May 2, 2007

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. 2 - REQUEST FOR ADDITIONAL INFORMATION REGARDING 2006 STEAM GENERATOR TUBE INSPECTIONS (TAC NO. MD2912)

Dear Mr. Keenan:

By letters dated May 19, August 21, and November 17, 2006, Pacific Gas and Electric Company (the licensee) submitted information summarizing the results of the 2006 steam generator (SG) tube inspections at Diablo Canyon Power Plant (Diablo Canyon), Unit No. 2. These inspections were performed during the thirteenth refueling outage (2R13). In addition to these reports, the U.S. Nuclear Regulatory Commission (NRC) staff summarized additional information concerning the 2006 SG tube inspections at Diablo Canyon, Unit No. 2, in a letter dated August 24, 2006.

The NRC staff has determined that we require additional information to complete our review of the SG inspection results. A request for additional information is enclosed. This request was discussed with Tom Grozan of your staff on May 1, 2007, 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, 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. 50-323

Enclosure: Request for Additional Information

cc w/encl: See next page

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ADAMS Accession Number: ML071090317 * See Memo dated 4/16/07

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REQUEST FOR ADDITIONAL INFORMATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

2006 STEAM GENERATOR TUBE INSPECTIONS

DIABLO CANYON POWER PLANT, UNIT NO. 2

DOCKET NO. 50-323

OPERATING LICENSE NO. DPR-82

By letters dated May 19 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML061450136), August 21 (ADAMS Accession No. ML062400518), and November 17, 2006 (ADAMS Accession No. ML063320484), Pacific Gas and Electric Company (the licensee) submitted information summarizing the results of the 2006 steam generator (SG) tube inspections at Diablo Canyon Power Plant, Unit No. 2 (DCPP). These inspections were performed during the thirteenth refueling outage (2R13). In addition to these reports, the U.S. Nuclear Regulatory Commission (NRC) staff summarized additional information concerning the 2006 SG tube inspections at DCPP in a letter dated August 24, 2006 (ADAMS Accession No. ML062370004).

In order for the NRC staff to complete its review of these reports, we request responses to the following questions:

W* Alternate Repair Criteria (ARC)

1. In the development of the growth rate distribution for implementation of the W* ARC, it was indicated that the growth rate data for one single axial indication was excluded because two indications merged in Cycle 13. Since merging of indications can occur in the future, please discuss whether the "growth rate" for this indication was consistent with the growth rates for the remaining indications.

Axial Primary Water Stress-Corrosion Cracking (PWSCC) ARC

1. In the tube at Row 10, Column 30, in SG 2-2, one circumferential outside diameter stress-corrosion cracking (ODSCC) indication, one circumferential PWSCC indication, and one axial PWSCC indication were located at the first hot-leg support plate elevation. In assessing whether these indications would interact, you considered the potential for each of the circumferential indications to independently interact with the axial indication. Please discuss whether the circumferential indications could interact (i.e., merge) and then affect the burst pressure of the axial indication. In addition, please discuss why nondestructive examination (NDE) uncertainty was not included in this assessment.

2. In Table 1 of Enclosure 2 to the August 21, 2006, letter, it was indicated that a 20-percent sample of the dents at the sixth hot-leg tube support was to be performed (refer to the footnotes); however, the table does not indicate that any exams were performed at the sixth hot-leg tube support. Please explain. If there are no dents at the

sixth hot-leg tube support, please discuss why a 20-percent sample was not performed at the seventh hot-leg tube support.

3. If the circumferential indications detected at the tube support plate elevations in 1996 are ignored (since they may represent an inspection transient), there appears to be an increase in the number of circumferential indications at the tube support plate elevations. Please discuss any insights into this trend. In addition, please discuss any insights into the increase in the average depth of newly detected circumferential indications. For example, did the chemical cleaning performed in 2R12 improve the ability to detect these flaws?

4. Regarding Table 6 of Enclosure 2 to the August 21, 2006, letter (which was superceded by Table 5 in Enclosure 1 to the November 17, 2006, letter), please discuss the difference between the "Adjusted for Upper 95% NDE Uncertainty" and "ODSCC Adjusted for Upper 95% NDE Uncertainty Mix Mode Only" columns. In addition, please discuss which assessments use the data in these columns.

ODSCC ARC

1. In 2R12, a 1.37 volt indication was missed (refer to page 18 of Enclosure 3 to the August 21, 2006, letter). Please discuss whether there were any complicating factors associated with this signal (or as your report suggests that this was just a missed indication as a result of the probability of detection).

2. Referring to Table 3-6 of Enclosure 3 to the August 21, 2006, letter, the average beginning of cycle voltage for Cycle 13 is larger than in prior cycles; however, the average growth has decreased substantially. Please discuss any insights into this trend. For example, were a large number of "larger" voltage indications detected during 2R13 whose prior voltages were near the voltage reported in 2R13 such that the overall growth rate was low.

3. In Section 5.2 of Enclosure 3 to the August 21, 2006, letter, it was noted that the composite probability of prior cycle detection (POPCD) data for eight inspections was used in the benchmarking. Please confirm that this composite curve includes only data that would have been available at the time the projections were being made (i.e., it does not include POPCD data from a subsequent inspection). If this POPCD data does contain information obtained in a subsequent inspection, please evaluate the effects if only the POPCD data available prior to the 2R13 inspections was used.

Other Inspection Findings (not related to an ARC)

1. Two axial ODSCC indications associated with dings were identified with a bobbin coil probe. These indications were found on the cold-leg side of the tube. No similar occurrences of cracking at free-span dings have been observed at DCPP. Given that these initial indications were found on the cold-leg rather than the hot-leg highlights that the prediction of areas susceptible to cracking requires consideration of the material, the environment, and the stresses. Given that your dent and ding sampling strategies are

primarily predicated on temperature being the main contributor to cracking, discuss whether these findings have resulted in changes to your inspection strategies. The NRC staff recognizes there are no additional inspections planned for the Unit 2 SGs.

2. In response to the axial indications identified at the dings, the rotating probe inspection sample of greater than 5 volt dings was expanded to 100-percent in the two SGs in which these indications were detected. Given the limited number of locations that would be expected to have this degradation mechanism, please address whether a 20-percent sample (in the unaffected SGs) is adequate to detect this mechanism. Similarly, given the potential for circumferential cracking at dings (most likely only affecting a small number of tubes), discuss whether a 20-percent sampling strategy is adequate for detecting circumferentially oriented indications in dings (for dings with voltages above 5 volts and for dings with voltages less than 5 volts).

3. On page 18 of Enclosure 1 to the November 17, 2006, letter, it was indicated that condition monitoring and an operational assessment are not required for preventive plugging of a tube (referring to a tube in Row 2 that was plugged due to noisy data). From the NRC staff's perspective, condition monitoring and an operational assessment should be performed on all tubes. It is possible that noise in the eddy current data could be masking a flaw. If the flaw were significant enough, it may call into question the adequacy of the inspections or the time interval between inspections (i.e., cycle length). Please discuss whether the noise in the data in the tube that was preventively plugged could have been masking a significant flaw that may call into question the adequacy of your inspection intervals.

4. Given the finding of cracking on the cold-leg side of the SG, discuss the need to perform random rotating probe examinations of potential cold-leg thinning indications to confirm the continued absence of cracking at these locations.

5. Several new ligament gaps were identified in the tube support plates. In some cases these indications were fairly large (60 to 85 degrees). Please discuss any insights on why these gaps were not identified in the prior inspections.

6. Please summarize the nature of the SG upper internals maintenance activities referenced on page 32 of Enclosure 1 to the November 17, 2006, letter.

7. Regarding the turbo-mix referenced on page 34 of Enclosure 1 to the November 17, 2006, letter, please discuss how this method was qualified for detecting potential loose parts or wear near the top of the tubesheet.

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

Antonio Fernández, 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 56
Avila Beach, CA 93424

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