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PG&E Letter DCL-01-036

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Revision of Dent Inspection Program Requirements

Dear Commissioners and Staff:

On February 20, 2001, PG&E submitted License Amendment Request (LAR) 00-06, Supplement 2, in PG&E Letter DCL-01-016, "Supplement 2 to LAR 00-06, 'Alternate Repair Criteria for Axial PWSCC at Dented Intersections in Steam Generator Tubing,'" to incorporate an alternate repair criteria (ARC) for axial primary water stress corrosion cracking (PWSCC) at dented tube support plate intersections. Independent of the approval of LAR 00-06, DCL-01-016 also requested NRC approval of the following inspection requirements on a permanent basis: (1) the use of the bobbin coil for detection of axial PWSCC in less than or equal to 2 volt dented intersections, and (2) elimination of less than 2 inferred volt axial outside diameter stress corrosion cracking not detectable by bobbin (AONDB) at less than or equal to 5 volt dented intersections as a criterion for determining initial Plus Point inspection scope and expansion requirements.

The use of the bobbin coil for detection of axial PWSCC in less than or equal to 2 volt dents reflects a change to a current commitment that was established before validation of the bobbin technique was completed. PG&E is currently committed to use Plus Point for inspection of less than or equal to 2 volt dents to detect axial PWSCC as stated in PG&E Letter DCL-98-011, "Response to Request for Additional Information, LAR 97-03," dated January 30, 1998. LAR 97-03 was approved in Amendments Nos. 124 and 122 for Diablo Canyon Power Plant (DCPP) Units 1 and 2, respectively, by the NRC letter dated March 12, 1998. These amendments allowed implementation of voltage-based alternate repair criteria for outside diameter stress corrosion cracking indications at tube support plate (TSP) intersections. Section 3.1.2 of the NRC safety evaluation for these amendments approved the dent inspection program proposed by PG&E and stated: *"If changes in eddy current technology indicate that the bobbin coil probe can be qualified to detect degradation in dent signals of a particular voltage range, NRC staff would like to have the opportunity to review the qualification data before PG&E implements the technique."*

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In 1998, subsequent to the NRC safety evaluation for Amendments Nos. 124 and 122 for DCPD Units 1 and 2, respectively, bobbin coil probe qualification was completed for detection of axial PWSCC in less than or equal to 2 volt dent signals. The qualification is documented in Westinghouse report SG-99-01-004, "NDE Qualification of Bobbin Detection and +Point Detection/Sizing for Axial PWSCC at Dented TSP Intersections," dated February 4, 1999. This Westinghouse report was transmitted to the NRC in PG&E Letter DCL-99-122, "Bobbin Detection of Axial Primary Water Stress Corrosion Cracking in Steam Generator Tubes at Dented Tube Support Plate Intersections," dated September 21, 1999. Westinghouse reports WCAP-15573, Revision 0 (Proprietary) and WCAP 15574, Revision 0 (Nonproprietary), "Depth-Based SG Tube Repair Criteria for Axial PWSCC at Dented TSP Intersections - Alternate Burst Pressure Calculation," present the results of the performance test, which validated the bobbin technique. These reports were transmitted to the NRC in PG&E Letter DCL-01-021, "Transmittal of Revision 0 of WCAP-15573 (Proprietary) and WCAP-15574 (Nonproprietary), "Depth-Based SG Tube Repair Criteria for Axial PWSCC at Dented TSP Intersections - Alternate Burst Pressure Calculation", dated March 6, 2001. Based on the submittal of the supporting bobbin coil qualification and performance test data, PG&E requests approval to use the bobbin coil for detection of axial PWSCC in less than or equal to 2 volt dented intersections including the expansion program for detection of circumferential cracks in small dents as given in Enclosure 1.

Existing AONDB inspection requirements were established in PG&E Letter DCL-98-020, "Response to Request for Additional Information, License Amendment Request 97-03," dated February 9, 1998, prior to industry accepted practice for disposition of AONDB indications. Since that time, an industry-accepted practice for disposition of AONDB indications has been established in Addendum 3 to EPRI Report NP-7480-L, "Steam Generator Tubing ODSCC at Tube Support Plates for Alternate Repair Limits, Database Update 1999," November 1999. Based on this industry-accepted practice for disposition of AONDB indications, PG&E is requesting NRC approval of elimination of less than 2 inferred volt AONDB at less than or equal to 5 volt dented intersections as a criterion for determining initial Plus Point inspection scope and expansion requirements.

Enclosure 1 provides PG&E's proposed revised dent inspection criteria reflecting use of the bobbin coil for detection of axial PWSCC in less than or equal to 2 volt dented intersection, and elimination of less than 2 inferred volt AONDB at less than or equal to 5 volt dented intersections as a criterion for determining initial Plus Point inspection scope and expansion requirements. The changes in the commitments related to these revised dent inspection criteria have been evaluated and are acceptable as previously described in Letter DCL-01-016. These dent inspection criteria were based on a phone discussion with the NRC Staff on April 4, 2001.



As a result of discussions with NRC during the April 4, 2001 phone discussion, the minimum sample size for a 20 percent sample previously committed to be performed for the Plus Point greater than or equal to 5 volt dent program for Unit 1 is now being included in the inspection requirements for greater than 2 and less than 5 volt dents and less than 2 volt dents for both Units.

The proposed Plus Point dent inspection criteria include a clarification that the inspection requirements are based on where degradation was found in the prior outage. This will allow a gradual reduction in inspection scope over time if susceptible tubes are removed from service and degradation rates decline over time. This is considered acceptable since the hot and cold leg elevations where degradation occurs can change as tubes are removed from service.

PG&E desires to implement these revised criteria during the Diablo Canyon Power Plant Unit 2 tenth refueling outage, currently scheduled to begin on April 29, 2001. PG&E requests that the NRC provide approval before this date. No Technical Specification changes are required to implement the revised criteria.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lawrence F. Womack'.

Lawrence F. Womack
Vice President, Nuclear Services

cc: Edgar Bailey, DHS
Ellis W. Merschoff
David L. Proulx
Girija S. Shukla
Diablo Distribution

Enclosures
KJS

PG&E Proposed Dent Inspection Criteria

(Note: Technical changes to existing commitments are highlighted in bold italics.)

1. PLUS POINT DENTED TSP INSPECTION REQUIREMENTS

1.1 ≥ 5 Volt Dent Program – Unit 2

- 1.1.1 Plus Point inspections shall be conducted on 100 percent of ≥ 5 volt dents in the hot leg and cold leg.

1.2 ≥ 5 Volt Dent Program – Unit 1

- 1.2.1 On a SG-specific basis, Plus Point inspections shall be conducted on 100 percent of ≥ 5 volt hot leg dents up to the highest hot leg elevation where PWSCC (at any size dent), circumferential indications (at any size dent), or AONDB (at ≥ 5 volt dent) have been detected in that SG in the **prior** outage, plus 20 percent of ≥ 5 volt dents at the next TSP.

- a. If PWSCC (at any size dent), circumferential indications (at any size dent), or AONDB (at ≥ 5 volt dent) are detected in the 20% sample the expansion will continue up through the hot leg side of the SG and down the cold leg side until a 20% sample is obtained which is free from PWSCC, circumferential cracking or AONDB.

- 1.2.2 In each SG where 100% hot leg TSP Plus Point inspections are not required, Plus Point inspections shall be conducted on 20 percent of ≥ 5 volt dents at each hot leg TSP.

- 1.2.3 Note: For any 20 percent sample, a minimum of 50 ≥ 5 volt dents shall be inspected. If the population of ≥ 5 volt dents at that TSP is less than 50, then 100 percent of the ≥ 5 volt dents at that TSP shall be inspected.

1.3 > 2 and < 5 Volt Dent Program – both units

- 1.3.1 On a SG-specific basis, Plus Point inspections shall be conducted on 100 percent of > 2 and < 5 volt dents up to the highest hot leg elevation where PWSCC (at any size dent), circumferential indications (at any size dent), or ≥ 2 **inferred volt** AONDB (at > 2 and < 5 volt dent) have been detected in that SG in the **prior** outage, plus 20 percent of > 2 and < 5 volt dents at the next TSP.

- a. If PWSCC (at any size dent), circumferential indications (at any size dent), or ≥ 2 **inferred volt**

AONDB (at 2 to 5 volt dent) are detected in the 20% sample the expansion will continue up through the hot leg side of the SG and down the cold leg side until a 20% sample is obtained which is free from PWSCC, circumferential cracking, or **≥ 2 inferred volt AONDB**.

- 1.3.2 If a SG is free from PWSCC (at any size dent), circumferential indications (at any size dent), or **≥ 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.

- 1.3.3 ***Note: 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 is less than 50, then 100 percent of the > 2 and < 5 volt dents at that TSP shall be inspected.***

1.4 **≤ 2 Volt Dent Program – both units**

- 1.4.1 On a SG-specific basis, if bobbin coil is not relied upon for detection of axial PWSCC in **≤ 2 volt dents**:
- a. Plus Point inspections shall be conducted on 100 percent of **≤ 2 volt dents** up to the highest hot leg elevation where PWSCC (at any size dent), circumferential indications (at any size dent), or **≥ 2 inferred volt AONDB** (at **≤ 2 volt dent**) have been detected in that SG in the **prior** outage, plus 20 percent of **≤ 2 volt dents** at the next TSP.
 - b. If PWSCC (at any size dent), circumferential indications (at any size dent), or **≥ 2 inferred volt AONDB** (at < 2 volt dent) are detected in the 20% sample the expansion will continue up through the hot leg side of the SG and down the cold leg side until a 20% sample is obtained which is free from PWSCC, circumferential cracking or **≥ 2 inferred volt AONDB**.
 - c. If a SG is free from PWSCC (at any size dent), circumferential indications (at any size dent), or **≥ 2 inferred volt AONDB** (at **≤ 2 volt dent**), then Plus Point inspections shall be conducted on 20 percent of **≤ 2 volt dents** at 1H.
- 1.4.2 ***On a SG-specific basis, if bobbin coil is relied upon for detection of axial PWSCC in ≤ 2 volt dents:***

- a. ***If a circumferential indication or ≥ 2 inferred volt AONDB is detected in a dent of "x" volts in the prior or current outage, 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 ≥ 2 inferred volt AONDB was detected in that SG.***

1.4.3 Note: For any 20 percent sample, a minimum of $50 \leq 2$ volt dents shall be inspected. If the population of ≤ 2 volt dents at that TSP is less than 50, then 100 percent of the ≤ 2 volt dents at that TSP shall be inspected.

2. **PLUS POINT TSP INSPECTION REQUIREMENTS BASED ON BOBBIN INDICATIONS**

- 2.1 Plus Point inspections of TSP intersections shall be conducted based on the following bobbin inspection results:
- 2.1.1 All < 5 volt dent signals which contain bobbin indications that could remain in service under voltage based repair criteria.
 - 2.1.2 ≥ 2 volt bobbin distorted OD support signal (DOS) indications.
 - 2.1.3 Bobbin mix residual indications that could cause a 1.0 volt ODSCC indication (as measured with a bobbin probe) to be missed or misread.
 - 2.1.4 Bobbin indications in the wedge region exclusion zone and the 7th TSP bending exclusion zone.