

**TVA Sequoyah Nuclear Plant Unit 2 Cycle 11
Steam Generator Tube Inspection
Update as of 04/29/2002**

Expansions

Due to the detection of one ODSCC axial indication in a freespan ding, the hot leg freespan ding examination was expanded to all hot leg dings ≥ 5 volts. A qualified bobbin technique was utilized to detect axial ODSCC in freespan dings < 5 volts. Computerized Data Screening is utilized as secondary analysis and the program detected the ODSCC axial indication by bobbin. This expansion is more conservative than the planned expansion.

Analyzed EC results: (100% complete)

	Total Projected In Preoutage <u>Assessment</u>	Total Pluggable <u>U2C11 To Date</u>	Total Cumulative <u>Plugged</u>
TTS Axial PWSCC	20	16	96
TTS Circ PWSCC	10	6	21
TTS Axial ODSCC	18	7	22
TTS Circ ODSCC	10	3	11
TSP Axial PWSCC	10	2	4
TSP Axial ODSCC	17	3	14
(Indications saved by ARC)	1,531	1,042	
Anti-Vibration Bar Wear	2	1	26
Cold Leg Wastage	2	11	47
U-Bend Axial PWSCC	5	1	85
U-Bend Circ PWSCC	5	2	8
Freespan ODSCC	3	1	1
Other	0	6	27

Thirty-two tubes were plugged in order to utilize the Westinghouse Flexi Rail System in future inspections. This system eliminates manual robot moves once the robots are installed.

Total to be plugged thus far - 91

Total cumulative thus far - 394 (including preventive plugging from past outages)
2.9%

The SQN Unit 2 Cycle 11 Steam Generator inspection results are categorized below:

<u>Initial Exam Sample</u>	<u>SG1</u>	<u>SG2</u>	<u>SG3</u>	<u>SG4</u>	
Full Length Bobbin Coil	C-2	C-2	C-2	C-3	No expansions
Low Row U-bend (+Pt)	C-3	C-1	C-1	C-1	No expansions
Top of Tubesheet (+Pt)	C-2	C-2	C-2	C-2	No expansions
Dented Tube Support Sample	C-2	C-3	C-1	C-1	No expansions
Freespan Dent Sample	C-1	C-1	C-3	C-1	Expand 100%

The bobbin program is C-3 due to the large number of ODSCC axial indications at tube support plates that remain in service via the GL 95-05 alternate repair criteria. 100% inspection is already performed, so no expansion necessary. The low row U-Bend program in SG1, the dented support plate program in SG2, and the freespan ding program in SG3 are C-3 due to the small sample size. One or two indications equal >1% defective. 100% of the critical areas are already inspected in the U-Bends and the dented support programs, so no expansion was necessary. The Freespan ding program was expanded to 100% of the hot leg freespan dings ≥ 5 volts. The freespan dings below 5 volts are inspected via bobbin coil so 100% of the hot leg freespan dings were inspected.

Limiting Flaw for Structural and Leakage Analysis

Tubesheet PWSCC Axial – All the indications are below the top of the tubesheet. The majority are > 0.5" below the top. Of the 3 indications closest to the top (< 0.5"), the largest length is 0.16" and the largest voltage is 0.38 volts.

Tubesheet PWSCC Circ – All indication are below the top of the tubesheet. Only one indication is less than 2 inches below (HTS – 0.36). This indication is 97° and 0.98 volts.

Tubesheet ODSCC Axial – All indications are close to the top of the tubesheet (HTS –0.18 to HTS + 0.1). The largest length is 0.25" and the largest voltage is 0.23 volts.

Tubesheet ODSCC Circ – All indications are close to the top of the tubesheet (HTS-0.14 to HTS + 0.0). The largest indication is 65° and the largest voltage is 0.17 volts.

ODSCC associated with a 2.65 volt Freespan Ding – Only one indication was identified. The examination was expanded and the indication was in situ pressure tested. The indication is at approximately 1 inch above the top of the tubesheet and the size is 0.15" and 0.3 volts

PWSCC associated with Dented Support Plates – This damage mechanism has a qualified sizing technique with quantified uncertainties. The limiting burst pressure is greater than 3Δ D. The indications were located in a 3.7 volt and in a 6 volt dent.

U-Bend Axial PWSCC – One indication was identified at H07+3.95, 0.24" and 1.32 volts.

U-Bend Circ PWSCC – Two indications were identified. Both were in situ pressure tested for leakage concerns. The indications were tested to steam line break pressure without leakage.

<u>Row</u>	<u>Col</u>	<u>Location</u>	<u>Length</u>	<u>Volts</u>
1	21	H07+4.22	45°	1.67
1	28	H07+10.58	45°	2.58

New inspection findings:

This is the first inspection to identify ODSCC axial indications associated with freespan dings. One indication was identified. The inspection was expanded to 100% of the hot leg freespan dings ≥ 5 volts. No other indications were identified. CDS was programmed to detect ODSCC axial indications in freespan dings < 5 volts. This indication was in situ pressure tested and reached the target pressure of $3\Delta P$ with no leakage. This degradation mechanism was documented in the site's corrective action program.

In situ pressure test plans and results, if available and tube selection criteria:

In situ pressure testing was planned as a contingency for flaws detected that challenge structural or leakage limits based on SQN-specific screening criteria developed by conducting a performance demonstration on potential degradation mechanisms. The EPRI Steam Generator In Situ Pressure Test Guidelines Rev. 1 will be utilized as well as the Interim Guidelines issued by the SGMP October 2000.

The new degradation was pressure tested and discussed above.

Two U-Bend circumferential indications were detected that had voltages that exceeded screening criteria. They were both in situ pressure tested and are discussed above.

Describe tube pull plans and preliminary results, if available and tube selection criteria:

Tube pull was performed in support of the OD Axial ARC . Three intersections were pulled and will be metallurgically examined. The best candidate for pulling was a 3.35 volt indication at the first hot support plate in SG#4. A 0.44 volt indication at the third hot support plate of the same tube was pulled as the second intersection to comply with the commitment to pull two intersections. Pulling one tube saves dose, and there are no other indications were large enough to provide data to industry correlations..