

August 24, 2007

Mr. John S. Keenan  
Senior Vice President – Generation  
and Chief Nuclear Officer  
Pacific Gas and Electric Company  
Diablo Canyon Power Plant  
P.O. Box 770000, Mail Code B32  
San Francisco, CA 94177-0001

SUBJECT: DIABLO CANYON POWER PLANT, UNIT NO. 2 - EVALUATION REGARDING  
THE 2006 (2R13) STEAM GENERATOR TUBE INSPECTIONS (MD2912)

Dear Mr. Keenan:

By letters dated May 19, 2006 (Agencywide Document Access and Management System (ADAMS) Accession No. ML061450136), August 21, 2006, (ADAMS Accession No. ML062400518), November 17, 2006 (ADAMS Accession No. ML063320484), and July 9, 2007 (ADAMS Accession No. ML072040054), 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 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 Power Plant, Unit 2 in a letter dated August 24, 2006 (ADAMS Accession No. ML062370004).

The NRC staff has completed its review of these reports and concludes that the licensee provided the information required by its technical specifications. In addition, the NRC staff concludes that there are no technical issues that warrant follow-up action at this time since the inspections appear to be consistent with the objective of detecting potential tube degradation and the inspection results appear to be consistent with industry operating experience at similarly designed and operated units. The NRC staff's review of the reports is enclosed.

If you have any questions regarding this matter, please contact me at (301) 415-1445.

Sincerely,

**/RAI**

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

Docket No. 50-323

Enclosure: SG Tube Inspections

cc: See next page

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NRR-106

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Diablo Canyon Power Plant, Units 1 and 2

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SUMMARY OF 2006 STEAM GENERATOR TUBE INSPECTIONS AT  
DIABLO CANYON POWER PLANT, UNIT 2  
DOCKET NO. 50-323

By letters dated May 19, 2006 (Agencywide Document Access and Management System (ADAMS) Accession No. ML061450136), August 21, 2006, (ADAMS Accession No. ML062400518), November 17, 2006 (ADAMS Accession No. ML063320484), and July 9, 2007 (ADAMS Accession No. ML072040054), 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 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 2 in a letter dated August 24, 2006 (ADAMS Accession No. ML062370004).

The SG's at Diablo Canyon Power Plant, Unit 2 are Westinghouse Model 51. Each SG contains 3388 mill annealed Alloy 600 tubes. Each tube has a nominal outside diameter (OD) of 0.875-inch and a nominal wall thickness of 0.050-inch. The tubes are supported by a number of carbon steel tube support plates and Alloy 600 antivibration bars. The tubes were explosively expanded into the tubesheet at both ends for the full length of the tubesheet.

The licensee provided the scope, extent, methods, and results of their SG tube inspections in the documents referenced above. In addition, the licensee described corrective actions (i.e., tube plugging) taken in response to the inspection findings.

As a result of the review of the reports, the NRC staff has the following comments/observations:

One tube (row 10, column 30 in SG 2) was identified as having a circumferential OD stress corrosion cracking (ODSCC) indication, one circumferential primary water stress-corrosion cracking (PWSCC) indication, and one axial PWSCC indication at the first hot-leg tube support plate elevation.

Four circumferential indications found during the 2R13 outage had maximum and average depth combinations that were under predicted. This included three ODSCC indications and one PWSCC indication. The licensee did not modify their predictive methodology, in part, because the reported voltage of these indications were small and could result in overly-conservative depth estimates and the indications were short (less than 32-degrees).

Two axial ODSCC indications were detected with a bobbin probe at ding locations. These dings were on the cold-leg side of the SG. This is the first instance of cracking at dings at either Diablo Canyon Power Plant, Units 1 or 2. This is significant since the cracking first occurred on the cold-leg rather than the hot-leg demonstrating that factors other than temperature (e.g., water chemistry, stresses) are important in assessing the susceptibility of a location to cracking.

In response to some of the inspection findings during 2R13, the licensee modified its inspection plan for the subsequent outage at Unit 1 (denoted 1R14). For example, the licensee modified its inspection plans to address the potential for cracking at free span, paired dings and to address the potential for cracking to occur at dings on the cold-leg side of the SG before they are observed on the hot-leg. Since the licensee plans to replace the SGs during their next Diablo Canyon Power Plant, Unit 2 outage (in 2008), no subsequent inspections are planned for the current Diablo Canyon Power Plant, Unit 2 SGs.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by their technical specifications. In addition, the NRC staff concludes that there are no technical issues that warrant follow-up action at this time since the inspections appear to be consistent with the objective of detecting potential tube degradation and the inspection results appear to be consistent with industry operating experience at similarly designed and operated units.