determined to be the result of a misjudgement on the part of both the primary and secondary analysts with regard to this indication. The cause of the misjudgements could not be definitively established.

An analysis of eddy current test data of S/G tubes is accomplished by using qualified primary and secondary contractor analysts to independently review the data. A data management person then compares the results. If any disagreement is found between the two analysts, a third individual, a TVA Level III qualified analyst, is notified for resolution. A review of the final report dispositions for this event indicates that both the primary and secondary analysts identified this specific intersection as no detectable degradation in the U1C6 refueling outage; therefore, no resolution was required.

A review of both analysts' qualifications in 1993 indicated that the analysts met or exceeded the minimum requirements, with the primary analyst qualified as a Level III with eight years of experience and the secondary analyst qualified as a Level IIA with three years of experience. Further, the analysts passed a written examination to ensure that the analysts are knowledgeable of the SQN guidelines. Also, a proficiency examination is conducted by a TVA Level III analyst to ensure that the analysts are capable of correctly diagnosing various indications.

C. Contributing Factors

A contributing cause was considered to be the lack of familiarity with the data patterns indicating a dented tube with flaws at a tube support plate intersection. This was the result of the unavailability of this type of signals in the SQN guidelines database at the time these evaluations were performed (Unit 1 Cycle 6 refueling outage).

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IV. ANALYSIS OF EVENT

It was concluded that not plugging the tube in S/G No.3 Row 11, Column 71 during the U1C6 refueling outage had no safety significance since the tube remained intact and did not leak during the cycle. The potential safety significance of not plugging the tube was minimal for the following reasons.

The location of the indication was in the S/G No.3 Row 11, Column 71 tube at the tube support plate (TSP) intersection. The TSPs would not be displaced by a steam line break (SLB) event relative to the full power position of the plates. The plates would move with the tubes even if it were postulated that the TSPs were cracked. Based on reviews of the eddy current data, there are no indications of significant cracking at the TSPs. The presence of the TSP enveloping a crack prevents burst of the crack within the TSP. Burst test data with no or small tube-to-TSP gaps show that the burst pressure of even a through-wall crack extending from within to outside the plate is equivalent to that for a free-span crack at the crack length extending outside the TSP. That is, the length of the crack within the TSP does not contribute to decreasing the burst pressure. Therefore, the burst pressure for the indications at the dented TSP intersections can be based on the free-span burst pressure for the crack length outside the TSP.

The data was evaluated to obtain the crack depth versus length profile for the indication. The indication has a length of 0.53 inches outside the TSP with an average depth of 71 percent and a total crack length of 1.05 inches with an average depth of 62 percent. An evaluation was performed with the unrealistic assumption that the support plate is not present after an SLB event. The results show that the free-span burst pressure capability for the total crack length exceeds the regulatory guidelines. Based on the above assessment, the indication at the dented TSP intersection satisfies Regulatory Guide 1.121 criteria for the structural margin guidelines. Therefore, it can be concluded that there were no adverse consequences to plant personnel or to the general public as a result of this condition.

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V. CORRECTIVE ACTIONS

A. Immediate Corrective Action

Evaluations of indications found during the current U1C7 outage were performed and did not identify other flaws with similar abnormal indications in previous inspections. This review concluded that all the indications were small in amplitude. Also, an evaluation was made to determine if either the primary or secondary analyst had an abnormal number of test analyses that went to resolution. The primary analyst had 3.4 percent of his inspections go to resolution, while the secondary analyst had 3.6 percent. The mean for the 14 analysts used during the U1C6 refueling outage was 3.5 percent. This indicates there was no systematic bias present in the results from either analyst. Based upon the above information, this misdiagnosis is considered to be an isolated event.

The S/G No.3 Row 11, Column 71 tube was plugged.

B. Corrective Action to Prevent Recurrence

Prior to this discovery, actions had been taken by SQN to ensure that the qualifications of analysts and the equipment utilized are based upon the continually improving industry information. The TVA S/G analyst guidelines for eddy current testing require analysts to be knowledgeable of the SQN guidelines and demonstrate proficiency in diagnosing various indications prior to each outage. In May 1993, the TVA S/G analyst guidelines for eddy current testing required analysts to be certified as a Level II with specific training for the evaluation of eddy current data from nonferromagnetic S/G tubing (i.e Level IIA). The performance database had been updated before the Unit 2 cycle 6 inspections were performed to include dented

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intersections with flaws. At the time of the SQN inspections for the U1C7 refueling outage, the TVA guidelines had been revised to require analysts performing degradation analysis to have successfully completed the Electrical Power Research Institute (EPRI) S/G Eddy Current Data Analyst Performance Demonstration, thus recognized as a Qualified Data Analyst. TVA will continue to follow the resolution of industry-identified issues in S/G eddy-current testing and integrate these lessons learned as appropriate.

Both the primary and secondary analysts have been informed of the misdiagnosed tube. The analysts were provided copies of the Unit 1 cycle 6 and 7 graphics for the intersection in question. No other corrective actions are considered necessary.

VI. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous Similar Events

A review of previous reportable events identified one event, LER 327/93012, associated with the failure to properly disposition a S/G tube with an indication requiring the S/G to be plugged. During the U1C6 outage, both the primary and secondary analysts reported a single axial indication on Row 24, Column 37 of S/G 1. A review of the previous history identified that, during the Unit 1 Cycle 5 (U1C5) refueling outage, the primary analyst initially reported an indication while the secondary analyst reported no detectable degradation. The primary analyst then resolved the discrepancy and changed his disposition to NDD. Multiple barriers broke down in this event, but the principal root cause was a loss of independence when the primary analyst resolved a discrepancy in which he was involved.

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Corrective actions for the 1993 event would not have been expected to prevent this condition.

VII. COMMITMENTS

None.