Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

SEP 1 1 2008

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of) Docket No. 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 – STEAM GENERATOR TUBE INSPECTION REPORT- CYCLE 8

In accordance with the requirements in WBN Technical Specification 5.9.9, "Steam Generator Tube Inspection Report," the Enclosure provides the 180 Day Steam Generator Inspection Report for Unit 1 Cycle 8. This report is required to be submitted within 180 days after the initial entry into MODE 4 following the completion of an inspection performed in accordance with Technical Specification 5.7.2.12, "Steam Generator (SG) Program." It provides the complete results of the tube inspections.

There are no regulatory commitments associated with this submittal. If you have any questions concerning this matter, please call Emmett Camp, Steam Generator Engineer, at (423) 843-8214.

Sincerely,

M. K. Brandon
Manager, Site Licensing
and Industry Affairs

Enclosure
cc: See Page 2

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Enclosure
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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 1
STEAM GENERATOR TUBE INSPECTION REPORT

Tennessee Valley Authority

Watts Bar Nuclear Plant

Unit 1 Cycle 8
Refueling Outage
February 2008

180 Day Steam Generator Inspection Report

Prepared by: Emmett Cox 7/14/08

Verified by: William David James 07/14/08

Approved by: [signature] 7/16/08

WBN Unit 1 Cycle 8

180 Day Report

In accordance with Technical Specification 5.7.2.12, "Steam Generator Program" and Technical Specification 5.9.9, "Steam Generator Tube Inspection Report," this report documents the results of the Unit 1 Cycle 8 steam generator (SG) tube inservice inspection. The following list is the required scope of the 180 Day Report.

1. The scope of inspections performed on each SG.

EDDY CURRENT EXAM TYPE	RSG 1	RSG 2	RSG 3	RSG 4	Total
Full Length Bobbin (0.610 - rows 5 and above)	4874	4873	4874	4873	19494
Full Length Bobbin (0.590 - rows 3 &4)	127	127	127	127	508
Partial Bobbin (0.590 - VS3-HTE Rows 1-2)	127	127	127	127	508
Partial Bobbin (0.590 - VS3-CTE Rows 1-2)	127	127	127	127	508
Hot Leg Special Interest Plus Point	38	14	9	11	72
Cold Leg Special Interest Plus Point	21	2	4	2	29
U-bend Special Interest Plus Point	6	3	9	4	22
Special Interest:	*65*	*19*	*22*	*17*	*123*
Total Exams Completed	5320	5273	5277	5271	21141
Total Tubes Examined	5128	5127	5128	5127	20510

2. Active Degradation Mechanisms found.

INDICATIONS (Tubes)	RSG 1	RSG 2	RSG 3	RSG 4	Total
SUPPORT GRID WEAR (Note 1)	1	1	3	1	6
TUBESHEET BULGE (Note 2)	1	0	0	0	1
Total	2	1	3	1	7

Note 1 - All tubes were preventively plugged. No indication exceeded the plugging limit.
Note 2 - Tubesheet bulge was below the top-of-tubesheet and was preventively plugged. The bulge (an increase in the tubesheet hole diameter which the tube wall follows) was detected during pre-service and had not changed. The tube was preventively plugged.

3. Nondestructive examination technique utilized for each degradation mechanism.

Bobbin coil examinations were utilized for the detection of Tube Support Grid Wear.

4. **Location, orientation (linear), and measured sizes (if available) of service induced indications.**

Refer to Table 1

5. **Number of tubes plugged during the inspection outage for each active degradation mechanism.**

PLUGGING STATUS	RSG 1	RSG 2	RSG 3	RSG 4	Total
Previously Plugged Tubes	0	1	0	1	2
Damage Mechanism					
SUPPORT GRID WEAR (Note 1)	1	1	3	1	6
TUBESHEET BULGE (Note 2)	1	0	0	0	1

Note 1 - All tubes were preventively plugged. No indication exceeded the plugging limit.
Note 2 - Tubesheet bulge was below the top-of-tubesheet and was preventively plugged. The bulge (an increase in the tubesheet hole diameter which the tube wall follows) was detected during pre-service and had not changed. The tube was preventively plugged.

Plugged Cycle 8	2	1	3	1	7
TOTAL TUBES PLUGGED	2	2	3	2	9
PLUGGED TUBE PERCENTAGES	0.039%	0.039%	0.059%	0.039%	0.044%

6. **Total number and percentage of tubes plugged to date.**

Refer to the response to number 5 above.

7. **The results of Condition Monitoring, including the results of tube pulls and In Situ testing,**

No tube pulls or In-Situ Pressure tests were performed.

STRAIGHT COLD LEG SUPPORT GRID WEAR

The Watts Bar Unit 1 Cycle 8 Degradation Assessment predicted that twenty-three tubes could be plugged for preventive reasons such as wear less than 40% through wall. A total of nine indications of Straight Leg Support Wear were detected in six tubes. None exceeded the plugging limit of 40% through wall. The Straight Leg Support Wear was assumed to have grown from 0% through wall over the past fuel cycle. The limiting

indications were 13% max depth. The affected tubes were in SG1 Row 24 Col 125 at C06+0.85 and C06-0.85. The calculated 95th percentile lower limit burst pressure was 7617 psig (3ΔP is 3687 psig). The largest amplitude Straight Cold Leg Support Grid Wear indication was 0.43 volts and therefore did not exceed the In-Situ Pressure Testing leakage screening criteria of 7.9 volt for leakage and 18.0 volts for structural. All of the Straight Leg Support Wear indications met condition monitoring structural performance criteria. Zero indications exceeded the 40% plugging limit.

The U1C7 Operational Assessment predicted support structural wear of less than 20% through wall. The 13 % through wall associated with straight leg support grid wear is bounded by this previous prediction.

LEAKAGE INTEGRITY

The industry experience of replacement SGs with Alloy 690 tubing has approximately 18 years of information without a single occurrence of cracking being discovered. Based on this, it is not probable that the WBN Unit 1 replacement SGs will experience cracking during their first few cycles of operation. Therefore, projected primary-to-secondary leakage during an accident due to cracking is not evaluated.

During the past fuel cycle, the primary to secondary leakage was below detection. All of the indications detected during the U1C8 inspection were below 0.5 volts which in accordance with EPRI Steam Generator In-Situ Pressure Testing Guidelines, section B.3.4, is a quick screen for structural and leakage integrity and provides a 95% probability that none of the indications would have leaked should a postulated main steam line break have occurred just prior to shutdown for the U1C8 outage. The deepest through wall was 13%. The associated 95th percentile lower limit burst pressure was 7617 psig. This burst pressure provides additional confidence that no leakage would have occurred should a postulated main steam line break have occurred during the previous fuel cycle.

In the unlikely event that wear from either a loose part / foreign object or from straight leg support wear or from U-bend support wear should go through wall and create operational leakage, WBN Unit 1 procedures would require the unit to shut down before the operation leakage could reach 75 gpd (the Technical Specification operational leakage limit per SG is 150 gpd). Should a Main Steam Line Break occur concurrent with the primary-to-secondary leakage at 75 gpd, then the leakage would have to increase almost 20 fold in order to exceed the primary-to-secondary accident leakage of 1 gpm (1440 gpd) assumed in the FSAR Chapter 15.4.4 analysis for Main Steam Line Break. An increase of this magnitude is not credible when tube wear is the damage mechanism.

The EPRI Flaw Handbook Section 5.3.3 indicates that the calculated burst pressure is the pressure at which ligament tearing occurs (i.e., the pressure at which the indication goes through wall). A wear indication of 70% through wall and 0.5 inches in length has a 95th percentile lower limit burst pressure of greater than 3439 psig (1.4 times 2405) Therefore, a wear indication could be 70% through wall concurrent with a Main Steam

Line Break accident and have a 95% probability of not leaking with a safety factor of 1.43.

In conclusion, all leakage integrity acceptance criteria was met for the end of cycle 8 operation.

8. The effective plugging percentage of all plugging in each SG.

Refer to the response to number 5 above.

WBN Unit 1 Cycle 8

180 Day Report
Table 1
List of Indications

The indications below were characterized as Tube Support Grid Wear. They were detected by bobbin coil. The associated maximum depth and voltage are included. The plugging limit at WBN Unit 1 is 40% through wall (TW).

SG	ROW	COL	VOLTS	%TW	LOCATION	CHARACTERIZATION	RESOLUTION
1	24	125	0.4	13	C06-.85	Support Grid Wear	PLUG-Preventive
1	24	125	0.43	13	C06+.85	Support Grid Wear	PLUG-Preventive
2	36	5	0.33	11	C06-1.00	Support Grid Wear	PLUG-Preventive
3	6	1	0.43	12	C05-.91	Support Grid Wear	PLUG-Preventive
3	6	1	0.25	8	C06-.89	Support Grid Wear	PLUG-Preventive
3	58	115	0.34	10	C05+.80	Support Grid Wear	PLUG-Preventive
3	88	33	0.39	12	C03-.98	Support Grid Wear	PLUG-Preventive
4	86	95	0.21	7	C03-.80	Support Grid Wear	PLUG-Preventive
4	86	95	0.29	9	C05-.88	Support Grid Wear	PLUG-Preventive