

August 8, 2007

Mr. Jack S. Keenan
Senior Vice President and CNO
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Diablo Canyon Power Plant
P.O. Box 770000
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SUBJECT: DIABLO CANYON POWER PLANT, UNIT 1 - SUMMARY OF CONFERENCE
CALL REGARDING THE 2007 STEAM GENERATOR TUBE INSPECTIONS
(TAC NO. MD5549)

Dear Mr. Keenan:

On May 15, 2007, the Nuclear Regulatory Commission (NRC) staff, participated in a conference call with Pacific Gas and Electric (PG&E) to discuss the 2007 steam generator tube inspections performed at Diablo Canyon Power Plant, Unit 1, during their 14th refueling outage (1R14). To facilitate the phone call, PG&E was provided some discussion points for the call. On May 15, 2007, PG&E provided preliminary information regarding the results of its inspection. This information is attached as Enclosure 2.

Based on the information provided during the conference call, the NRC staff did not identify any issues that warranted additional follow-up at this time. Enclosure 1 is a summary of the conference call.

This completes our review of the preliminary results for the 2007 steam generator tube inspections at the Diablo Canyon Power Plant, Unit 1.

Sincerely,

/RA/

Alan B. Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-275

Enclosures: 1. Summary of Conference Call
2. PG&E Preliminary SG Inspection Results

cc w/encls: See next page

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NRC SUMMARY OF MAY 15, 2007, CONFERENCE CALL ON
STEAM GENERATOR TUBE INSPECTIONS FOR REFUELING OUTAGE 14
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON POWER PLANT, UNIT 1
DOCKET NO. 50-275

On May 15, 2007, the Nuclear Regulatory Commission (NRC) staff participated in a conference call with Diablo Canyon Power Plant, Unit 1, representatives regarding their 2007 steam generator (SG) tube inspections. A summary of the information discussed during the call is provided below.

The four SGs at Diablo Canyon Unit 1 are Westinghouse model 51. Each SG contains approximately 3400 mill-annealed Alloy 600 tubes. Each tube has a nominal outside diameter of 0.875 inches and a nominal wall thickness of 0.050 inches. Each tube is roll-expanded for approximately 2.75 inches from the bottom of the tubesheet, and is secured into the remaining portion of the tubesheet by the Westinghouse Explosive Tube Expansion (WEXTEx) process. The tubesheet is approximately 21 inches thick and each tube is expanded for essentially the full thickness of the tubesheet. Each SG contains seven carbon steel tube support plates with drilled holes through which the tubes pass. All four SGs are scheduled to be replaced during the next refueling outage in 2009.

In addition to a depth-based tube repair criteria, the licensee is authorized to apply the voltage-based tube repair criteria for predominantly axially-oriented outside diameter stress-corrosion cracking (ODSCC) within the tube support plates. The licensee is also authorized to implement an alternate repair criteria for primary water stress-corrosion cracking (PWSCC) indications at the tube support plate elevations and to leave certain flaws within the tubesheet region in service, provided they satisfy the W* repair criteria.

Prior to the call, the licensee was provided with discussion points to help facilitate the phone conference. In support of the phone call, the licensee provided a document that provided the inspection status as of May 15, 2007 (see Enclosure 2). At the time of the call, the eddy current inspections for Diablo Canyon Unit 1 were complete and repairs (tube plugging) were in progress. No unusual degradation or unexpected conditions were detected during the inspections. Most of the new indications were less than 0.5 volts.

Additional clarifying information or information not included in Enclosure 2 provided by the licensee is summarized below:

- Acronyms used by the licensee in the material they provided include: SG (steam generator), HTS (hotleg tubesheet), TSP (tube support plate), AVB (antivibration bar), SCC (stress corrosion cracking), DSI (distorted support indication), CLT (cold leg thinning), AONDB (axial ODSCC not detectable by bobbin), ET (eddy current testing), TTS (top of tubesheet), ARC (alternate repair criteria), ID (inside diameter), OD (outside diameter), DNT (dent), SAI (single axial indication), SPR

(support plate residual), NDD (no detectable degradation), and DIS (distorted ID support plate bobbin signal).

- The amount of primary-to-secondary leakage observed during cycle 14, just completed, was very small and was similar to that observed during prior cycles.
- A deviation from Electric Power Research Institute guidelines for secondary water chemistry has existed for many years.
- No additional indications were found in the expanded scope examinations performed in SG 1-1 and SG 1-3 at dented TSPs.
- Approximately 16 CLT indications that were greater than 1.5 volts were re-inspected with a rotating probe. There were no unusual results. There were 11 new CLT indications identified this outage and these were inspected with a rotating probe. The total population of tubes with known CLT is approximately 171.
- All crack-like indications not covered by an ARC are plugged.
- In Table 2, the DIS Overcall Rate should be 94 percent since 2 of the 32 DIS indications in less than 2 volt dents were confirmed as SAls. The DIS overcall rate is typical.
- In Table 2, the “axial PWSCC (New)” row should indicate that there were two indications in SG 1-1 and none in SG 1-3.
- In Table 2, there were a total of 13 circumferential ODSCC indications.
- Of the 219 axial PWSCC indications that were present since the prior outage, the worst underprediction in the burst pressure (from the projections based on the last inspection) was only approximately 300 pounds per square inch (psig).
- The number of axial-oriented ODSCC indications at the TSPs was less than the projections from the last inspection.
- The axial ODSCC indication in the sludge pile was approximately 1 inch above the TTS. The sludge pile extends to approximately 2-inches above the TTS. The sludge pile is considered small. This is the first time that an indication was found in the sludge pile. The indication was found with the rotating probe. The licensee concluded that this was not a free-span crack based on the location and the number of rotating probe exams performed in the free-span region (as a result of indications at tube supports (i.e., 2 inches above and below the support), the free-span ding sampling program, and the inspection of other bobbin indications in the free-span region).

- All of the volumetric OD indications were located at the TSP elevations. All indications were at the lower TSPs and associated with bobbin indications. The indications were attributed to intergranular attack or closely spaced axial ODS/SCC indications.
- The performance criteria associated with the steam line break and feedwater line break differential pressures are 3367 psig and 3790, psig, respectively (i.e., 1.4 times the differential pressure). The performance criteria associated with three times the normal operating differential pressure is 4473 psig.
- In Table 3, the projected (i.e., 2009) burst pressure for the tube in row 34 column 53 in SG 1-2 was 3582 psig based on the Argonne National Laboratory burst pressure model. This tube was plugged. The burst pressure for this indication (in the as-found 2007 condition) was slightly less than the projected burst pressure (based on the projection from the prior inspection in 2005).
- The axial indications in the sludge pile and at the TTS were small so the flaw dimensions were not profiled.
- All circumferential indications were considered small (i.e., less than the threshold value for in-situ pressure testing).

The NRC staff did not identify any issues that warranted follow-up action at this time; however, the NRC staff asked to be notified in the event that any unusual conditions were detected during the remainder of the outage.