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PG&E Letter DCL-07-085

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

Docket No. 50-275, OL-DPR-80  
Diablo Canyon Unit 1  
Results of Steam Generator (SG) Tube Alternate Repair Criteria (ARC)  
Inspections for Diablo Canyon Power Plant Unit 1 Fourteenth Refueling Outage

Dear Commissioners and Staff:

In accordance with Technical Specifications (TS) 5.6.10.c and 5.6.10.d, Enclosure 1 provides the 90-day report of results of the Unit 1 SG Wstar (W\*) ARC tubesheet inspections and calculated steam line break leakage from application of all ARC and non-ARC.

In accordance with TS 5.6.10.f, Enclosure 2 provides the 120-day report of results of the Unit 1 SG primary water stress corrosion cracking ARC inspections at dented tube support plate (TSP) intersections.

In accordance with TS 5.6.10.e, Enclosure 3 provides the 90-day report of results of Unit 1 SG voltage-based ARC inspections for TSP outside diameter stress corrosion cracking, prepared by Areva for PG&E. As concluded in Section 5.3 of Enclosure 3, there were no underpredictions, and reporting to the NRC in accordance with TS 5.6.10.g is not required.

There are no new or revised regulatory commitments as defined by the Nuclear Energy Institute 99-04, "Guidelines for Managing NRC Commitment changes," dated July 1999, in this report.

If you have any questions, please contact John Arhar at (805) 545-4629.

Sincerely,

Donna Jacobs

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NRR



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Enclosures

cc: Diablo Distribution  
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## ENCLOSURE 1

### W\* ALTERNATE REPAIR CRITERIA 90-DAY REPORT

#### DIABLO CANYON POWER PLANT UNIT 1 FOURTEENTH REFUELING OUTAGE

This report implements the Diablo Canyon Power Plant (DCPP) Technical Specification (TS) 5.6.10.c and 5.6.10.d steam generator (SG) tube inspection reporting criteria.

Wstar (W\*) Alternate Repair Criteria (ARC) was implemented for the sixth time in DCP Unit 1 during the Unit 1 Fourteenth Refueling Outage (1R14) SG inspections and repairs that were completed in May 2007. One hundred percent of the SG tubes were inspected by bobbin from tube end to tube end, except for Row 1 and 2 U-bends. One hundred percent of the hot leg top of tubesheet (TTS) WEXTEx region was inspected by Plus Point in each SG. Cold leg TTS Plus Point inspections were not required.

#### Technical Specification 5.6.10.c Reporting Requirements

DCPP TS 5.6.10.c requires that the results of the inspection of W\* tubes be submitted within 90 days after initial entry into MODE 4 following completion of an inspection performed in accordance with TS 5.5.9. This enclosure provides the specific TS reporting requirements, and Pacific Gas and Electric Company's (PG&E) description of compliance.

A comprehensive list of axial primary water stress corrosion cracking (PWSCC) indications detected in the hot leg WEXTEx region during 1R14 Plus Point inspections are provided in Table 1. The following discussions provide references to columns in Table 1 where appropriate information is contained.

- *Identification of W\* tube indications and indications that do not meet W\* requirements and were plugged.*

Table 1 column labeled "W\* Cand" identifies 17 tubes (containing 20 single axial PWSCC indications [SAI] within or below the W\* length) that are categorized as W\* candidates (W\* tubes) and left in service under W\* ARC. There were no indications that did not meet W\* requirements, and no indications were plugged because of failure to meet W\* ARC.

Not included in Table 1 are circumferential outside diameter stress corrosion cracking (ODSCC) indications located at the top of tubesheet (in non-W\* tubes) that were plugged because the crack type and location is excluded from application of W\* ARC.

- *Number of indications and location of the indications (relative to below the W\* transition [BWT] and top of tubesheet [TTS]).*

For each of the 20 indications, the lower crack tip (LCT) and upper crack tip (UCT) columns provide the elevation (inch) of the upper crack tip and elevation of the lower crack tip relative to the TTS. The "Dist UCT to TTS" column provides the distance (inch) between the upper crack tip and the TTS, accounting for nondestructive examination (NDE) uncertainty on locating the crack tip relative to the TTS. The "Dist UCT to BWT" column provides the distance (inch) between the upper crack tip and the BWT, accounting for NDE uncertainty on locating the crack tip relative to the BWT.

- *Orientation (axial, circumferential, volumetric, inclined).*

The "Ind" column provides the orientation of the indication. All indications are SAls. No indications are circumferential, volumetric, or inclined.

- *Radial position of the tube within the tubesheet.*

The "Tube Radial Position" column provides the radial position of the tube within the tubesheet.

- *W\* Zone of the tube.*

The "W\*ZONE" column provides the W\* zone of each indication.

- *Severity of each indication (estimated depth).*

The "MD-adj" column provides the estimated maximum depth (MD) (percent through-wall) of each indication. The depth is the adjusted depth using the same techniques as PWSCC ARC depth sizing.

- *Side of the tube in which the indication initiated (inside or outside diameter [ID/OD]).*

The "ID/OD" column provides the side of the tube in which the indication initiated. All indications are ID initiated (i.e., PWSCC).

- *W\* inspection distance measured with respect to the BWT or TTS (whichever is lower).*

For the one hundred percent Plus Point hot leg TTS exam, the inspection extent relative to the TTS was specified as +2/-8 inches. Assuming no degradation in the W\* length, 8 inches below the TTS constitutes the W\* inspection distance. If degradation is detected in the W\* region, the inspection extent must bound the calculated flexible W\* length. The "W\* Insp Ext wrt BWT" column lists the W\* inspection distances measured with respect to BWT for tubes in which axial PWSCC was detected. The distances are with respect to BWT because, in all

cases, the BWT elevation was located lower than the TTS elevation. In all cases, the W\* inspection distance was greater than or equal to the flexible W\* length, as indicated by "Yes" in the "Insp Ext Satisfied?" column.

- *Length of axial indications.*

The "Crack Length" column provides the crack length of each axial indication. For tubes with multiple cracks, the "Total Length" column provides the total (summed) length of individual cracks within the flexible W\* length.

- *Angle of inclination of clearly skewed axial cracks (if applicable).*

No axial cracks were inclined, so this item is not applicable.

- *Verification that the upper crack tip of W\* indications returned to service in the prior cycle remain below the BWT by at least the 95 percent confidence NDE uncertainty on locating the crack tip relative to the BWT.*

The "Dist UCT to BWT" column in Table 1 provides the as-found elevation of the upper crack tip relative to the BWT, accounting for NDE uncertainty in locating the crack relative to the BWT. In all cases, the as-found upper crack tip for indications returned to service in the prior cycle is below the BWT, as indicated by "Yes" in the "UCT below BWT?" column.

- *Updated 95 percent growth rate for use in operational assessment.*

Of the 20 axial PWSCC indications in the hot leg WEXTEx region that were detected in 1R14 as listed in Table 1, two were new indications and eighteen were repeat W\* indications that had been left in service in the prior Unit 1 thirteenth refueling outage (1R13) inspection. All repeat indications were detected in 1R14. The new indications were detectable in 1R13 based on lookup reviews. As a result, 20 additional length growth rate data points were available for evaluation, and their average growth rate was 0.00 inch per effective full power years (EFPY) at  $T_{hot}$  of 604 degrees, indicating negligible growth. After addition of the Unit 1 Cycle 14 data points, the updated W\* growth rate distribution now consists of 370 data points from DCP Units 1 and 2 over 12 cycles. The updated growth rate at 95 percent cumulative probability for all data is 0.100 inch per EFPY at 604 degrees. The W\* methodology requires that, if the new growth data and deletion of the oldest cycle(s) of growth data results in a minimum of 200 data points, then the oldest cycle(s) of data is excluded. Exclusion of 108 data points for the oldest 6 cycles results in 262 data points after 1R14. The 95 percent cumulative probability growth rate of 262 data points is 0.112 inch per EFPY. For conservatism, the growth rate value used in the operational assessment (OA) is 0.119 inch per EFPY at 604 degrees, which is consistent with the growth rate used in the prior cycle Unit 1 operational assessment.

In support of growth rate evaluations and  $W^*$  calculations, the actual length of Unit 1 Cycle 14 was 1.39 EFPY, and the projected length of Unit 1 Cycle 15 is 1.63 EFPY.

- *Cumulative number of indications detected in the tubesheet region as a function of elevation within the tubesheet.*

Table 2 provides the cumulative number of indications detected in the tubesheet region as a function of elevation within the tubesheet. The table includes the distribution of Unit 1 indications before 1R14, the distribution of new 1R14 indications, updated Unit 1 distribution after 1R14, and the Unit 1 cumulative distribution and cumulative frequency after 1R14. In 1R14, two new indications were detected: one at 4.84 inch below the TTS (included in the minus 4 inch bin), and one at 1.38 inch below the TTS (included in the minus 1 inch bin).

- *Condition monitoring [CM] and operational assessment [OA] main steamline break leak rate for each indication and each SG in accordance with the leak rate methodology described in PG&E Letter DCL-05-018, dated March 11, 2005, as supplemented by PG&E Letter DCL-05-090 dated August 25, 2005.*

#### *SLB Leak Rate for Detected Indications within 12 inches from TTS*

The CM and OA leak rates for axial PWSCC indications detected within 12 inches from the TTS are determined by using the constrained crack leak model. The 95 percent prediction bound leak rates for each indication, as well as each SG, are provided in Table 1 columns "CM Leak Rate" and "OA Leak Rate." The total CM SG leak rates are repeated in Table 3. The total OA SG leak rates are repeated in Table 4.

#### *SLB Leak Rate for Undetected Indications within 12 inches from TTS*

The CM and OA leak rates for undetected indications between 8 and 12 inches below the TTS are determined by multiplying the number of undetected indications between 8 and 12 inches below the TTS by a factor of 0.0033 gallons per minute (gpm). The leak rate value of 0.0033 gpm is the 95 percent prediction bound leak rate, applying the constrained crack model with a Zone B1 contact pressure at a depth of eight inches below the TTS. For both CM and OA, eleven undetected indications are estimated between 8 and 12 inches below the TTS based on the more conservative of the 2 methods described below. Therefore, the CM and OA leak rates for undetected indications between eight and twelve inches below the TTS is 0.0363 gpm for each SG. These SG leak rates are repeated in Tables 3 and 4.

*Historical data projection method.*

The number of undetected PWSCC indications between 8 and 12 inches below the TTS would not be expected to be much greater than the number reported between 4 and 8 inches below the TTS, due to the trend of decreasing number of indications with distance below the TTS.

Of the 39 historical PWSCC indications in DCP Unit 1, 5 (13 percent) were between 4 to 8 inches below the TTS, and 6 (15 percent) were between 8 to 12 inches below the TTS. Therefore, for CM, 6 indications are assumed to be undetected at 1R14 between 8 and 12 inches below the TTS.

Figure 1 illustrates the cumulative number of PWSCC indications versus EFPY in DCP Unit 1. A linear regression analysis using only data from the last six Unit 1 outages shows that about 44 cumulative indications are projected at EOC-15, about five new indications. Therefore, for OA, 7 indications (15 percent of 44) are assumed to be undetected at EOC-15 between 8 and 12 inches below the TTS.

*Ninety percent probability prediction method.*

Figure 2 presents a plot of the binned PWSCC elevation data for all DCP Unit 1 historical indications located greater than 1 inch below the TTS. Excluding the expansion transition indications above 1 inch for Unit 1 would be expected to provide the best dataset for estimating indications at deeper depths. Figure 2 provides a best-fit regression of this data, an upper 90 percent probability prediction bound, and an upper 90 percent probability cumulative prediction bound. The number of indications that could be present in the range of 8 to 12 inches below the top of tubesheet is obtained by summing the upper 90 percent probability prediction bound individual values at 8, 9, 10, and 11 inches (approximately 2 to 3 in each bin), for a total of about 11 indications. As a result, 11 indications will be applied for CM and OA because it is slightly greater than the 6 to 7 indications from the historical data projection method.

*SLB Leak Rate for Indications Below 12 inches from TTS*

The CM and OA leak rates for indications located below 12 inches from the TTS are determined by the severed tube model. This model assumes all in-service tubes contain a 360 degree tube sever located 12 inches below the TTS and assigns a leak rate of 0.00009 gpm per tube. This value is the 90 percent prediction bound leak rate at 2560 pounds per square inch differential for a contact pressure representative of the 3 inch nominal crevice test specimen from the drilled hole crevice leak rate test data in WCAP-14797-P, Revision 2. The resulting CM and OA leak rates for each SG are listed in Tables 3 and 4, and are approximately 0.3 gpm for each SG.

- *Assessment of whether the results were consistent with expectations and, if not consistent, a description of the proposed corrective action.*

The CM leak rates were consistent with expectations. Table 1 column "Prior OA Leak Rate" provides the prior cycle projected operational assessment leak rates for each repeat indication. This leak rate is compared to the CM leak rate under column "CM Leak Rate." For all repeat indications, the prior cycle OA leak rates are greater than or equal to the CM leak rates, and the "OA Underprediction" column reports no underpredictions.

The numbers and elevations of new PWSCC indications were consistent with expectations. Two new PWSCC indications were detected, which is less than the five new indications projected for EOC-14 based on a linear regression analysis using data from the five prior inspections. The elevations of the two new indications were about 1 and 4 inches below the TTS. Since about 72 percent of the PWSCC indications have been detected within about 4 inches from the TTS, the elevations of the new indications are consistent with expectations.

#### Technical Specification 5.6.10.d Reporting Requirements

DCPP TS 5.6.10.d requires that the aggregate calculated SLB leakage from application of all ARC and non-ARC be submitted within 90 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with TS 5.5.9.

Table 5 (for CM) and Table 6 (for OA) report the calculated SLB leakage from application of each ARC in each SG, that is, W\* ARC, Generic Letter 95-05 voltage-based ARC, and PWSCC ARC. SLB leakage from non-ARC degradation is also provided in these tables, and was determined to be 0 gpm. The ARC and non-ARC leak rates are then summed to arrive at an aggregate SLB leakage for each SG.

No in-situ leak testing of indications was performed in 1R14, so there is no SLB leakage contribution from in-situ testing.

In order to meet the accident-induced leakage performance criteria (AILPC), the aggregate calculated SLB leakage from application of all ARC and non-ARC must not exceed 10.5 gpm (at room temperature) in the faulted SG for CM and OA. The 10.5 gpm limit was approved by the NRC in License Amendment (LA) 156/156. The aggregate calculated CM SLB leakage at EOC-14 is 0.95 gpm for the limiting SG (SG 1-1) as shown in Table 5. The aggregate calculated operational assessment SLB leakage at EOC-15 is 3.07 gpm for the limiting SG (SG 1-2) as shown in Table 6. In both assessments, SLB leakage is less than the allowable limit. Therefore, the AILPC has been satisfied for CM at EOC-14 and OA at EOC-15.



**Table 1**  
**1R14 Indications in Hot Leg WEXTEx Tubesheet Region (Excluding Circumferential Indications)**

SG	Count	Row	Col	Tube Radial Position	Ind	Volts	ID/OD	Crack #	CAL	LCT	UCT	Crack Length	Total Length	MD-adj	Dist UCT to TTS	UCT below TTS	W*ZONE	W* Length	BWT	Dist UCT to BWT	UCT Below W* ?
11	1	2	41	9.02	SAI	0.49	ID	1	21	-1.38	-1.27	0.11	0.11	60	1.05	Yes	B1	7.12	-0.20	0.79	No
11	2	3	2	58.49	SAI	0.85	ID	1	21	-1.33	-1.08	0.25	0.25	60	0.86	Yes	A	5.32	-0.09	0.71	No
11	3	15	10	52.09	SAI	0.84	ID	1	21	-9.22	-9.06	0.16	0.34	39	8.84	Yes	A	5.32	-0.26	8.52	Yes
11	4	15	10	52.09	SAI	1.5	ID	2	21	-8.72	-8.54	0.18	0.34	54	8.32	Yes	A	5.32	-0.26	8.00	Yes
11	5	20	44	26.91	SAI	0.67	ID	1	21	-8.7	-8.6	0.1	0.1	31	8.38	Yes	B2	7.12	-1.85	6.47	No
12	1	1	87	50.65	SAI	3.38	ID	1	36	-10.03	-9.66	0.37	0.37	64	9.44	Yes	A	5.32	-0.28	9.10	Yes
12	2	2	9	49.45	SAI	0.48	ID	1	21	-1.60	-1.38	0.22	0.22	54	1.16	Yes	A	5.32	-0.34	0.76	No
12	3	7	33	21.04	SAI	2.14	ID	1	36	-2.15	-1.72	0.43	0.43	93	1.50	Yes	B2	7.12	-0.35	1.09	No
12	4	20	37	29.75	SAI	2.56	ID	1	36	-1.86	-1.62	0.24	0.24	70	1.40	Yes	B3	7.12	-0.13	1.21	No
13	1	10	20	37.81	SAI	0.34	ID	1	25	-2.31	-2.19	0.12	0.12	20	1.97	Yes	B4	7.12	-0.11	1.80	No
13	2	30	45	39.47	SAI	0.32	ID	1	25	-2.22	-2.13	0.09	0.09	20	1.91	Yes	B4	7.12	-0.19	1.66	No
13	3	31	36	43.21	SAI	0.44	ID	1	25	-2.88	-2.76	0.12	0.12	20	2.54	Yes	A	5.32	-0.21	2.27	No
13	4	33	37	45.23	SAI	0.43	ID	1	25	-5.83	-5.71	0.12	0.12	20	5.49	Yes	A	5.32	-0.40	5.03	No
13	5	39	46	50.91	SAI	0.7	ID	1	25	-2.74	-2.59	0.15	0.15	20	2.37	Yes	A	5.32	-0.25	2.06	No
14	1	23	7	60.12	SAI	0.47	ID	1	39	-8.20	-8.05	0.15	0.28	20	7.83	Yes	A	5.32	-0.19	7.58	Yes
14	2	23	7	60.12	SAI	0.46	ID	2	39	-5.08	-4.95	0.13	0.28	20	4.73	Yes	A	5.32	-0.19	4.48	No
14	3	28	57	38.74	SAI	0.26	ID	1	16	-2.79	-2.66	0.13	0.26	20	2.44	Yes	B4	7.12	-0.33	2.05	No
14	4	28	57	38.74	SAI	0.34	ID	2	16	-6.55	-6.42	0.13	0.26	20	6.20	Yes	B4	7.12	-0.33	5.81	No
14	5	35	33	49.38	SAI	0.42	ID	1	25	-4.95	-4.84	0.11	0.11	20	4.62	Yes	A	5.32	-0.16	4.40	No
14	6	39	58	52.62	SAI	0.42	ID	1	39	-6.09	-5.91	0.18	0.18	20	5.69	Yes	A	5.32	-0.04	5.59	Yes

**Table 1 (continued)**  
**1R14 Indications in Hot Leg WEXTEx Tubesheet Region (Excluding Circumferential Indications)**

SG	Count	Row	Col	UCT Below BWT?	Dist EOC (N+1) UCT to TTS	Dist EOC (N+1) UCT to BWT	EOC (N+1) UCT Below BWT?	W* Cand	Inspect Extent	W* Insp Ext wrt BWT	Flex W* Length	Insp Ext Satisfied ?	Prior OA Leak Rate	OA Under Prediction	CM Leak rate	OA Leak Rate	PREVW* Tube	Depugged?	Tube Plugged
11	1	2	41	Yes	0.86	0.60	Yes	Yes	-9.57	9.28	7.28	Yes	0.308	No	0.283	0.325	Yes		No
11	2	3	2	Yes	0.67	0.52	Yes	Yes	-9.66	9.48	5.62	Yes	0.005	No	0.005	0.005	Yes		No
11	3	15	10	Yes	8.65	8.33	Yes	Yes	-11.26	10.91	5.32	Yes	0.001	No	0.001	0.001	Yes		No
11	4	15	10	Yes	8.13	7.81	Yes	Yes	-11.26	10.91	5.32	Yes	0.001	No	0.001	0.001	Yes		No
11	5	20	44	Yes	8.19	6.28	Yes	Yes	-11.40	9.46	7.27	Yes	0.003	No	0.002	0.002	Yes		No
													0.318		0.293	0.335			
12	1	1	87	Yes	9.25	8.91	Yes	Yes	-11.91	11.54	5.32	Yes	0.001	No	0.001	0.001	Yes		No
12	2	2	9	Yes	0.97	0.57	Yes	Yes	-9.40	8.97	5.59	Yes		NA	0.014	0.015			No
12	3	7	33	Yes	1.31	0.90	Yes	Yes	-9.03	8.59	7.60	Yes	0.150	No	0.127	0.144	Yes	Yes	No
12	4	20	37	Yes	1.21	1.02	Yes	Yes	-8.61	8.39	7.41	Yes	0.091	No	0.077	0.086	Yes	Yes	No
													0.242		0.219	0.245			
13	1	10	20	Yes	1.78	1.61	Yes	Yes	-8.39	8.19	7.29	Yes	0.033	No	0.031	0.034	Yes		No
13	2	30	45	Yes	1.72	1.47	Yes	Yes	-9.76	9.48	7.26	Yes	0.029	No	0.027	0.030	Yes		No
13	3	31	36	Yes	2.35	2.08	Yes	Yes	-8.40	8.10	5.49	Yes	0.016	No	0.015	0.016	Yes		No
13	4	33	37	Yes	5.30	4.84	Yes	Yes	-8.84	8.35	5.49	Yes	0.005	No	0.004	0.005	Yes		No
13	5	39	46	Yes	2.18	1.87	Yes	Yes	-9.36	9.02	5.52	Yes	0.008	No	0.008	0.008	Yes		No
													0.091		0.085	0.093			
14	1	23	7	Yes	7.64	7.39	Yes	Yes	-9.15	8.87	5.32	Yes	0.001	No	0.001	0.001	Yes		No
14	2	23	7	Yes	4.54	4.29	Yes	Yes	-9.15	8.87	5.71	Yes	0.002	No	0.002	0.002	Yes		No
14	3	28	57	Yes	2.25	1.86	Yes	Yes	-8.50	8.08	7.43	Yes	0.023	No	0.023	0.025	Yes		No
14	4	28	57	Yes	6.01	5.62	Yes	Yes	-8.50	8.08	7.49	Yes	0.004	No	0.004	0.005	Yes		No
14	5	35	33	Yes	4.43	4.21	Yes	Yes	-8.24	7.99	5.48	Yes		NA	0.004	0.005			No
14	6	39	58	Yes	5.50	5.40	Yes	Yes	-9.08	8.95	5.32	Yes	0.003	No	0.003	0.003	Yes	Yes	No
													0.033		0.037	0.040			

Column – Table 1	Legend and Notes for Table 1
SG	Steam generator
Count	Indication count per SG
Row	Tube Row
Col	Tube Column
Tube Radial Position	Tube radial position, inch.
Ind	Indication of degradation. SAI means single axial indication.
Volts	Peak voltage from Plus Point coil
ID/OD	Tube surface, either inside diameter (ID) or outside diameter (OD)
Crack #	Crack number
CAL	Plus Point calibration group number
LCT	Elevation (inch) of lower crack tip (LCT), relative to the top of tubesheet (TTS).
UCT	Elevation (inch) of upper crack tip (UCT), relative to the TTS.
Crack Length	Length of crack (inch)
Total Length	Total length of all cracks (inch).
MD-adj	Maximum depth (% through-wall) from Plus Point coil. The depth is the adjusted depth using the same techniques as PWSCC ARC depth sizing.
Dist UCT to TTS	Distance (inch) between the UCT and TTS, including $\Delta NDE_{CT-TTS}$ (Plus Point NDE uncertainty on locating the crack tip relative to the TTS).
UCT below TTS?	If the UCT (including NDE uncertainty) is located below TTS (i.e., a positive number in the "Dist UCT to TTS" column), then "yes" is indicated (information only).
W* ZONE	W* tubesheet zone based on crack location.
W* Length	W* length is 7.12 inch for hot leg Zone B and 5.32 inch for hot leg Zone A, and includes $\Delta NDE_W$ (NDE uncertainty in measuring the W* depth).
BWT	Elevation of the bottom of the WEXTEx transition (BWT), inch, measured by bobbin relative to the TTS.
Dist UCT to BWT	Distance (inch) between the UCT and BWT, including $\Delta NDE_{CT-BWT}$ (Plus Point NDE uncertainty on locating the crack tip relative to the BWT).
UCT Below W*?	If the UCT is located below the W* length, then the tube is a W* tube. Any type of degradation below the W* length is acceptable.
UCT Below BWT?	If the UCT is located below BWT, then the tube is a W* candidate, and performance monitoring is satisfied for repeat indications.
Dist EOC (n+1) UCT to TTS	Distance (inch) between the UCT and TTS at the end of the next cycle including $\Delta NDE_{CT-TTS}$ , based on growing the UCT at 0.119 inch/EFPPY.
Dist EOC (n+1) UCT to BWT	Distance (inch) between the UCT and BWT at the end of the next cycle including $\Delta NDE_{CT-BWT}$ , based on growing the UCT at 0.119 inch/EFPPY.
EOC (n+1) UCT below BWT?	If the UCT (including NDE uncertainty) is located below BWT at the end of the next cycle (i.e., a positive number in the "Dist UCT (n+1) UCT to BWT" column), the tube is a W* candidate.
W* Cand?	W* candidate, also referred to as W* tube. A tube is a W* candidate (or W* tube) if the UCT is below BWT and the EOC (n+1) UCT is below BWT.
Inspect Extent	Elevation of Plus Point inspection relative to TTS (inch).
W* Insp Ext wrt BWT	W* inspection extent with respect to BWT, also referred to as the W* inspection distance (inch). This is the Plus Point inspection extent relative to BWT. The W* inspection distance below BWT is equal to the Plus Point inspection extent below TTS, plus measured distance from BWT to TTS, plus bobbin NDE uncertainty in locating BWT relative to TTS.
Flex W* Length	Flexible W* length relative to BWT (inch), equal to $W^* \text{ Length} + \sum CL_i$ (total axial crack length) + $N_{CL} * \Delta NDE_{CL}$ (number of indications times Plus Point NDE uncertainty with measuring length of axial cracks) + $N_{CG} * \Delta CG$ (number of indications times crack growth, 0.119 inch/EFPPY)
Insp Ext Satisfied?	If the W* inspection distance is greater than or equal to the flexible W* length, then the inspection extent is satisfied.
Prior OA Leak Rate	Prior cycle projected operational assessment (OA) leak rate, gpm at room temperature, using Constrained Crack leak model.
OA Underprediction?	If the CM leak rate is greater than the prior cycle OA projected leak rate, then the OA would be underpredicted.
CM Leak Rate	Condition monitoring (CM) SLB leak rate, gpm at room temperature, using Constrained Crack leak model, based on distance of UCT to TTS. No SLB leak rate is assigned to indications with UCT located below TTS minus 12 inches.
OA Leak Rate	Operational assessment (OA) SLB leak rate, gpm at room temperature, using Constrained Crack leak model, based on distance of EOC (n+1) UCT to TTS. No SLB leak rate is assigned to indications with EOC (n+1) UCT located below TTS minus 12 inches.
PREVW* Tube?	Previous W* Tube. If the indication was left in service in the prior cycle, it is classified as a previous W* tube (i.e., a repeat indication). Otherwise, the indication is new.
Depugged?	If tube was de-plugged during a previous outage, then "yes" is indicated.
Tube Plugged?	If tube was plugged during the current outage, then "yes" is indicated.

**Table 2**  
**Cumulative Number of Unit 1 PWSCC Indications Detected in the Tubesheet Region as a Function of Tubesheet Elevation**

Distance (inch) relative to TTS	Distribution Pre 1R14	Distribution of New Indications in 1R14	Distribution Post 1R14	Cumulative Distribution Post 1R13	Cumulative Frequency Post 1R13
-12	0		0	0	0.00
-11	0		0	0	0.00
-10	0		0	0	0.00
-9	2		2	2	0.05
-8	4		4	6	0.15
-7	0		0	6	0.15
-6	2		2	8	0.21
-5	1		1	9	0.23
-4	1	1	2	11	0.28
-3	2		2	13	0.33
-2	6		6	19	0.49
-1	6	1	7	26	0.67
0	13		13	39	1.00
1	0		0	39	1.00
Total	37	2	39	39	

**Table 3**  
**DCPP Unit 1 Condition Monitoring Steam Line Break Leak Rates for W\* Alternate Repair Criteria**

EOC-14 Condition Monitoring Leak Rate (gpm at room temperature)	SG 1-1	SG 1-2	SG 1-3	SG 1-4
Detected indications within TTS minus 12 inches	0.293	0.219	0.085	0.037
Undetected indications within 8 to 12 inches below TTS	0.0363	0.0363	0.0363	0.0363
Undetected indications below TTS minus 12 inches (Note 1)	0.28	0.28	0.30	0.29
Total	0.61	0.54	0.42	0.36

Note 1: Leak rates are based on 0.00009 gpm multiplied by the number of inservice tubes in Cycle 14

**Table 4**  
**DCPP Unit 1 Operational Assessment Steam Line Break Leak Rates for W\* Alternate Repair Criteria**

EOC-15 Operational Assessment Leak Rate (gpm at room temperature)	SG 1-1	SG 1-2	SG 1-3	SG 1-4
Detected indications within TTS minus 12 inches	0.335	0.245	0.093	0.040
Undetected indications within 8 to 12 inches below TTS	0.0363	0.0363	0.0363	0.0363
Undetected indications below TTS minus 12 inches (Note 1)	0.28	0.27	0.30	0.29
Total	0.65	0.55	0.43	0.37

Note 1: Leak rates are based on 0.00009 gpm multiplied by the number of inservice tubes in Cycle 15.

**Table 5**  
**DCPP Unit 1 Aggregate Condition Monitoring Steam Line Break Leak Rates**

EOC-14 Condition Monitoring Leak Rate (gpm at room temperature)	SG 1-1	SG 1-2	SG 1-3	SG 1-4
W* ARC	0.609	0.535	0.421	0.363
Voltage-Based ARC (Note 1)	0.34	0.19	0.10	0.06
PWSCC ARC (Note 2)	0	0	0	0
Non-ARC degradation	0	0	0	0
Aggregate	0.95	0.73	0.52	0.42

Note 1: Voltage-based ARC leak rates are described in Enclosure 3.

Note 2: PWSCC ARC leak rates are described in Enclosure 2.

**Table 6**  
**DCPP Unit 1 Aggregate Operational Assessment Steam Line Break Leak Rates**

EOC-15 Operational Assessment Leak Rate (gpm at room temperature)	SG 1-1	SG 1-2	SG 1-3	SG 1-4
W* ARC	0.651	0.551	0.429	0.366
Voltage-Based ARC (Note 1)	0.68	0.38	0.20	0.16
PWSCC ARC (Note 2)	0	2.14	0	0
Non-ARC degradation	0	0	0	0
Aggregate	1.33	3.07	0.63	0.53

Note 1: Voltage-based ARC leak rates are described in Enclosure 3.

Note 2: PWSCC ARC leak rates are described in Enclosure 2.

Figure 1

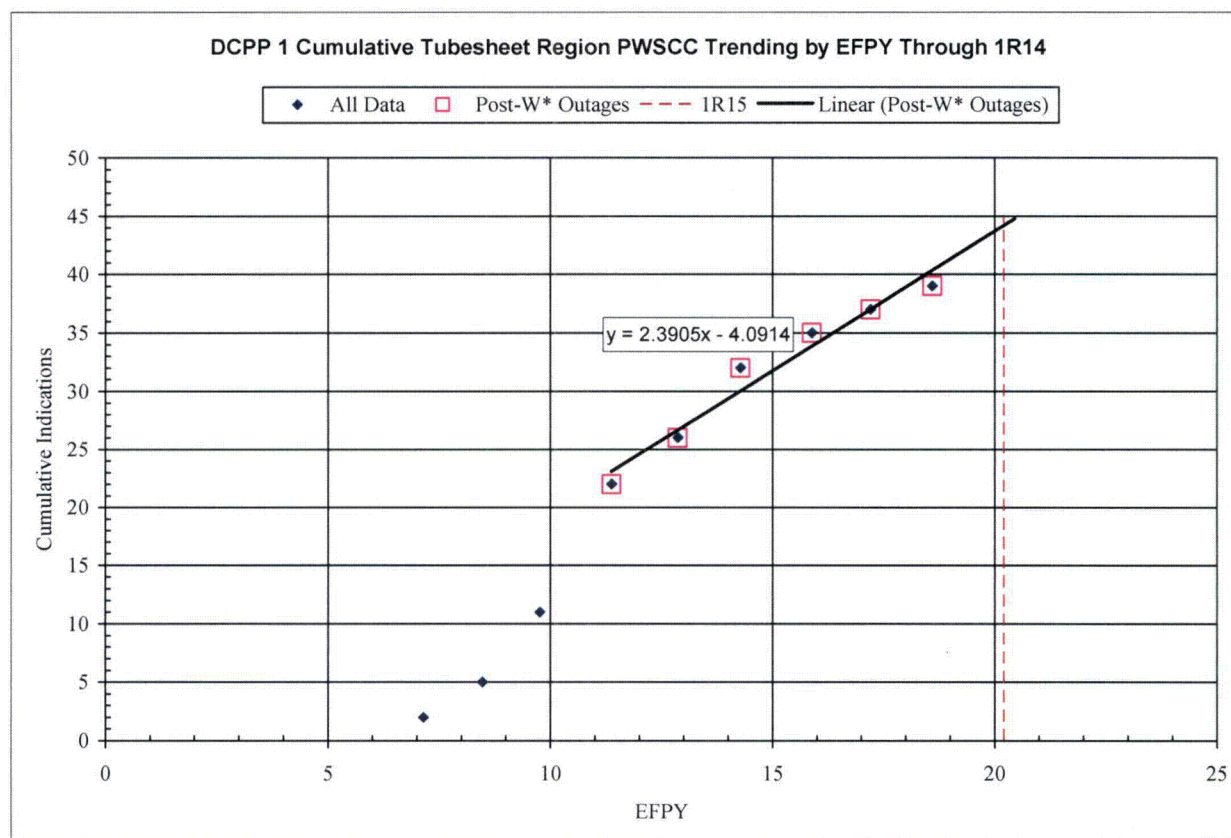
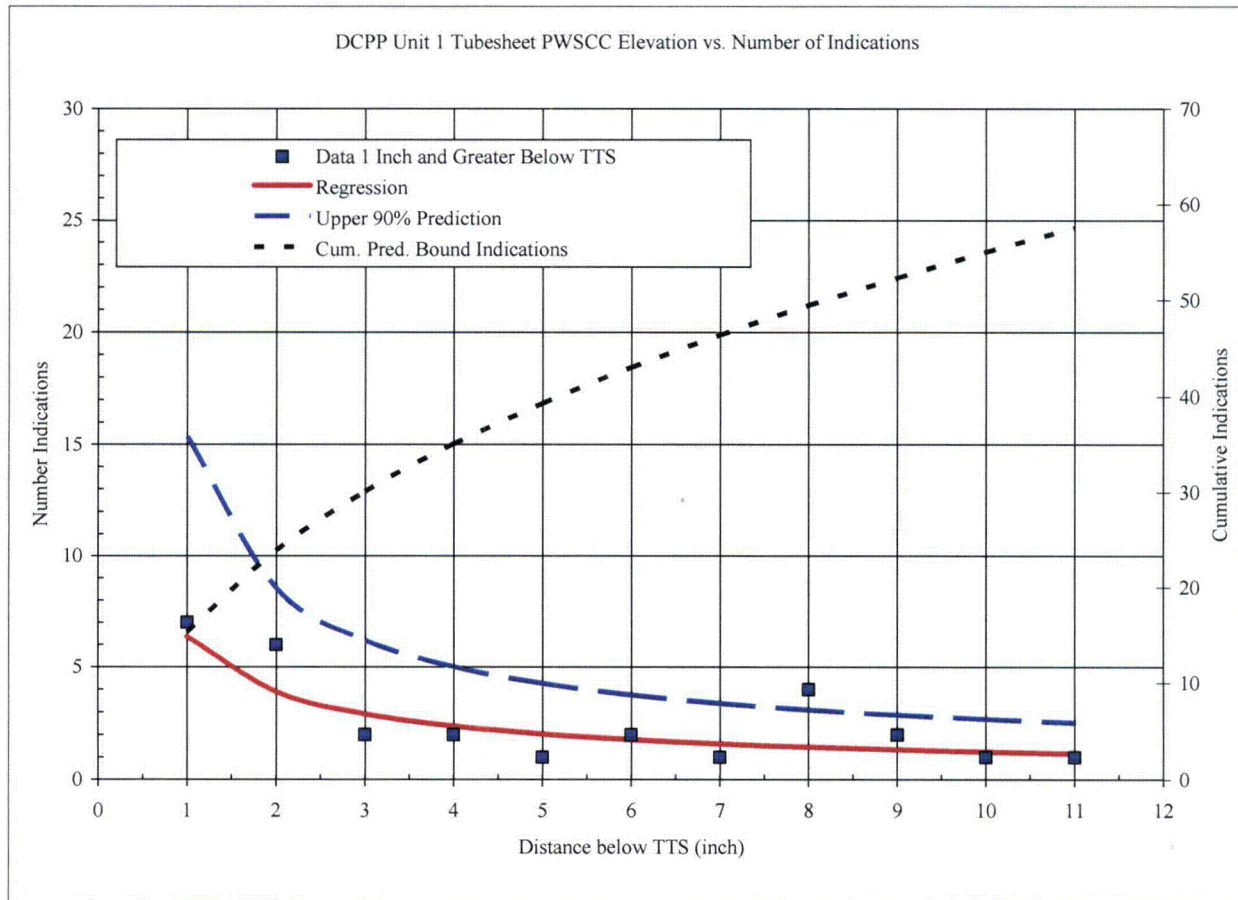


Figure 2



## ENCLOSURE 2

### TSP PWSCC ALTERNATE REPAIR CRITERIA 120-DAY REPORT

#### DIABLO CANYON POWER PLANT UNIT 1 FOURTEENTH REFUELING OUTAGE

##### NRC Reporting Requirements

Primary water stress corrosion cracking (PWSCC) alternate repair criteria (ARC) for axial PWSCC at dented tube support plates (TSP) was implemented for the fourth time in Diablo Canyon Power Plant (DCPP) Unit 1 during the Unit 1 Fourteenth Refueling Outage (1R14). 1R14 steam generator (SG) inspections and repairs were completed in May 2007.

For implementation of ARC for axial PWSCC at dented TSPs, DCPD TS 5.6.10.f requires that the results of the condition monitoring (CM) and operational assessments (OA) be submitted within 120 days after initial entry into MODE 4 following completion of an inspection performed in accordance with TS 5.5.9. This report implements the DCPD technical specification (TS) reporting criteria.

To satisfy the TS, this report includes the following:

- Tabulations of indications found in the inspection, tubes repaired, and tubes left in service under the ARC.
- Growth rate distributions for indications found in the inspection and growth rate distributions used to establish the tube repair limits.
- Plus Point confirmation rates for bobbin detected indications when bobbin is relied upon for detection of axial PWSCC in less than or equal to 2 volt dents.
- For CM, an evaluation of any indications that satisfy burst margin requirements based on the Westinghouse burst pressure model, but do not satisfy burst margin requirements based on the combined Argonne National Laboratory (ANL) ligament tearing and EPRI through-wall (ANL/TW) burst pressure model.
- Performance evaluation of the OA methodology for prediction of flaw distributions as a function of flaw size.
- Evaluation results of number and size of previously reported versus new PWSCC indications found in the inspection, and the potential need to account for new indications in the OA burst evaluation.
- Identification of mixed mode (axial PWSCC and circumferential) indications found in the inspection and an evaluation of the mixed mode indications for potential impact on the axial indication burst pressures or leakage. In addition, as committed in Pacific Gas and Electric Company (PG&E) Letter DCL-02-045, Response to Final NRC Request for Additional Information Regarding Supplement 3 to License Amendment Request 00-06, "Alternate Repair Criteria for Axial PWSCC at Dented Intersections in Steam Generator Tubing," dated April 18, 2002, performance of a



trending analysis to assess the potential for increasing mixed mode affects over time.

- Any corrective actions found necessary in the event that CM requirements are not met.

#### Background: Dented TSP Plus Point Inspection Scope

The 1R14 Plus Point dent inspection scope for greater than 2 volt dents was based on greater than 2 volt dents called in the prior Unit 1 Thirteenth Refueling Outage (1R13). The minimum scope for greater than 2 volt dents inspected by Plus Point in 1R14 is provided in Table 1.

The dented TSP inspection criteria and expansion plan criteria described below are based on PG&E Letter DCL-01-036, "Revision of Dent Inspection Program Requirements," dated April 16, 2001, and WCAP-15573, Revision 1, "Depth-Based SG Tube Repair Criteria for Axial PWSCC at Dented TSP Intersections – Alternate Burst Pressure Calculation."

#### *Plus Point inspection criteria for axial PWSCC left in service*

Plus Point inspections shall be conducted on 100 percent of axial PWSCC indications at dented TSP intersections that were left in service in Unit 1 Cycle 14. Two hundred nineteen axial PWSCC indications had been left in service in Cycle 14 under PWSCC ARC.

#### *Plus Point inspection criteria for greater than or equal to ( $\geq$ ) 2 volt dented intersections*

On a SG-specific basis, Plus Point inspections shall be conducted on 100 percent of  $\geq 5$  volt dented intersections up to and including the coldest TSP elevation where PWSCC (at any size dent), circumferential indications (at any size dent), or axial outside diameter stress corrosion cracking (ODSCC) not detected by bobbin (AONDB) (at  $\geq 5$  volt dent) have been previously detected in that SG in the prior two outages, or current outage (expansion required), plus 20 percent of  $\geq 5$  volt dents at the next colder TSP elevation. In each SG where 100 percent hot leg TSP Plus Point inspections are not required, Plus Point inspections shall be conducted on 20 percent of  $\geq 5$  volt dents at each hot leg TSP. For any 20 percent sample, a minimum of 50  $\geq 5$  volt dents shall be inspected. If the population of  $\geq 5$  volt dents at that TSP elevation is less than 50, then 100 percent of the  $\geq 5$  volt dents at that TSP shall be inspected.

On a SG-specific basis, Plus Point inspections shall be conducted on 100 percent of greater than ( $>$ ) 2 and less than ( $<$ ) 5 volt dented intersections up to and including the coldest TSP elevation where PWSCC (at any size dent), circumferential indications (at any size dent), or  $\geq 2$  inferred volt AONDB (at  $> 2$  and  $< 5$  volt dent) have been previously detected in that SG in the prior two outages, or current outage (expansion required), plus 20 percent of  $> 2$  and  $< 5$  volt dent at the next colder TSP elevation. If a

SG is free from PWSCC (at any size dent), circumferential indications (at any size dent) and  $\geq 2$  inferred volt AONDB (at  $> 2$  and  $< 5$  volt dent), then Plus Point inspections shall be conducted on 20 percent of  $> 2$  and  $< 5$  volt dents at 1H. For any 20 percent sample, a minimum of 50  $> 2$  and  $< 5$  volt dents shall be inspected. If the population of  $> 2$  and  $< 5$  volt dents at that TSP elevation is less than 50, then 100 percent of the  $> 2$  and  $< 5$  volt dents at that TSP shall be inspected.

The coldest TSP where PWSCC, AONDB with  $\geq 5$  volt dent, or circumferential indications have been found in the prior two outages (Unit 1 Twelfth Refueling Outage [1R12] and 1R13) was 4H for SG 1-1, 7C for SG 1-2, and 6H for SG 1-4. In SG 1-3, no PWSCC, AONDB with  $\geq 5$  volt dent, or circumferential indications have been detected. In addition, all inferred bobbin voltages for AONDB indications have been less than 2 volts, so AONDB indications are not a factor in the inspection criteria

*Plus Point inspection criteria for detection of circumferential indications at dents*

On a SG-specific basis, if a circumferential indication or  $\geq 2$  inferred volt AONDB is detected in a dent of "x" volts in the prior two outages, or current outage (expansion required), then Plus Point inspections shall be conducted on 100 percent of dents greater than "x - 0.3" volts up to the affected TSP, plus 20 percent of dents greater than "x - 0.3" volts at the next higher TSP. "X" is defined as the lowest dent voltage where a circumferential crack or  $\geq 2$  inferred volt AONDB was detected in that SG. For any 20 percent sample, a minimum of 50 "x - 0.3" volt dents shall be inspected. If the population of "x - 0.3" volt dents at that TSP elevation is less than 50, then 100 percent of the "x - 0.3" volt dents at that TSP shall be inspected.

In SG 1-1, the smallest dent in which a circumferential crack has been detected in the prior two outages (1R12 and 1R13) was 0.51 volts (in 1R12 at 1H). Thus, in 1R14, 100 percent of dents greater than 0.21 volts (i.e.,  $0.51 - 0.3 = 0.21$ ) were required to be Plus Point inspected in SG 1-1 at 1H, and 20 percent at 2H. Because there are no dents less than 0.21 volts at 1H in SG 1-1, the actual SG 1-1 Plus Point inspection plan became 100 percent of less than or equal to ( $\leq$ ) 2 volt dents at 1H, and 20 percent at 2H.

In SG 1-3, no circumferential cracking has ever been detected. In SG 1-2 and SG 1-4, the smallest dents in which a circumferential crack has been detected in the prior two outages (1R12 and 1R13) are 3.13 volts and 14.89 volts, respectively. Since these dent voltages are much greater than the 2.3 volt dent threshold for inspection, less than 2 volt dent Plus Point inspections were not required in the inspection plans in these SGs, along with SG 1-3.

*Summary of Plus Point inspection plan of dented TSPs*

Based on the Plus Point inspection criteria listed above, the following Plus Point dent inspection criteria were implemented. The numbers of dent inspections is summarized in Table 1.

- SG 1-1: 100% of  $\leq 2$  volt dents at 1H, 20% at 2H  
100% of  $> 2$  and  $< 5$  volt dents from 1H to 4H, 20% at 5H  
100% of  $\geq 5$  volt dents from 1H to 4H, 20% from 5H to 7H
- SG 1-2: 100% of  $> 2$  and  $< 5$  volt dents from 1H to 7C, 20% at 6C  
100% of  $\geq 5$  volt dents from 1H to 7C, 20% at 6C
- SG 1-3: 20% of  $> 2$  and  $< 5$  volt dents at 1H  
20% of  $\geq 5$  volt dents from 1H to 7H
- SG 1-4: 100% of  $> 2$  and  $< 5$  volt dents from 1H to 6H, 20% at 7H  
100% of  $\geq 5$  volt dents from 1H to 6H, 20% at 7H
- All 20 percent samples shall contain a minimum of 50 dents. If the population of dents at the TSP elevation is less than 50, then inspect 100 percent of the dents at the TSP.

*Plus Point inspection of bobbin distorted indications at less than or equal to 2 volt dents*

One hundred percent of the tubes were inspected by bobbin coil, and the bobbin coil was relied upon for detection of axial PWSCC in  $\leq 2$  volt dents. If the bobbin coil detected a distorted inside diameter support signal (DIS) at a dented TSP intersection, then Plus Point inspection was performed.

*Summary of Inspection Results*

Table 5 provides a list of all TSP axial PWSCC indications detected in 1R14. Table 7 provides a list of all TSP circumferential indications detected in 1R14.

Expansion of the Plus Point dent inspection program was required in SG 1-1 in 1R14, based on detection of axial PWSCC at R19C15 7C dented TSP (1.26 volt dent). The indication was detected by bobbin and confirmed by Plus Point. The required expansion was 100 percent of  $>2$  volt dents from 5H to 7C, and 20 percent at 6C. The actual expanded scope was more conservative and included 100 percent of  $>2$  volt dents in the cold leg. No additional indications were detected in this expanded program.

In SG 1-3, preliminary disposition of a Plus Point signal at a 7C TSP was initially attributed to axial PWSCC, which initiated a Plus Point expansion program. However, final disposition of the signal was no detectable degradation (NDD) based on tracing the bobbin signal to the baseline inspection. One hundred percent of  $>2$  volt cold leg dents (103 cold leg dents) and 33 percent of  $>2$  volt hot leg dents that were not originally planned for inspection (140 hot leg dents) were inspected as part of expanded scope prior to termination of the expansion program. No indications were detected.

No additional expansions of the Plus Point dent inspection program were required, based on no observations of axial PWSCC, AONDB with  $\geq 5$  volt dent, or circumferential indications at TSP elevations higher than the defined critical areas. All inferred bobbin voltages for AONDB indications were less than 2 volts. The dent voltages associated with TSP circumferential indications were greater than or equal to 4.95 volts, higher than the 2.3 volt dent threshold for potential expansion.

Tabulations of indications found in the inspection, tubes repaired, and tubes left in service under the ARC.

Two hundred thirty five (235) axial PWSCC indications at dented TSP intersections were detected in 1R14. Table 5 provides a tabulation of indications, including the following information:

- SG, row, column, TSP, crack number, calibration group number
- Identifies the indication as repeat or new.
- For indications that were plugged in 1R14, the reason for plugging.
- Adjusted nondestructive examination (NDE) measurements (length, maximum depth, and average depth), voltage, and adjusted NDE crack location relative to the TSP centerline.
- Burst pressures (free span and total length). For the operational assessment, the pressures are calculated using the ANL/TW burst model. For the CM assessment, the pressures are calculated using the Westinghouse burst model. A burst pressure of 6100 pounds per square inch (psi) represents a predicted burst pressure  $\geq 6100$  psi since all pressures predicted to exceed 6100 psi are grouped at 6100 psi to reduce computer storage requirements in the analysis.
- Steam line break (SLB) leak rates (free span and total length) using the ANL ligament tearing model, for CM and OA.

The PWSCC ARC allows axial PWSCC indications to remain in service at dented TSP intersections if the following PWSCC ARC conditions are satisfied for each indication:

- OA free span burst pressure (based on the ANL/TW model) exceeds  $3\Delta P_{NO}$ . The  $3\Delta P_{NO}$  burst pressure is equal to 4419 psi.
- OA total length burst pressure (based on the ANL/TW model) exceeds  $1.4\Delta P_{SLB}$ . The  $1.4\Delta P_{SLB}$  burst pressure is equal to 3367 psi, based on a  $\Delta P_{SLB}$  of 2405 psi (pressurizer power operated relief valve (PORV) setpoint plus uncertainty).
- OA free span leak rate, when combined with free span leak rates from other degradation mechanisms, is less than 0.54 gpm at room temperature in a faulted SG.
- OA total length leak rate, when combined with leak rates from other degradation mechanisms, is less than 10.5 gallons per minute (gpm) (room temperature) in a faulted SG.

- The indication is less than 40 percent through-wall outside the TSP crevice.

In addition to the above PWSCC ARC conditions, axial PWSCC indications must satisfy the following exclusion criteria in order to remain in service:

- The indication is not located at a TSP intersection located in the wedge region or 7H/7C high bending stress region.
- The indication is not located at a TSP intersection that contains cracked or missing TSP ligaments.
- The indication is not located at a TSP intersection that contains a different degradation mechanism.
- The indication is not located in a tube that contains another repairable indication.

Two hundred eighteen (218) axial PWSCC indications at dented TSPs had been returned to service in 1R13 under PWSCC ARC. 1R13 indication at SG 1-2 R25C79 TSP 2H was subsequently re-evaluated and determined that there were two separate indications in 1R13 (crack 1 and 2), consistent with 1R14 results. Therefore, 219 axial PWSCC indications had been returned to service in Cycle 14. Two of the repeat indications were merged into a single indication in Cycle 14 (SG 1-2 R8C61 crack 1). Following 1R14 Plus Point inspection, sizing, and application of PWSCC ARC requirements, ten of these repeat indications were plugged, as described below, and all others were allowed to remain in service under PWSCC ARC.

- Two due to inside diameter or outside diameter (ID/OD) indications at the same TSP.
- Two preventively plugged with the lowest axial PWSCC projected OA burst pressures at the end of the next cycle, even though burst pressure margins were satisfied. Each of these locations had an additional PWSCC indication, so the number of indications plugged was four.
- Four due to pluggable degradation at a different tube location.

In 1R14, 17 new axial PWSCC indications at dented TSPs were detected (two of which were at a TSP with an additional repeat indication), sized by Plus Point, and applied to PWSCC ARC requirements. One of these were plugged due to ID/OD degradation, and one was plugged due to the axial PWSCC indication being greater than or equal to 40 percent depth outside the tube support plate (as indicated by "DOP > 40%" in Table 5).

The indications that were located outside the TSP region were reviewed to determine the need for in-situ pressure testing in accordance with the criteria in WCAP-15573, Revision 1. Namely, if CM for axial PWSCC at dented TSPs predicts free span leakage or free span burst pressures less than  $3\Delta P_{NO}$ , then in-situ pressure testing is required. These conditions were not predicted by CM, and therefore no in-situ pressure testing of axial PWSCC at dents was required nor performed.

Two hundred twenty three (223) axial PWSCC indications at dented TSPs were returned to service in 1R14: 208 repeat indications and 15 new indications.

Growth rate distributions for indications used to establish the tube repair limits and for indications found in the inspection

The growth rate distribution used to establish the tube repair limits was based on prior outage growth data. The methodology for establishing the growth rate was established in WCAP-15573, Revision 1, as further explained in PG&E Letters DCL-02-023 and DCL-02-045. The methodology is summarized below:

- If there are at least 200 points in each of the last 2 cycles on the unit being inspected, the most conservative growth distribution from the last 2 cycles shall be used.
- If there are at least 200 points over the last 2 cycles on the unit being inspected, the growth distribution to be used is the more conservative of the combined data or either of the 2 cycles.
- If there are less than 200 points over the last 2 cycles on the unit being inspected, the growth distribution to be used shall contain data from both units over the last 2 (or 3 if necessary) cycles of each unit until 200 data points are obtained. The data from each cycle is compared for consistency in growth magnitude. If a given cycle has lower growth rates than other cycles, it is not included in the growth distribution.

In preparation for 1R14, the first bullet applied. As shown in Table 2, the number of growth rate data points in Cycle 12 and Cycle 13 are 215 and 226, respectively, such that there are over 200 points in each of the last 2 cycles. Because there are a total of at least 200 points over the last 2 cycles on Unit 1, all other prior cycle growth rates did not require consideration. The Cycle 13 Cumulative Probability Distribution (CPD) growth rates are more conservative than Cycle 12 for length, and are also more conservative for maximum depth and average depth in all bins except for the upper tails. To bound the ARC method, for the preliminary EOC-15 OA, PG&E chose to conservatively use the lower bound CPD growth rates between Cycle 12 and Cycle 13. The lower bound growth rate CPD is provided in Table 1 and was used in the Monte Carlo preliminary EOC-15 OA calculations for determining the need for tube repair.

In accordance with WCAP-15573, Revision 1, Unit 1 Cycle 14 growth rates that could impact the upper tail of the preliminary OA growth distribution were evaluated during 1R14. The methodology requires that if new growth data causes the growth distribution above 90 percent probability to be more conservative, the new data should be added to the growth distribution for the final OA.

Two hundred twenty four (224) additional growth rate data points from Cycle 14 were established, 217 from repeat indications and 7 from new indications. Cycle 14 repeat indication growth rates are provided in Table 6, and the CPD of the Cycle 14 repeat plus new growth data is provided in Table 2.

In support of growth rate evaluations and OA, the actual length of Unit 1 Cycle 14 was 1.39 EFPY and the projected length of Unit 1 Cycle 15 is 1.63 EFPY.

The Cycle 14 growth rates were compared to the 90 percentile growth rates used in the preliminary EOC-15 OA (0.069 inch, 9.6 percent maximum depth [MD], 6.9 percent average depth [AD]). Several Cycle 14 growth rates exceeded these values, and the WCAP methodology required that these Cycle 14 data points be added to the growth distribution for the final OA. To satisfy this method requirement, PG&E compared the growth rate CPD values from Cycle 14 to the growth rate CPD values used in the preliminary OA, and determined that the preliminary OA CPDs were equal to or bounding in all bins for length, maximum depth, and average depth, except for the 0 percent and 0.08 percent bins for average depth. For these two bins, the Cycle 14 CPD values were used in the Monte Carlo final EOC-15 OA calculations for determining the need for tube repair, as shown in Table 2. For information, Table 3 compares the 90 and 95 percentile growth values per EFPY at 604 degrees for Cycles 11 through 14.

Consistent with past practices, the merged indication (SG 1-2 R8C61 crack 1) was not included in the growth rate evaluations because two indications in 1R13 merged into one indication in 1R14. The length and maximum voltage of the 1R14 indication was 0.59 inch and 1.81 volts, which were not significantly larger than the combined length (0.55 inch) and maximum voltage (1.53 volts) of the two 1R13 indications. Thus, these indications did not undergo significant growth in length and depth.

As noted above, several Cycle 14 depth growth rates were in the upper tail of the growth distribution. Most of these were associated with a maximum voltage increase from less than or equal to 1 volt in 1R13 to greater than 1 volt in 1R14. As discussed in PG&E Letter DCL-06-029, "Special Report 06-01 - Results of Steam Generator (SG) Tube Inspections for Diablo Canyon Power Plant Unit 1 Thirteenth Refueling Outage," dated February 24, 2006, in accordance with PWSCC ARC methods, the maximum depth for an indication less than or equal to 1 volt is determined by the depth from phase angle analysis at maximum volts (likely most reliable depth for low voltage indications) with a minimum of 20 percent, and the maximum depth for an indication greater than 1 volt is determined by direct phase angle analysis even though the location of maximum depth may not be at the location of maximum volts. This difference in sizing techniques for low voltage indications can lead to increased growth estimates. For conservatism, all of these data points were included in the final growth distribution for the OA.

Plus Point confirmation rates for bobbin detected indications when bobbin is relied upon for detection of axial PWSCC in less than or equal to 2 volt dents.

In 1R14, the bobbin coil was relied upon for detection of axial PWSCC in less than or equal to 2 volt dents. As identified in Table 4, there were 132 DIS indications detected by bobbin at TSP intersections with nonrepeat PWSCC indications. Tracking of Plus

Point confirmation rates for repeat PWSCC indications tubes is not required because these known flaws are inspected by Plus Point regardless of the bobbin call.

All DIS indications were inspected by Plus Point. Only 8 of the 132 DIS indications were confirmed as PWSCC by Plus Point, for a Plus Point confirmation rate of about 6 percent, or a 94 percent bobbin overcall rate. Each SG exceeded the approximately 90 percent overall rate generated during the bobbin coil performance test documented in WCAP-15573, Revision 1. The high bobbin overcall rate establishes a very high probability of detecting significant axial PWSCC indications in less than or equal to 2 volt dents.

For condition monitoring, an evaluation of any indications that satisfy burst margin requirements based on the Westinghouse burst pressure model, but do not satisfy burst margin requirements based on the combined ANL ligament tearing and through-wall burst pressure model.

This item is not applicable. All indications satisfied CM burst margin requirements based on the combined ANL ligament tearing and EPRI through-wall (ANL/TW) burst pressure model, as well as the Westinghouse (WEC) burst pressure model. The CM Westinghouse model burst pressures are shown in Table 5 for both free span and total length. The ANL/TW model CM burst pressures for total length are shown in Table 6. The total length CM burst requirement was 3367 psi at 1.4 (differential pressure steam line break (dPSLB), based on dPSLB of 2405 psi (PORV setpoint plus uncertainty). The free span length CM burst requirement was 4419 psi, based on  $3\Delta P_{NO}$ .

Performance evaluation of the operational assessment methodology for prediction of flaw distributions as a function of flaw size.

PG&E evaluated the performance of the PWSCC ARC OA methodology for prediction of flaw distributions as a function of flaw size. WCAP-15573, Revision 1, provides guidance for determining when corrective actions are needed when a single indication OA prediction significantly underestimates the burst pressure or leak rate when compared to the CM results. When comparing single indication projected leak and burst data with that obtained for the same indication from the inspection results, additional evaluations are to be performed and included in the 120-day report if: (1) the CM single indication burst pressure is less than 5600 psi and more than 500 psi less than the projection obtained using the same burst model; or (2) the CM single indication leak rate is more than 0.2 gpm larger than the projected SLB leak rate.

#### *Performance Evaluation of Single Indication SLB Leak Rates*

From the prior cycle OA, no single indication leakage was projected at EOC-14 in any SG, either from total length or free span. In 1R14, no CM single indication leakage was calculated in any SG, either from total length or free span. Therefore, the single indication leak rate methodology using the ANL ligament tearing model is determined to



be adequately conservative, and no corrective actions are required.

#### *Performance Evaluation of Single Indication Burst Pressures*

The free span burst pressure for all indications exceeded the default value of 6100 psi for both the prior cycle OA and the CM assessment, using both burst models. Therefore, the single indication free span burst pressure methodology is determined to be adequately conservative, and no corrective actions are required.

A detailed total length burst pressure benchmarking analysis (CM versus prior cycle OA projections) was performed for the repeat indications that had been left in service in Cycle 14 under PWSCC ARC. As required by the PWSCC ARC, the OA burst pressures are 95/95 values, and the CM burst pressures are 95/50 values. Table 6 provides the results of the benchmarking. For both the Westinghouse model and the ANL/TW model, the total length burst pressures listed in the "prior cycle OA projection" columns were compared against the same model burst pressures in the "CM" columns, and the differences in CM versus OA burst pressures are listed. Three differences are listed: difference between CMOA from the Westinghouse model, difference between CMOA from the ANL/TW model, and difference between CM from the Westinghouse model and OA from the ANL/TW model (since the CM of record uses the Westinghouse model and the OA of record uses the ANL/TW model). Negative differences are underpredictions, while positive differences are overpredictions. Three underpredictions were identified, as discussed below.

SG 1-2 R16C59 crack 1 had underpredictions of 346 psi and 173 psi using the ANL/TW model and Westinghouse model, respectively. It is noted that the indication's length growth rate is in the upper tail of the growth curve. Since the CM burst pressures were less than 5600 psi, these underpredictions do not require evaluation.

SG 1-2 R27C69 crack 1 had underpredictions of 349 psi and 329 psi using the ANL/TW model and Westinghouse model, respectively. The underprediction is only 118 psi when using the models of record. Since these underpredictions are less than the 500 psi threshold value, the single indication total length burst pressure methodology is determined to be adequately conservative, and no corrective actions are required. This tube was plugged as a conservative preventive measure due to a predicted low OA burst pressure.

SG 1-2 R32C30 crack 1 had underpredictions of 241 psi and 288 psi using the ANL/TW model and Westinghouse model, respectively. The underprediction is only 110 psi when using the models of record. Since these underpredictions are less than the 500 psi threshold value, the single indication total length burst pressure methodology is determined to be adequately conservative, and no corrective actions are required.

Burst pressure benchmarking of the SG 1-2 R8C61 crack 1 merged indication was not conducted due to lack of valid comparison between 1R13 and 1R14. As discussed

earlier, the merged indications did not undergo significant growth in length and depth over Cycle 14. Table 5 shows a Westinghouse model burst pressure of 6100 psi for the merged indication.

*Performance Evaluation of Total SG Monte Carlo SLB Leakage*

Table 8 provides a summary of SLB leak rates for EOC-14 and EOC-15 for single indication Monte Carlo analyses and total SG Monte Carlo analyses.

Page 7-12 of WCAP-15573, Revision 1, requires the following: "If the results of the single indication analyses show leakage for condition monitoring or operational assessment for either free span or total length, then a total SG leak rate Monte Carlo operational assessment is required for each SG that shows leakage. A conservative probability of detection (POD) of 0.6 is used in the SG analysis."

The results of the 1R14 single indication analysis did not show CM OA leakage for free span and total length analyses, with the exception of two indications that each had 0.001 gpm OA leakage (SG 1-2 R27C69 crack 1 and SG 1-2 R34C53 crack 1). These indications were subsequently removed from service by tube plugging in 1R14. Because of this predicted single indication leakage, a total SG leak rate Monte Carlo OA (using a POD of 0.6) was required for SG 1-2 per the WCAP methodology. In addition, total SG leak rate analyses were performed for CM (using a POD of 1.0) and OA (using a POD of 0.6) for all SGs with indications, regardless of the results of single indication leakage analyses, as committed by PG&E in letter DCL-06-29 dated February 24, 2006. The results of the total SG leak rate analyses show that no SG had any CM OA leakage, with the exception of SG 1-2 OA for which the 95/95 leak rate was 2.14 gpm. This 2.14 gpm leak rate value is greater than the 0 gpm leak rate predicted from the single indication Monte Carlo analyses (after 1R14 tube plugging of the two indications that had small 0.001 gpm OA leakage predicted), and is therefore considered to be the licensing basis OA leak rate for PWSCC ARC projections for SG 1-2 at EOC-15.

As discussed in PG&E Letter DCL-06-029, the SG 1-2 leak rate predicted by the prior cycle OA (total SG Monte Carlo) was 1.35 gpm, and no OA leakage was predicted in SG 1-1 and SG 1-4. Because condition monitoring at 1R14 did not calculate any leakage in any SG for both the single indication Monte Carlo analyses and the total SG Monte Carlo analyses, the leak rate OA methodology is determined to be adequately conservative.

Evaluation results of number and size of previously reported versus new PWSCC indications found in the inspection, and the potential need to account for new indications in the operational assessment burst evaluation.

As discussed above, there were 235 axial PWSCC indications detected in 1R14: 17 new indications and 218 repeat indications. The number of new indications continues to be a small fraction of the total number of indications.

Of the 17 new indications: 3 had no prior Plus Point inspections; 10 had a Plus Point inspection in 1R13, of which 7 were detectable in 1R13 based on a lookup review; 4 had prior Plus Point inspections in outages prior to 1R13, of which 3 were detectable based on a lookup. Only growth rates from 1R13 to 1R14 inspections were included in the growth distribution. In summary, 10 of the 14 new indications with prior inspections could be traced to the prior inspection data, indicating that the indications have a small growth rate progression.

All of the new indications had CM burst pressures in excess of 6100 psi using both the Westinghouse model and the ANL/TW model. The average depths of the new indications were bounded by about 35 percent throughwall. Table 9 shows the frequency, as a function of average depth, of the new indications and repeat indications. As shown in Table 9, the frequency percentage of the new versus repeat trends down with increasing depths, illustrating that depths of new indications do not substantially contribute to the OA burst evaluation.

In conclusion, because of the low frequency and small average depths of new indications relative to repeat indications, slow growth rates of new indications, and CM burst pressures of new indications well in excess of burst margin requirements, there is no need to account for new indications in the OA burst evaluation.

Identification of mixed mode (axial PWSCC and circumferential) indications found in the inspection and an evaluation of the mixed mode indications for potential impact on the axial indication burst pressures or leakage. In addition, performance of a trending analysis to assess the potential for increasing mixed mode affects (e.g., circumferential crack depths, burst pressure reductions, increased leakage rates) over time.

For PWSCC ARC, a mixed mode indication is defined as an axial PWSCC indication and a circumferential indication (either PWSCC or ODSCC) occurring at the same dented TSP intersection. The indications are termed PWSCC mixed mode. No PWSCC mixed mode indications were detected in 1R14.

There are several conditions that require evaluation to determine the need for corrective actions. These are discussed below:

- If an interacting PWSCC mixed-mode indication is found to have led to a reduction in the axial indication burst pressure by more than 10 percent and to less than

4000 psi, or to have caused an indication to not satisfy burst margin requirements, the burst margin requirements for implementation in the OA at the next and subsequent outages must be increased by the percentage reduction in the burst pressure found for the mixed mode indication. As discussed above, because no mixed-mode indications were detected in 1R14, this condition did not occur and there are no corrective actions needed to adjust burst margin requirements for future operational assessments.

- If an interacting PWSCC mixed-mode indication is found, and the axial indication condition monitoring predicts SLB leakage at 95/50, and the circumferential indication has greater than 50 percent average depth including NDE uncertainty, then the CM leak rate for the axial indication must be increased by a leakage factor. In addition, the OA SLB leak rate for each SG must be increased by a leakage factor. As discussed above, because no mixed-mode indications were detected in 1R14, this condition did not occur and there are no corrective actions needed to adjust SLB leak rates for CM or OA.
- If a previously Plus Point-inspected TSP intersection is found to have a circumferential indication with average depth greater than 80 percent after accounting for NDE uncertainty, then the OA SLB leak rate for each SG must be increased by a leakage factor. There were 14 TSP circumferential indications detected in 1R14 (1 PWSCC and 13 ODSCC). All of the TSPs with circumferential indications detected in 1R14 were previously Plus Point inspected in 1R13. The deepest 1R14 circumferential indication was 69.8 percent average depth, including 95 percent NDE uncertainty, less than the 80 percent average depth threshold. The maximum Plus Point amplitude for this flaw was only 0.17 volt, and it is expected that the flaw is very conservatively sized. Therefore, no corrective actions are needed to adjust the OA SLB leak rates.

In response to NRC request for additional information, PG&E Letter DCL-02-045, committed to performing a trending analysis in the 120-day report to assess the potential for increasing mixed mode affects (e.g., circumferential crack depths, burst pressure reductions, increased leakage rates) over time. Since no burst pressure reductions or leakage rate multipliers have been required, there is no data to trend for these parameters. Trending of circumferential depths, maximum voltages, and number of circumferential indications is provided in Figures 1, 2, 3, and 4.

Figure 1 provides all DCP Unit 1 TSP PWSCC and ODSCC circumferential indication measured adjusted average depths versus year detected. The adjustments do not include NDE uncertainty. The mean trend line (excluding 1995 data since Plus Point inspections were conducted for the first time in that year) shows a slight increase in average depths over time. The frequency of larger depths tends to show an oscillating up and down pattern between outages, which is a result of conservative sizing of low amplitude flaws (less than 1 volt). Because of the large frequency of low amplitude flaws, a more realistic trend of depths over time is shown in Figure 2, which plots the same data in terms of maximum voltage. The mean trend line shows a slight decrease in maximum voltage over time, even when excluding the 1995 data. Thus, there are no

increasing depths over time associated with TSP circumferential indications.

Figure 3 data is a subset of Figures 1 and 2, showing only the PWSCC mixed mode circumferential indication average depths and maximum voltages versus year detected. A total of three PWSCC mixed mode indications have been detected in DCP Unit 1. No PWSCC mixed mode indications were detected in 1R13 and 1R14. The maximum voltages show a decreasing trend, although there are only three data points being trended.

Figure 4 provides the number of DCP Unit 1 TSP PWSCC and ODSCC circumferential indications detected over time, which shows an increasing trend. The increase is attributed to an increasing number of circumferential ODSCC indications, whereas the number of circumferential PWSCC indications has trended down. The most likely reason for increased numbers of ODSCC indications is due to increased operation time at a higher stress state associated with dented TSPs. Chemical cleaning in the Unit 1 twelfth refueling outage (1R12) did not clean the TSP crevices, and has no effect on detection capability of ODSCC.

Even though there is an increasing trend in the number of circumferential indications, the indications are being detected at an early stage as reflected in the trend of decreasing maximum voltages. In addition, there were no PWSCC mixed mode indications detected in 1R13 and 1R14. Therefore, there is not a significant potential for increasing mixed mode affects over time.

Any corrective actions found necessary in the event that condition monitoring requirements are not met.

This item is not applicable, because all indications satisfied CM burst margin requirements and leakage margin requirements.

All CM burst pressures, evaluated at 95 percent probability and 50 percent confidence (95/50), exceeded the 3367 psi total length SLB burst margin requirement and the 4419 psi free span burst margin requirement, using both the Westinghouse model and the ANL/TW model.

CM single indication SLB leak rates were evaluated at 95 percent probability and 50 percent confidence (95/50), using the ANL ligament tearing model. No free span leakage was calculated, and no total length leakage was calculated. In addition, total SG leak rate Monte Carlo CM analyses were performed for each SG with indications, and no free span or total length leakage was calculated at 95/50 confidence levels using a POD of 1.0. Table 8 summarizes these leak rate calculations.

**Table 1**  
**1R14 Minimum Scope for Plus Point Inspection of Dented TSP Intersections**  
(Based on 1R13 Dent Population)

<b>2-5 Volt Dents</b>					
TSP	SG 1-1	SG 1-2	SG 1-3	SG 1-4	TOTAL
1H	14	149	50	326	539
2H	49	132		130	311
3H	16	93		193	302
4H	5	96		112	213
5H	6	58		75	139
6H		18		194	212
7H		99		50	149
7C		26			26
6C		1			1
TOTAL	90	672	50	1080	1892

<b>≥ 5 Volt Dents</b>					
TSP	SG 1-1	SG 1-2	SG 1-3	SG 1-4	TOTAL
1H	1	67	15	333	416
2H	17	59	4	50	130
3H	5	54	10	59	128
4H	2	67	6	81	156
5H	4	16	38	35	93
6H	1	1	16	231	249
7H	50	27	50	68	195
7C		5			5
6C					0
5C					0
4C					0
3C					0
2C					0
1C					0
TOTAL	80	296	139	857	1372

<b>≤ 2 Volt Dents</b>					
TSP	SG 1-1	SG 1-2	SG 1-3	SG 1-4	TOTAL
1H	199				199
2H	50				50
TOTAL	249				249

1R14 Plus Point dent inspection criteria:

- SG 1-1: 100% of ≤2 volt dents at 1H, 20% at 2H  
100% of >2 and <5 volt dents from 1H to 4H, 20% at 5H  
100% of ≥5 volt dents from 1H to 4H, 20% from 5H to 7H
- SG 1-2: 100% of >2 and <5 volt dents from 1H to 7C, 20% at 6C  
100% of ≥5 volt dents from 1H to 7C, 20% at 6C (Note: There are no ≥5 volt dents at 1C-6C)
- SG 1-3: 20% of >2 and <5 volt dents at 1H  
20% of ≥5 volt dents from 1H to 7H
- SG 1-4: 100% of >2 and <5 volt dents from 1H to 6H, 20% at 7H  
100% of ≥5 volt dents from 1H to 6H, 20% at 7H
- All 20% samples shall contain a minimum of 50 dents. If the population of dents at the TSP elevation is less than 50, then inspect 100% of the dents at the TSP.

**Table 2**  
**Axial PWSCC Cumulative Probability Distribution (CPD) Growth Rates per EFPY at 604F**

	Cycle 12		Cycle 13		Cycle 15 Prelim OA	Cycle 14		Cycle 15 Final OA
Length Bin (inch)	Frequency	CPD	Frequency	CPD	Lower Bound CPD from Cycle 12-13	Frequency	CPD	Same as prelim OA
0	78	0.363	58	0.257	0.257	119	0.531	
0.01	24	0.474	27	0.376	0.376	29	0.661	
0.02	45	0.684	24	0.482	0.482	21	0.754	
0.03	17	0.763	34	0.633	0.633	25	0.866	
0.04	19	0.851	19	0.717	0.717	7	0.897	
0.05	14	0.916	14	0.779	0.779	6	0.924	
0.06	7	0.949	21	0.872	0.872	10	0.969	
0.07	5	0.972	7	0.903	0.903	3	0.982	
0.08	1	0.977	3	0.916	0.916	3	0.996	
0.09	4	0.995	4	0.934	0.934	0	0.996	
0.1	1	1.000	4	0.951	0.951	0	0.996	
0.11	0	1.000	1	0.956	0.956	1	1.000	
0.12	0	1.000	2	0.965	0.965	0	1.000	
0.13	0	1.000	1	0.969	0.969	0	1.000	
0.14	0	1.000	0	0.969	0.969	0	1.000	
0.15	0	1.000	6	0.996	0.996	0	1.000	
0.16	0	1.000	0	0.996	0.996	0	1.000	
0.17	0	1.000	0	0.996	0.996	0	1.000	
0.18	0	1.000	1	1.000	1.000	0	1.000	
	Cycle 12		Cycle 13		Cycle 15 Prelim OA	Cycle 14		Cycle 15 Final OA
MD Bin (%TW fraction)	Frequency	CPD	Frequency	CPD	Lower Bound CPD from Cycle 12-13	Frequency	CPD	Same as prelim OA
0	63	0.293	141	0.624	0.293	84	0.375	
0.01	8	0.330	14	0.686	0.330	11	0.424	
0.02	20	0.423	9	0.726	0.423	15	0.491	
0.03	16	0.498	17	0.801	0.498	32	0.634	
0.04	19	0.586	5	0.823	0.586	9	0.674	
0.05	28	0.716	13	0.881	0.716	21	0.768	
0.06	7	0.749	7	0.912	0.749	14	0.830	
0.07	11	0.800	4	0.929	0.800	8	0.866	
0.08	7	0.833	1	0.934	0.833	10	0.911	
0.09	9	0.874	5	0.956	0.874	3	0.924	
0.1	10	0.921	3	0.969	0.921	1	0.929	
0.11	2	0.930	0	0.969	0.930	8	0.964	
0.12	7	0.963	2	0.978	0.963	3	0.978	
0.13	1	0.967	0	0.978	0.967	2	0.987	
0.14	1	0.972	1	0.982	0.972	0	0.987	
0.15	2	0.981	1	0.987	0.981	0	0.987	
0.16	2	0.991	0	0.987	0.987	1	0.991	
0.17	0	0.991	0	0.987	0.987	1	0.996	
0.18	0	0.991	1	0.991	0.991	0	0.996	
0.19	0	0.991	0	0.991	0.991	1	1.000	
0.2	2	1.000	0	0.991	0.991	0	1.000	
0.21	0	1.000	1	0.996	0.996	0	1.000	
0.22	0	1.000	0	0.996	0.996	0	1.000	
0.23	0	1.000	1	1.000	1.000	0	1.000	

**Table 2**  
**Axial PWSCC Cumulative Probability Distribution (CPD) Growth Rates per EFPY at 604F**

	Cycle 12		Cycle 13		Cycle 15 Prelim OA	Cycle 14		Cycle 15 Final OA
AD Bin (%TW fraction)	Frequency	CPD	Frequency	CPD	Lower Bound CPD from Cycle 12-13	Frequency	CPD	Same as prelim OA except for 0.00% and 0.08% bins
0	53	0.247	112	0.496	0.247	53	0.237	0.237
0.01	25	0.363	33	0.642	0.363	30	0.371	0.363
0.02	24	0.474	19	0.726	0.474	32	0.513	0.474
0.03	17	0.553	23	0.827	0.553	18	0.594	0.553
0.04	23	0.660	12	0.881	0.660	21	0.688	0.660
0.05	23	0.767	10	0.925	0.767	26	0.804	0.767
0.06	18	0.851	7	0.956	0.851	11	0.853	0.851
0.07	12	0.907	3	0.969	0.907	14	0.915	0.907
0.08	6	0.935	2	0.978	0.935	4	0.933	0.933
0.09	2	0.944	0	0.978	0.944	8	0.969	0.944
0.1	4	0.963	1	0.982	0.963	3	0.982	0.963
0.11	1	0.967	1	0.987	0.967	1	0.987	0.967
0.12	2	0.977	1	0.991	0.977	2	0.996	0.977
0.13	2	0.986	0	0.991	0.986	1	1.000	0.986
0.14	3	1.000	2	1.000	1.000	0	1.000	1.000
0.15	0	1.000	0	1.000	1.000	0	1.000	1.000
0.16	0	1.000	0	1.000	1.000	0	1.000	1.000
0.17	0	1.000	0	1.000	1.000	0	1.000	1.000
0.18	0	1.000	0	1.000	1.000	0	1.000	1.000
0.19	0	1.000	0	1.000	1.000	0	1.000	1.000
0.2	0	1.000	0	1.000	1.000	0	1.000	1.000
Total	215		226			224		



**Table 3**  
**Unit 1 Growth Rates per EFPY at 604F**

Cycle	Data Points	90 Percentile Growth per EFPY			95 Percentile Growth per EFPY		
		Length inch	Max Depth %	Average Depth %	Length inch	Max Depth %	Average Depth %
11	119	0.035	6.67	6.14	0.050	8.58	8.03
12	215	0.050	9.69	6.88	0.060	11.37	9.14
13	226	0.067	5.78	4.40	0.097	8.77	5.62
14	224	0.041	7.91	6.83	0.050	10.79	8.61

**Table 4**  
**1R14 DIS Confirmation Rates**

	SG 1-1	SG 1-2	SG 1-3	SG 1-4	Total
Number of bobbin DIS in less than or equal to 2 volt dented TSP intersections (excludes repeat PWSCC indications)	32	66	18	16	132
Number of new PWSCC indications confirmed by Plus Point	2	6	0	0	8
Plus Point confirmation rate	6%	9%	0%	0%	6%
Bobbin DIS overcall rate	94%	91%	100%	100%	94%

**Table 5 - 1R14 PWSCC ARC Summary of Analysis Results**

								Adjusted NDE						Condition Monitoring (WEC Model)				Operational Assessment (ANL/TW Model)			
SG	R	C	TSP	Crack No.	Cal	Plug reason	Ind cat	Length (in.)	Max. Depth (%)	Avg. Depth (%)	Max. Volts	From	To	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm
1	3	28	02H	1	16		Repeat	0.16	45.0	31.1	0.92	-0.22	-0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	4	41	01H	1	16		Repeat	0.15	26.0	20.2	0.64	-0.05	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	14	28	02H	1	16		Repeat	0.14	34.0	22.6	0.59	0.19	0.33	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	15	16	02H	1	16		Repeat	0.08	20.0	10.9	0.44	-0.08	0.00	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	15	76	02H	1	16		Repeat	0.12	34.0	24.3	0.68	-0.16	-0.04	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	17	16	02H	1	16		Repeat	0.19	37.0	28.3	1.11	-0.21	-0.02	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	19	15	03H	1	16		Repeat	0.36	51.0	37.6	1.54	-0.21	0.15	6100	0.000	6100	0.000	6100	0.000	5527	0.000
1	19	15	7C	1	56		New	0.28	48.0	34.8	1.03	-0.21	0.07	6100	0.000	6100	0.000	6100	0.000	5945	0.000
1	20	28	02H	1	16		Repeat	0.14	34.0	25.3	1.26	-0.22	-0.08	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	20	29	02H	1	16		Repeat	0.33	37.0	26.0	1.00	-0.04	0.29	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	20	33	01H	1	16		Repeat	0.08	20.0	14.2	0.34	-0.14	-0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	21	13	03H	1	16		Repeat	0.20	37.0	27.8	1.35	-0.14	0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	21	51	02H	1	16		Repeat	0.08	20.0	13.3	0.54	-0.14	-0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	21	54	01H	1	16		Repeat	0.17	60.0	38.0	1.09	-0.16	0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	23	14	03H	1	16		Repeat	0.12	39.0	27.9	0.93	-0.13	-0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	24	67	02H	1	16		Repeat	0.26	54.0	39.8	1.38	-0.18	0.08	6100	0.000	6100	0.000	6100	0.000	5749	0.000
1	25	57	03H	1	16		Repeat	0.33	42.0	35.7	1.04	-0.13	0.20	6100	0.000	6100	0.000	6100	0.000	5756	0.000
1	27	75	02H	1	16		Repeat	0.14	31.0	21.3	0.92	-0.08	0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	28	23	03H	1	66		New	0.22	42.0	27.7	0.85	-0.16	0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	29	37	02H	1	16		Repeat	0.28	37.0	30.0	1.00	-0.08	0.20	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	30	21	02H	1	16		Repeat	0.12	34.0	22.7	0.69	-0.11	0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	30	59	02H	1	16		Repeat	0.22	31.0	24.8	0.86	-0.19	0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	30	67	02H	1	16		Repeat	0.32	39.0	29.8	1.31	-0.18	0.14	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	34	24	03H	1	16		Repeat	0.16	42.0	29.0	0.74	-0.08	0.08	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	34	24	03H	2	16		Repeat	0.14	37.0	26.2	0.57	0.08	0.22	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	35	59	03H	1	16		Repeat	0.33	51.0	38.2	1.85	-0.21	0.12	6100	0.000	6100	0.000	6100	0.000	5601	0.000
1	38	41	04H	1	16		Repeat	0.26	45.0	32.9	1.45	-0.35	-0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000
1	39	57	02H	1	16		Repeat	0.17	26.0	14.6	0.84	-0.24	-0.07	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	10	03H	1	17		Repeat	0.39	48.0	36.9	1.59	-0.09	0.30	6100	0.000	6100	0.000	6100	0.000	5489	0.000
2	2	28	03H	1	17		Repeat	0.24	45.0	29.4	0.98	-0.22	0.02	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	67	02H	1	59		New	0.16	31.0	20.8	0.82	-0.10	0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	76	02H	1	15		Repeat	0.19	20.0	12.0	0.57	-0.22	-0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000

**Table 5 - 1R14 PWSCC ARC Summary of Analysis Results**

							Adjusted NDE							Condition Monitoring (WEC Model)				Operational Assessment (ANL/TW Model)			
SG	R	C	TSP	Crack No.	Cal	Plug reason	Ind cat	Length (in.)	Max. Depth (%)	Avg. Depth (%)	Max. Volts	From	To	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm
2	2	78	01H	1	15		Repeat	0.09	20.0	12.6	0.55	0.10	0.19	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	79	03H	1	15		Repeat	0.50	35.0	25.4	1.02	-0.18	0.32	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	90	03H	1	15		Repeat	0.22	21.5	9.5	0.56	-0.13	0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	90	04H	1	15		Repeat	0.14	37.0	25.8	1.15	-0.41	-0.27	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	90	04H	2	15		Repeat	0.28	45.0	32.2	1.76	-0.16	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	92	05H	1	15		Repeat	0.09	20.0	10.5	0.43	-0.49	-0.40	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	92	05H	2	15		Repeat	0.10	20.0	11.0	0.72	-0.07	0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	92	05H	3	15		Repeat	0.23	21.5	14.1	0.75	0.03	0.26	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	2	93	04H	1	15		Repeat	0.12	36.5	25.5	0.63	0.14	0.26	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	3	46	7C	1	47		Repeat	0.28	38.0	29.2	0.67	-0.16	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	4	54	02H	1	16		Repeat	0.26	42.0	28.4	1.11	-0.10	0.16	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	4	57	01H	1	16		Repeat	0.11	20.0	11.9	0.58	0.01	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	4	84	01H	1	15		Repeat	0.17	26.0	17.3	0.65	0.02	0.19	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	5	66	02H	1	15		Repeat	0.16	31.0	21.0	0.81	-0.15	0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	5	72	02H	1	59	IDOD	New	0.17	20.0	10.0	0.42	-0.29	-0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	5	77	05H	1	15		Repeat	0.23	42.0	34.4	1.22	-0.31	-0.08	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	5	78	01H	1	15		Repeat	0.42	51.0	33.2	1.29	-0.01	0.41	6100	0.000	6100	0.000	6100	0.000	5642	0.000
2	5	93	01H	1	15		Repeat	0.41	42.0	29.6	1.74	-0.27	0.14	6100	0.000	6100	0.000	6100	0.000	5892	0.000
2	6	55	7C	1	47		Repeat	0.24	34.0	25.1	0.77	-0.20	0.04	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	6	74	03H	1	15		Repeat	0.07	20.0	12.9	0.53	-0.50	-0.43	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	6	74	03H	2	15		Repeat	0.24	31.0	19.2	1.03	-0.19	0.05	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	7	17	04H	1	17		Repeat	0.18	48.0	30.0	0.78	-0.06	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	7	23	02H	1	24		New	0.54	23.0	15.3	0.80	-0.29	0.25	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	7	31	01H	1	17	IDOD	Repeat	0.33	48.0	35.5	1.15	-0.01	0.32	6100	0.000	6100	0.000	6100	0.000	5752	0.000
2	7	31	7C	1	47	IDOD at 1H	Repeat	0.61	60.0	46.8	1.99	-0.34	0.27	6100	0.000	5217	0.000	6100	0.000	4146	0.000
2	7	53	03H	1	16		Repeat	0.23	37.0	25.0	0.78	-0.05	0.18	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	7	68	03H	1	15		Repeat	0.14	37.0	22.8	0.97	0.14	0.28	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	7	86	02H	1	45		New	0.10	20.5	14.0	0.55	-0.04	0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	8	4	05H	1	16		Repeat	0.34	48.0	40.3	1.52	-0.31	0.03	6100	0.000	6100	0.000	6100	0.000	5428	0.000
2	8	15	02H	1	17		Repeat	0.27	54.0	39.3	1.54	-0.13	0.14	6100	0.000	6100	0.000	6100	0.000	5755	0.000
2	8	48	01H	1	13		Repeat	0.19	23.0	16.0	0.66	-0.22	-0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	8	55	01H	1	16		Repeat	0.27	57.0	41.3	1.86	-0.18	0.09	6100	0.000	6100	0.000	6100	0.000	5557	0.000

**Table 5 - 1R14 PWSCC ARC Summary of Analysis Results**

								Adjusted NDE						Condition Monitoring (WEC Model)				Operational Assessment (ANL/TW Model)			
SG	R	C	TSP	Crack No.	Cal	Plug reason	Ind cat	Length (in.)	Max. Depth (%)	Avg. Depth (%)	Max. Volts	From	To	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm
2	8	57	01H	1	16		Repeat	0.46	60.0	44.8	2.71	-0.29	0.17	6100	0.000	5729	0.000	6100	0.000	4713	0.000
2	8	61	02H	1	15		Merged	0.59	48.0	38.9	1.81	-0.33	0.26	6100	0.000	6100	0.000	6100	0.000	4830	0.000
2	8	61	02H	2	15		New	0.09	20.0	11.6	0.36	0.08	0.17	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	8	66	02H	1	15		Repeat	0.14	34.0	25.3	0.85	-0.33	-0.19	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	8	82	04H	1	15		Repeat	0.33	28.0	18.9	0.49	-0.13	0.20	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	8	93	01H	1	15		Repeat	0.25	50.5	30.3	1.42	-0.26	-0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	9	27	03H	1	17		Repeat	0.08	20.0	13.0	0.35	-0.13	-0.05	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	9	30	01H	1	17		Repeat	0.49	60.0	49.8	2.67	-0.26	0.23	6100	0.000	5340	0.000	6100	0.000	4301	0.000
2	9	38	02H	1	17		Repeat	0.44	54.0	45.1	3.01	-0.30	0.14	6100	0.000	5727	0.000	6100	0.000	4738	0.000
2	9	45	01H	1	17		Repeat	0.20	48.0	28.2	1.33	0.02	0.22	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	9	53	01H	1	16		Repeat	0.35	45.0	34.3	1.41	-0.14	0.21	6100	0.000	6100	0.000	6100	0.000	5805	0.000
2	9	56	01H	1	16		Repeat	0.22	51.0	39.1	1.60	-0.36	-0.14	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	9	75	02H	1	48		New	0.10	20.0	8.2	0.34	-0.34	-0.24	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	9	82	03H	1	15		Repeat	0.25	42.0	30.5	1.58	0.09	0.34	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	9	83	04H	1	59		New	0.25	42.0	28.9	1.38	-0.19	0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	10	49	03H	1	16		Repeat	0.37	23.0	12.4	0.68	-0.12	0.25	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	10	62	01H	1	15		Repeat	0.32	51.0	37.2	1.34	-0.11	0.21	6100	0.000	6100	0.000	6100	0.000	5663	0.000
2	10	62	01H	2	15		New	0.11	20.0	11.3	0.33	-0.14	-0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	10	67	01H	1	15	SCI OD 2H	Repeat	0.27	20.0	13.5	1.00	-0.26	0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	10	68	01H	1	15		Repeat	0.23	42.0	32.7	1.75	-0.24	-0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	10	69	02H	1	15		Repeat	0.12	28.5	18.9	0.62	-0.27	-0.15	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	10	85	04H	1	15		Repeat	0.12	34.0	21.4	0.69	0.18	0.30	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	11	20	02H	1	17		Repeat	0.27	54.0	42.9	1.84	-0.06	0.21	6100	0.000	6100	0.000	6100	0.000	5503	0.000
2	11	45	01H	1	17		Repeat	0.47	37.0	21.0	1.23	-0.13	0.34	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	11	66	03H	1	15		Repeat	0.23	38.0	30.1	1.04	-0.20	0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	11	71	01H	1	15		Repeat	0.30	48.0	35.2	1.42	-0.33	-0.03	6100	0.000	6100	0.000	6100	0.000	5904	0.000
2	11	71	01H	2	15		Repeat	0.06	20.0	11.3	0.54	0.04	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	11	71	01H	3	15		Repeat	0.19	45.0	31.1	1.33	-0.18	0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	11	71	01H	4	15		Repeat	0.39	26.0	19.5	0.58	-0.17	0.22	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	11	84	02H	1	15		Repeat	0.47	42.0	20.6	1.20	-0.26	0.21	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	11	87	01H	1	15		Repeat	0.40	73.0	48.1	2.55	-0.22	0.18	6100	0.000	5565	0.000	6100	0.000	4626	0.000
2	13	20	03H	1	60		New	0.24	51.0	35.1	1.06	-0.15	0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000

**Table 5 - 1R14 PWSCC ARC Summary of Analysis Results**

								Adjusted NDE						Condition Monitoring (WEC Model)				Operational Assessment (ANL/TW Model)			
SG	R	C	TSP	Crack No.	Cal	Plug reason	Ind cat	Length (in.)	Max. Depth (%)	Avg. Depth (%)	Max. Volts	From	To	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm
2	13	34	01H	1	17		Repeat	0.18	51.0	37.6	1.31	0.04	0.22	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	13	44	01H	1	17		Repeat	0.25	60.0	48.6	2.27	-0.13	0.12	6100	0.000	6100	0.000	6100	0.000	5218	0.000
2	13	60	02H	1	16		Repeat	0.26	54.0	35.6	1.47	-0.15	0.11	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	14	16	04H	1	17		Repeat	0.25	48.0	36.3	1.12	-0.13	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	14	45	01H	1	17		Repeat	0.09	20.0	12.6	0.55	-0.02	0.07	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	14	58	04H	1	16		Repeat	0.09	28.0	19.0	0.55	0.14	0.23	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	14	68	01H	1	15		Repeat	0.43	20.0	13.2	0.88	-0.22	0.21	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	14	70	01H	1	15		Repeat	0.09	22.0	11.6	0.34	-0.09	0.00	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	14	74	01H	1	15		Repeat	0.26	32.5	20.8	1.15	-0.26	0.00	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	16	12	05H	1	17		Repeat	0.07	31.0	18.5	0.61	-0.05	0.02	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	16	59	02H	1	15		Repeat	0.32	57.0	45.9	2.39	-0.09	0.23	6100	0.000	5927	0.000	6100	0.000	5064	0.000
2	16	60	02H	1	15		Repeat	0.09	22.0	14.0	0.48	-0.23	-0.14	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	16	82	01H	1	15		Repeat	0.23	23.0	12.6	0.74	-0.08	0.15	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	16	82	04H	1	15		Repeat	0.30	45.0	32.3	1.01	-0.10	0.20	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	16	85	02H	1	14		Repeat	0.26	37.0	27.2	0.79	-0.25	0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	16	87	02H	1	14		Repeat	0.21	48.0	37.9	1.47	-0.02	0.19	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	16	88	02H	1	14		Repeat	0.22	48.0	35.3	1.44	-0.14	0.08	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	16	88	02H	2	14		Repeat	0.09	20.0	9.8	0.37	-0.29	-0.20	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	17	9	06H	1	16		Repeat	0.12	28.0	17.4	0.71	-0.13	-0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	17	54	01H	1	15		Repeat	0.37	60.0	51.9	2.27	-0.13	0.24	6100	0.000	5393	0.000	6100	0.000	4533	0.000
2	17	59	01H	1	15		Repeat	0.27	48.0	39.3	1.73	-0.02	0.25	6100	0.000	6100	0.000	6100	0.000	5707	0.000
2	17	66	01H	1	15		Repeat	0.41	45.0	36.6	2.35	-0.26	0.15	6100	0.000	6100	0.000	6100	0.000	5437	0.000
2	17	67	01H	1	15		Repeat	0.24	54.0	25.7	1.09	-0.35	-0.11	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	17	88	01H	1	14		Repeat	0.36	34.0	22.7	0.87	-0.14	0.22	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	17	88	02H	1	14		Repeat	0.36	20.0	12.1	0.98	-0.07	0.29	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	18	64	03H	1	15		Repeat	0.16	26.0	13.5	0.83	-0.21	-0.05	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	18	67	01H	1	14		Repeat	0.20	45.0	36.4	1.23	-0.27	-0.07	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	19	34	02H	1	17		Repeat	0.49	48.0	37.9	2.55	-0.20	0.29	6100	0.000	6100	0.000	6100	0.000	5147	0.000
2	19	74	02H	1	14		Repeat	0.15	31.0	17.4	0.67	-0.17	-0.02	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	19	84	03H	1	14		Repeat	0.22	54.0	37.4	1.01	-0.14	0.08	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	20	14	02H	1	27		New	0.07	26.0	15.7	0.45	-0.04	0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	20	48	03H	1	13		Repeat	0.30	34.0	21.2	0.72	-0.19	0.11	6100	0.000	6100	0.000	6100	0.000	6100	0.000

**Table 5 - 1R14 PWSCC ARC Summary of Analysis Results**

								Adjusted NDE						Condition Monitoring (WEC Model)				Operational Assessment (ANL/TW Model)			
SG	R	C	TSP	Crack No.	Cal	Plug reason	Ind cat	Length (in.)	Max. Depth (%)	Avg. Depth (%)	Max. Volts	From	To	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm
2	20	77	01H	1	14		Repeat	0.30	42.0	33.0	1.19	-0.16	0.14	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	21	38	01H	1	17		Repeat	0.29	57.0	46.7	2.49	-0.13	0.16	6100	0.000	6100	0.000	6100	0.000	5183	0.000
2	21	57	01H	1	13		Repeat	0.40	54.0	39.9	1.78	-0.22	0.18	6100	0.000	6100	0.000	6100	0.000	5280	0.000
2	21	60	02H	1	14		Repeat	0.29	28.5	18.8	0.71	-0.26	0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	21	65	02H	1	14		Repeat	0.43	54.0	36.5	2.11	-0.15	0.28	6100	0.000	6100	0.000	6100	0.000	5458	0.000
2	21	77	01H	1	59		New	0.19	28.0	19.4	0.93	-0.07	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	22	42	01H	1	17		Repeat	0.31	48.0	34.8	1.74	-0.01	0.30	6100	0.000	6100	0.000	6100	0.000	5882	0.000
2	22	55	03H	1	13		Repeat	0.33	51.0	39.3	1.47	-0.08	0.25	6100	0.000	6100	0.000	6100	0.000	5512	0.000
2	23	25	03H	1	17		Repeat	0.26	37.0	25.0	1.13	-0.34	-0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	23	54	01H	1	13		Repeat	0.18	37.0	23.3	0.61	0.03	0.21	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	23	79	01H	1	14		Repeat	0.07	37.0	25.8	0.46	-0.13	-0.06	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	24	77	01H	1	14		Repeat	0.19	34.0	22.4	0.87	-0.22	-0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	25	17	02H	1	17		Repeat	0.25	51.0	35.7	1.19	-0.34	-0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	25	50	02H	1	13		Repeat	0.42	60.0	47.9	2.73	-0.26	0.16	6100	0.000	5551	0.000	6100	0.000	4614	0.000
2	25	55	02H	1	13		Repeat	0.09	26.0	15.1	0.43	0.14	0.23	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	25	79	02H	1	14		Repeat	0.09	42.0	24.8	1.07	-0.12	-0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	25	79	02H	2	14		Repeat	0.08	54.0	36.8	1.38	-0.03	0.05	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	25	85	04H	1	14		Repeat	0.22	32.5	22.8	0.95	-0.17	0.05	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	25	87	04H	1	14		Repeat	0.29	57.0	46.8	1.54	-0.19	0.10	6100	0.000	6100	0.000	6100	0.000	5160	0.000
2	26	22	04H	1	17		Repeat	0.28	51.0	38.1	1.82	-0.07	0.21	6100	0.000	6100	0.000	6100	0.000	5765	0.000
2	26	39	02H	1	17		Repeat	0.11	45.0	32.2	1.02	-0.04	0.07	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	26	48	04H	1	34	DOP>40%	New	0.10	57.0	35.3	1.04	-0.42	-0.32	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	26	73	01H	1	14		Repeat	0.20	48.0	35.7	2.00	-0.10	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	26	79	01H	1	14		Repeat	0.40	60.0	46.2	1.37	-0.20	0.20	6100	0.000	5672	0.000	6100	0.000	4733	0.000
2	27	55	01H	1	13		Repeat	0.07	34.0	20.9	0.64	0.20	0.27	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	27	56	01H	1	13		Repeat	0.09	20.0	14.8	0.57	-0.21	-0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	27	63	02H	1	13		Repeat	0.28	60.0	49.2	2.20	-0.33	-0.05	6100	0.000	5817	0.000	6100	0.000	5037	0.000
2	27	63	02H	2	13		Repeat	0.63	48.0	28.2	1.34	-0.34	0.29	6100	0.000	6100	0.000	6100	0.000	5549	0.000
2	27	64	03H	1	14	AONDB 1H >5v DNT	Repeat	0.25	23.0	12.4	0.75	-0.13	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	27	65	02H	1	14		Repeat	0.40	64.0	44.2	1.69	-0.20	0.20	6100	0.000	5810	0.000	6100	0.000	4868	0.000
2	27	67	01H	1	14		Repeat	0.43	60.0	37.7	2.23	-0.34	0.09	6100	0.000	6100	0.000	6100	0.000	5198	0.000
2	27	67	01H	2	14		Repeat	0.14	31.0	22.6	0.85	0.58	0.72	6100	0.000	6100	0.000	6100	0.000	6100	0.000

Table 5 - 1R14 PWSCC ARC Summary of Analysis Results

							Adjusted NDE							Condition Monitoring (WEC Model)				Operational Assessment (ANL/TW Model)			
SG	R	C	TSP	Crack No.	Cal	Plug reason	Ind cat	Length (in.)	Max. Depth (%)	Avg. Depth (%)	Max. Volts	From	To	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm
2	27	67	04H	1	14		Repeat	0.35	39.0	26.1	1.02	-0.25	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	27	69	01H	1	14	Preventive low OA burst C1	Repeat	0.43	80.0	58.7	2.81	-0.30	0.13	6100	0.000	4682	0.000	6100	0.000	3808	0.001
2	27	69	01H	2	14	Preventive low OA burst C1	Repeat	0.22	31.0	20.5	0.95	-0.03	0.19	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	27	72	02H	1	14		Repeat	0.14	28.0	22.7	0.73	-0.30	-0.16	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	27	72	02H	2	14		Repeat	0.16	20.0	9.5	0.47	0.11	0.27	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	27	73	04H	1	59		New	0.30	28.0	20.2	0.77	-0.20	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	28	25	02H	1	30		New	0.14	26.0	16.0	0.50	-0.25	-0.11	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	28	25	02H	2	30		New	0.09	20.0	11.9	0.58	-0.01	0.08	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	28	47	03H	1	13		Repeat	0.23	31.0	23.9	1.00	0.04	0.27	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	28	66	02H	1	14		Repeat	0.09	31.0	21.3	0.60	-0.02	0.07	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	29	51	02H	1	13		Repeat	0.16	31.0	20.1	0.81	-0.08	0.08	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	29	66	01H	1	14		Repeat	0.15	54.0	39.7	1.79	-0.06	0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	30	56	01H	1	13		Repeat	0.50	67.0	50.7	2.99	-0.38	0.12	6100	0.000	5267	0.000	6100	0.000	4251	0.000
2	30	62	01H	1	13		Repeat	0.12	23.0	13.9	0.61	-0.16	-0.04	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	30	62	01H	2	13		Repeat	0.09	20.0	13.3	0.45	0.03	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	30	67	02H	1	14		Repeat	0.34	73.0	53.5	2.90	-0.35	-0.01	6100	0.000	5231	0.000	6100	0.000	4414	0.000
2	31	37	03H	1	17		Repeat	0.22	42.0	28.6	0.88	-0.13	0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	31	53	02H	1	13		Repeat	0.26	67.0	47.7	2.74	-0.29	-0.03	6100	0.000	5915	0.000	6100	0.000	5142	0.000
2	31	68	01H	1	14		Repeat	0.45	45.0	30.4	1.04	-0.23	0.22	6100	0.000	6100	0.000	6100	0.000	5815	0.000
2	32	30	02H	1	17	IDOD	Repeat	0.31	67.0	52.7	1.34	-0.25	0.06	6100	0.000	5454	0.000	6100	0.000	4641	0.000
2	32	37	03H	1	17		Repeat	0.22	26.0	14.6	0.64	-0.05	0.17	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	32	44	04H	1	17		Repeat	0.31	45.0	28.3	1.23	-0.27	0.04	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	32	47	03H	1	13		Repeat	0.31	54.0	41.0	1.70	-0.32	-0.01	6100	0.000	6100	0.000	6100	0.000	5433	0.000
2	32	59	04H	1	13		Repeat	0.09	27.0	18.2	0.41	-0.13	-0.04	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	32	62	01H	1	13		Repeat	0.19	32.5	22.2	0.68	-0.08	0.11	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	33	57	02H	1	13		Repeat	0.19	37.0	23.2	0.98	0.05	0.24	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	33	69	02H	1	14		Repeat	0.21	34.0	17.0	0.51	-0.18	0.03	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	33	71	02H	1	14	AONDB 4H >5v DNT	Repeat	0.14	29.5	18.3	0.46	0.12	0.26	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	33	72	04H	1	14		Repeat	0.18	39.0	23.4	0.86	-0.09	0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	34	36	03H	1	17		Repeat	0.28	45.0	32.5	1.12	-0.17	0.11	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	34	42	02H	1	17		Repeat	0.13	20.0	13.8	0.48	0.02	0.15	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	34	47	02H	1	13		Repeat	0.16	42.0	32.4	1.32	0.01	0.17	6100	0.000	6100	0.000	6100	0.000	6100	0.000

**Table 5 - 1R14 PWSCC ARC Summary of Analysis Results**

						Plug reason	Ind cat	Adjusted NDE						Condition Monitoring (WEC Model)				Operational Assessment (ANL/TW Model)			
SG	R	C	TSP	Crack No.	Cal			Length (in.)	Max. Depth (%)	Avg. Depth (%)	Max. Volts	From	To	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm
2	34	51	06H	1	13		Repeat	0.09	42.0	30.6	0.77	0.05	0.14	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	34	53	02H	1	13	Preventive low OA burst C1	Repeat	0.51	83.0	57.9	3.15	-0.31	0.20	6100	0.000	4569	0.000	6100	0.000	3583	0.001
2	34	53	02H	2	13	Preventive low OA burst C1	Repeat	0.28	39.0	27.5	1.28	-0.14	0.14	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	34	55	01H	1	13		Repeat	0.33	51.0	45.5	2.75	-0.34	-0.01	6100	0.000	5939	0.000	6100	0.000	5113	0.000
2	34	58	02H	1	13		Repeat	0.33	60.0	47.0	2.05	-0.25	0.08	6100	0.000	5826	0.000	6100	0.000	4978	0.000
2	34	59	02H	1	13		Repeat	0.15	37.0	27.5	0.80	-0.05	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	34	65	02H	1	13		Repeat	0.12	20.0	12.6	0.55	-0.05	0.07	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	35	49	02H	1	13		Repeat	0.32	54.0	44.2	2.38	-0.18	0.14	6100	0.000	6100	0.000	6100	0.000	5239	0.000
2	35	52	03H	1	13		Repeat	0.26	31.5	24.2	1.10	-0.15	0.11	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	35	56	02H	1	13		Repeat	0.25	26.0	19.8	0.94	-0.05	0.20	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	35	70	02H	1	14		Repeat	0.22	51.0	33.3	1.24	-0.13	0.09	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	36	60	04H	1	13		Repeat	0.19	64.0	35.1	1.39	-0.17	0.02	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	37	53	02H	1	13		Repeat	0.58	73.0	52.4	2.95	-0.35	0.23	6100	0.000	4936	0.000	6100	0.000	3818	0.000
2	37	68	03H	1	13		Repeat	0.16	28.0	17.3	0.57	-0.14	0.02	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	37	69	01H	1	14		Repeat	0.41	48.0	31.7	1.24	-0.27	0.14	6100	0.000	6100	0.000	6100	0.000	5776	0.000
2	37	69	01H	2	14		Repeat	0.32	46.5	34.5	1.75	0.04	0.36	6100	0.000	6100	0.000	6100	0.000	5816	0.000
2	37	69	03H	1	14		Repeat	0.27	28.0	14.5	0.76	0.01	0.28	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	37	70	01H	1	14		Repeat	0.35	64.0	51.8	2.65	-0.19	0.16	6100	0.000	5407	0.000	6100	0.000	4542	0.000
2	37	73	03H	1	14		Repeat	0.25	37.0	28.3	0.96	-0.09	0.16	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	37	74	03H	1	14		Repeat	0.41	48.0	37.0	1.57	-0.17	0.24	6100	0.000	6100	0.000	6100	0.000	5392	0.000
2	38	66	01H	1	13		Repeat	0.26	51.0	36.3	1.08	0.02	0.28	6100	0.000	6100	0.000	6100	0.000	5921	0.000
2	39	73	02H	1	14		Repeat	0.31	28.0	20.4	0.97	-0.31	0.00	6100	0.000	6100	0.000	6100	0.000	6100	0.000
2	39	73	02H	2	14		Repeat	0.25	48.0	39.1	1.70	0.03	0.28	6100	0.000	6100	0.000	6100	0.000	5828	0.000
2	43	49	03H	1	13		Repeat	0.30	51.0	40.6	1.62	-0.23	0.07	6100	0.000	6100	0.000	6100	0.000	5540	0.000
4	17	24	01H	1	16		Repeat	0.08	34.0	23.4	0.39	0.34	0.42	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	20	25	01H	1	16		Repeat	0.15	20.0	12.4	0.23	-0.72	-0.57	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	21	67	05H	1	39		Repeat	0.22	48.0	33.7	0.97	-0.21	0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	21	76	01H	1	17		Repeat	0.12	30.0	24.2	0.53	-0.13	-0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	21	84	01H	1	17		Repeat	0.15	39.5	30.3	0.74	-0.03	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	26	37	06H	1	39		Repeat	0.11	39.0	22.5	1.19	0.08	0.19	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	28	58	02H	1	16		Repeat	0.08	24.0	14.4	0.16	0.04	0.12	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	35	36	02H	1	16		Repeat	0.14	20.0	10.6	0.40	0.14	0.28	6100	0.000	6100	0.000	6100	0.000	6100	0.000



**Table 5 - 1R14 PWSCC ARC Summary of Analysis Results**

								Adjusted NDE						Condition Monitoring (WEC Model)				Operational Assessment (ANL/TW Model)			
SG	R	C	TSP	Crack No.	Cal	Plug reason	Ind cat	Length (in.)	Max. Depth (%)	Avg. Depth (%)	Max. Volts	From	To	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm	FS Burst Pressure psi	FS Leakage gpm	Total Length Burst Press. psi	Total Length Leakage gpm
4	35	56	02H	1	16		Repeat	0.08	26.0	15.7	0.37	0.02	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	35	56	03H	1	16		Repeat	0.10	20.0	10.4	0.32	-0.28	-0.18	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	35	56	03H	2	16		Repeat	0.10	28.0	18.5	0.44	0.00	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	35	61	02H	1	16		Repeat	0.10	37.0	25.5	0.36	-0.10	0.00	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	38	46	06H	1	16		Repeat	0.07	20.0	11.1	0.20	-0.06	0.01	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	38	46	06H	2	16		Repeat	0.06	20.0	10.0	0.27	0.17	0.23	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	38	69	02H	1	39		Repeat	0.12	47.0	33.4	0.67	-0.02	0.10	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	38	72	01H	1	17		Repeat	0.10	34.0	21.7	0.51	0.25	0.35	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	39	48	03H	1	16		Repeat	0.20	26.0	15.5	0.38	0.07	0.27	6100	0.000	6100	0.000	6100	0.000	6100	0.000
4	39	58	01H	1	16		Repeat	0.28	57.0	43.1	1.33	0.07	0.35	6100	0.000	6100	0.000	6100	0.000	5414	0.000
4	46	42	01H	1	16		Repeat	0.28	37.0	19.9	0.47	-0.28	0.00	6100	0.000	6100	0.000	6100	0.000	6100	0.000

**Table 6 – PWSCC ARC Repeat Indications - Comparison of CM versus Prior Cycle OA Projections and Cycle 14 Growth Rates**

SG	R	C	TSP	Crack No.	Ind cat	Total Length Burst Pressure CM versus OA Comparison (psi)							Growth Rate per EFPY (1.39 EFPY)			
						CM (WEC) psi	CM (ANL/TW) psi	Prior Cycle OA Projection (ANL/TW) psi	Prior Cycle OA Projection (WEC) psi	WEC CM minus ANL/TW OA	CM minus OA (ANL/TW)	CM minus OA (WEC)	Length (in)	Max Depth (%)	Average Depth (%)	Volt
1	3	28	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	-1.44	0.91	0.22
1	4	41	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.02	4.32	5.86	0.15
1	14	28	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	5.04	4.20	0.06
1	15	16	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.07	0.00	-0.30	0.09
1	15	76	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	5.04	3.04	0.20
1	17	16	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	1.44	0.66	0.12
1	19	15	03H	1	Repeat	6100	6100	5594	5858	506	506	242	-0.01	-0.72	-0.06	0.20
1	20	28	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.05	5.04	4.41	0.24
1	20	29	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	1.44	2.47	0.14
1	20	33	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	0.00	6.06	0.03
1	21	13	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	1.44	3.94	0.21
1	21	51	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	0.32	0.12
1	21	54	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.05	15.83	6.78	0.19
1	23	14	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	0.72	1.57	0.19
1	24	67	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.04	11.51	7.95	0.33
1	25	57	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	8.63	11.12	0.16
1	27	75	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	0.72	-1.02	0.03
1	29	37	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	5.04	8.68	0.17
1	30	21	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.04	2.88	3.39	0.10
1	30	59	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.04	-0.72	0.79	0.14
1	30	67	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.02	-9.35	3.26	0.22
1	34	24	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	5.04	9.06	0.12
1	34	24	03H	2	Repeat	6100	6100	6100	6100	0	0	0	0.04	10.79	8.70	0.10
1	35	59	03H	1	Repeat	6100	6100	5935	6100	165	165	0	0.01	0.72	2.32	0.38
1	38	41	04H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	0.72	6.39	0.22
1	39	57	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.05	1.44	-1.32	0.17
2	2	10	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	6.47	6.85	0.14

**Table 6 – PWSCC ARC Repeat Indications - Comparison of CM versus Prior Cycle OA Projections and Cycle 14 Growth Rates**

SG	R	C	TSP	Crack No.	Ind cat	Total Length Burst Pressure CM versus OA Comparison (psi)							Growth Rate per EFPY (1.39 EFPY)			
						CM (WEC) psi	CM (ANL/TW) psi	Prior Cycle OA Projection (ANL/TW) psi	Prior Cycle OA Projection (WEC) psi	WEC CM minus ANL/TW OA	CM minus OA (ANL/TW)	CM minus OA (WEC)	Length (in)	Max Depth (%)	Average Depth (%)	Volt
2	2	28	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.08	4.32	2.71	0.06
2	2	76	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	0.00	-0.21	0.08
2	2	78	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	0.00	-0.19	0.04
2	2	79	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.02	10.79	9.17	0.16
2	2	90	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	-1.80	-5.35	-0.05
2	2	90	04H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.04	7.91	6.17	0.12
2	2	90	04H	2	Repeat	6100	6100	6100	6100	0	0	0	0.06	-2.88	1.32	0.06
2	2	92	05H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	0.00	0.14	0.06
2	2	92	05H	2	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	-0.84	0.10
2	2	92	05H	3	Repeat	6100	6100	6100	6100	0	0	0	-0.07	1.08	5.21	0.10
2	2	93	04H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	6.12	3.24	0.11
2	3	46	7C	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	3.60	4.60	0.05
2	4	54	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	4.32	1.80	0.09
2	4	57	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	1.06	0.02
2	4	84	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	2.16	3.78	0.04
2	5	66	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	0.25	0.03
2	5	77	05H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	1.44	3.73	0.20
2	5	78	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	3.60	4.21	0.11
2	5	93	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.02	-0.72	0.93	0.33
2	6	55	7C	1	Repeat	6100	6100	6100	6100	0	0	0	-0.04	0.72	1.45	0.08
2	6	74	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	-1.03	0.11
2	6	74	03H	2	Repeat	6100	6100	6100	6100	0	0	0	-0.04	4.68	4.84	0.14
2	7	17	04H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	8.63	8.94	0.19
2	7	31	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	4.32	4.54	0.09
2	7	31	7C	1	Repeat	5217	4904	4624	4986	593	280	231	0.02	2.88	2.25	0.26
2	7	53	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	2.88	3.08	0.06
2	7	68	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	2.16	-0.80	-0.01
2	8	4	05H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	2.16	4.16	0.20

**Table 6 – PWSCC ARC Repeat Indications - Comparison of CM versus Prior Cycle OA Projections and Cycle 14 Growth Rates**

SG	R	C	TSP	Crack No.	Ind cat	Total Length Burst Pressure CM versus OA Comparison (psi)							Growth Rate per EFPY (1.39 EFPY)			
						CM (WEC) psi	CM (ANL/TW) psi	Prior Cycle OA Projection (ANL/TW) psi	Prior Cycle OA Projection (WEC) psi	WEC CM minus ANL/TW OA	CM minus OA (ANL/TW)	CM minus OA (WEC)	Length (in)	Max Depth (%)	Average Depth (%)	Volt
2	8	15	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	8.63	6.71	0.17
2	8	48	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.04	-1.44	0.68	0.10
2	8	55	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	4.32	3.44	0.24
2	8	57	01H	1	Repeat	5729	5417	4823	5091	906	594	638	-0.01	-0.72	1.13	0.24
2	8	66	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	-5.76	-3.03	0.21
2	8	82	04H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	0.80	0.06
2	8	93	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	3.24	2.66	0.27
2	9	27	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.03	0.00	0.81	0.04
2	9	30	01H	1	Repeat	5340	5050	4889	5141	451	161	199	0.06	4.32	2.25	0.24
2	9	38	02H	1	Repeat	5727	5469	4837	5163	890	633	564	-0.03	0.00	0.57	0.15
2	9	45	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.02	2.16	-1.23	0.12
2	9	53	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.05	2.16	1.88	0.09
2	9	56	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	0.00	3.40	0.26
2	9	82	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	1.44	5.55	0.12
2	10	49	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	2.16	-0.14	0.04
2	10	62	01H	1	Repeat	6100	6100	5645	5800	455	455	300	0.01	0.72	-1.51	0.15
2	10	67	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	-2.16	0.20	0.10
2	10	68	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	1.44	0.26	0.06
2	10	69	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	3.96	5.50	0.06
2	10	85	04H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	4.32	1.17	0.06
2	11	20	02H	1	Repeat	6100	6100	5615	5782	485	485	318	-0.02	2.16	1.50	0.08
2	11	45	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	-5.76	0.61	0.13
2	11	66	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	7.19	9.11	0.04
2	11	71	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	-0.72	0.48	0.07
2	11	71	01H	2	Repeat	6100	6100	6100	6100	0	0	0	-0.01	-2.16	-1.19	0.02
2	11	71	01H	3	Repeat	6100	6100	6100	6100	0	0	0	-0.01	1.44	1.80	0.01
2	11	71	01H	4	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	5.30	0.10
2	11	84	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	-0.72	-0.32	0.27

**Table 6 – PWSCC ARC Repeat Indications - Comparison of CM versus Prior Cycle OA Projections and Cycle 14 Growth Rates**

SG	R	C	TSP	Crack No.	Ind cat	Total Length Burst Pressure CM versus OA Comparison (psi)							Growth Rate per EFY (1.39 EFY)			
						CM (WEC) psi	CM (ANL/TW) psi	Prior Cycle OA Projection (ANL/TW) psi	Prior Cycle OA Projection (WEC) psi	WEC CM minus ANL/TW OA	CM minus OA (ANL/TW)	CM minus OA (WEC)	Length (in)	Max Depth (%)	Average Depth (%)	Volt
2	11	87	01H	1	Repeat	5565	5355	4449	4724	1116	906	841	-0.02	-1.44	-2.62	0.25
2	13	34	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.03	4.32	0.97	0.09
2	13	44	01H	1	Repeat	6100	5907	5496	5619	604	411	481	0.02	2.16	1.41	0.22
2	13	60	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.03	0.72	-0.09	0.02
2	14	16	04H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	10.79	12.31	0.14
2	14	45	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	0.00	2.14	0.05
2	14	58	04H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	5.76	6.09	0.07
2	14	68	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	0.00	-1.28	0.11
2	14	70	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	1.44	1.06	-0.01
2	14	74	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	4.68	4.20	0.10
2	16	12	05H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.03	7.91	5.78	0.06
2	16	59	02H	1	Repeat	5927	5754	6100	6100	-173	-346	-173	0.08	5.04	4.44	0.09
2	16	60	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	-2.16	-0.70	0.04
2	16	82	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	2.16	1.39	0.04
2	16	82	04H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.07	7.91	11.06	0.06
2	16	85	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	2.16	5.32	0.09
2	16	87	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.04	-0.72	0.53	0.15
2	16	88	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.04	3.60	2.57	0.14
2	16	88	02H	2	Repeat	6100	6100	6100	6100	0	0	0	-0.01	0.00	-3.71	0.06
2	17	9	06H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	0.00	-1.14	0.01
2	17	54	01H	1	Repeat	5393	5244	5072	5252	322	172	141	0.01	4.32	4.15	0.30
2	17	59	01H	1	Repeat	6100	6100	5740	5919	360	360	181	-0.03	0.00	0.49	0.02
2	17	66	01H	1	Repeat	6100	6100	5608	5870	492	492	230	0.02	0.00	-0.36	0.09
2	17	67	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	16.55	3.74	0.06
2	17	88	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.03	-2.16	-1.94	0.16
2	17	88	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	0.00	-0.23	0.18
2	18	64	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.04	0.72	-3.42	0.14
2	18	67	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	-2.16	4.14	0.29

**Table 6 – PWSCC ARC Repeat Indications - Comparison of CM versus Prior Cycle OA Projections and Cycle 14 Growth Rates**

SG	R	C	TSP	Crack No.	Ind cat	Total Length Burst Pressure CM versus OA Comparison (psi)							Growth Rate per EFPY (1.39 EFPY)			
						CM (WEC) psi	CM (ANL/TW) psi	Prior Cycle OA Projection (ANL/TW) psi	Prior Cycle OA Projection (WEC) psi	WEC CM minus ANL/TW OA	CM minus OA (ANL/TW)	CM minus OA (WEC)	Length (in)	Max Depth (%)	Average Depth (%)	Volt
2	19	34	02H	1	Repeat	6100	5825	5380	5711	720	446	389	0.01	-2.16	0.39	0.12
2	19	74	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	2.16	0.28	0.06
2	19	84	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.07	10.79	7.00	0.20
2	20	48	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	-3.60	-0.94	0.02
2	20	77	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	1.44	1.57	0.06
2	21	38	01H	1	Repeat	6100	5880	5480	5638	620	400	462	0.01	2.16	1.42	0.22
2	21	57	01H	1	Repeat	6100	5950	5421	5658	679	529	442	0.03	2.88	-0.91	-0.04
2	21	60	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	6.12	4.32	0.00
2	21	65	02H	1	Repeat	6100	6100	5375	5696	725	725	404	-0.01	2.88	-1.61	0.09
2	22	42	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	2.16	0.63	0.01
2	22	55	03H	1	Repeat	6100	6100	5842	6100	258	258	0	0.04	-2.16	0.48	0.14
2	23	25	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.07	-3.60	-0.34	0.03
2	23	54	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	6.47	4.32	0.07
2	23	79	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	4.32	3.66	0.06
2	24	77	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	4.32	4.74	0.09
2	25	17	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	0.00	1.53	0.09
2	25	50	02H	1	Repeat	5551	5337	4842	5054	708	495	497	0.03	2.16	0.35	0.14
2	25	55	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	-7.19	-2.82	0.04
2	25	79	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	11.51	7.83	0.29
2	25	79	02H	2	Repeat	6100	6100	6100	6100	0	0	0	0.01	12.23	8.17	0.53
2	25	85	04H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.04	4.68	5.81	0.19
2	25	87	04H	1	Repeat	6100	5850	5742	5862	358	108	238	0.03	3.60	3.03	0.21
2	26	22	04H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	6.47	2.16	0.12
2	26	39	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	6.47	5.78	0.09
2	26	73	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	1.44	-0.35	0.09
2	26	79	01H	1	Repeat	5672	5450	5363	5593	309	87	79	0.00	5.76	4.46	0.14
2	27	55	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	4.32	1.88	0.05
2	27	56	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.04	0.00	4.60	-0.10

**Table 6 – PWSCC ARC Repeat Indications - Comparison of CM versus Prior Cycle OA Projections and Cycle 14 Growth Rates**

SG	R	C	TSP	Crack No.	Ind cat	Total Length Burst Pressure CM versus OA Comparison (psi)							Growth Rate per EFPY (1.39 EFPY)			
						CM (WEC) psi	CM (ANL/TW) psi	Prior Cycle OA Projection (ANL/TW) psi	Prior Cycle OA Projection (WEC) psi	WEC CM minus ANL/TW OA	CM minus OA (ANL/TW)	CM minus OA (WEC)	Length (in)	Max Depth (%)	Average Depth (%)	Volt
2	27	63	02H	1	Repeat	5817	5753	5390	5496	427	363	321	0.01	5.04	2.06	0.43
2	27	63	02H	2	Repeat	6100	6100	5307	5787	793	793	313	-0.02	2.16	-3.15	0.10
2	27	64	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.10	-1.44	-4.90	0.07
2	27	65	02H	1	Repeat	5810	5578	5134	5410	676	444	400	-0.01	-0.72	1.32	0.40
2	27	67	01H	1	Repeat	6100	5887	5109	5387	991	777	713	-0.08	5.04	0.22	0.19
2	27	67	01H	2	Repeat	6100	6100	6100	6100	0	0	0	-0.01	2.16	1.73	0.09
2	27	67	04H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	7.91	7.27	0.20
2	27	69	01H	1	Repeat	4682	4452	4801	5011	-118	-349	-329	0.05	10.79	6.87	0.11
2	27	69	01H	2	Repeat	6100	6100	6100	6100	0	0	0	0.01	5.76	5.82	0.11
2	27	72	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	2.16	4.63	0.00
2	27	72	02H	2	Repeat	6100	6100	6100	6100	0	0	0	0.02	0.00	-0.93	-0.01
2	28	47	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	-1.44	2.01	0.12
2	28	66	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	2.16	3.95	0.12
2	29	51	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.05	0.72	1.29	0.05
2	29	66	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.07	0.72	3.82	0.15
2	30	56	01H	1	Repeat	5267	5007	4253	4571	1013	753	696	-0.02	-2.88	-0.64	-0.11
2	30	62	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	2.16	0.63	0.04
2	30	62	01H	2	Repeat	6100	6100	6100	6100	0	0	0	0.01	0.00	1.14	0.04
2	30	67	02H	1	Repeat	5231	5115	4737	4893	494	378	338	0.04	5.76	0.26	0.23
2	31	37	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	12.23	8.09	0.16
2	31	53	02H	1	Repeat	5915	5849	5294	5412	622	556	503	-0.01	2.16	0.32	0.10
2	31	68	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	10.07	6.43	0.08
2	32	30	02H	1	Repeat	5454	5322	5564	5742	-110	-241	-288	-0.01	11.51	8.49	0.27
2	32	37	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.04	2.88	1.93	0.08
2	32	44	04H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	-4.32	-3.14	0.06
2	32	47	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.06	2.16	1.31	0.04
2	32	59	04H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	2.88	1.07	0.07
2	32	62	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.06	3.24	2.29	0.06

**Table 6 – PWSCC ARC Repeat Indications - Comparison of CM versus Prior Cycle OA Projections and Cycle 14 Growth Rates**

SG	R	C	TSP	Crack No.	Ind cat	Total Length Burst Pressure CM versus OA Comparison (psi)							Growth Rate per EFY (1.39 EFY)			
						CM (WEC) psi	CM (ANL/TW) psi	Prior Cycle OA Projection (ANL/TW) psi	Prior Cycle OA Projection (WEC) psi	WEC CM minus ANL/TW OA	CM minus OA (ANL/TW)	CM minus OA (WEC)	Length (in)	Max Depth (%)	Average Depth (%)	Volt
2	33	57	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	-3.60	-2.74	0.00
2	33	69	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.05	-5.76	-8.48	0.14
2	33	71	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	6.83	3.75	0.08
2	33	72	04H	1	Repeat	6100	6100	6100	6100	0	0	0	0.02	1.44	1.43	0.00
2	34	36	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	10.79	8.73	0.17
2	34	42	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	0.00	1.90	0.04
2	34	47	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.02	0.00	3.16	0.14
2	34	51	06H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	4.32	4.86	0.11
2	34	53	02H	1	Repeat	4569	4282	4354	4627	215	-72	-58	0.04	7.19	5.02	0.40
2	34	53	02H	2	Repeat	6100	6100	6100	6100	0	0	0	0.05	7.91	6.97	0.22
2	34	55	01H	1	Repeat	5939	5807	5354	5544	585	453	395	0.01	-6.47	0.85	0.22
2	34	58	02H	1	Repeat	5826	5671	4944	5126	882	727	700	0.01	-5.76	-2.35	0.01
2	34	59	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	2.88	1.76	0.02
2	34	65	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	-2.16	-2.25	0.06
2	35	49	02H	1	Repeat	6100	5925	5879	6100	221	46	0	0.04	4.32	3.98	0.31
2	35	52	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	2.52	4.92	0.09
2	35	56	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.04	-9.35	-6.13	0.13
2	35	70	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	3.60	4.27	0.06
2	36	60	04H	1	Repeat	6100	6100	6100	6100	0	0	0	0.07	7.91	1.20	0.08
2	37	53	02H	1	Repeat	4936	4568	4197	4563	739	371	373	-0.01	6.47	2.36	0.41
2	37	68	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.06	-2.16	-3.07	0.10
2	37	69	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	1.44	4.20	0.14
2	37	69	01H	2	Repeat	6100	6100	6100	6100	0	0	0	0.01	4.68	4.53	0.10
2	37	69	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	-2.16	-2.67	-0.01
2	37	70	01H	1	Repeat	5407	5252	4994	5207	413	258	200	-0.02	4.32	4.44	0.16
2	37	73	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	7.91	7.95	0.08
2	37	74	03H	1	Repeat	6100	6100	5611	5936	489	489	164	0.01	3.60	3.79	0.01
2	38	66	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.04	-1.44	2.55	0.01



**Table 6 – PWSCC ARC Repeat Indications - Comparison of CM versus Prior Cycle OA Projections and Cycle 14 Growth Rates**

SG	R	C	TSP	Crack No.	Ind cat	Total Length Burst Pressure CM versus OA Comparison (psi)							Growth Rate per EFPY (1.39 EFPY)			
						CM (WEC) psi	CM (ANL/TW) psi	Prior Cycle OA Projection (ANL/TW) psi	Prior Cycle OA Projection (WEC) psi	WEC CM minus ANL/TW OA	CM minus OA (ANL/TW)	CM minus OA (WEC)	Length (in)	Max Depth (%)	Average Depth (%)	Volt
2	39	73	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	-3.60	1.70	0.17
2	39	73	02H	2	Repeat	6100	6100	6100	6100	0	0	0	-0.02	0.00	3.06	0.20
2	43	49	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	0.00	4.32	0.12
4	17	24	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	-3.60	-1.89	0.04
4	20	25	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	3.65	0.01
4	21	67	05H	1	Repeat	6100	6100	6100	6100	0	0	0	0.03	-2.16	-0.94	0.16
4	21	76	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.05	-2.88	1.71	-0.08
4	21	84	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	1.80	1.45	0.04
4	26	37	06H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	9.35	2.22	0.22
4	28	58	02H	1	Repeat	6100	6100	6100	6100	0	0	0	0.01	2.88	2.03	-0.09
4	35	36	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.06	0.00	2.09	0.02
4	35	56	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	4.32	0.81	0.04
4	35	56	03H	1	Repeat	6100	6100	6100	6100	0	0	0	0.00	0.00	2.32	0.05
4	35	56	03H	2	Repeat	6100	6100	6100	6100	0	0	0	-0.02	5.76	6.07	0.01
4	35	61	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	5.76	8.63	0.06
4	38	46	06H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.02	0.00	-1.75	-0.04
4	38	46	06H	2	Repeat	6100	6100	6100	6100	0	0	0	-0.02	0.00	-1.00	-0.06
4	38	69	02H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	10.07	6.36	0.08
4	38	72	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	-2.88	-3.34	0.02
4	39	48	03H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	-2.16	1.39	0.04
4	39	58	01H	1	Repeat	6100	6100	6100	6100	0	0	0	0.04	2.88	6.69	0.06
4	46	42	01H	1	Repeat	6100	6100	6100	6100	0	0	0	-0.01	7.19	4.31	0.05

**Table 7 – 1R14 TSP Circumferential Indications**

											Unadjusted NDE			Adjusted NDE			Adjusted for Upper 95% NDE Uncertainty			Growth Rate per EFPY			
SG	Row	Col	TSP	Crack	Elevation	Flaw Volt	Dent Volt	ID or OD	Stabilize	Mixed Mode	Angle deg	Max Depth %	Avg Depth %	Angle deg	Max Depth %	Avg Depth %	Angle deg	Max Depth %	Avg Depth %	Angle deg	Max Depth %	Avg Depth %	Volt
11	33	37	2H	1	0.03	0.91	4.95	ID			24.0	41.0	29.7	24.0	39.0	20.3	77.8	63.5	39.7	5.8	2.9	-1.2	0.39
12	4	75	1H	1	0.33	0.17	20.31	OD	Yes		37.9	98.0	65.0	37.9	76.0	61.4	176.1	90.7	69.8	-1.5	-7.1	-9.4	0.05
12	4	75	1H	2	0.42	0.14	20.31	OD	Yes		30.3	69.0	54.5	30.3	60.0	48.3	173.0	79.0	61.6	1.7	-8.3	-7.6	0.00
12	5	75	1H	1	0.34	0.37	33.85	OD			53.1	42.0	27.5	53.1	45.0	33.2	182.4	68.0	52.2	15.2	0.0	-0.8	0.06
12	6	75	1H	1	0.35	0.21	16.48	OD			30.6	29.0	12.6	30.6	45.0	37.6	173.1	68.0	54.9	-6.8	0.0	-0.3	0.01
12	10	67	2H	1	0.14	0.23	5.24	OD			26.0	49.0	24.7	26.0	45.0	35.1	171.2	68.0	53.4	1.8	0.0	0.1	0.02
12	11	82	4H	1	0.29	0.14	10.25	OD			46.0	48.0	31.5	46.0	45.0	36.8	179.5	68.0	54.4	7.5	0.0	-0.7	0.01
12	19	68	1H	1	-0.19	0.2	8.68	OD	Yes		42.1	57.0	43.7	42.1	49.0	38.1	177.9	70.9	55.3	5.0	-7.9	-6.1	0.06
12	19	68	1H	2	0.13	0.2	8.68	OD	Yes		23.0	46.0	29.6	23.0	45.0	34.1	170.0	68.0	52.8	2.4	0.0	0.8	0.03
12	19	68	1H	3	0.2	0.13	8.68	OD	Yes		42.1	47.0	27.7	42.1	45.0	38.9	177.9	68.0	55.7	5.0	-1.4	1.1	0.01
12	24	40	1H	1	0.25	0.29	8.64	OD			44.0	29.0	15.0	44.0	45.0	37.0	178.6	68.0	54.6	23.3	0.0	5.1	0.06
12	24	40	1H	2	0.27	0.24	8.64	OD			36.0	50.0	30.8	36.0	49.0	38.9	175.3	70.9	55.7	11.9	2.9	3.8	0.06
12	32	77	4H	1	0.3	0.1	24.99	OD			19.1	55.0	40.4	19.1	55.0	38.7	168.4	75.3	55.6	2.2	7.2	5.1	0.03
14	42	64	1H	1	0.3	0.26	11.61	OD	Yes		74.4	76.0	57.4	74.4	66.0	51.0	191.2	83.3	63.3	22.9	12.2	12.7	0.06

Note 1: Growth rate based on adjusted NDE, not the uncertainty adjusted NDE.

Note 2: Location (inch) is relative to the centerline of the tube support plate.

Note 3: Tube stabilization determined per evaluation by Westinghouse.

Note 4: There were no mixed mode indications (combined circumferential and axial indications at same TSP).

**Table 8**  
**PWSCC ARC Leak Rate Predictions**

			SLB Leak Rate (gpm at room temperature)			
Cycle	CM or OA	Type of Monte Carlo Analysis and Confidence Level	SG 1-1	SG 1-2	SG 1-3	SG 1-4
EOC-14	Prior cycle OA	Single Indication 95/95	0	0	NA	0
EOC-14	Prior cycle OA	Total SG 95/95 (POD 0.6)	0	1.35	NA	0
EOC-14	CM	Single Indication 95/50	0	0	NA	0
EOC-14	CM	Total SG 95/50 (POD 1.0)	0	0	NA	0
EOC-15	OA	Single Indication 95/95	0	0 (Note 1)	NA	0
EOC-15	OA	Total SG 95/95 (POD 0.6)	0	2.14	NA	0

Note 1: Single indication analyses projected a leak rate of 0.001 gpm for two indications in SG 1-2, for a total SG 1-2 leak rate of 0.002 gpm. However, these two indications were removed from service by tube plugging in 1R14, so the resulting single indication leak rate for SG 1-2 was 0 gpm.

**Table 9**  
**Comparison of Frequencies of 1R14 New and Repeat Axial PWSCC Indications as a Function of Average Depth**

AD% TW Bin	Frequency New	Frequency Repeat	Relative Percentage New vs Repeat
10	2	4	50%
15	4	35	11%
20	4	21	19%
25	2	35	6%
30	2	31	6%
35	1	26	4%
40	2	34	6%
45	0	9	0%
50	0	14	0%
55	0	6	0%
60	0	2	0%
Total	17	217	

Figure 1

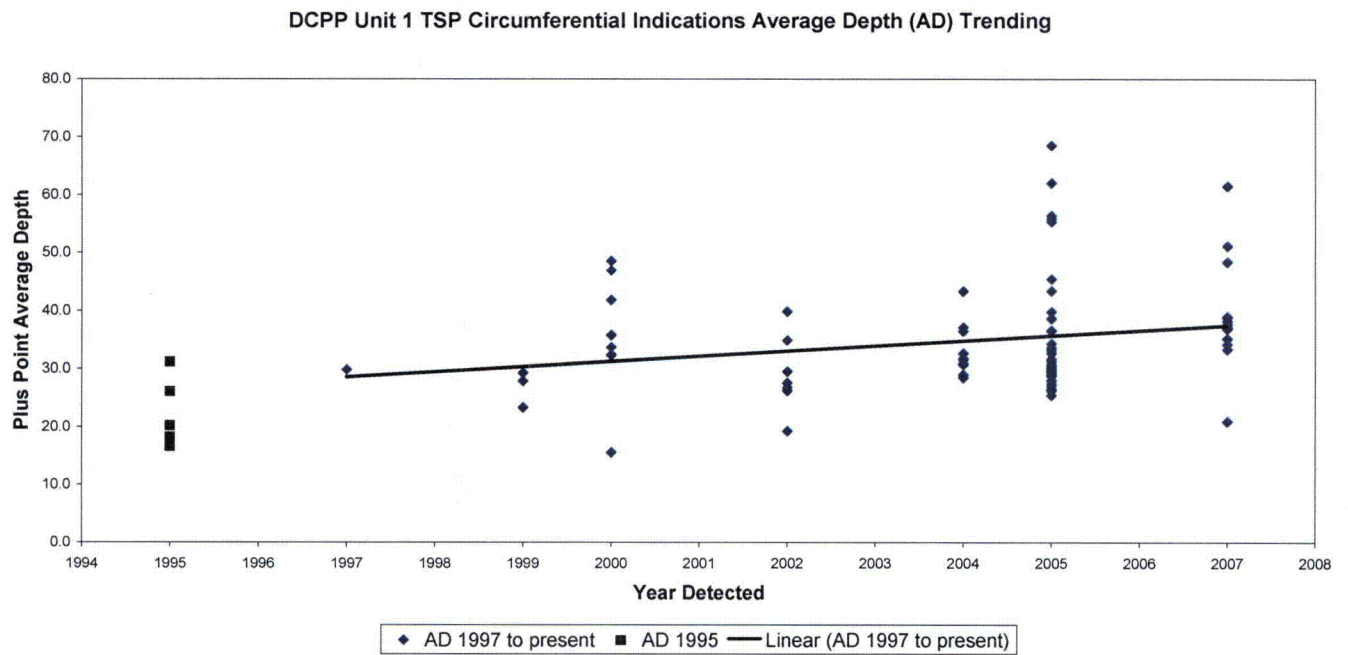
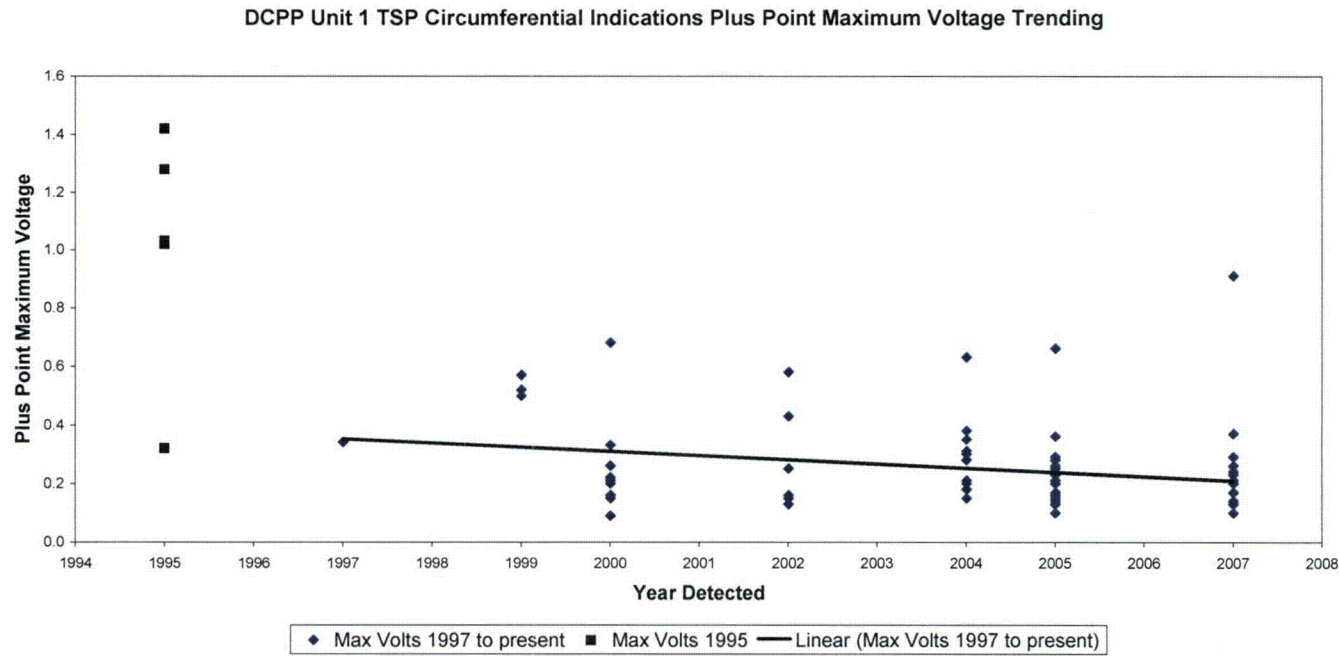
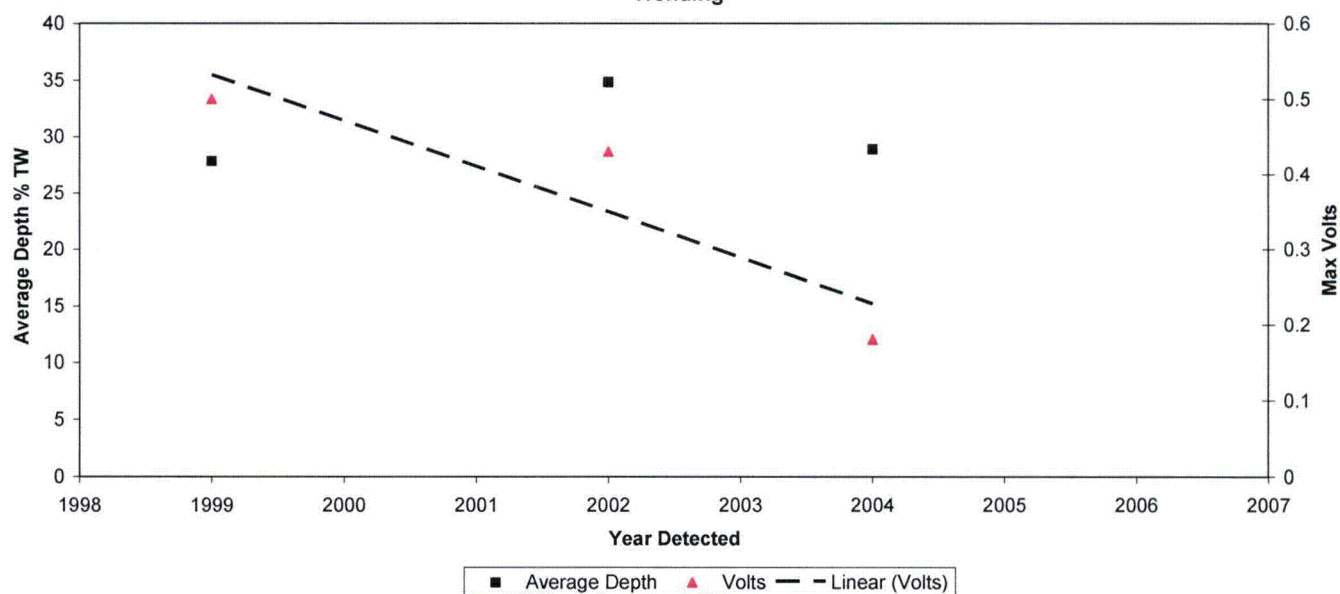


Figure 2



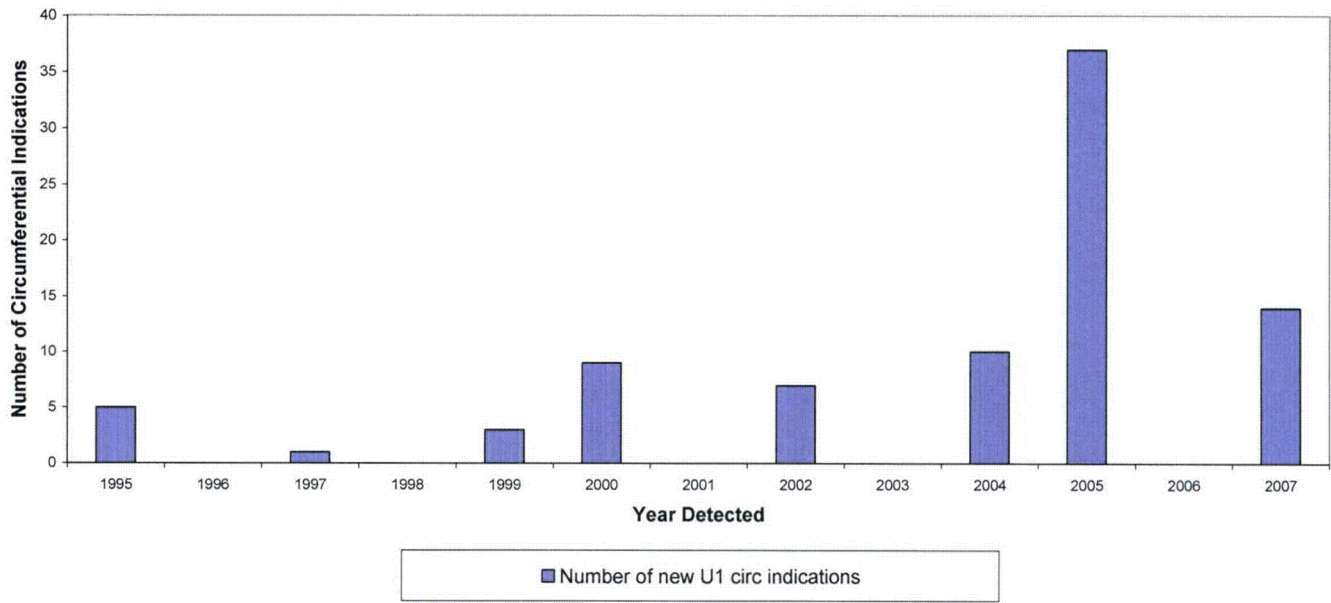
**Figure 3**

DCPP Unit 1 TSP PWSCC Mixed Mode - Circumferential Indications Average Depth and Maximum Volts  
Trending



**Figure 4**

DCPP Unit 1 Number of New TSP Circumferential Indications





**ENCLOSURE 3**

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