

October 26, 2006

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

SUBJECT: DIABLO CANYON POWER PLANT, UNIT NOS. 1 AND 2 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING THE STEAM GENERATOR TUBE
INTEGRITY TECHNICAL SPECIFICATION AMENDMENT (TAC NOS. MD2132
AND MD2133)

Dear Mr. Keenan:

By letter dated May 30, 2006, Pacific Gas and Electric Company (the licensee) submitted a license amendment request regarding the steam generator tube integrity technical specifications for the Diablo Canyon Power Plant, Unit Nos. 1 and 2. The licensee stated that the proposed amendment is modeled after Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, "Steam Generator Tube Integrity," Revision 4.

The Nuclear Regulatory Commission staff has reviewed the May 30, 2006, amendment request and has determined that we require additional information to complete our review. A request for additional information is enclosed. This request was discussed with Tom Grozan of your staff on October 4, 2006, and it was agreed that a response would be provided within 45 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 Nos. 50-275 and 50-323

Enclosure: Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
STEAM GENERATOR TUBE INTEGRITY TECHNICAL SPECIFICATION AMENDMENTS
DIABLO CANYON POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-275 AND 50-323
OPERATING LICENSE NOS. DPR-80 AND DPR-82

By letter dated May 30, 2006 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML061570107), Pacific Gas and Electric Company (the licensee) submitted a license amendment request regarding the steam generator (SG) tube integrity technical specifications (TSs) for the Diablo Canyon Power Plant, Unit Nos. 1 and 2. The licensee stated that the proposed amendment is modeled after Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, "Steam Generator Tube Integrity," Revision 4 (ADAMS Accession No. ML051090200).

1. Per your proposed structural integrity performance criterion, a safety factor of 1.4 against burst will be applied to the design basis accident primary-to-secondary pressure differentials. However, Generic Letter (GL) 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking," indicated that there is a possibility that a tube may have a burst-pressure less than 1.4 times the steamline break pressure differential (given the uncertainties associated with the various correlations); therefore, the GL 95-05 alternate repair criteria (ARC) imposed a limit on the probability of burst (POB) of 1×10^{-2} . As a result, it is not clear from your submittal that the structural integrity performance criteria is complete since it does not fully address all the performance criteria for implementation of the voltage-based ARC. Please discuss your plans to modify the performance criteria to fully address the voltage-based ARC. For example, discuss your plans for modifying the structural integrity performance criteria to indicate that for predominantly axially-oriented outside-diameter stress-corrosion cracking (ODSCC) at the tube support plate elevations, the POB of one or more indications given a steamline break shall be less than 1×10^{-2} .

Upon incorporation of this criterion into the structural integrity performance criterion, please discuss your plans to eliminate the associated reporting requirement in proposed TS 5.6.10.b.3 since operation in excess of this limit will not be permitted.

Wording such as the following may address the above questions/comments:

"This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differential and in a safety factor of 1.4 against burst applied to the design basis accident primary-to-secondary pressure differentials."

ENCLOSURE

“When alternate repair criteria discussed in Specification 5.5.9.c.1 are applied to axially-oriented outside diameter stress corrosion cracking indications at tube support plate locations, the probability that one or more of these indications in a SG will burst under postulated main steamline break conditions shall be less than 1×10^{-2} .”

The Nuclear Regulatory Commission (NRC) staff notes that similar modifications may need to be made to reflect the performance criteria associated with implementation of the axial primary water stress-corrosion cracking (PWSCC) depth-based repair criteria. Incorporation of these criteria may also eliminate the need for the reporting requirements in proposed TS 5.6.10.e.1.

2. Proposed TS 5.5.9.b.2 describes the accident-induced leak rate limit. There is an exception allowed to the 1 gallon per minute (gpm) limit that references paragraph c of this TS section. Since TS paragraph c addresses all degradation mechanisms, please discuss your plans to modify your submittal to be more specific with respect to which degradation mechanisms the 1 gpm limit does not apply. In addition, as currently written it appears that the second sentence of the accident-induced leakage performance criteria essentially limits leakage from all sources to 10.5 gpm. This sentence is inconsistent with TSTF-449 which is intended to limit leakage from non-alternate tube repair criteria sources to 1 gpm. Please discuss your plans to modify the submittal to address this issue.

In addition, it appears that you have made the second sentence an interpretation of your current design and licensing basis. The NRC staff notes that the second sentence in the accident-induced leakage performance criteria in TSTF-449 is not intended to be an interpretation of the current design and licensing basis. Rather, the second sentence (in the accident-induced performance criteria in TSTF-449) is intended to ensure that the potential for induced leakage during severe accidents will be maintained at a level that will not increase risk. This is discussed in the NRC staff’s model safety evaluation on TSTF-449. As a result, please discuss your plans to modify your proposal to be consistent with TSTF-449 or justify why only a limit on the “faulted” SG is considered necessary to maintain risk at acceptable levels during the severe-accident scenarios discussed in the NRC staff’s model safety evaluation on TSTF-449.

Wording such as the following may address the above questions/comments:

“Except during a steam generator tube rupture, leakage from all sources, excluding the leakage attributed to the degradation described in TS Section [insert appropriate Sections], is also not to exceed 1 gallon per minute per SG.”

The NRC staff notes that reference to the 10.5 gpm limit in your current proposal is not needed since this should be consistent with your current accident analysis (which is addressed by the first sentence in your proposed accident-induced leakage performance criterion). The NRC staff also notes that your Bases may need to be revised to clarify this issue.

3. With respect to proposed TS 5.5.9.c.1, please address the following:
 - a. The second sentence of the introductory paragraph in this section states that the plugging (repair) limit at tube support plate intersections is based on maintaining SG tube serviceability. Please discuss your plans for removing the phrase “maintaining SG tube serviceability,” since serviceability is not defined in your proposed TS. In addition, this sentence references the “plugging limit.” Since this term is no longer defined, discuss your plans to replace it with “repair criteria.”
 - b. In several locations in this section, the proposed TS uses the phrase “the lower voltage repair limit (Note 1).” Please discuss your plans for removing this phrase and replacing it with “2.0 volts,” since this is the value applicable to Diablo Canyon. Keeping Note 1 complicates the proposed TS.
 - c. Proposed TS 5.5.9.c.1.b and TS 5.5.9.c.1.c reference the repair of tubes. Since Diablo Canyon does not have an option for tube repair (i.e., sleeving), please discuss your plans to remove the reference to tube repair from your proposed TSs.
 - d. Proposed TS 5.5.9.c.1.c specifies a particular eddy current probe (i.e., “rotating pancake coil inspection”). The proposal would require you to use this technology even if other, more advanced, probes were developed for detecting ODSCC at tube support plates. Please discuss your plans for modifying the TSs to avoid this limitation (e.g., “rotating pancake coil inspection or a comparable inspection technique”).
 - e. Proposed TS 5.5.9.c.1.c references “NOTE 2.” To simplify the reading of the TSs, please discuss your plans to incorporate the wording from NOTE 2 directly into the TS (e.g., “calculated according to the methodology in Generic Letter 95-05 as supplemented”).
 - f. As currently proposed, you may elect to implement alternate tube repair criteria. As a result, it would appear that the requirement contained in proposed TS 5.5.9.c.3 to plug tubes which contain a tube support plate intersection with both an axial ODSCC and an axial PWSCC indication should be listed under proposed TS 5.5.9.c.1. Please discuss your plans to incorporate this requirement under TS 5.5.9.c.1.
4. With respect to proposed TS 5.5.9.c.2, please address the following:
 - a. Proposed TS 5.5.9.c.2.e references “serviceability.” Since serviceability is not defined in your proposed TS, please discuss your plans for removing it. In addition, this sentence references the “plugging (repair) limit.” Since this term is no longer defined, discuss your plans to replace it with “repair criteria.”
 - b. Proposed TSs 5.5.9.c.2.e.4 and 5 reference tube repair. Since Diablo Canyon does not have an option for tube repair (i.e., sleeving), please discuss your plans to remove the reference to tube repair from your proposed TSs.

- c. Proposed TS 5.5.9.c.2 describes the W* repair criteria. Given that your current TS do not address the cold-leg tubesheet region, there were only a few instances in your current TS that indicate the W* repair criteria applies only to the hot leg. However, in your current proposal, inspections in the cold-leg tubesheet would be required by your TS. As a result, please discuss your plans to modify your proposal to clearly indicate that the W* ARC could be applied only to the hot-leg side of the tubesheet (i.e., by referencing the hot leg throughout proposed TS 5.5.9.c.2).
5. Proposed TS 5.5.9.c.3 indicates that under certain circumstances, tubes should be “removed from service.” Since plugging is referenced throughout your proposed TS, please discuss your plans to replace this phrase with “plugged.”
6. Proposed TS 5.5.9.d.4 references the “Tube Support Plate Voltage-Based Repair Criteria” discussed in TS 5.5.9.c.1 using different terminology. Please discuss your plans to consistently refer to the repair criteria and for referencing the applicable specification in this section (i.e., reference TS 5.5.9.c.1).
7. Please discuss your plans to reference TS 5.5.9.c.3 in TS 5.5.9.d.6 (e.g., “...to implement the axial PWSCC depth-based repair criteria discussed in Technical Specification 5.5.9.c.3”).
8. Proposed TS 5.6.10.b refers to the “Tube Support Plate Voltage-Based Repair Criteria” in TS 5.5.9.c.1 as “voltage-based repair criteria to tube support plate intersections.” Please discuss your plans to modify this proposed TS to indicate that for implementation of the “alternate tube repair criteria in TS 5.5.9.c.1” the indicated report will be made.
9. Given that your proposed TS does not allow operation when the accident-induced leakage criteria is exceeded, please discuss your plans to omit TS Section 5.6.10.b.1.
10. To be consistent with the other reporting requirements, discuss your plans to remove the reference to 10 CFR 50.4 in proposed TS 5.6.10.c, d, and g. In addition, discuss your plans to indicate that the reports in these sections (and proposed TS 5.6.10.f) will be submitted “after the initial entry into MODE 4 following completion of an inspection performed in accordance with Specification 5.5.9, Steam Generator (SG) Program.” This will make these reporting requirements consistent with the TSTF-449 reporting requirement.
11. Since failure of the SG performance criteria is required (by 10 CFR, Sections 50.72 and 50.73) to be reported and future operation is not permitted when the performance criteria (i.e., tube integrity) are not maintained, discuss your plans to delete proposed TS 5.6.10.e.2.
12. One of the purposes of TSTF-449 is to allow licensees to update their TSs to accurately reflect their SG tube integrity program. For implementation of the voltage-based tube repair criteria, licensees have submitted “90-day reports” providing information concerning tube pulls and condition monitoring/operational assessment results. Consistent with the philosophy of TSTF-449, please discuss your plans to modify TS

Section 5.6.10 to include a requirement to provide the information described in Section 6b of Attachment 1 of GL 95-05 to the NRC.

13. In several locations in the proposed TS 5.5.9 (e.g., 5.5.9.d.4, 5.5.9.d.5), you reference a “refueling outage inspection.” Under the proposed TS, inspections need not be performed during a refueling outage. They only need to be performed at intervals not to exceed 24 effective full-power months or one operating interval between refueling outages (whichever is less). As a result, if you were to elect to perform inspections at times other than refueling outages, you would still be required to inspect during the refueling outage. Please discuss your plans to modify your proposal to require the inspections every 24 effective full-power months or one refueling outage (whichever is less).
14. With respect to “Insert 1” to the Reactor Coolant System Operational Leakage Bases Section, the proposed wording does not match the wording in TSTF-449. For example, the reference that the leak rate may increase as a result of accident-induced conditions was not included. In addition, the wording is not clear (i.e., there is 1 gpm primary-to-secondary leakage to all SGs). Please discuss your plans to modify your Bases to indicate that the leak rate can increase due to accident conditions and to clarify whether the assumption on accident-induced leakage is 1 gpm from all SGs or 1 gpm from each SG (resulting in 4 gpm). Similarly, the wording for “Insert 2” is not clear (i.e., 1 gpm total primary-to-secondary leakage to all SGs). Please discuss your plans to clarify how much primary-to-secondary leakage was assumed in your accident analysis. Similar comments apply to the Steam Generator Tube Integrity Bases Section (first two paragraphs in the Applicable Safety Analyses Section, and the second from last paragraph in the Limiting Condition for Operation Section). With respect to the discussion on the accident-induced leakage in the Limiting Condition for Operation Section in the Steam Generator Tube Integrity Bases Section, this discussion may need to be modified depending on the response to question 2 above.
15. Please discuss the reasons for deleting the sentence in TSTF-449 that indicates, “The accident induced leakage rate includes any primary-to-secondary LEAKAGE existing prior to the accident in addition to primary-to-secondary LEAKAGE induced during the accident.” In addition, discuss your plans to include this sentence in your TS Bases.

Diablo Canyon Power Plant, Units 1 and 2

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March 2006