Sequoyah Nuclear Plant

Unit 1 Cycle 9 Refueling Outage

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INTRODUCTION

During the scheduled Sequoyah Nuclear Plant (SQN) Unit 1 Cycle 9 refueling outage (U1C9 RFO) extensive inservice inspections were conducted in all four steam generators (SGs) to address all active and potential damage mechanisms identified in the Unit 1 Degradation Assessment. The results of the inspections were classified as follows:

	SG1	SG2	SG3	SG4
Bobbin	C-1	C-2	C-2	C-2
TTS RPC	C-2	C-2	C-2	C-2
Freespan Dents	C-1	C-1	C-1	C-1
U-Bend +Point	C-2	C-2	C-3	C-3

Dented intersection inspections are not applicable to the categorization above. A buffer zone is established in accordance with SQN's response to NRC's Request for Additional Information regarding Technical Specification Change for ODSCC Alternate Repair Criteria (ARC).

ARC implementation continued during this inspection due to the detection of outside diameter stress corrosion cracking (ODSCC) at tube support plate (TSP) intersections. A report was issued 90 days after restart U1C9 with details of this implementation.

This report fulfills the reporting requirements of SQN Technical Specification section 4.4.5.5.b for reporting results of SG inservice inspection and section 4.4.5.5.c for C-3 reporting.

SG TUBE INSERVICE INSPECTION SCOPE

The SQN SG tube inservice inspection (ISI) initial sample and expansion for all SGs and all damage mechanisms was as follows:

100% full-length bobbin examination in all 4 SGs

100% hot leg top of tubesheet (TTS) (WEXTEX transition region) examination in all 4 SGs with 0.080 mid range/0.080 high frequency/ 0.115 mid range rotating pancake coil (RPC) probe.

100% Row 1 and 2 U-Bend examinations in all 4 SGs with magnetic biased ZETEC plus point Row 1&2 U-Bend RPC probe.

100% >=5 volt dented TSP intersections from H01 to H07 in SGs 1, 2, and 4 with +Point probe.

100% >=5 volt dented TSP intersections from H01 to H05 and a 20% random sample of H06 in SG 3 with plus point probe.

100% < 5 volt dented TSP intersections from H01 to H02 and a 20% random sample of H03 in SGs 1 and 2 with plus point probe.

100% <5 volt dented TSP intersections from H01 to H04 and a 20% random sample of H05 in SG 3 and 4 with plus point probe.

100% of <2 volt dented TSP intersections were examined during the bobbin coil examination utilizing the qualified technique for detection of primary water stress corrosion cracking (PWSCC). This requires an additional two days of extensive analyst training and testing.

The inspection of dents is performed to envelop the highest TSP with identified PWSCC indications since the PWSCC degradation mechanism is strongly temperature dependent.

All test techniques used for detection were EPRI Appendix H qualified examination techniques and validated for use at SQN. Sizing techniques were also Appendix H qualified where available. If qualified sizing techniques did not exist, the best available technique was used.

Due to the detection of TSP PWSCC at H06 (buffer zone) in SG 3, the plus point examination scope in >5 volt dented TSPs in SG 3 was expanded to 100% of H06 and 100% of H07. No further expansions were necessary.

INTEGRITY ASSESSMENT CRITERIA

All crack-like indications were screened for in-situ pressure testing using guidance from the Draft EPRI In-Situ Guidelines and using critical flaw parameters developed specifically for Sequoyah by Westinghouse. Both documents support a three-step process for screening for structural and for leakage integrity, beginning with length for structural integrity and voltage for leakage integrity.

The screening values for 3 times normal operating delta pressure are as follows. Uncertainties are accounted for in the screening criteria where applicable:

Axial Flaws for Structural Integrity:

Step 1 - Length

Straight Leg	Row 1 U-Bend	Row 2 U-Bend
0.465" (ID/OD)	0.714" (ID/OD)	0.672" (ID/OD)

Step 2 – For those indications that exceed Step 1 length – Maximum Depth

Straight Leg	Row 1 U-Bend	Row 2 U-Bend
63% for 1.5" flaw (ID/OD)	79% for 1.5" flaw (ID/OD)	77% for 1.5" flaw (ID/OD)

Step 3 – For those indications that exceed both Steps 1 and 2 – Examine average depth versus length

Axial Flaws for Leakage Integrity:

Step 1 – Maximum Voltage

Straight Leg		Row 1 U-Bend		Row 2 U-Bend	
ID	OD	ID	OD	ID	OD
2V	1.5V	2V	I.5V	2V	1.5V

Step 2 – For those indications that exceed Step 1 – Maximum Depth

Straight Leg		Row 1 U-Bend		Row 2 U-Bend	
ID	OD	ID	OD	ID	OD
80%	75%	80%	75%	80%	75%

Step 3 – For those indications that exceed both Steps 1 and 2 – Examine Maximum depth versus length – Length at Maximum Depth must exceed 0.1"

Circumferential Flaws for Structural Integrity:

Step 1 – Angle - 223° (ID/OD)

Step 2 – For those indications that exceed Step 1 – Average Depth – 50% (ID/OD)

Circumferential Flaws for Leakage Integrity:

Step 1 – Maximum Voltage – 1.5V ID – 1V OD

Step 2 – For those indications that exceed Step 1 – Maximum Depth – 80% ID – 75% OD

Step 3 – For those indications that exceed both Steps 1 and 2 – Examine Maximum depth versus angle – Angle at Maximum Depth must exceed 20°

SG TUBE INSPECTION RESULTS

Table 1 summarizes the SQN U1C9 eddy current testing ISI exams, active degradation, and the repair status of the SGs. Table 2 provides a summary of the tube damage detected and a characterization of the damage morphology.

Degradation Mechanisms Detected

PWSCC U-Bend

A low occurrence of PWSCC in the Row 1 U-bend area was predicted in the degradation assessment. SG 4 had three tubes with U-Bend PWSCC, and SG 3 had two tubes with U-Bend PWSCC.

C-3 Reporting Requirement

Since the inspection scope for Row 1 and 2 U-Bends in SG 4 was only 155 tubes and in SG 3 was only 146 tubes, these inspections were categorized as C-3. However, since 100% inspection of Rows 1 and 2 was performed and since all indications were in Row 1 tubes, no further investigation was necessary. PWSCC at inner radius U-Bends is directly related to cold work and residual stresses associated with the tubing manufacturing technique. The Unit 1 U-Bends operated in this condition for multiple cycles and subsequently were in situ stress relieved as a corrective measure. Cracking initiated prior to stress relief and continues to grow to detectable levels. Also, continually improving detection techniques are being utilized. The U-Bends were inspected with magnetic bias plus point for the first time this inspection. The 100% inspection ensures that significant flaws are removed from service.

Circumferential PWSCC was detected in the U-bend area of 1 tube:

SG	Row	Column	Location	Length or Angle	Max Depth	Average Depth	Max Volts
4	1	77	H07+3.68	38°	76%	19.77%	0.58

The crack arc length of 38° was well below the 223° structural screening limit, and a voltage of 0.58 was well below the 1.5 volt leakage screening limit.

Axial PWSCC was detected in the U-bend area of 5 tubes:

SG	Row	Column	Location	Length or Angle	Max Depth	Average Depth	Max Volts
1	1	39	H07+10.57	0.49"	90%	57.29%	2.04
4	1	81	H07+4.07	0.25"	100%	76.48%	1.92
3	1	89	H07+3.60	0.23"	92%	53.09%	1.04
4	1	80	H07+2.93	0.16"	100%	83.06%	0.97
3	1	90	H07+10.45	0.22"	70%	47.23%	0.57

No indication exceeded the 0.714" structural screening criteria. However, SG1 R1 C39 exceeded the first screening criteria for leakage and with a maximum depth of 90%, it was taken to the third step of screening for in situ testing. Since the length at maximum depth was less 0.1" and since this indication is bound by past successful in situ pressure testing of Row 1 U-Bend indications, this indication was not considered a challenge to leakage integrity and was not in situ pressure tested.

Past In Situ Tests on U-Bend Axial PWSCC

SG	Row	Column	Location	Length	Max Depth	Avg Depth	Max Volts	Leakage at SLB (gpm)	Leakage at 3dP (gpm)
3	1	36	H07+10.26	0.75"	65%	51%	1.94	0	0
4	1	84	H07+11.24	0.99"	96%	74.4%	5.35	0.079	0.43
2	1	61	H07+3.78	0.36"	100%	80.9%	3.21	0	0

Condition Monitoring for U-Bend PWSCC

The limiting U-Bend axial PWSCC indication for condition monitoring is SG 1 R1 C39. A bounding tube in situ tested end-of-cycle (EOC)-8 did not rupture at the 4750 psi pressure test, and leaked at SLB 0.079 gpm at room temperature. Conservatively, this leakage is added to the total predicted accident-induced leakage for 4 of the 5 U-Bend indications, which is a total of 0.316. This is the only other potential contribution to SLB leakage results from the ARC for ODSCC at TSP intersections. Consequently, the total SLB leak rate at EOC-9 is negligible compared to the allowable limit, and the U-Bend PWSCC indications satisfy tube integrity requirements for condition monitoring.

The circumferential U-Bend PWSCC met condition monitoring performance criteria.

Operational Assessment for U-Bend PWSCC

For axial U-Bend PWSCC, using the worst growth from the last three outages at Sequoyah determined by the largest growth minus the smallest detected flaw, the largest growth in length is 0.33". Using the smallest indication detected in the EOC-9 inspection, 0.16", the worst SQN growth rate, 0.33", and the sizing

uncertainty from ETSS 96703, 0.13", an indication left undetected BOC-10 would grow to 0.62" axial length, which is less than the 0.714" structural length criteria. Assuming the undetected crack grew to 100% this indication would not challenge structural integrity. The largest voltage growth was 2.04 volts. With detection capabilities as low as 0.57 volts EOC-9, a missed indication could grow to 2.61 volts. Assuming the undetected crack grew to 100%, this indication would be bound by prior in situ testing and would not compromise leakage integrity. Typical PWSCC indications at U-Bends at SQN are short (less than 0.5") with one point at maximum depth. Typical average depths are less than 60% and voltages are less than 2 volts.

For circumferential U-Bend PWSCC, the worst SQN crack angle growth rate is 38°. Using the smallest detected circumferential indication EOC-9 as detection capability (38°), and sizing uncertainties from ETSS 96702, 21.02°, an indication left undetected BOC-10 would only grow to 97°. Assuming the undetected crack grew to 100% max depth, this indication would still meet condition monitoring structural performance criteria. The largest voltage growth was 0.58 volts. With detection capabilities as low as .58 volts EOC-9, a missed indication could grow to 1.16 volts, which is below the screening criteria for leakage. Therefore, all circumferential U-Bend indications found at EOC-10 will also satisfy leakage condition monitoring performance criteria.

The U-Bend inspection at EOC-9 included 100% of Row 1 and 2 U-Bends with a magnetic bias plus point probe. Given the 100% RPC inspection at EOC-9, the potential undetected indications left in service for Cycle 10 can be expected to be equal to or smaller than that for Cycle 9. Since operating conditions are essentially the same between Cycles 9 and 10 and all EOC-9 indications satisfied tube integrity requirements, it can be expected that all U-Bend indications found at EOC-10 will also satisfy performance criteria.

PWSCC TTS

Twenty-five tubes were predicted to be plugged for PWSCC at TTS based on SQN and industry experience. Thirty-two PWSCC indications were identified during this inspection. Fifty-five were identified during the U1C8 inspection. These indications are primarily in the central region of the tube bundle as predicted for WEXTEX cracking.

Twenty-three indications were identified as circumferential PWSCC at TTS. The longest and bounding circumferential crack was 56° in SG4 R13 C46, which is well below the 223° structural screening criteria. The largest maximum voltage was in SG4 R13 C46, 1.43 volts, which is below the 1.5 volt leakage screening criteria. Therefore, no TTS PWSCC circumferential indications challenge structural or leakage integrity. All circumferential cracks were compared to stabilization criteria, and one PWSCC TTS exceeded the criteria because of its location in the bundle, SG1 R35 C77, and this tube was stabilized.

A total of 9 indications were identified as axial PWSCC at TTS. The largest and bounding indication was 0.36", which is below the freespan structural screening criteria. Only one axial indication exceeded the 2 volt screening criteria for leakage integrity and was located at the top of the tubesheet at HTS-0.19. SG3 R12 C48 had an axial PWSCC indication at 2.3 volts. This indication had a maximum depth of 96% and a 69.10% average depth. However, since the length at maximum depth was less than 0.1" and since it was bound by past in situ pressure test, no in situ testing was done.

Past In Situ Tests on TTS Axial PWSCC

SG	Row	Column	Location	Length	Max Depth	Avg Depth	Max Volts	Leakage at SLB (gpm)	Leakage at 3dP (gpm)
4	7	17	HTS-0.15	0.32"	100%	56.5%	3.55	0	0

Condition Monitoring for TTS PWSCC

The limiting TTS axial PWSCC indication for condition monitoring is SG 3 R12 C48. A bounding tube in situ tested did not rupture or leak at the 4750 psi pressure test. Therefore, all PWSCC indications at the top of the tubesheet met structural and leakage condition monitoring performance criteria.

All circumferential TTS PWSCC met condition monitoring performance criteria.

Operational Assessment for TTS PWSCC

The growth rate study performed during the past three SQN outages indicates that the worst growth for axial PWSCC at TTS is 0.17". Using the smallest indication detected EOC-9 inspection (0.09") and the sizing uncertainty from ETSS 96703 of 0.13", an indication left undetected BOC-10 would only grow to 0.39". Assuming the indication grew to 100% maximum depth, this indication would still not challenge structural integrity. The worst maximum voltage growth from SQN growth data is 0.89 volts. Using the smallest voltage indication detected EOC-9 (0.39) as the detection threshhold, an indication would grow to 1.28 volts, which would not challenge leakage integrity even if the indication was 100% through wall.

The growth rate study performed during the past three SQN outages indicates that worst growth for circumferential PWSCC at TTS is 13°. Using the smallest detected circumferential indication from U1C9 as detection capability (24°) and the sizing uncertainty from ETSS 96702 (21.02°), an indication left undetected BOC-10 would only grow to 58°. Assuming the indication grew to 100% through wall, this indication would still not challenge structural integrity. The worst maximum voltage growth from SQN growth data is 0.35 volts. Using the smallest voltage indication detected EOC-9 (0.15 volts) as the detection threshold, an

indication left undetected BOC-10 would grow to 0.5 volts, which would not challenge leakage integrity and would be consistent with EOC-9 data.

The PWSCC TTS indications from EOC-9 inspection met tube integrity requirements for condition monitoring, and since operation cycle and conditions will be essentially the same for Cycle 10 and given the 100% inspection, it is again expected that any axial PWSCC TTS indication identified EOC-10 will meet tube integrity requirements.

ODSCC TTS

Although SQN unit 1 has had low occurrence of ODSCC at TTS, based on industry experience, this mechanism was predicted this cycle and 100% examination at the hot TTS was performed.

Axial ODSCC was detected in one tube at TTS. The indication was well below the 0.465" length criteria for structural integrity and well below the 1.5 volt criteria for leakage integrity.

Three indications were identified as ODSCC circumferential. All were below the 223° screening criteria for structural integrity. One of the OCSCC circumferential indications exceeded the 1 volt screening criteria for leakage. SG 1 R26 C41 at HTS-.04. The circumferential indication was 55°, 95% maximum depth, and 59% average depth. Because the maximum depth was greater than the screening criteria values, this indication was taken to the third step of screening and the maximum depth value was not continuous over a 20° arc. This indication was not a leakage concern. Since this indication was the bounding indication and it did not exceed screening criteria, no structural or leakage concerns exist. All circumferential indications were compared to stabilization criteria, and one tube was stabilized.

Condition Monitoring for TTS ODSCC

The ODSCC indications identified in the WEXTEX transition do not challenge structural or leakage integrity for EOC-9; therefore, all indications met condition monitoring performance criteria.

Operational Assessment for TTS ODSCC

Growth data is only available from the U1C9 outage. The only axial ODSCC at TTS had no growth. The largest growth rate of circumferential ODSCC at TTS from U1C9 was 24°. Using the smallest detected circumferential indication from U1C9 as detection capability (44°) and a sizing uncertainty of 20°, an indication left undetected BOC-10 would grow to 88°. Assuming the indication grew to 100% through wall, this indication would still not challenge structural integrity. The worst maximum voltage growth from SQN growth data is 0.08 volts. Using

the smallest voltage indication detected EOC-9 (0.28 volts) as the detection threshold, an indication left undetected BOC-10 would grow to 0.36 volts, which would not challenge leakage.

Given the 100% TTS +Point inspection at EOC-9, the potential undetected indications left in service for Cycle 10 can be expected to be equal to or smaller than that for Cycle 9. Since operating conditions are essentially the same between Cycles 9 and 10 and all EOC-9 indications satisfied condition monitoring requirements, it can be expected that all ODSCC TTS indications at EOC-10 will also satisfy condition monitoring performance criteria.

PWSCC TSP

Degradation assessment predictions for axial PWSCC at dented TSPs were higher than actual results. Based on SQN's experience during EOC-8 where the incidence of axial PWSCC at dented intersections increased by a factor of four, 219 tubes were projected to be identified with axial PWSCC and 68 were predicted with circumferential PWSCC. Because of the number of dented intersections and the occurrence of PWSCC in these intersections, this is predicted to be the life-limiting damage mechanism.

Prior to the U1C9 outage, TVA, PG&E, and Westinghouse developed a qualified sizing technique for axial PWSCC at dented TSPs. The results of this qualification project were reviewed by the NRC staff, who agreed that the technique met the intent of qualification for sizing per Draft Regulatory Guide 1074. Based on this qualification, indications identified during the EOC-9 outage were sized, and if less than 40% maximum depth, were left in service.

A total of 123 axial PWSCC indications were detected.

Disposition	Number of Indications	Number of Tubes
Left In Service due to MD<40%	54	51
Plugged due to additional damage mechanism in same tube	3	3
Plugged conservatively	18	10
Plugged due to MD>40%	48	46

A total of 51 tubes were left in service sized as less than 40% maximum depth. Table 3 is a listing of these indications sorted by maximum depth. Since all laboratory burst and leak testing was done freespan, cracks did not have to be totally inside the support plate to be left in service. The longest indication left in service that extended outside the support plate was in SG4 R5 C16. It began 0.06" above the center of the support plate and grew out of the top of the support

plate by 0.265 inches. This tube was no threat to structural or leakage integrity because it was only 35.68% maximum depth and 22.87% average depth.

The following axial TSP PWSCC indications exceeded the .465" screening criteria. However none of them exceeded the second step maximum depth screening criteria of 63%. Therefore none were a chalienge to structural integrity.

SG	Row	Column	Location	Length	Max Depth	Average Depth	Max Volts	Disposition
3	10	40	H01-.14	0.63"	38.48%	31.08%	1.34	In Service
3	11	74	H01-.51	1.19"	45.95%	30.34%	2.02	Plugged
3	16	50	H01-.21	0.47"	37.55%	26.65%	1.25	In Service
3	24	80	H01-.19	0.54"	40.35%	24.02%	1.09	Plugged
4	3	47	H03-.05	0.47	34.75%	24.21%	0.88	In Service
4	5	16	H01+.06	0.59	35.68%	22.87	0.56	In Service
4	31	18	H01-.33	0.57"	57.14%	41.34%	1.18	Plugged

Two indications exceeded the 2 volt screening criteria for leakage. However, neither of them exceeded the second step maximum depth screening criteria of 80% maximum depth. Therefore none were a challenge to leakage integrity.

SG	Row	Column	Location	Length or Angle	Max Depth	Average Depth	Max Volts
3	10	36	H01-.06	0.45"	45.95%	33.14%	2.1
3	11	74	H01-.51	1.19"	45.95%	30.34%	2.02

Table 4 is a listing of the axial PWSCC at dented TSP indications that were removed from service.

A total of 14 circumferential PWSCC indications were detected and all were below the 223° structural screening limit. One indication exceeded the 1.5 volt screening criteria for leakage; however since maximum depth was only 48%, this indication was not considered a challenge to leakage integrity. All circumferential PWSCC indications were compared to stabilization criteria, and 4 tubes required stabilization due to their location in the bundle.

Condition Monitoring for TSP PWSCC

All indications that exceeded the 40% maximum depth repair limit were taken out of service. All indications met condition monitoring performance criteria.

Operational Assessment of TSP PWSCC

Adequate detection of circumferential indications at dented TSPs is supported by prior tube pulls at SQN Unit 1 and at Diablo Canyon Unit 1. The +Point inspection at EOC-9 of dented TSP intersections was slightly more extensive than that performed at EOC-8. All indications at dented TSP intersections satisfied burst and leakage requirements at EOC-9 and can be expected to satisfy requirements at EOC-10.

Acceptable tube integrity at EOC-10 can also be obtained from considerations of +Point detection thresholds and uncertainties and growth rates obtained during the eddy current qualification program. An estimate of the +Point detection threshold for PWSCC at dented TSP intersections can be obtained as the smallest pulled tube indication that was detected in the field inspection. From Westinghouse Report SG 97-02-007, the smallest pulled tube indication had a crack length of 0.12", a maximum depth of 38%, and an average depth of 23%. Growth rates were developed at a 95% confidence during the qualification of NDE techniques: length - 0.24"/cycle, maximum depth – 25.1%/cycle, and average depth – 21.5%/cycle. NDE uncertainties were also developed at a 95% confidence: length - 0.25", maximum depth - 19.2%, average depth - 10.1%. With this information, the worse case flaw that could be predicted to have been left in service BOC-10 would grow to 0.61", 82.3% maximum depth, and 54.6% average depth.

Structural limits for Axial PWSCC at dented TSP were also developed during the TVA/PG&E/Westinghouse program. The structural limit is 61.5% average depth for a 0.5" flaw at 3dP, which assumes the whole crack is freespan. At SLB conditions the structural limit is 62.1% for a 1.4" flaw. Since the worse case flaw would only be predicted to be 54.6% average depth, this indication would not challenge structural integrity. It should also be noted that the growth rates used in this evaluation are very conservative. Typical growth rates seen in the field are less than 0.1" per cycle and less than 10% average depth per cycle.

The worse case indication from the above evaluation would only be 81.58% maximum depth, which would not indicate a leakage concern.

The following tubes were in situ tested during U1C8 inspection. None failed or leaked at 3dP pressures. SG4 R36 C42 with two axial cracks clearly bounds the worse case indication at EOC-9 or predicted for EOC-10.

SG	Row	Column	Flaw Location	Flaw Type	Orientation	MD	AD	Axial Length	Length Outside TSP	Max Volts RPC	Leakage at SLB gpm	Leakage at 3dP gpm
3	14	73	H01+0.6	PWSCC	Axial	76%	56.5%	0.43"	0.43"	3.11	0	0
3	16	67	H01-0.23	PWSCC	2 Axials	62%	41.2%	0.45"		2.14	0	0
						48%	27.1%	0.21"		0.58	0	0
3	16	83	H01-0.58	PWSCC	3 Axials	69%	40%	0.31"		0.72	0	0
						22%	13.3%	0.12"		0.92	0	0
						60%	47.3%	0.20"		2.02	0	0
3	30	71	H02-0.45	PWSCC	Axial	54%	34.3%	0.58"		2.23	0	0
4	1	21	H02-0.27	PWSCC	Axial	61%	31.5%	0.53"		0.79	0	0
4	3	45	H01+0.01	PWSCC	Axial	43%	30.6%	0.22"		1.07	0	0
4	6	31	H01+0.03	PWSCC	Axial	42%	29.6%	0.2"		1.05	0	0
4	14	29	H02+0.04	PWSCC	Axial	84%	69.2%	0.34"		0.90	0	0
4	33	21	H01+0.0	PWSCC	Axial	76%	30.5%	0.29"		0.38	0	0
4	36	42	H02+0.61	PWSCC	Axial	69%	48.4%	0.42"	0.06"	1.36	0	0
						91%	71.1%	0.31"	0.31"	1.84	0	0
4	37	28	H01+0.29	PWSCC	Axial	83%	54.8%	0.89"	0.14"	2.70	0	0
4	14	63	H02+0.0	PWSCC	Axial	45%	31.3%	0.21"		0.40	0	0
4	14	63	H02+0.0	ODSCC	Axial	83%	61.8%	0.51"		0.56	0	0

All predicted Axial PWSCC at TSP will meet condition monitoring performance criteria at the EOC-10.

ODSCC TSP

SQN unit 1 experience with circumferential ODSCC associated with TSP dents was projected to increase this outage based on industry experience. Thirty-eight tubes were predicted to be plugged for this damage mechanism.

A total of 21 circumferential ODSCC indications were detected at dented TSP intersections. The longest circumferental crack was 104° (SG2 R16 C33), which is below the 223° screening criteria for structural integrity. One tube exceeded the 1 volt screening criteria for leakage (SG1 R7 C47); however, maximum depth was only 20%, therefore, this indication did not challenge leakage integrity.

A total of 376 axial ODSCC indications were detected in non-dented intersections during the Unit 1 Cycle 9 outage. Generic Letter 95-05 ARC implementation continued in non-dented tubes and 370 tubes were left in service based on application of ARC.

A total of 2 tubes were plugged with ODSCC indications at dented intersections greater than 5 volts, 4 tubes were plugged with ID and OD axial indications in the same support plate, and 3 tubes were plugged for other damage mechanisms. One tube was pulled. A detailed report containing the 90-day reporting criteria for ARC was issued 90 days after completion of the steam generator inspection.

AVB Wear

Based on past indications and growth rate data from past outages, one tube was predicted to be plugged for AVB wear. A total of 66 indications were detected with only one tube plugged; SG3 R35 C41 with a 42% through wall indication at AV3+0.00.

Cold Leg Wastage

Two tubes were predicted to be plugged for cold leg wastage. A total of 37 indications were detected with no indications exceeding the plugging limit of 40% through wall.

Other Plugged Tubes

Two tubes were preventively plugged in SG3 due to bulges at the top of the tubesheet. One tube was preventively plugged in SG2 due to a partial tubesheet expansion.

SECONDARY SIDE INSPECTION SCOPE AND RESULTS

Cracked Support Plate Indications

Cracked tube support plate indications (CSIs) are indications of cracks in the tube support plates and not necessarily indicative of tube degradation. A total of 34 tubes were reported with CSIs. There were 9 in SG1, 9 in SG2, 10 in SG3 and 6 in SG4. These were detected during an automated analysis of bobbin data. All indications were tested with plus point probe.

SQN unit 1 steam generators do not have extensive support plate cracking. Therefore, design basis function of the support plate has not been lost. There is also no evidence of wrapper drop or wrapper degradation.

Upper Internals Inspection

An upper internals inspection was performed on two steam generators and no degradation was detected.

Sludge Lancing

Sludge lancing was performed on all four steam generators: 61.5 pounds of sludge was removed from SG1, 85 pounds from SG2, 88.5 pounds from SG3, and 73 pounds from SG4. A post-lance inspection confirmed that the top of the tubesheet on all generators was clean.

Foreign Object Search and Retrieval (FOSAR)

Foreign object search and retrieval was completed on all four steam generators and all identified foreign objects were retrieved.

CONCLUSIONS

The NDE testing completed on the SQN Unit 1 SGs and plugging of defective tubes met the Technical Specification and ASME Section XI code requirements for inservice inspection; therefore, each SG has been demonstrated operable.

Alternate Repair Criteria was implemented in accordance with the Unit 1 Technical Specification License Condition 2.C(9)(d).

Based on the criteria of 10 CFR 50.59 and utilizing the criteria of Draft Regulatory Guide 1.121, TVA concludes that the integrity of the SQN Unit 1 SGs was maintained during Cycle 9 operation and will be maintained through full Cycle 10 and does not represent an unreviewed safety question.

Table 1

SUMMARY OF SEQUOYAH UNIT 1 CYCLE 9
SG EDDY CURRENT INSPECTION/TUBE PLUGGING RESULTS

EDDY CURRENT EXAM TYPE	SG 1	SG 2	SG 3	SG 4
Full Length Bobbin Coil	3311	3284	3183	3149
U-Bend Plus Point	176	176	146	155
Top of Tubesheet 3panc RPC	3311	3284	3183	3149
H01 Plus Point	375	62	867	1529
H02 Plus Point	105	111	823	760
H03 Plus Point	18	4	429	1212
H04 Plus Point	1	0	977	598
H05 Plus Point	0	0	21	40
H06 Plus Point	2	1	163	0
H07 Plus Point	15	12	7	2
HL Additional TSP Plus Point & 3Coil	84	60	138	147
CL RPC (ALL)	9	7	10	1
Dented Freespan HL Plus Point	18	20	10	17
Total Exams Completed	7425	7021	9957	10759
Total Tubes Examined	3311	3284	3183	3149
INDICATIONS (Tubes)	**SG 1**	**SG 2**	**SG 3**	**SG 4**
AVB WEAR	3	11	15	8
BULGE	0	0	1	0
CL WASTAGE	19	8	8	1
COPPER	5	1	0	0
DISTORTED BOBBIN SIGNAL (RRC)	3	3	24	11
PI BOBBIN CALL	102	117	81	52
ODSCC HTS AXIAL	0	1	0	0
ODSCC HTS CIRC	1	2	0	0
ODSCC TSP AXIAL	16	15	43	27
ODSCC TSP CIRC	2	1	4	11
OVER EXPANSION TTS	0	0	1	0
PARTIAL TS EXPANSION	4	1	0	0
POTENTIAL LOOSE PART	0	15	9	1
PWSCC HTS AXIAL	2	1	3	3
PWSCC HTS CIRC	1	12	3	5
PWSCC TSP AXIAL	6	4	67	29
PWSCC TSP CIRC	0	0	9	3
PWSCC U-BEND AXIAL	1	0	2	2
PWSCC U-BEND CIRC	0	0	0	1
SLUDGE	0	0	0	0
TSP CRACK	9	9	10	6
Total	174	201	280	160

SUMMARY OF SEQUOYAH UNIT 1 CYCLE 9
SG EDDY CURRENT INSPECTION/TUBE PLUGGING RESULTS

PLUGGING STATUS	SG 1	SG 2	SG 3	SG 4
Previously Plugged Tubes	77	104	205	239
Plugged Cycle 9	10	23	55	42
Damage Mechanism				
AVB WEAR	0	0	1	0
LOOSE PART	0	0	0	0
ODSCC HTS	1	3	0	0
ODSCC TSP	2	2	5	12
ODSCC U-BEND	0	0	0	0
PREVENTATIVE	0	1	2	0
PWSCC HTS	3	13	6	8
PWSCC TSP	3	4	39	19
PWSCC U-BEND	1	0	2	3
TOTAL TUBES PLUGGED	87	127	260	281

Table 2

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
Sample: 0						
1	1	39	SAI	H07+10.57	PWSCC UBEND AXIAL	PLUG
1	2	52	SAI	HTS-.29	PWSCC HTS AXIAL	PLUG
1	2	85	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	2	91	PI	H01+.29	ODSCC TSP AXIAL	(1)
1	2	91	PI	H02-.29	ODSCC TSP AXIAL	(1)
1	3	41	12	C01+.00	C/L WASTAGE	(1)
1	3	59	SAI	H01+.51	PWSCC > 5v DNT AXIAL	PLUG
1	4	54	SAI	HTS-2.01	PWSCC HTS AXIAL	PLUG
1	4	60	PI	H07-.09	ODSCC TSP AXIAL	(1)
1	4	70	PI	H06+.06	ODSCC TSP AXIAL	(1)
1	4	87	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	5	1	PI	C07+.06	ODSCC TSP AXIAL	(1)
1	5	51	PI	C06+.09	ODSCC TSP AXIAL	(1)
1	5	55	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	5	57	PI	H01+.12	ODSCC TSP AXIAL	(1)
1	6	1	PI	C06-.03	ODSCC TSP AXIAL	(1)
1	6	27	PI	H01-.06	ODSCC TSP AXIAL	(1)
1	6	31	PI	H02+.03	ODSCC TSP AXIAL	(1)
1	6	50	PI	C03+.11	ODSCC TSP AXIAL	(1)
1	6	57	PI	H01-.06	ODSCC TSP AXIAL	(1)
1	7	27	PI	C03-.03	ODSCC TSP AXIAL	(1)
1	7	47	SCI	H01+.00	ODSCC TSP CIRC	PLUG
1	7	65	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	7	65	PI	H02+.00	ODSCC TSP AXIAL	(1)
1	7	94	PI	H01+.06	ODSCC TSP AXIAL	(1)
1	7	94	PI	H02-.35	ODSCC TSP AXIAL	(1)
1	8	2	20	C01+.06	C/L WASTAGE	(1)
1	8	2	23	C02+.09	C/L WASTAGE	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
1	8	6	36	C04+.00	C/L WASTAGE	(1)
1	8	26	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	8	46	PI	H07+.18	ODSCC TSP AXIAL	(1)
1	8	46	PI	H07+.26	ODSCC TSP AXIAL	(1)
1	8	63	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	8	65	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	8	65	PI	H02+.00	ODSCC TSP AXIAL	(1)
1	8	66	PI	H01+.12	ODSCC TSP AXIAL	(1)
1	8	69	PI	H02+.15	ODSCC TSP AXIAL	(1)
1	9	2	SCI	H01+.01	ODSCC TSP CIRC	PLUG/STABILIZE
1	9	11	PI	H02+.00	ODSCC TSP AXIAL	(1)
1	9	39	PI	C03-.03	ODSCC TSP AXIAL	(1)
1	9	61	PI	H07+.06	ODSCC TSP AXIAL	(1)
1	9	66	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	9	66	PI	H02+.00	ODSCC TSP AXIAL	(1)
1	10	49	PI	H01+.06	ODSCC TSP AXIAL	(1)
1	10	51	PI	H01+.00	ODSCC TSP AXIAL	(1)
1	10	53	PI	H01-.15	ODSCC TSP AXIAL	(1)
1	10	66	PI	H01+.17	ODSCC TSP AXIAL	(1)
1	10	78	PI	C01-.03	ODSCC TSP AXIAL	(1)
1	10	91	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	10	92	PI	H01+.12	ODSCC TSP AXIAL	(1)
1	11	5	11	C02-.09	C/L WASTAGE	(1)
1	11	32	PI	H01+.14	ODSCC TSP AXIAL	(1)
1	11	57	PI	H01+.00	ODSCC TSP AXIAL	(1)
1	11	84	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	11	91	PI	H02-.09	ODSCC TSP AXIAL	(1)
1	12	36	PI	C03-.09	ODSCC TSP AXIAL	(1)
1	12	55	20	H01+.20	PWSCC 2-5v DNT AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9

Date: *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
1	14	6	PI	C06+.06	ODSCC TSP AXIAL	(1)
1	15	39	PI	C03-.06	ODSCC TSP AXIAL	(1)
1	15	84	PI	H01+.00	ODSCC TSP AXIAL	(1)
1	16	78	PI	C05-.03	ODSCC TSP AXIAL	(1)
1	16	89	PI	H04+.12	ODSCC TSP AXIAL	(1)
1	17	26	PI	C06-.03	ODSCC TSP AXIAL	(1)
1	17	55	SAI	H01+.58	PWSCC > 5v DNT AXIAL	PLUG
1	17	85	PI	H01-.06	ODSCC TSP AXIAL	(1)
1	17	90	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	18	71	PI	H06+.00	ODSCC TSP AXIAL	(1)
1	18	86	PI	H03+.12	ODSCC TSP AXIAL	(1)
1	19	16	PI	H04-.03	ODSCC TSP AXIAL	(1)
1	20	29	PI	C05-.09	ODSCC TSP AXIAL	(1)
1	20	66	39	H02+.03	PWSCC 2-5v DNT AXIAL	(1)
1	20	68	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	20	70	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	21	27	PI	H02+.00	ODSCC TSP AXIAL	(1)
1	21	54	PI	H01-.06	ODSCC TSP AXIAL	(1)
1	21	76	PI	H01+.14	ODSCC TSP AXIAL	(1)
1	21	81	PI	H01+.12	ODSCC TSP AXIAL	(1)
1	21	86	PI	H01+.15	ODSCC TSP AXIAL	(1)
1	21	87	7	C04-.09	C/L WASTAGE	(1)
1	21	89	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	22	65	PI	H01+.17	ODSCC TSP AXIAL	(1)
1	23	7	20	C04-.09	C/L WASTAGE	(1)
1	23	45	27	AV1-.06	AVB WEAR	(1)
1	23	45	32	AV3+.00	AVB WEAR	(1)
1	23	46	PI	C04+.03	ODSCC TSP AXIAL	(1)
1	23	88	SAI	H01+.00	PWSCC < 2v DNT AXIAL	PLUG

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
1	24	85	PI	H01+.09	ODSCC TSP AXIAL	(1)
1	25	74	PI	H01+.06	ODSCC TSP AXIAL	(1)
1	26	37	PI	H01+.21	ODSCC TSP AXIAL	(1)
1	26	41	SCI	HTS-.04	ODSCC HTS CIRC	PLUG
1	26	58	38	H01-.16	PWSCC < 2v DNT AXIAL	(1)
1	26	79	PI	H01+.06	ODSCC TSP AXIAL	(1)
1	27	80	PI	C01-.03	ODSCC TSP AXIAL	(1)
1	27	80	PI	H01+.06	ODSCC TSP AXIAL	(1)
1	28	46	18	AV2+.00	AVB WEAR	(1)
1	28	46	21	AV3+.00	AVB WEAR	(1)
1	28	46	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	28	50	26	AV1+.00	AVB WEAR	(1)
1	28	50	36	AV2+.00	AVB WEAR	(1)
1	29	13	PI	H06-.03	ODSCC TSP AXIAL	(1)
1	29	66	PI	H01-.06	ODSCC TSP AXIAL	(1)
1	29	75	PI	H03+.00	ODSCC TSP AXIAL	(1)
1	29	78	PI	H01+.12	ODSCC TSP AXIAL	(1)
1	29	81	PI	H01-.03	ODSCC TSP AXIAL	(1)
1	30	14	PI	H06+.12	ODSCC TSP AXIAL	(1)
1	30	16	PI	H06+.12	ODSCC TSP AXIAL	(1)
1	30	77	PI	H02+.12	ODSCC TSP AXIAL	(1)
1	31	14	PI	H06-.12	ODSCC TSP AXIAL	(1)
1	32	16	18	C01+.09	C/L WASTAGE	(1)
1	32	16	PI	H05+.03	ODSCC TSP AXIAL	(1)
1	32	16	PI	H06+.12	ODSCC TSP AXIAL	(1)
1	32	74	PI	C07+.00	ODSCC TSP AXIAL	(1)
1	33	17	PI	H05-.03	ODSCC TSP AXIAL	(1)
1	33	17	PI	H06+.06	ODSCC TSP AXIAL	(1)
1	33	74	PI	H01-.06	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
1	34	16	34	C01+.09	C/L WASTAGE	(1)
1	34	16	PI	H04+.09	ODSCC TSP AXIAL	(1)
1	34	17	PI	H05+.06	ODSCC TSP AXIAL	(1)
1	34	74	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	35	17	22	C01-.20	C/L WASTAGE	(1)
1	35	77	SCI	HTS+.00	PWSCC HTS CIRC	PLUG/STABILIZE
1	35	78	PI	H02+.18	ODSCC TSP AXIAL	(1)
1	36	18	22	C01+.09	C/L WASTAGE	(1)
1	36	47	PI	H03+.09	ODSCC TSP AXIAL	(1)
1	37	20	6	C01-.12	C/L WASTAGE	(1)
1	37	70	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	37	74	5	C04+.00	C/L WASTAGE	(1)
1	38	30	PI	H01-.06	ODSCC TSP AXIAL	(1)
1	38	55	PI	H03+.09	ODSCC TSP AXIAL	(1)
1	39	72	PI	H03+.12	ODSCC TSP AXIAL	(1)
1	40	68	PI	C04-.03	ODSCC TSP AXIAL	(1)
1	41	35	PI	H03+.03	ODSCC TSP AXIAL	(1)
1	42	40	PI	H02+.09	ODSCC TSP AXIAL	(1)
1	42	41	PI	H03-.06	ODSCC TSP AXIAL	(1)
1	42	60	PI	H02+.09	ODSCC TSP AXIAL	(1)
1	42	61	15	C01+.06	C/L WASTAGE	(1)
1	43	49	PI	H04+.12	ODSCC TSP AXIAL	(1)
1	43	59	16	C01-.03	C/L WASTAGE	(1)
1	43	61	PI	H02-.06	ODSCC TSP AXIAL	(1)
1	43	63	PI	H02-.20	ODSCC TSP AXIAL	(1)
1	44	35	36	C01+.20	C/L WASTAGE	(1)
1	44	38	PI	H01+.03	ODSCC TSP AXIAL	(1)
1	44	60	3	C01+.20	C/L WASTAGE	(1)
1	44	61	10	C01+.00	C/L WASTAGE	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
1	44	61	PI	H05+.06	ODSCC TSP AXIAL	(1)
1	44	62	19	C01+.03	C/L WASTAGE	(1)
1	45	46	PI	C05-.09	ODSCC TSP AXIAL	(1)
1	45	59	29	C01-.12	C/L WASTAGE	(1)
1	46	48	PI	H03+.06	ODSCC TSP AXIAL	(1)
1	46	54	PI	H05+.12	ODSCC TSP AXIAL	(1)

Bobbin inspection sample is category C-1

TTS RPC inspection sample is category C-2

Dented TSP +Point inspection sample is category C-2

U-Bend +Point inspection sample is category C-2

(1) Retest Future Outage

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
Sample: 0						
2	2	11	PI	C04+.00	ODSCC TSP AXIAL	(1)
2	2	12	PI	C04-.09	ODSCC TSP AXIAL	(1)
2	2	31	PI	H02-.03	ODSCC TSP AXIAL	(1)
2	2	43	PI	H01-.03	ODSCC TSP AXIAL	(1)
2	2	46	PI	H03-.26	ODSCC TSP AXIAL	(1)
2	2	49	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	2	58	PI	H01+.09	ODSCC TSP AXIAL	(1)
2	2	65	PI	C03-.03	ODSCC TSP AXIAL	(1)
2	2	92	PTE	HTS+.00	RESTRICTED TUBE	PLUG PREVENTIVELY
2	3	1	PI	C06-.15	ODSCC TSP AXIAL	(1)
2	3	13	PI	H01+.09	ODSCC TSP AXIAL	(1)
2	3	30	PI	H05-.09	ODSCC TSP AXIAL	(1)
2	3	41	PI	H01+.15	ODSCC TSP AXIAL	(1)
2	4	6	PI	H01+.09	ODSCC TSP AXIAL	(1)
2	4	10	PI	C06-.09	ODSCC TSP AXIAL	(1)
2	4	13	PI	H01+.03	ODSCC TSP AXIAL	(1)
2	4	15	PI	H01+.03	ODSCC TSP AXIAL	
2	4	15	PI	H02-.06	ODSCC TSP AXIAL	PULL/PLUG
2	4	30	PI	H01+.09	ODSCC TSP AXIAL	(1)
2	4	36	SAI	HTS+.15	ODSCC HTS AXIAL	PLUG
2	4	83	PI	C03-.03	ODSCC TSP AXIAL	(1)
2	5	39	PI	H01+.17	ODSCC TSP AXIAL	(1)
2	5	61	17	C01+.03	C/L WASTAGE	(1)
2	5	68	11	C01+.03	C/L WASTAGE	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
2	6	43	PI	H01+.03	ODSCC TSP AXIAL	(1)
2	6	52	PI	H02-.06	ODSCC TSP AXIAL	(1)
2	6	59	PI	H01+.03	ODSCC TSP AXIAL	(1)
2	6	63	PI	H05+.06	ODSCC TSP AXIAL	(1)
2	7	24	PI	H01+.03	ODSCC TSP AXIAL	(1)
2	7	41	PI	H07+.06	ODSCC TSP AXIAL	(1)
2	7	53	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	7	63	PI	H07+.00	ODSCC TSP AXIAL	(1)
2	7	66	PI	H01+.03	ODSCC TSP AXIAL	(1)
2	7	70	PI	H01+.15	ODSCC TSP AXIAL	(1)
2	8	32	SAI	H01+.08	ODSCC TSP AXIAL	
2	8	32	41	H01-.17	PWSCC < 2v DNT AXIAL	PLUG
2	8	88	PI	C04-.06	ODSCC TSP AXIAL	(1)
2	9	55	PI	H01-.03	ODSCC TSP AXIAL	(1)
2	10	4	PI	H01+.00	ODSCC TSP AXIAL	(1)
2	10	15	PI	H02-.09	ODSCC TSP AXIAL	(1)
2	10	25	SCI	HTS-.19	PWSCC HTS CIRC	PLUG
2	10	34	36	H01+.06	PWSCC 2-5v DNT AXIAL	PLUG
2	10	89	PI	C06+.00	ODSCC TSP AXIAL	(1)
2	10	89	PI	C07+.00	ODSCC TSP AXIAL	(1)
2	11	25	SCI	HTS-.17	PWSCC HTS CIRC	PLUG
2	11	34	PI	H01-.23	ODSCC TSP AXIAL	(1)
2	11	40	PI	C04-.03	ODSCC TSP AXIAL	(1)
2	11	56	PI	H01-.09	ODSCC TSP AXIAL	(1)
2	11	68	PI	H01+.09	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
2	12	6	PI	H01+.03	ODSCC TSP AXIAL	(1)
2	12	10	PI	H01+.00	ODSCC TSP AXIAL	(1)
2	12	17	14	C06-.06	C/L WASTAGE	(1)
2	12	89	PI	C05+.00	ODSCC TSP AXIAL	(1)
2	13	4	PI	C06-.06	ODSCC TSP AXIAL	(1)
2	13	4	PI	H02+.12	ODSCC TSP AXIAL	(1)
2	13	4	PI	H03-.03	ODSCC TSP AXIAL	(1)
2	13	4	PI	H05+.00	ODSCC TSP AXIAL	(1)
2	13	5	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	13	5	PI	H03-.06	ODSCC TSP AXIAL	(1)
2	13	17	SCI	HTS-.12	PWSCC HTS CIRC	PLUG
2	13	18	SCI	HTS-.14	PWSCC HTS CIRC	PLUG
2	13	60	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	13	89	PI	C05+.03	ODSCC TSP AXIAL	(1)
2	14	6	PI	H01-.12	ODSCC TSP AXIAL	(1)
2	14	6	PI	H05+.06	ODSCC TSP AXIAL	(1)
2	14	9	PI	H01+.03	ODSCC TSP AXIAL	(1)
2	14	14	PI	H01-.06	ODSCC TSP AXIAL	(1)
2	14	33	56	H02-.12	PWSCC < 2v DNT AXIAL	PLUG
2	14	37	PI	H01-.21	ODSCC TSP AXIAL	(1)
2	15	12	PI	H01+.12	ODSCC TSP AXIAL	(1)
2	15	29	PI	H01-.20	ODSCC TSP AXIAL	
2	15	29	SCI	HTS-.10	PWSCC HTS CIRC	PLUG
2	16	9	PI	H01-.06	ODSCC TSP AXIAL	(1)
2	16	10	PI	H01+.09	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 — Date: *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
2	16	24	PI	H07+.06	ODSCC TSP AXIAL	(1)
2	16	33	MCI	H02+.12	ODSCC TSP CIRC	PLUG/STABILIZE
2	16	33	MCI	H02+.17	ODSCC TSP CIRC	
2	16	44	PI	H01+.18	ODSCC TSP AXIAL	(1)
2	16	53	SCI	HTS-.07	PWSCC HTS CIRC	PLUG
2	16	78	SAI	HTS-2.74	PWSCC HTS AXIAL	PLUG
2	17	19	PI	H03-.06	ODSCC TSP AXIAL	(1)
2	17	30	SCI	HTS-.11	PWSCC HTS CIRC	PLUG
2	17	35	PI	H02-.15	ODSCC TSP AXIAL	(1)
2	17	60	PI	H01+.21	ODSCC TSP AXIAL	(1)
2	17	61	PI	C03-.06	ODSCC TSP AXIAL	(1)
2	18	22	PI	H01-.15	ODSCC TSP AXIAL	(1)
2	18	30	59	H01-.17	PWSCC < 2v DNT AXIAL	PLUG
2	19	24	SCI	HTS-.08	PWSCC HTS CIRC	PLUG
2	20	30	15	AV4+.00	AVB WEAR	(1)
2	20	30	PI	H05-.03	ODSCC TSP AXIAL	(1)
2	20	31	PI	H03-.06	ODSCC TSP AXIAL	(1)
2	20	53	PI	H01+.12	ODSCC TSP AXIAL	(1)
2	20	54	PI	H01+.15	ODSCC TSP AXIAL	(1)
2	20	55	PI	H01+.12	ODSCC TSP AXIAL	(1)
2	21	13	15	C05-.06	C/L WASTAGE	(1)
2	21	76	PI	H02-.03	ODSCC TSP AXIAL	(1)
2	22	12	PI	H01-.06	ODSCC TSP AXIAL	(1)
2	22	34	SCI	HTS+.04	ODSCC HTS CIRC	PLUG/STABILIZE
2	22	34	SCI	HTS-.15	ODSCC HTS CIRC	

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 Date: *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
2	22	36	21	AV3+.15	AVB WEAR	(1)
2	22	37	20	AV2+.00	AVB WEAR	(1)
2	22	37	18	AV3+.00	AVB WEAR	(1)
2	23	33	SCI	HTS-.03	PWSCC HTS CIRC	PLUG
2	24	12	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	25	65	SCI	HTS-.08	PWSCC HTS CIRC	PLUG
2	25	83	PI	H07+.06	ODSCC TSP AXIAL	(1)
2	26	9	PI	H01-.06	ODSCC TSP AXIAL	(1)
2	26	13	PI	H01-.06	ODSCC TSP AXIAL	(1)
2	26	27	SCI	HTS-.08	PWSCC HTS CIRC	PLUG
2	26	50	SCI	HTS-.06	ODSCC HTS CIRC	PLUG
2	26	51	PI	H01-.03	ODSCC TSP AXIAL	(1)
2	26	53	PI	H01+.03	ODSCC TSP AXIAL	(1)
2	26	59	PI	H01+.12	ODSCC TSP AXIAL	(1)
2	27	15	19	C05-.03	C/L WASTAGE	(1)
2	27	40	16	AV1+.00	AVB WEAR	(1)
2	27	40	24	AV2+.00	AVB WEAR	(1)
2	27	40	18	AV3+.00	AVB WEAR	(1)
2	27	76	PI	H02+.15	ODSCC TSP AXIAL	(1)
2	28	11	PI	H01-.20	ODSCC TSP AXIAL	(1)
2	28	19	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	29	17	PI	C06+.18	ODSCC TSP AXIAL	(1)
2	29	28	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	29	30	PI	H01-.12	ODSCC TSP AXIAL	(1)
2	29	35	PI	H04-.21	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
2	29	56	SCI	HTS-.13	PWSCC HTS CIRC	PLUG
2	30	23	PI	H02-.18	ODSCC TSP AXIAL	(1)
2	31	14	PI	H02+.12	ODSCC TSP AXIAL	(1)
2	31	45	PI	C05+.00	ODSCC TSP AXIAL	(1)
2	31	45	PI	C05+.03	ODSCC TSP AXIAL	(1)
2	31	57	PI	H01+.17	ODSCC TSP AXIAL	(1)
2	31	67	PI	H07+.00	ODSCC TSP AXIAL	(1)
2	31	82	10	C01+.00	C/L WASTAGE	(1)
2	32	52	PI	H05+.09	ODSCC TSP AXIAL	(1)
2	32	55	25	AV3+.09	AVB WEAR	(1)
2	32	55	23	AV4-.12	AVB WEAR	(1)
2	32	56	PI	H05+.00	ODSCC TSP AXIAL	(1)
2	33	40	PI	H06+.06	ODSCC TSP AXIAL	(1)
2	33	49	34	AV1+.00	AVB WEAR	(1)
2	33	49	37	AV2+.00	AVB WEAR	(1)
2	33	49	34	AV3+.00	AVB WEAR	(1)
2	33	49	17	AV4+.00	AVB WEAR	(1)
2	33	49	PI	H01+.12	ODSCC TSP AXIAL	(1)
2	34	20	PI	C06+.00	ODSCC TSP AXIAL	(1)
2	34	46	PI	H01+.12	ODSCC TSP AXIAL	(1)
2	34	48	PI	H01+.15	ODSCC TSP AXIAL	(1)
2	34	64	PI	H01+.12	ODSCC TSP AXIAL	(1)
2	34	76	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	34	79	PI	H01+.18	ODSCC TSP AXIAL	(1)
2	35	18	PI	H01-.03	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
2	35	18	PI	H02+.12	ODSCC TSP AXIAL	(1)
2	35	20	PI	C06+.03	ODSCC TSP AXIAL	(1)
2	36	19	PI	H01+.06	ODSCC TSP AXIAL	(1)
2	36	64	PI	H05+.03	ODSCC TSP AXIAL	(1)
2	36	67	PI	H03+.00	ODSCC TSP AXIAL	(1)
2	36	73	PI	H07+.00	ODSCC TSP AXIAL	(1)
2	37	41	PI	H02+.00	ODSCC TSP AXIAL	(1)
2	38	34	PI	H01-.06	ODSCC TSP AXIAL	(1)
2	38	34	PI	H03+.00	ODSCC TSP AXIAL	(1)
2	38	45	19	AV3+.00	AVB WEAR	(1)
2	38	46	29	AV3+.00	AVB WEAR	(1)
2	38	47	29	AV3+.00	AVB WEAR	(1)
2	38	48	23	AV3+.00	AVB WEAR	(1)
2	38	49	28	AV2+.00	AVB WEAR	(1)
2	38	49	18	AV3-.29	AVB WEAR	(1)
2	38	57	26	C05+.03	C/L WASTAGE	(1)
2	39	28	PI	H04-.09	ODSCC TSP AXIAL	(1)
2	40	39	PI	H01+.09	ODSCC TSP AXIAL	(1)
2	41	52	PI	H03+.15	ODSCC TSP AXIAL	(1)
2	43	30	PI	H04-.12	ODSCC TSP AXIAL	(1)
2	43	30	PI	H05+.06	ODSCC TSP AXIAL	(1)
2	43	30	PI	H06+.06	ODSCC TSP AXIAL	(1)
2	43	32	PI	H05+.09	ODSCC TSP AXIAL	(1)
2	43	52	PI	H03-.03	ODSCC TSP AXIAL	(1)
2	43	54	PI	H02+.18	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
2	44	34	PI	H03+.03	ODSCC TSP AXIAL	(1)
2	44	34	PI	H04-.12	ODSCC TSP AXIAL	(1)
2	44	34	PI	H05+.00	ODSCC TSP AXIAL	(1)
2	44	36	PI	H05+.09	ODSCC TSP AXIAL	(1)
2	44	54	PI	H06+.06	ODSCC TSP AXIAL	(1)
2	45	36	24	C03+.09	C/L WASTAGE	(1)
2	45	41	PI	H06+.03	ODSCC TSP AXIAL	(1)
2	45	54	PI	H04+.03	ODSCC TSP AXIAL	(1)
2	45	57	PI	H06+.06	ODSCC TSP AXIAL	(1)

Bobbin inspection sample is category C-2

TTS RPC inspection sample is category C-2

Dented TSP +Point inspection sample is category C-2

U-Bend +Point inspection sample is category C-2

(1) Retest Future Outage

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
Sample: 0						
3	1	81	30	H01+.04	PWSCC > 5v DNT AXIAL	(1)
3	1	89	SAI	H07+3.60	PWSCC UBEND AXIAL	PLUG
3	1	90	SAI	H07+10.45	PWSCC UBEND AXIAL	PLUG
3	2	86	PI	H01-.12	ODSCC TSP AXIAL	(1)
3	2	92	PI	H02+.06	ODSCC TSP AXIAL	(1)
3	3	53	42	H01-.12	PWSCC < 2v DNT AXIAL	PLUG
3	3	58	52	H01-.04	PWSCC < 2v DNT AXIAL	PLUG
3	3	63	PI	H01-.15	ODSCC TSP AXIAL	(1)
3	3	75	PI	C01+.09	ODSCC TSP AXIAL	(1)
3	3	88	35	H02-.05	PWSCC < 2v DNT AXIAL	(1)
3	3	88	17	H04+.00	PWSCC 2-5v DNT AXIAL	(1)
3	4	28	PI	H02-.09	ODSCC TSP AXIAL	(1)
3	4	42	PI	H04-.32	ODSCC TSP AXIAL	(1)
3	4	60	SCI	H01+.02	ODSCC TSP CIRC	PLUG
3	4	60	PI	H01-.14	ODSCC TSP AXIAL	
3	4	76	38	H01-.06	PWSCC 2-5v DNT AXIAL	(1)
3	4	84	PI	H01-.24	ODSCC TSP AXIAL	(1)
3	5	6	PI	H02+.09	ODSCC TSP AXIAL	(1)
3	5	13	PI	H01-.35	ODSCC TSP AXIAL	(1)
3	5	29	PI	H01+.06	ODSCC TSP AXIAL	(1)
3	5	34	PI	H01+.12	ODSCC TSP AXIAL	(1)
3	5	51	PI	H01+.00	ODSCC TSP AXIAL	(1)
3	5	62	30	H01+.00	PWSCC < 2v DNT AXIAL	PLUG
3	5	62	PI	H01+.12	ODSCC TSP AXIAL	
3	5	71	PI	H01-.06	ODSCC TSP AXIAL	(1)
3	5	87	PI	H01-.06	ODSCC TSP AXIAL	(1)
3	6	20	PI	H01-.09	ODSCC TSP AXIAL	(1)
3	6	21	PI	H01+.12	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
3	6	26	PI	H01+.03	ODSCC TSP AXIAL	(1)
3	6	27	PI	H01+.12	ODSCC TSP AXIAL	(1)
3	6	38	31	H02-.06	PWSCC 2-5v DNT AXIAL	(1)
3	6	41	PI	H01+.03	ODSCC TSP AXIAL	(1)
3	6	45	44	H03-.09	PWSCC 2-5v DNT AXIAL	PLUG
3	6	54	SCI	H04-.21	ODSCC TSP CIRC	PLUG
3	6	54	SCI	H06-.01	PWSCC > 5v DNT CIRC	
3	6	54	SAI	HTS-.10	PWSCC HTS AXIAL	
3	6	54	SAI	HTS-.46	PWSCC HTS AXIAL	
3	6	64	SAI	HTS-.29	PWSCC HTS AXIAL	PLUG
3	6	74	36	H01+.46	PWSCC > 5v DNT AXIAL	
3	6	74	32	H01-.07	PWSCC > 5v DNT AXIAL	
3	6	74	18	H01-.28	PWSCC > 5v DNT AXIAL	
3	6	74	55	H01-.30	PWSCC > 5v DNT AXIAL	PLUG
3	7	34	22	H01-.44	PWSCC 2-5v DNT AXIAL	(1)
3	7	36	46	H05-.08	PWSCC < 2v DNT AXIAL	PLUG
3	7	54	SCI	H01+.11	PWSCC > 5v DNT CIRC	PLUG
3	7	65	PI	H01+.03	ODSCC TSP AXIAL	(1)
3	7	76	40	H02-.24	PWSCC 2-5v DNT AXIAL	PLUG
3	7	83	40	H01+.37	PWSCC > 5v DNT AXIAL	PLUG
3	7	89	PI	H01-.03	ODSCC TSP AXIAL	(1)
3	7	91	PI	H02+.09	ODSCC TSP AXIAL	(1)
3	8	3	49	H03-.05	PWSCC < 2v DNT AXIAL	PLUG
3	8	30	PI	H01+.03	ODSCC TSP AXIAL	(1)
3	8	37	PI	H01+.12	ODSCC TSP AXIAL	(1)
3	8	40	PI	H01+.00	ODSCC TSP AXIAL	(1)
3	8	43	PI	C07+.18	ODSCC TSP AXIAL	(1)
3	8	77	PI	H01+.15	ODSCC TSP AXIAL	(1)
3	9	67	43	H02+.05	PWSCC 2-5v DNT AXIAL	PLUG

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
3	9	83	18	H01-.07	PWSCC 2-5v DNT AXIAL	PLUG
3	9	83	PI	H01-.23	ODSCC TSP AXIAL	
3	9	86	SAI	H01+.01	PWSCC < 2v DNT AXIAL	PLUG
3	9	86	PI	H01+.09	ODSCC TSP AXIAL	
3	9	93	PI	H01+.20	ODSCC TSP AXIAL	(1)
3	10	27	PI	H01-.09	ODSCC TSP AXIAL	(1)
3	10	36	46	H01-.06	PWSCC < 2v DNT AXIAL	PLUG
3	10	40	38	H01-.14	PWSCC 2-5v DNT AXIAL	(1)
3	10	41	40	H01-.14	PWSCC 2-5v DNT AXIAL	PLUG
3	10	42	PI	H01+.00	ODSCC TSP AXIAL	(1)
3	10	54	SCI	HTS+.06	PWSCC HTS CIRC	PLUG
3	10	55	30	H01-.10	PWSCC 2-5v DNT AXIAL	(1)
3	10	85	80	H01-.20	PWSCC < 2v DNT AXIAL	PLUG
3	10	85	PI	H03-.26	ODSCC TSP AXIAL	
3	10	87	PI	H01-.23	ODSCC TSP AXIAL	(1)
3	10	88	26	H02-.14	PWSCC < 2v DNT AXIAL	(1)
3	10	93	PI	H01+.03	ODSCC TSP AXIAL	(1)
3	11	3	PI	H02-.03	ODSCC TSP AXIAL	(1)
3	11	19	SCI	HTS-.07	PWSCC HTS CIRC	PLUG
3	11	46	PI	C01+.09	ODSCC TSP AXIAL	(1)
3	11	46	23	H04+.44	PWSCC 2-5v DNT AXIAL	(1)
3	11	72	18	H02-.15	PWSCC 2-5v DNT AXIAL	(1)
3	11	74	46	H01-.51	PWSCC 2-5v DNT AXIAL	PLUG
3	12	4	PI	H02-.03	ODSCC TSP AXIAL	(1)
3	12	28	PI	H01+.00	ODSCC TSP AXIAL	(1)
3	12	48	SAI	HTS-.19	PWSCC HTS AXIAL	PLUG
3	12	69	25	H01-.18	PWSCC 2-5v DNT AXIAL	(1)
3	12	71	SAI	H01-.06	ODSCC TSP AXIAL	PLUG
3	12	81	SAI	H01+.67	PWSCC > 5v DNT AXIAL	PLUG

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
3	12	81	SAI	H01-.57	PWSCC > 5v DNT AXIAL	
3	13	15	PI	C04-.03	ODSCC TSP AXIAL	(1)
3	13	28	PI	H01+.00	ODSCC TSP AXIAL	(1)
3	13	45	PI	H01-.09	ODSCC TSP AXIAL	(1)
3	13	49	PI	H01+.09	ODSCC TSP AXIAL	(1)
3	13	71	PI	H03+.26	ODSCC TSP AXIAL	(1)
3	13	75	19	H01-.13	PWSCC 2-5v DNT AXIAL	(1)
3	13	85	18	H01-.03	PWSCC 2-5v DNT AXIAL	(1)
3	14	37	28	H01-.12	PWSCC < 2v DNT AXIAL	(1)
3	14	54	PI	H01+.06	ODSCC TSP AXIAL	(1)
3	14	57	49	H01-.06	PWSCC < 2v DNT AXIAL	PLUG
3	14	84	41	H01-.27	PWSCC 2-5v DNT AXIAL	PLUG
3	15	29	PI	H03-.23	ODSCC TSP AXIAL	(1)
3	15	62	SCI	H01+.17	ODSCC TSP CIRC	PLUG
3	15	62	SCI	H03+.06	ODSCC TSP CIRC	
3	16	43	SCI	HTS-.12	PWSCC HTS CIRC	PLUG
3	16	50	38	H01-.21	PWSCC < 2v DNT AXIAL	(1)
3	16	57	PI	H01-.09	ODSCC TSP AXIAL	(1)
3	16	64	35	H01-.53	PWSCC > 5v DNT AXIAL	(1)
3	16	69	32	H01+.10	PWSCC > 5v DNT AXIAL	
3	16	69	39	H01+.46	PWSCC > 5v DNT AXIAL	PLUG
3	16	69	18	H02-.15	PWSCC 2-5v DNT AXIAL	
3	16	71	PI	H02-.29	ODSCC TSP AXIAL	(1)
3	17	36	PI	H01-.32	ODSCC TSP AXIAL	(1)
3	17	44	PI	H01+.00	ODSCC TSP AXIAL	(1)
3	17	53	PI	H01-.29	ODSCC TSP AXIAL	(1)
3	17	79	PI	C01-.03	ODSCC TSP AXIAL	(1)
3	18	68	25	H02-.07	PWSCC < 2v DNT AXIAL	(1)
3	18	74	51	H01+.31	PWSCC 2-5v DNT AXIAL	PLUG

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
3	18	74	32	H01-.18	PWSCC 2-5v DNT AXIAL	
3	19	22	28	AV3+.00	AVB WEAR	(1)
3	19	36	PI	H01+.00	ODSCC TSP AXIAL	(1)
3	19	38	13	AV3+.00	AVB WEAR	(1)
3	19	38	PI	H03-.38	ODSCC TSP AXIAL	(1)
3	19	68	SCI	H01+.03	PWSCC 2-5v DNT CIRC	PLUG
3	19	89	PI	H01-.12	ODSCC TSP AXIAL	(1)
3	20	31	35	H01+.01	PWSCC < 2v DNT AXIAL	(1)
3	20	63	8	AV2+.00	AVB WEAR	(1)
3	20	63	18	AV3+.00	AVB WEAR	(1)
3	20	69	18	H01-.10	PWSCC 2-5v DNT AXIAL	(1)
3	20	85	PI	H01+.18	ODSCC TSP AXIAL	(1)
3	21	39	PI	H01+.03	ODSCC TSP AXIAL	(1)
3	21	46	SCI	H01+.15	PWSCC 2-5v DNT CIRC	PLUG
3	21	55	22	H01-.07	PWSCC 2-5v DNT AXIAL	(1)
3	21	74	SCI	H01+.00	ODSCC TSP CIRC	PLUG
3	21	84	PI	H01+.12	ODSCC TSP AXIAL	(1)
3	21	86	PI	H01+.06	ODSCC TSP AXIAL	(1)
3	21	88	PI	H01+.20	ODSCC TSP AXIAL	(1)
3	22	57	PI	H01-.37	ODSCC TSP AXIAL	(1)
3	22	64	26	AV2+.24	AVB WEAR	(1)
3	22	64	33	AV3+.00	AVB WEAR	(1)
3	22	67	26	AV2+.00	AVB WEAR	(1)
3	22	67	19	AV3+.00	AVB WEAR	(1)
3	22	67	14	AV4+.00	AVB WEAR	(1)
3	22	74	PI	H02+.06	ODSCC TSP AXIAL	(1)
3	23	68	PI	H01-.27	ODSCC TSP AXIAL	(1)
3	23	71	30	H01-.15	PWSCC 2-5v DNT AXIAL	(1)
3	23	74	32	H01-.09	PWSCC < 2v DNT AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
3	23	76	57	H02-.18	PWSCC > 5v DNT AXIAL	PLUG
3	23	85	27	H01+.31	PWSCC 2-5v DNT AXIAL	(1)
3	23	85	22	H01-.21	PWSCC 2-5v DNT AXIAL	(1)
3	24	62	38	H01-.05	PWSCC < 2v DNT AXIAL	(1)
3	24	71	19	H01+.17	PWSCC 2-5v DNT AXIAL	(1)
3	24	73	30	H01-.10	PWSCC > 5v DNT AXIAL	(1)
3	24	80	40	H01-.19	PWSCC 2-5v DNT AXIAL	PLUG
3	24	80	35	H02-.08	PWSCC 2-5v DNT AXIAL	
3	24	81	SCI	H02-.12	PWSCC 2-5v DNT CIRC	PLUG/STABILIZE
3	24	84	22	H01+.08	PWSCC 2-5v DNT AXIAL	(1)
3	24	84	22	H01+.34	PWSCC 2-5v DNT AXIAL	(1)
3	24	85	54	H01-.03	PWSCC 2-5v DNT AXIAL	PLUG
3	25	25	9	AV2+.00	AVB WEAR	(1)
3	25	62	44	H01+.41	PWSCC > 5v DNT AXIAL	PLUG
3	25	66	PI	H01-.12	ODSCC TSP AXIAL	(1)
3	25	67	28	H01-.06	PWSCC < 2v DNT AXIAL	(1)
3	25	76	SAI	H01+.06	PWSCC 2-5v DNT AXIAL	PLUG
3	25	87	17	AV4+.00	AVB WEAR	(1)
3	26	15	PI	C05-.06	ODSCC TSP AXIAL	(1)
3	26	66	PI	H02-.09	ODSCC TSP AXIAL	(1)
3	26	75	SCI	H01+.17	PWSCC 2-5v DNT CIRC	
3	26	75	SCI	H01-.15	PWSCC 2-5v DNT CIRC	PLUG
3	27	54	15	AV3+.67	AVB WEAR	(1)
3	27	84	20	C01+.03	C/L WASTAGE	(1)
3	28	66	21	AV3+.00	AVB WEAR	(1)
3	28	66	14	AV4+.00	AVB WEAR	(1)
3	28	80	SCI	H01+.01	PWSCC > 5v DNT CIRC	PLUG/STABILIZE
3	29	80	44	H01-.25	PWSCC < 2v DNT AXIAL	PLUG
3	31	68	20	H01-.08	PWSCC 2-5v DNT AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
3	32	70	SCI	H01+.17	PWSCC 2-5v DNT CIRC	PLUG
3	32	78	24	H02-.08	PWSCC < 2v DNT AXIAL	(1)
3	33	16	37	C01+.00	C/L WASTAGE	(1)
3	33	79	40	H01-.01	PWSCC 2-5v DNT AXIAL	PLUG
3	34	52	41	H01+.12	PWSCC 2-5v DNT AXIAL	PLUG
3	34	56	27	H04-.12	PWSCC 2-5v DNT AXIAL	(1)
3	34	72	SCI	H02-.10	PWSCC > 5v DNT CIRC	PLUG/STABILIZE
3	34	76	BLG	HTS+.00	BULGE	PLUG/STAB PREVENTIVELY
3	34	76	OXP	HTS+1.58	OVER EXP TTS	
3	35	18	20	C01+.00	C/L WASTAGE	(1)
3	35	41	24	AV2+.00	AVB WEAR	
3	35	41	42	AV3+.03	AVB WEAR	PLUG
3	35	69	21	AV3+.00	AVB WEAR	(1)
3	35	69	12	AV4-.26	AVB WEAR	(1)
3	36	70	26	H01+.07	PWSCC 2-5v DNT AXIAL	(1)
3	36	19	7	C01+.12	C/L WASTAGE	(1)
3	36	62	PI	H01-.35	ODSCC TSP AXIAL	(1)
3	36	67	PI	C02-.03	ODSCC TSP AXIAL	(1)
3	36	70	PI	H01+.12	ODSCC TSP AXIAL	(1)
3	36	72	PI	H01+.09	ODSCC TSP AXIAL	(1)
3	36	73	PI	H02+.03	ODSCC TSP AXIAL	(1)
3	38	22	19	C01+.12	C/L WASTAGE	(1)
3	38	52	PI	H02+.03	ODSCC TSP AXIAL	(1)
3	38	55	31	AV3+.00	AVB WEAR	(1)
3	38	55	16	AV4+.00	AVB WEAR	(1)
3	38	62	21	AV3+.00	AVB WEAR	(1)
3	38	62	27	AV4+.00	AVB WEAR	(1)
3	38	64	21	AV1+.00	AVB WEAR	(1)
3	38	64	36	AV2+.00	AVB WEAR	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
3	38	64	29	AV3+.00	AVB WEAR	(1)
3	38	64	14	AV4+.00	AVB WEAR	(1)
3	39	48	PI	H02-.29	ODSCC TSP AXIAL	(1)
3	39	73	PI	H04+.12	ODSCC TSP AXIAL	(1)
3	41	64	28	AV1+.00	AVB WEAR	(1)
3	42	46	19	H01-.16	PWSCC > 5v DNT AXIAL	(1)
3	42	56	BLG	HTS+3.55	BULGE	PLUG/STAB PREVENTIVELY
3	42	58	PI	H01+.09	ODSCC TSP AXIAL	(1)
3	42	60	44	H03-.11	PWSCC < 2v DNT AXIAL	PLUG
3	43	31	11	C01-.09	C/L WASTAGE	(1)
3	43	38	45	H01-.18	PWSCC < 2v DNT AXIAL	PLUG
3	43	65	PI	H05+.15	ODSCC TSP AXIAL	(1)
3	43	65	PI	H06+.06	ODSCC TSP AXIAL	(1)
3	44	45	22	H01+.04	PWSCC 2-5v DNT AXIAL	(1)
3	44	59	PI	H01+.00	ODSCC TSP AXIAL	(1)
3	44	61	16	C01+.00	C/L WASTAGE	(1)
3	44	62	PI	H06+.00	ODSCC TSP AXIAL	(1)
3	45	52	46	H02-.07	PWSCC < 2v DNT AXIAL	PLUG
3	45	58	3	C01+.09	C/L WASTAGE	(1)
3	45	59	PI	C01+.32	ODSCC TSP AXIAL	(1)
3	46	42	18	H01-.20	PWSCC 2-5v DNT AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION

Bobbin inspection sample is category C-2

TTS RPC inspection sample is category C-2

Dented TSP +Point inspection sample is category C-2

U-Bend +Point inspection sample is category C-3

(1) Retest Future Outage

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
Sample: 0						
4	1	4	SAI	HTS-.56	PWSCC HTS AXIAL	PLUG
4	1	27	SCI	H03+.30	ODSCC TSP CIRC	PLUG
4	1	77	SCI	H07+3.68	PWSCC UBEND CIRC	PLUG
4	1	80	SAI	H07+2.93	PWSCC UBEND AXIAL	PLUG
4	1	81	SAI	H07+4.07	PWSCC UBEND AXIAL	PLUG
4	2	11	SCI	H01-.17	ODSCC TSP CIRC	PLUG
4	2	12	PI	H01+.16	ODSCC TSP AXIAL	(1)
4	2	25	26	H01-.29	PWSCC > 5v DNT AXIAL	(1)
4	2	49	PI	H01+.00	ODSCC TSP AXIAL	(1)
4	2	56	43	H01-.25	PWSCC 2-5v DNT AXIAL	PLUG
4	3	11	PI	H01+.03	ODSCC TSP AXIAL	(1)
4	3	12	SCI	H01+.14	ODSCC TSP CIRC	PLUG
4	3	16	SCI	H01-.15	ODSCC TSP CIRC	PLUG
4	3	27	18	H02-.17	PWSCC 2-5v DNT AXIAL	(1)
4	3	47	35	H03-.05	PWSCC < 2v DNT AXIAL	(1)
4	3	75	49	H02-.10	PWSCC < 2v DNT AXIAL	PLUG
4	4	9	PI	H01-.06	ODSCC TSP AXIAL	(1)
4	4	39	35	H02+.02	PWSCC < 2v DNT AXIAL	(1)
4	4	50	SCI	H01+.30	ODSCC TSP CIRC	PLUG
4	4	69	PI	H01+.00	ODSCC TSP AXIAL	(1)
4	5	2	PI	H01+.00	ODSCC TSP AXIAL	(1)
4	5	5	PI	H01-.06	ODSCC TSP AXIAL	(1)
4	5	16	36	H01+.06	PWSCC > 5v DNT AXIAL	(1)
4	5	24	PI	H01-.03	ODSCC TSP AXIAL	(1)
4	5	31	PI	H02+.03	ODSCC TSP AXIAL	(1)
4	5	32	PI	H01-.14	ODSCC TSP AXIAL	(1)
4	5	33	SCI	H01-.24	ODSCC TSP CIRC	PLUG
4	5	60	PI	H05-.14	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
4	5	71	PI	H01-.09	ODSCC TSP AXIAL	(1)
4	5	71	PI	H02+.09	ODSCC TSP AXIAL	(1)
4	6	15	SCI	H03-.07	ODSCC TSP CIRC	PLUG
4	6	18	SCI	H03-.25	ODSCC TSP CIRC	PLUG
4	7	10	SCI	H01-.19	ODSCC TSP CIRC	PLUG
4	7	57	PI	H01-.09	ODSCC TSP AXIAL	(1)
4	7	75	52	H01+.06	PWSCC < 2v DNT AXIAL	PLUG
4	8	4	PI	H01+.00	ODSCC TSP AXIAL	(1)
4	8	10	21	H01-.21	PWSCC 2-5v DNT AXIAL	(1)
4	8	46	SAI	HTS-.34	PWSCC HTS AXIAL	PLUG
4	9	38	SCI	H01+.21	ODSCC TSP CIRC	PLUG
4	10	4	40	H01+.03	PWSCC < 2v DNT AXIAL	PLUG
4	10	51	PI	H06+.00	ODSCC TSP AXIAL	(1)
4	10	69	PI	H01+.03	ODSCC TSP AXIAL	(1)
4	11	35	43	H02-.08	PWSCC < 2v DNT AXIAL	
4	11	35	45	H04+.22	PWSCC > 5v DNT AXIAL	PLUG
4	11	58	PI	H01-.09	ODSCC TSP AXIAL	(1)
4	11	62	PI	H01-.06	ODSCC TSP AXIAL	(1)
4	11	77	52	H03-.27	PWSCC < 2v DNT AXIAL	PLUG
4	12	29	SCI	HTS-.09	PWSCC HTS CIRC	PLUG
4	13	75	SCI	HTS-.35	PWSCC HTS CIRC	PLUG
4	13	37	21	H04-.15	PWSCC > 5v DNT AXIAL	
4	13	37	SCI	HTS-.11	PWSCC HTS CIRC	PLUG
4	13	46	SCI	HTS-.15	PWSCC HTS CIRC	PLUG
4	13	61	97	H03-.40	PWSCC > 5v DNT AXIAL	PLUG
4	14	62	24	H02-.13	PWSCC 2-5v DNT AXIAL	(1)
4	14	81	PI	H02+.00	ODSCC TSP AXIAL	(1)
4	15	42	38	H01+.32	PWSCC > 5v DNT AXIAL	(1)
4	15	59	26	H02-.23	PWSCC > 5v DNT AXIAL	

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
4	15	59	38	H02-.59	PWSCC > 5v DNT AXIAL	PLUG
4	16	67	PI	H01-.03	ODSCC TSP AXIAL	(1)
4	17	11	38	H01+.39	PWSCC > 5v DNT AXIAL	PLUG
4	17	48	PI	H03-.06	ODSCC TSP AXIAL	(1)
4	17	53	40	H01-.14	PWSCC < 2v DNT AXIAL	PLUG
4	18	11	PI	H01+.00	ODSCC TSP AXIAL	(1)
4	18	33	SCI	HTS-.69	PWSCC HTS CIRC	PLUG
4	19	7	PI	H01+.00	ODSCC TSP AXIAL	(1)
4	20	21	PI	C05+.00	ODSCC TSP AXIAL	(1)
4	20	44	SCI	H01+.00	PWSCC > 5v DNT CIRC	PLUG
4	20	58	PI	H01-.06	ODSCC TSP AXIAL	(1)
4	20	59	PI	H01-.09	ODSCC TSP AXIAL	(1)
4	20	59	PI	H02+.06	ODSCC TSP AXIAL	(1)
4	21	17	4	C01-.03	C/L WASTAGE	(1)
4	21	57	35	H01+.40	PWSCC > 5v DNT AXIAL	PLUG
4	22	56	PI	H01-.06	ODSCC TSP AXIAL	(1)
4	22	86	PI	H02+.09	ODSCC TSP AXIAL	(1)
4	23	11	PI	H01-.06	ODSCC TSP AXIAL	(1)
4	23	24	PI	H01-.23	ODSCC TSP AXIAL	(1)
4	23	37	18	H01-.17	PWSCC > 5v DNT AXIAL	(1)
4	23	43	43	H01+.39	PWSCC > 5v DNT AXIAL	PLUG
4	23	43	40	H01-.57	PWSCC > 5v DNT AXIAL	
4	24	10	PI	H02-.17	ODSCC TSP AXIAL	(1)
4	24	56	19	AV3+.00	AVB WEAR	(1)
4	25	22	MCI	H01+.08	PWSCC 2-5v DNT CIRC	
4	25	22	MCI	H01-.03	PWSCC 2-5v DNT CIRC	PLUG
4	25	61	PI	H01+.15	ODSCC TSP AXIAL	(1)
4	25	70	PI	H06-.06	ODSCC TSP AXIAL	(1)
4	26	12	SAI	H01+.00	ODSCC TSP AXIAL	PLUG

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
4	26	63	21	H02+.00	PWSCC < 2v DNT AXIAL	
4	26	63	25	H02-.12	PWSCC < 2v DNT AXIAL	
4	26	63	46	H02-.29	PWSCC < 2v DNT AXIAL	PLUG
4	27	13	PI	H01-.09	ODSCC TSP AXIAL	(1)
4	28	18	20	H01-.17	PWSCC 2-5v DNT AXIAL	(1)
4	28	24	SCI	H01+.00	ODSCC TSP CIRC	PLUG
4	28	40	PI	H03+.00	ODSCC TSP AXIAL	(1)
4	28	45	25	AV2+.00	AVB WEAR	(1)
4	28	47	26	AV2+.00	AVB WEAR	(1)
4	28	52	52	H01-.09	PWSCC > 5v DNT AXIAL	PLUG
4	29	31	26	AV1+.09	AVB WEAR	(1)
4	29	31	32	AV2-.36	AVB WEAR	(1)
4	29	31	33	AV3-.06	AVB WEAR	(1)
4	29	31	22	AV4+.00	AVB WEAR	(1)
4	29	84	PI	H02+.03	ODSCC TSP AXIAL	(1)
4	30	44	PI	H02-.03	ODSCC TSP AXIAL	(1)
4	30	72	PI	C05+.00	ODSCC TSP AXIAL	(1)
4	31	16	PI	H03+.00	ODSCC TSP AXIAL	(1)
4	31	18	57	H01-.33	PWSCC < 2v DNT AXIAL	PLUG
4	31	20	PI	H01+.06	ODSCC TSP AXIAL	(1)
4	31	37	PI	H03+.03	ODSCC TSP AXIAL	(1)
4	31	62	PI	H06+.00	ODSCC TSP AXIAL	(1)
4	32	24	PI	H01-.09	ODSCC TSP AXIAL	(1)
4	32	49	27	AV3+.00	AVB WEAR	(1)
4	33	22	PI	H01-.03	ODSCC TSP AXIAL	(1)
4	33	55	PI	H07-.03	ODSCC TSP AXIAL	(1)
4	33	60	19	AV2-.06	AVB WEAR	(1)
4	33	60	24	AV3-.20	AVB WEAR	(1)
4	33	76	PI	H05+.03	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
4	35	43	31	AV2+.00	AVB WEAR	(1)
4	35	43	25	AV3+.00	AVB WEAR	(1)
4	35	58	18	H01-.18	PWSCC > 5v DNT AXIAL	(1)
4	36	22	32	H02-.18	PWSCC 2-5v DNT AXIAL	(1)
4	37	30	PI	H03-.03	ODSCC TSP AXIAL	(1)
4	37	69	PI	H06+.09	ODSCC TSP AXIAL	(1)
4	38	38	SCI	H01-.11	PWSCC > 5v DNT CIRC	PLUG/STABILIZE
4	38	63	PI	H03+.03	ODSCC TSP AXIAL	(1)
4	39	23	PI	H01+.03	ODSCC TSP AXIAL	(1)
4	39	36	SCI	H01-.11	PWSCC > 5v DNT CIRC	PLUG
4	39	55	18	AV2-.21	AVB WEAR	(1)
4	39	55	29	AV3+.00	AVB WEAR	(1)
4	41	27	SAI	HTS-.10	PWSCC HTS AXIAL	PLUG
4	41	42	PI	H04-.03	ODSCC TSP AXIAL	(1)
4	43	52	19	H01+.16	PWSCC 2-5v DNT AXIAL	(1)
4	45	52	PI	H06+.06	ODSCC TSP AXIAL	(1)

Resolution of Defective Tubes and All Service-Induced Wall Loss Indications

SQN Unit 1 Cycle 9 **Date:** *04-May-99*

SG	ROW	COL	IND	LOCATION	CHARACTERIZATION	RESOLUTION
Bobbin inspection sample is category C-2						
TTS RPC inspection sample is category C-2						
Dented TSP +Point inspection sample is category C-2						
U-Bend +Point inspection sample is category C-3						

(1) Retest Future Outage

Table 3
Axial PWSCC at Dented TSPs Left In Service

SG	Row	Column	Location	From	To	Length Outside TSP	Max. Volts	Max. Depth(%)	Avg Depth (%)	Length (in.)
1	20	66	H02	0.03	0.38	0.01	0.54	38.95	19.59	0.36
3	10	40	H01	-0.14	0.48	0.11	1.34	38.48	31.08	0.63
3	4	76	H01	-0.06	0.19		0.72	37.55	21.04	0.26
4	15	42	H01	0.32	0.45	0.08	0.41	37.55	27.77	0.13
3	16	50	H01	-0.21	0.25		1.25	37.55	26.65	0.47
3	24	62	H01	-0.0[illegible]	0.15		0.52	37.55	23.82	0.20
1	26	58	H01	-0.16	0.19		0.48	37.55	26.71	0.36
4	5	16	H01	0.06	0.64	0.27	0.56	35.68	22.87	0.59
4	3	47	H03	-0.05	0.41	0.04	0.88	34.75	24.21	0.47
3	3	88	H02	-0.05	0.25		0.88	34.75	23.79	0.30
4	4	39	H02	0.02	0.17		0.52	34.75	24.12	0.15
3	16	64	H01	-0.53	-0.35	0.16	0.64	34.75	22.28	0.18
3	20	31	H01	0.01	0.22		0.69	34.75	23.91	0.21
3	23	74	H01	-0.09	0.07		0.83	31.95	18.54	0.16
4	36	22	H02	-0.16	0.21		0.78	31.95	22.84	0.37
3	10	55	H01	-0.12	0.17		0.67	31.48	20.84	0.30
3	1	81	H01	0.04	0.29		1.27	30.09	19.06	0.25
3	6	38	H02	-0.06	0.12		0.36	30.09	16.30	0.18
3	23	71	H01	-0.15	0.06		0.58	30.09	19.93	0.21
3	24	73	H01	-0.10	0.08		0.78	30.09	20.93	0.18
4	2	25	H01	-0.27	-0.10		0.45	29.00	20.30	0.17
3	34	56	H04	-0.12	0.16		1.02	29.00	21.07	0.28
3	14	37	H01	-0.12	0.02		0.35	27.29	19.55	0.14
3	23	85	H01	0.31	0.51	0.14	0.69	27.29	18.83	0.20
3	25	67	H01	-0.06	0.12		0.75	27.29	18.22	0.18
3	35	70	H01	0.07	0.27		0.88	25.89	17.82	0.20
3	10	88	H02	-0.14	0.07		0.80	25.89	16.91	0.21
3	32	78	H02	-0.08	0.08		0.97	24.49	12.55	0.16
3	12	69	H01	-0.18	-0.06		0.41	24.49	16.45	0.11
3	18	68	H02	-0.07	0.11		0.69	24.49	16.43	0.18
4	14	62	H02	-0.13	0.09		0.72	23.55	12.88	0.22
3	11	46	H04	0.44	0.60	0.16	0.44	22.62	14.71	0.16
3	7	34	H01	-0.44	-0.07	0.07	0.61	21.69	10.88	0.38
3	21	55	H01	-0.07	0.21		0.49	21.69	9.43	0.28
3	23	85	H01	-0.21	0.02		0.67	21.69	10.13	0.23
3	24	84	H01	0.08	0.29		0.87	21.69	13.68	0.21
3	24	84	H01	0.34	0.45	0.08	0.40	21.69	16.57	0.11
3	44	45	H01	0.04	0.17		0.37	21.69	11.24	0.13
4	8	10	H01	-0.21	0.17		0.58	21.22	12.03	0.38
3	31	68	H01	-0.08	0.29		0.56	19.36	8.17	0.37
4	43	52	H01	0.16	0.31		0.50	19.36	14.12	0.15
3	13	75	H01	-0.13	0.29		0.78	18.89	9.95	0.42
3	24	71	H01	0.17	0.54	0.17	0.74	18.89	11.17	0.38
3	42	46	H01	-0.16	0.02		0.37	18.89	11.68	0.18
4	3	27	H02	-0.17	0.00		0.22	17.96	11.19	0.17
3	3	88	H04	0.00	0.14		0.55	17.96	11.72	0.14
3	11	72	H02	-0.15	-0.01		0.70	17.96	12.98	0.14
1	12	55	H01	0.18	0.39	0.02	0.87	17.96	11.15	0.21
3	13	85	H01	-0.03	0.16		0.63	17.96	10.95	0.19
3	20	69	H01	-0.10	0.06		0.37	17.96	11.00	0.16

Table 3
Axial PWSCC at Dented TSPs Left In Service

SG	Row	Column	Location	From	To	Length Outside TSP	Max. Volts	Max. Depth(%)	Avg Depth (%)	Length (in.)
4	23	37	H01	-0.17	0.11		0.70	17.96	11.39	0.29
4	28	18	H01	-0.16	0.26		0.72	17.96	10.81	0.43
4	35	58	H01	-0.18	-0.06		0.32	17.96	13.69	0.12
3	46	42	H01	-0.20	0.19		0.47	17.96	11.80	0.40

Table 4
Axial PWSCC at Dented TSPs Removed From Service

SG	Row	Column	Location	From	To	Length Outside TSP	Max. Volts	Max. Depth(%)	Avg Depth (%)	Length (in.)
4	13	61	H03	-0.40	-0.15	0.03	0.46	91.66	76.82	0.26
3	10	85	H01	-0.20	0.14		1.56	80.47	36.05	0.35
1	17	55	H01	0.20	0.37		0.75	67.00	47.06	0.17
1	3	59	H01	0.47	0.60	0.23	0.47	64.00	36.77	0.13
2	18	30	H01	-0.17	0.15		1.75	59.01	46.30	0.33
3	23	76	H02	-0.18	0.03		1.11	57.14	27.63	0.21
4	31	18	H01	-0.33	0.23		1.18	57.14	41.34	0.57
2	14	33	H02	-0.12	0.17		0.91	56.21	40.02	0.30
3	6	74	H01	-0.51	-0.30	0.14	1.30	54.34	41.65	0.21
3	24	85	H01	-0.03	0.15		0.46	54.34	38.51	0.18
4	7	75	H01	-0.06	0.18		1.24	52.48	36.17	0.25
4	11	77	H03	-0.27	0.07		1.59	52.48	42.40	0.35
4	28	52	H01	-0.09	0.04		0.46	52.48	32.57	0.13
3	3	58	H01	-0.04	0.17		1.02	51.54	37.00	0.21
3	18	74	H01	0.31	0.52	0.14	1.15	50.14	33.15	0.21
3	8	3	H03	-0.05	0.25		1.25	48.75	39.70	0.31
3	14	57	H01	-0.06	0.15		0.85	48.75	32.33	0.21
4	3	75	H02	-0.10	0.20		1.29	48.75	32.73	0.31
3	7	36	H05	-0.08	0.15		0.76	45.95	28.56	0.23
3	10	36	H01	-0.06	0.38	0.01	2.10	45.95	33.14	0.45
3	11	74	H01	-0.51	0.67	0.43	2.02	45.95	30.34	1.19
3	45	52	H02	-0.07	0.14		0.99	45.95	36.00	0.21
4	26	63	H02	-0.29	0.02		1.04	45.95	32.45	0.31
1	23	88	H01	-0.10	0.06		0.25	45.25	26.27	0.16
3	29	80	H01	-0.25	0.10		1.60	44.55	28.43	0.36
3	42	60	H03	-0.11	0.19		0.75	44.55	31.25	0.31
3	43	38	H01	-0.18	0.03		1.34	44.55	35.94	0.21
4	11	35	H04	0.22	0.51	0.14	0.95	44.55	32.54	0.30
3	6	45	H03	-0.17	0.28		0.77	44.08	31.02	0.46
3	9	67	H02	0.05	0.26		0.73	43.15	25.51	0.21
3	25	62	H01	0.41	0.57	0.16	0.69	43.15	34.14	0.16
4	2	56	H01	-0.25	-0.04		0.59	43.15	30.47	0.21
4	11	35	H02	-0.08	0.12		0.70	43.15	29.47	0.20
4	23	43	H01	0.40	0.53	0.13	0.45	43.15	30.68	0.13
3	3	53	H01	-0.12	0.13		0.49	42.21	31.85	0.26
3	14	84	H01	-0.27	0.19		0.92	41.75	30.86	0.46
2	8	32	H01	-0.17	-0.05		0.33	41.28	29.20	0.12
3	9	86	H01	-0.02	0.13		1.11	41.00	29.57	0.15
3	25	76	H01	0.02	0.11		0.56	41.00	29.42	0.09
3	34	52	H01	0.12	0.30		0.37	40.81	26.53	0.18
3	7	76	H02	-0.24	0.01		0.92	40.35	25.03	0.26
3	7	83	H01	0.37	0.51	0.14	0.47	40.35	21.68	0.14
3	24	80	H01	-0.19	0.35		1.09	40.35	24.02	0.54
3	33	79	H01	-0.01	0.17		0.50	40.35	22.37	0.18
4	10	4	H01	0.03	0.22		0.84	40.35	30.58	0.19
4	17	53	H01	-0.14	0.20		0.82	40.35	21.23	0.35
4	23	43	H01	-0.57	-0.41	0.16	0.63	40.35	29.27	0.16
3	10	41	H01	-0.14	0.16		0.86	39.88	26.36	0.30
3	16	69	H01	0.46	0.69	0.23	0.56	38.95	28.65	0.23
4	17	11	H01	0.39	0.65	0.26	0.57	38.48	22.51	0.26
3	24	80	H02	-0.06	0.30		1.34	38.00	22.50	0.36
4	15	59	H02	-0.59	-0.41	0.18	0.60	37.55	26.82	0.18

Table 4
Axial PWSCC at Dented TSPs Removed From Service

SG	Row	Column	Location	From	To	Length Outside TSP	Max. Volts	Max. Depth(%)	Avg Depth (%)	Length (in.)
3	6	74	H01	0.46	0.65	0.19	0.72	36.15	26.45	0.19
3	24	80	H01	0.43	0.60	0.17	0.90	36.15	25.02	0.17
2	10	34	H01	0.06	0.25		0.41	35.68	19.93	0.19
4	21	57	H01	0.40	0.60	0.2	0.73	34.75	26.87	0.20
3	12	81	H01	0.50	0.67	0.17	0.54	33.35	22.71	0.17
3	6	74	H01	-0.07	0.20		1.01	31.95	18.51	0.28
3	16	69	H01	0.10	0.29		0.89	31.95	23.45	0.19
3	18	74	H01	-0.18	-0.01		0.86	31.95	19.54	0.17
3	5	62	H01	0.00	0.12		0.57	30.09	21.97	0.12
4	15	59	H02	-0.23	0.02		0.72	26.35	12.14	0.26
4	26	63	H02	-0.03	0.18		0.65	23.55	12.88	0.21
4	13	37	H04	-0.15	0.02		0.50	20.76	8.02	0.17
4	26	63	H02	0.00	0.18		0.71	20.76	13.91	0.18
3	6	74	H01	-0.28	-0.13		0.34	17.96	9.89	0.15
3	9	83	H01	-0.07	0.07		0.44	17.96	10.27	0.14
3	16	69	H02	-0.15	0.03		0.53	17.96	10.82	0.18
3	12	81	H01	-0.63	-0.57	0.06	0.30	16.00	8.67	0.06