



Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

April 23, 2008

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

Gentlemen:

In the Matter of)
Tennessee Valley Authority (TVA))

Docket No. 50-327

**SEQUOYAH NUCLEAR PLANT (SQN) - UNIT 1 CYCLE 15 (U1C15) - 180-DAY -
STEAM GENERATOR (SG) INSPECTION REPORT**

In accordance with the requirements of SQN Unit 1 Technical Specification 6.8.4.k, Steam Generator Program and Technical Specification 6.9.1.16, Steam Generator Inspection report, TVA is submitting the 180-day report that includes the results of inservice inspections performed on Unit 1 SGs during the U1C15 refueling outage.

There are no commitments contained in this letter.

Please direct questions concerning this issue to me at (423) 843-7170 or Russell R. Thompson at (423) 843-6672.

Sincerely,

James D. Smith
Manager, Site Licensing and
Industry Affairs

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cc: See page 2

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cc (Enclosure):

Mr. Thomas H. Boyce, Senior Project Manager
U.S. Nuclear Regulatory Commission
Mail Stop 08G-9a
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2739

Tennessee Valley Authority

Sequoyah Nuclear Plant

**Unit 1 Cycle 15
Refueling Outage
October 2007**

180 Day Steam Generator Inspection Report

Prepared by: Emmett Coyle 28 Mar 08

Verified by: William David James 03/28/08

Approved by: Tim E. Massey 3/28/08

SQN Unit 1 Cycle 15

180-Day Report

In accordance with Technical Specification 6.8.4.k, Steam Generator Program and Technical Specification 6.9.1.16, "Steam Generator Tube Inspection Report," this report documents the results of the Unit 1 Cycle 15 (U1C15) 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.

<u>EDDY CURRENT EXAM TYPE (Exams)</u>	<u>RSG 1</u>	<u>RSG 2</u>	<u>RSG 3</u>	<u>RSG 4</u>	<u>Total</u>
Full Length Bobbin (.610 coil)	2477	2481	2479	2480	9917
Full Length Bobbin (.590 coil)	42	42	42	42	168
Partial Length Bobbin (.570 coil HTE-VS3)	123	122	123	123	491
Expansion Full Length Bobbin (.610 coil)	479	286	116	0	881
Predetermined Diagnostic Plus Point	2	3	29	1	35
Diagnostic/PID Plus Point	0	1	1	1	3
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Total Exams Completed	3123	2935	2790	2647	11495
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Total Tubes Examined	3121	2933	2775	2645	11474

In accordance with the U1C15 Degradation Assessment, expansion sample examinations were performed in SGs 1, 2, and 3. No expansion sample was required in SG 4.

2. Active Degradation Mechanisms found.

<u>INDICATIONS (Tubes)</u>	<u>RSG 1</u>	<u>RSG 2</u>	<u>RSG 3</u>	<u>RSG 4</u>	<u>Total</u>
U-Bend Support Wear	32	2	11	2	47
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Total	32	2	11	2	47

3. Nondestructive examination technique utilized for each degradation mechanism.

Bobbin coil examinations were utilized for the detection of U-bend Support Wear.

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

Refer to Table 1

SQN Unit 1 Cycle 15

180-Day Report

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

<u>PLUGGING STATUS</u>	<u>RSG 1</u>	<u>RSG 2</u>	<u>RSG 3</u>	<u>RSG 4</u>	<u>TOTAL</u>
Previously Plugged Tubes	14	6	6	5	31
Tubes Plugged by Damage Mechanism					
U-Bend Support Wear	0	0	0	0	0
Total Plugged Cycle 15	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Tubes Plugged	14	6	6	5	31
Plugged Tube Percentage	0.28%	0.12%	0.12%	0.10%	0.16%

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

Refer to the response to Number 5 above. The U-bend Support Wear indications were tapered along the tube axially.

7. The results of condition monitoring, including the results of tubes pulls and in-situ testing.

No tube pulls or in-situ pressure tests were performed.

U-BEND SUPPORT WEAR

Structural Integrity

The SQN U1C15 degradation assessment predicted, based on past indications and growth rate data, that 25 tubes could be preventively plugged. A total of 51 indications in 47 tubes were detected. None exceeded the plugging limit of 40 percent. The U-bend Support Wear was assumed to have grown from 0 percent through wall over the last 2 fuel cycles. Using these growth rates, a repair limit of 30 percent was calculated which would ensure that a safety factor of 3 would be maintained (with a 95 percent probability) until the next planned inspection during the U1C18 refueling outage. Condition monitoring assumed the axial length of the U-bend Support Wear indication to be the width of the U-bend Support (i.e., 2 inches). All indications were a fraction of this length. The limiting indications were 16 percent maximum depth. The limiting tubes were in SG1, Row 76, Col 100 at VS2-0.97, Row 85, Col 67 at VS4+0.91, and Row 87, Col 73 at VS2+1.28. The EPRI, "Steam Generator Degradation Specific Management Flaw Handbook," Section 5.3.3, "Axial Thinning with Limited Circumferential Extent," equations were utilized to calculate the burst pressure. The calculated 95th percentile lower limit burst pressure was 6958 psig (3ΔP is 4114 psig). The largest amplitude U-bend Support Wear indication was 0.58 volts, and therefore did not exceed the in-situ pressure testing leakage screening criteria of 7.9 volts. All U-bend Support Wear indications met condition monitoring performance criteria. Zero indications exceeded the 40 percent plugging limit and zero indications exceeded the 30 percent repair limit.

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Leakage Integrity

During the previous two fuel cycles, the Unit 1 operational primary to secondary leakage was below detection. The majority of the indications detected during U1C15 were less than 0.5 volts which in accordance with EPRI Steam Generator In-Situ Pressure Test Guidelines Revision 2 (TR-1007904), dated August 2003, Section B.3.4 is a quick screen for structural and leakage integrity, and therefore provides a 95 percent probability that none of the indications would leak should a postulated main steam line break have occurred. The greatest through wall was 16 percent. The associated 95th percentile lower limit burst pressure was 6958 psig. The equations utilized for burst pressure determine the ligament tearing pressure or the pressure at which a partial through-wall indication goes through-wall (i.e., pop-through). If an indication has a 95 percent probability of not going through wall at 6958 psig, then it should not go through wall at the Main Steam Line Break pressure of 2405 psig. This provides additional confidence that no leakage would occur should a postulated main steam line break occur.

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

Refer to the response to Number 5 above.

SQN Unit 1 Cycle 15

**180 Day Report
Table 1
List of Indications**

The indications below were characterized as U-bend Support Wear. They were detected by bobbin coil. The associated maximum depth and voltage are included. The plugging limit at SQN Unit 1 is 40 percent through wall (TW).

SG	ROW	COL	LOCATION	%TW	VOLTS	CHARACTERIZATION	RESOLUTION
1	68	76	VS2-.26	7	0.21	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	75	73	VS3+.80	9	0.28	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	78	78	VS2+.91	8	0.23	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	83	77	VS2+.91	10	0.32	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	87	73	VS2+1.28	16	0.58	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	87	73	VS3+1.00	15	0.51	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	87	75	VS2+1.14	13	0.4	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	87	81	VS4-1.11	15	0.53	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	88	70	VS4-1.11	13	0.39	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	90	70	VS4-1.00	13	0.37	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	92	70	VS2-.91	9	0.24	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	92	70	VS4+1.00	15	0.45	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	95	77	VS4-1.11	9	0.27	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	96	76	VS3+1.28	11	0.35	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	55	115	VS3-.91	15	0.47	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	61	85	VS2-1.09	8	0.21	U-BEND SUPPORT WEAR	In service <30% Repair Limit
3	67	87	VS3-.92	6	0.19	U-BEND SUPPORT WEAR	In service <30% Repair Limit
3	76	90	VS2+.86	9	0.26	U-BEND SUPPORT WEAR	In service <30% Repair Limit
4	68	64	VS3-.83	10	0.37	U-BEND SUPPORT WEAR	In service <30% Repair Limit
4	97	55	VS4-.83	8	0.29	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	69	59	VS3+.77	10	0.31	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	70	66	VS4-1.03	15	0.53	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	74	48	VS3-.88	6	0.17	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	83	45	VS4-.91	6	0.15	U-BEND SUPPORT WEAR	In service <30% Repair Limit
2	20	80	VS3-.06	14	0.45	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	83	49	VS2+.77	7	0.2	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	84	64	VS4+1.03	11	0.31	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	85	65	VS4+.80	11	0.33	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	85	67	VS4+.91	16	0.54	U-BEND SUPPORT WEAR	In service <30% Repair Limit
1	88	52	VS4-.91	8	0.22	U-BEND SUPPORT WEAR	In service <30% Repair Limit

SQN Unit 1 Cycle 15

180 Day Report Table 1 List of Indications

SG	ROW	COL	LOCATION	%TW	VOLTS	CHARACTERIZATION	RESOLUTION
1	92	52	VS3+.83	6	0.17	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	92	68	VS4+.62	14	0.41	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	93	65	VS2+.85	9	0.25	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	95	63	VS3-.63	13	0.42	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	95	63	VS4-1.14	11	0.33	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	98	66	VS3+.82	8	0.24	U-BEND SUPPORT WEAR	Limit In service <30% Repair
2	92	42	VS2-.74	8	0.23	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	62	112	VS3+.77	13	0.41	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	66	110	VS3+.80	11	0.34	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	76	100	VS2-.97	16	0.56	U-BEND SUPPORT WEAR	Limit In service <30% Repair
1	92	88	VS4-.85	11	0.33	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	73	75	VS3+.74	7	0.23	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	79	79	VS2-.86	7	0.23	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	79	79	VS3+.86	8	0.27	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	80	72	VS4-.83	9	0.31	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	85	69	VS4+.83	10	0.35	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	87	63	VS2+1.07	9	0.28	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	87	65	VS3+.95	12	0.4	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	89	71	VS4+1.01	8	0.26	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	97	71	VS3+.74	8	0.26	U-BEND SUPPORT WEAR	Limit In service <30% Repair
3	98	56	VS4-1.06	12	0.39	U-BEND SUPPORT WEAR	Limit