Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379

August 1, 1994

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) - ADDITIONAL INFORMATION FOR TECHNICAL SPECIFICATION (TS) 94-09, ALTERNATE PLUGGING CRITERIA FOR STEAM GENERATOR (S/G) TUBING - UNIT 2

Reference: TVA letter to NRC dated June 28, 1994, "Technical Specification (TS) Change 94-09, Alternate Plugging Criteria for Steam Generator (S/G) Tubing - Unit 2"

On July 6, 1994, a telephone conference was held with NRC staff for the purpose of discussing issues relating to TVA's referenced TS Change 94-09. The staff requested the following information to support their review of TS Change 94-09.

1. A comparison of the SQN interim plugging criteria (as contained in Westinghouse Commercial Atomic Power 13990) with the Farley Nuclear Plant Safety Evaluation Report for Unit 1.

2. SQN's S/G tube pull plan.

Enclosures 1 and 2 provide the above Items 1 and 2, respectively; Enclosure 3 provides a TVA commitment associated with the implementation of SQN's S/G tube pull plan.

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In addition, Enclosure 4 provides a revised commitment page that supersedes the commitment page from Enclosure 4 of TVA's referenced TS Change 94-09 letter. The revised commitment page includes three new commitments (Items 7, 8, and 9) that are based on the additional information contained in this submittal.

Please direct questions concerning this issue to D. V. Goodin at (615) 843-7734.

Sincerely,

R. H. Shell

R. H. Shell
Manager
SQN Site Licensing

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ENCLOSURE 1

COMPARISON OF THE SEQUOYAH NUCLEAR PLANT

INTERIM PLUGGING CRITERIA

AS CONTAINED IN WESTINGHOUSE COMMERCIAL ATOMIC POWER 13990

WITH THE FARLEY NUCLEAR PLANT - UNIT 1

SAFETY EVALUATION REPORT

Comparison of Sequoyah IPC WCAP and Farley-1 NRC IPC SER

Item	Farley-1 SER	Sequoyah IPC WCAP-13990
Repair limits	Repair RPC confirmed ind. >2.0 volts and ≤3.6 volts. Repair bobbin flaw ind. >3.6 volts independent of RPC confirmation.	No change
Operating leakage limit	150 gpd for voltage based IPC, although 140 gpd at Farley-1 for reasons unrelated to IPC.	150 gpd
Bobbin inspection	100% of hot and cold leg TSP intersections. EC guidelines typical of Appendix A.	100% of hot leg TSP intersections and all cold leg intersections to lowest TSP where ODSCC has been identified.[1] EC guidelines of App. A.
RPC inspection	All bobbin ind. >1.5 volt and <2.0 volt. Licensee stated all ind. >1.5 volts will be RPC inspected.	Same
RPC sample inspection	RPC inspect 100 tubes including dents > 5 volts and artifact indications. Licensee committed to inspect all dents > 5.0 volts. Expansion, if required, to be based on the nature and number of indications. Report unexpected indications such as circumferential or outside TSP prior to next cycle.	Same, except WCAP commits to inspecting at least 100 TSP intersections including dents > 5.0 volts.[2] Report unexpected indications such as circumferential or outside TSP prior to next cycle.
Allowable SLB leakage	5.7 gpm based on SRP methods and ICRP-2 thyroid dose conversion. Increased to 22.8 gpm by factor of 4 coolant activity reduction.	4.3 gpm based on SRP methods and ICRP-30 thyroid dose conversion. No reduction in coolant activity.
BOC bobbin distribution for SLB analyses	All indications including RPC NDD and non-detected indications based on draft NUREG-1477 method with POD = 0.6	Same
Growth data in SLB analyses	Most recent growth rate data.	Same, unless less than about 100 indications, in which case EPRI bounding growth distribution would be applied if more limiting.

[1] See enclosure 4 item 7 of this submittal. [2] See enclosure 4 item 8 of this submittal

Item	Farley-1 SER	Sequoyah IPC WCAP-1399[illegible]
Database for burst pressure correlation	Most recent correlation including all data, unless a specific error in burst test or voltage measurement (called NRC database).	EPRI database recommended for burst correlation. Correlation also provided for NRC database. Differences in databases outlined in Section 5.1 of WCAP. WCAP commits to using database accepted by the NRC at the time of IPC approval.
Database for leak rate analysis	Most recent leak rate data should be used for leakage analysis - it is assumed that this implies NRC database including all data without known test errors.	EPRI database recommended and also is more conservative than NRC database for draft NUREG-1477 leak rate methods. Differences in EPRI vs. NRC database outlined in Section 5.1 of WCAP. WCAP commits to using database accepted by NRC.
Probability of leakage correlation	Most conservative relative to leakage of six forms for POL should be used in predicting SLB leakage.	Log logistic POL recommended for comparing leakage with allowable limits. Other 5 forms for POL to be provided as sensitivity analyses.
SLB leak rate analysis method	SLB leakage to be calculated using draft NUREG-1477 methods.	Same, unless EPRI leak rate versus voltage correlation accepted by NRC prior to IPC approval.
Reporting of SLB analysis results	SLB leak rate to be reported prior to restart from refueling outage. SLB burst probability to be reported following completion of the outage.	Projected EOC SLB leak rate must be shown <4.3 gpm for limiting SG. Additional tubes to be plugged if necessary to meet limit. SLB burst prob. to be calculated and compared to 2.5E-02 value of NUREG-0844. [1]
IPC assessment report	Perform an assessment following completion of the outage on the effectiveness of the IPC methodology and address differences between predicted and actual values.	Not applicable to first time IPC implementation such as Sequoyah.
Tube pull requirements	No additional tube pull data required due to prior tube pull data obtained.	Not addressed in WCAP. (See enclosure 2 of this submittal.)

[1] See enclosure 4 item 9 of this submittal.

ENCLOSURE 2

SEQUOYAH NUCLEAR PLANT

STEAM GENERATOR TUBE PULL PROGRAM

Sequoyah Nuclear Plant - Unit 2

Steam Generator Tube Pull Program in support of Technical Specification Change 94-09

Upon implementation of the Technical Specification Change 94-09, SQN will initiate a tube pull program which is consistent with the EPRI draft "Steam Generator Degradation Specific Management (SGDSM) Tube Pull Program" and consists of the following:

A. Initial steam generator tube pull during Unit 2 Cycle 6 will consist of a minimum of two tubes and a minimum of six tube support plate intersections:

1. Tubes will be selected from those locations (excluding peripheral tubes and tubes that are not capable of being pulled) that exhibit the largest accessible indications and those tubes with indications at multiple tube support plate (TSP) locations. Tube selection will focus on large voltage indications (single dominant crack) versus a network of cracks (two or more) about the circumference.

2. The goal for each tube pulled is to remove three TSP intersections, which should include TSP intersections with no detectable degradation. However, if an unusually large indication is found at the first or second TSP intersection, the tube would be cut above the large indication to minimize the potential for damage to the intersection from the pulling operations.

3. Intersections exhibiting degradation shall be evaluated using pre- and post-pull nondestructive examination (NDE) and metallurgical examination to assess the crack morphology and verify the outside diameter stress corrosion cracking (ODSCC) degradation mechanism.

4. Pre-pull NDE and laboratory NDE examinations shall be performed on all pulled tube sample intersections to evaluate the degradation morphology.

5. Each tube support plate intersection exhibiting degradation will be burst and leak tested.

6. Tube support plate intersections that do not exhibit degradation by NDE will be further examined for degradation.

7. Leak rate tests will be performed to obtain data at primary- and secondary-side pressure and temperature conditions corresponding to normal operation and postulated faulted events. Leak rate tests shall be conducted using approved standard procedures developed for SGDSM implementation.

8. Burst tests shall be conducted to obtain the maximum pressure capacity of the degraded tube. Burst tests shall be conducted using approved standard procedures developed for SGDSM implementation.

9. The results from all leak and burst tests shall be made available for inclusion in the industry ODSCC data base maintained by EPRI.

B. Subsequent outage steam generator tube pulls after the Unit 2 Cycle 6 refueling outage will be as follows:

1. Pull one accessible tube with three intersections for leak rate and burst testing during alternating refueling outages as necessary to obtain at least one intersection in each of the voltage regions (2 to 4 volts, 4 to 8 volts, and 8 to 15 volts).

2. The following alternative tube pull schedules may be implemented to obtain leak and burst data: (a) the time for tube pulls may be extended to the next outage if the degradation at any outage is not extensive enough to provide data in any of the indicated voltage regions, or (b) more than one tube may be pulled in an outage when the degradation at any outage extends into more than one of the voltage regions.

3. No additional tube pulls are necessary once data have been obtained to verify the degradation mechanism, and one leak rate and one burst test data point have been obtained for each of the three indicated voltage regions, except for tubes with unanticipated voltage levels substantially higher than those expected for plant specific implementation of the SGDSM criteria for ODSCC.

ENCLOSURE 3

TVA COMMITMENT

TVA Commitment

Upon implementation of Technical Specification (TS) Change 94-09 for Unit 2, SQN will initiate a steam generator (S/G) pull program, as described in Item A of Enclosure 2. The S/G tube pull program will be implemented before restart from the Unit 2 Cycle 6 refueling outage.