

April 18, 2006

Mr. John S. Keenan
Senior Vice President and Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
P.O. Box 770000
San Francisco, CA 94177-0001

SUBJECT: DIABLO CANYON POWER PLANT, UNIT NO. 1 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING THE 2005 (1R13) STEAM
GENERATOR TUBE INSPECTIONS (TAC NO. MD0317)

Dear Mr. Keenan:

By letters dated November 25, 2005, and February 24, 2006, Pacific Gas and Electric Company, the licensee, submitted information summarizing the results of the 2005 steam generator (SG) tube inspections at Diablo Canyon Power Plant, Unit 1. These inspections were performed during the thirteenth refueling outage (1R13). In addition to these reports, the U.S. Nuclear Regulatory Commission (NRC) staff summarized additional information concerning the 2005 SG tube inspections at Diablo Canyon Power Plant, Unit 1, in a letter dated January 18, 2006.

The NRC staff has reviewed the above reports and has determined that it requires additional information to complete its review. A request for additional information is enclosed. This request was discussed with Tom Grozan of your staff on April 14, 2006, and it was agreed that a response would be provided within 60 days of receipt of this letter.

If you or your staff have any questions concerning the resolution of this matter, please contact Alan B. Wang at (301) 415-1445.

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

Enclosure: Request for Additional Information

cc w/encl: See next page

April 18, 2006

Mr. John S. Keenan
Senior Vice President and Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
P.O. Box 770000
San Francisco, CA 94177-0001

SUBJECT: DIABLO CANYON POWER PLANT, UNIT NO. 1 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING THE 2005 (1R13) STEAM
GENERATOR TUBE INSPECTIONS (TAC NO. MD0317)

Dear Mr. Keenan:

By letters dated November 25, 2005, and February 24, 2006, Pacific Gas and Electric Company, the licensee, submitted information summarizing the results of the 2005 steam generator (SG) tube inspections at Diablo Canyon Power Plant, Unit 1. These inspections were performed during the thirteenth refueling outage (1R13). In addition to these reports, the U.S. Nuclear Regulatory Commission (NRC) staff summarized additional information concerning the 2005 SG tube inspections at Diablo Canyon Power Plant, Unit 1, in a letter dated January 18, 2006.

The NRC staff has reviewed the above reports and has determined that it requires additional information to complete its review. A request for additional information is enclosed. This request was discussed with Tom Grozan of your staff on April 14, 2006, and it was agreed that a response would be provided within 60 days of receipt of this letter.

If you or your staff have any questions concerning the resolution of this matter, please contact Alan B. Wang at (301) 415-1445.

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

Enclosure: Request for Additional Information

cc w/encl: See next page

DISTRIBUTION:

PUBLIC

LPLIV Reading

RidsRegion4MailCenter (BJones)

RidsNrrLALFeizollahi

RidsNrrPMAWang

RidsAcrcAcnwMailCenter

RidsNrrDorl (CHaney/CHolden)

RidsNrrDorlLpl4 (DTerao)

RidsOgcRp

JMedoff

ADAMS Accession Number: **ML061070070**

| | | | |
|--------|------------|-------------|---------|
| OFFICE | LPL4/PM | LPL4/LA | LPL4/BC |
| NAME | AWang;mxr4 | LFeizollahi | DTerao |
| DATE | 4/18/06 | 4/18/06 | 4/18/06 |

OFFICIAL RECORD COPY

REQUEST FOR ADDITIONAL INFORMATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
2005 STEAM GENERATOR TUBE INSPECTIONS
DIABLO CANYON POWER PLANT, UNIT 1
DOCKET NO. 50-275
OPERATING LICENSE NO. DPR-80

By letters dated November 25, 2005 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML053410394), and February 24, 2006 (ADAMS Accession No. ML060660468), Pacific Gas and Electric Company, the licensee, submitted information summarizing the results of the 2005 steam generator (SG) tube inspections at Diablo Canyon Power Plant, Unit 1. These inspections were performed during the thirteenth refueling outage (1R13). In addition to these reports, the U.S. Nuclear Regulatory Commission (NRC) staff summarized additional information concerning the 2005 SG tube inspections at Diablo Canyon Power Plant, Unit 1, in a letter dated January 18, 2006 (ADAMS Accession No. ML053640392). The NRC staff has reviewed the above reports and has determined that the following information is required to complete its review:

Axial Primary Water Stress-Corrosion Cracking (PWSCC) Alternate Repair Criteria (ARC)

1. Please clarify the number of axial PWSCC indications detected and plugged during your 2005 inspections in 1R13. The NRC staff notes the following:

On page 2-5 of Enclosure 2 to your February 24, 2006, letter, 240 axial PWSCC indications were reported as being detected in 1R13.

On page 2-6 of Enclosure 2 to your February 24, 2006, letter, 217 axial PWSCC indications were reported as being left in service in 1R12. Of these, 17 were plugged.

On page 2-6 of Enclosure 2 to your February 24, 2006, letter, 25 new axial PWSCC indications were detected in 1R13 (25 + 217 = 242 not 240). Of these, five were plugged.

On page 2-7 of Enclosure 2 to your February 24, 2006, letter, 218 axial PWSCC indications were returned to service: 196 repeat, 2 repeat merged, and 20 new indications (198 returned to service + 17 plugged = 215 not 217).

On page 2-12 of Enclosure 2 to your February 24, 2006, letter, 240 axial PWSCC indications were reported as being detected in 1R13, 215 from repeat indications and 25 new indications.

ENCLOSURE

2. On page 2-8 of Enclosure 2 to your February 24, 2006, letter, it was indicated that the Cycle 13 growth rate data included 213 data points from repeat indications. Since there were 217 indications left in service, it is not clear why there were only 213 data points. Presumably part of this difference is that in two instances an intersection had two flaws during 1R12 and these two flaws subsequently merged and appeared as one indication in 1R13. Please clarify this discrepancy.
3. Please confirm that the column titled "1R13 OA (ANL/TW Model)" in Table 5 in Enclosure 2 to your February 24, 2006, letter, reflects the projection for the End-of-Cycle 14 (i.e., it uses the "1R14 Final OA" growth rate distribution in Table 2).
4. Given that it appears that the growth rate from Cycle 13 was greater than that in Cycle 12, discuss the need to account for this increasing growth rate from cycle-to-cycle in your analysis (i.e., similar to the delta-volts adjustment used in implementing the voltage-based ARC).
5. A number of circumferential indications were detected at the tube support plates elevations during the 1R13 inspections when compared to several previous years. Please discuss whether there was any specific reason for this trend (e.g., less noise in the eddy current data, expected increase in degradation with time, etc.).

Outside-Diameter Stress-Corrosion Cracking (ODSCC) ARC

1. Table 3-18 of Enclosure 4 to your February 24, 2006, letter, lists indications that were re-inspected following a failed probe wear check. In evaluating the data in Table 3-18, it appears that all indications are greater than 75 percent of the tube repair criteria (1.5 volts). Please confirm that the tubes re-tested with a "good (non-worn)" probe only had indications greater than 1.5 volts. If there were other indications (i.e., less than 1.5 volts), please update Table 3-18 and Figure 3-37 with this data. This analysis is consistent with the NRC staff's approval of the alternate probe wear criteria.
2. Table 3-19 of Enclosure 4 to your February 24, 2006, letter, shows that a 1.78 volt indication was detected during 1R13 in a tube that had been inspected with a worn probe during the prior inspection. With hindsight, please discuss whether an indication is present at this location in the 1R12 data and the size of this indication. Please discuss the extent to which probe wear may have been a reason for missing the indication at this location in 1R12 (if one was present).
3. The growth rate of axial indications that were detected by bobbin in 1R13 and were only detectable with a rotating probe in 1R12 axial ODSCC indications not detected by bobbin (AONDBs) is approximately 50 percent than that of the population of indications detected by bobbin in both outages. Some of the larger growth rate differences were in tubes in which the 1R13 bobbin voltage was influenced by the presence of a dent. Since the reason for the analysis of the AONDB voltage changes is to determine whether the use of the rotating probe to bobbin voltage correlation is reasonable, discuss whether additional limitations should be placed on the use of the correlation (i.e., to those intersections where the dent would not significantly influence the voltage). In addition, discuss whether additional limitations are needed on this correlation for multiple axial indications since these indications had some of the largest growth rate

differences. The NRC staff notes that comparing “inferred to inferred” bobbin voltages could be misleading since the whole purpose of the correlation is to determine the “true” bobbin voltage (which is directly related to the integrity of the flaw). In addition, discuss whether Figure 3-39 should be used to place an upper limit on the inferred bobbin voltages beyond which the affected indication would be removed from service (i.e., at an inferred bobbin voltage of approximately 0.6 volts, the measured bobbin voltage could exceed 2.0 volts, which is the plugging limit).

With respect to Table 3-23 of Enclosure 4 to your February 24, 2006, letter, please clarify the following column: “Cycle 13 Avg Voltage Change (w/EFPY).”

4. Figure 6-1 of Enclosure 4 to your February 24, 2006, letter, indicates that for the recently completed cycle that the probability of detecting larger voltage indications may be declining. In light of this potential decrease in performance, discuss why the composite probability of prior cycle detection curve was used in the End-of-Cycle 14 projections rather than the data from the recently completed cycle (labeled as “1R12 POPCD” in Figure 6-1). Please clarify the nomenclature in Table 6-8, Table 7-1, and Figure 6-1 of Enclosure 4 to your February 24, 2006, letter. For example, is the “composite POPCD through 1R13 (Eight Inspections)” in Figure 6-1 identical to the “Updated POPCD through 1R12 (8 inspections)” in Table 6-8 (and similarly in Table 7-1).

Other Inspection Findings (not related to an ARC)

1. Three tubes were preventively plugged in 1R13. Please discuss the reason for plugging these tubes.
2. Please discuss the process used for determining an indication is a result of cold-leg thinning. For example, discuss how the shape, phase angle, and amplitude of the signal are evaluated to result in a classification of cold-leg thinning.

Diablo Canyon Power Plant, Units 1 and 2

cc:

NRC Resident Inspector
Diablo Canyon Power Plant
c/o U.S. Nuclear Regulatory Commission
P.O. Box 369
Avila Beach, CA 93424

Sierra Club San Lucia Chapter
ATTN: Andrew Christie
P.O. Box 15755
San Luis Obispo, CA 93406

Ms. Nancy Culver
San Luis Obispo
Mothers for Peace
P.O. Box 164
Pismo Beach, CA 93448

Chairman
San Luis Obispo County
Board of Supervisors
1055 Monterey Street, Suite D430
San Luis Obispo, CA 93408

Mr. Truman Burns
Mr. Robert Kinosian
California Public Utilities Commission
505 Van Ness, Room 4102
San Francisco, CA 94102

Diablo Canyon Independent Safety
Committee
ATTN: Robert R. Wellington, Esq.
Legal Counsel
857 Cass Street, Suite D
Monterey, CA 93940

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Harris Tower & Pavillion
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Richard F. Locke, Esq.
Pacific Gas & Electric Company
P.O. Box 7442
San Francisco, CA 94120

City Editor
The Tribune
3825 South Higuera Street
P.O. Box 112
San Luis Obispo, CA 93406-0112

Director, Radiologic Health Branch
State Department of Health Services
P.O. Box 997414, MS 7610
Sacramento, CA 95899-7414

Mr. James D. Boyd, Commissioner
California Energy Commission
1516 Ninth Street (MS 31)
Sacramento, CA 95814

Mr. James R. Becker, Vice President
Diablo Canyon Operations
and Station Director
Diablo Canyon Power Plant
P.O. Box 3
Avila Beach, CA 93424

Jennifer Tang
Field Representative
United States Senator Barbara Boxer
1700 Montgomery Street, Suite 240
San Francisco, CA 94111

March 2006