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June 20, 2008

PG&E Letter DCL-08-051

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Supplement to License Amendment Request 08-02, "Revision to Technical Specifications 3.7.5, 'Auxiliary Feedwater System,' and 3.7.6, 'Condensate Storage Tank and Fire Water Storage Tank'"

References:
1. PG&E Letter DCL-08-023, "License Amendment Request 08-02, Revision to Technical Specifications 3.7.5, 'Auxiliary Feedwater System,' and 3.7.6, 'Condensate Storage Tank and Fire Water Storage Tank,'" dated April 3, 2008
2. NRC Letter, "Diablo Canyon Power Plant, Unit Nos. 1 and 2 - Amendments RE: Auxiliary Feedwater and Condensate Storage Tanks (TAC NOS. MD8471 AND MD8472)," dated June 4, 2008

Dear Commissioners and Staff:

In Reference 1, Pacific Gas and Electric Company (PG&E) submitted License Amendment Request 08-02, which proposes to revise Technical Specification (TS) 3.7.5, "Auxiliary Feedwater System," to remove Surveillance Requirement 3.7.5.6, and revise TS 3.7.6, "Condensate Storage Tank (CST) and Fire Water Storage Tank (FWST)," to remove the FWST level requirements, revise the CST level requirements, and revise TS 3.7.6 to be consistent with the NUREG-1431 Standard Technical Specifications.

In Reference 2, the NRC requested that PG&E supplement the Reference 1 application to address the information requested in Reference 2 by June 20, 2008. PG&E's response to the staff's Reference 2 request is provided in Enclosure 1. Enclosure 2 provides PG&E Calculation M-1095, Revision 0, "Plenum (funnel) Requirements for Condensate Storage Tanks." Enclosure 3 provides PG&E Design Change Package C-50829, Revision 0, "Condensate Storage Tank Plenum Addition," and PG&E Calculation 52.21.14, Revision 0.

On June 10, 2008, a phone call was held between PG&E, the NRC staff, and Westinghouse Electric Company to discuss submittal of the CST minimum storage

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usable volume calculation. During the phone call, the staff stated that documentation providing the differences in the assumptions from the original CST minimum storage usable volume calculation, that provided the basis for the current TS 3.7.6, and the revised calculation, that provided the basis for the proposed TS 3.7.6 CST volume in Reference 1, was required for the staff safety evaluation and that the CST minimum storage usable volume calculation did not need to be submitted. Enclosure 4 provides Westinghouse Letter PGE-08-45, "Minimum Condensate Storage Tank Water Storage Requirements," dated June 16, 2008, which summarizes the differences in the assumptions between the original and the revised CST minimum storage usable volume calculations.

This information does not affect the results of the technical evaluation or the no significant hazards consideration determination previously transmitted in Reference 1.

PG&E makes no regulatory commitments (as defined by NEI 99-04) in this letter. This letter includes no revisions to existing regulatory commitments.

If you have any questions, or require additional information, please contact Stan Ketelsen at (805) 545-4720.

I state under penalty of perjury that the foregoing is true and correct.

Executed on June 20, 2008.

Sincerely,

James R. Besker
Site Vice President and Station Director

kjse/4328/A0730287
Enclosures
cc: Gary W. Butner, Acting Branch Chief, California Department of Public Health
Elmo E. Collins, NRC Region IV
Michael S. Peck, NRC, Senior Resident Inspector
Diablo Distribution
cc/enc: Alan B. Wang, Project Manager, Office of Nuclear Reactor Regulation

PG&E Response to NRC Request for Information Regarding License Amendment Request (LAR) 08-02, "Revision to Technical Specifications 3.7.5, 'Auxiliary Feedwater System,' and 3.7.6, 'Condensate Storage Tank and Fire Water Storage Tank'"

NRC Request 1:

On page 2 of the LAR, the licensee states, "The revised CST minimum storage usable volume calculations are being performed by PG&E under 10 CFR 50.59, and NRC review of the calculations is not being requested." The NRC staff request that this calculation and supporting documentation be provided for our review as it is the basis for the revised CST minimum volume.

PG&E Response:

On June 10, 2008, a phone call was held between Pacific Gas and Electric Company (PG&E), the NRC staff, and Westinghouse Electric Company to discuss submittal of the Condensate Storage Tank (CST) minimum storage usable volume calculation. During the phone call, the staff stated that documentation providing the differences in the assumptions from the original CST minimum storage usable volume calculation, that provided the basis for the current Technical Specification (TS) 3.7.6, and the revised calculation, that provided the basis for the proposed TS 3.7.6 CST volume in Reference 1, was required for the staff safety evaluation and that the CST minimum storage usable volume calculation did not need to be submitted. Enclosure 4 to this letter provides Westinghouse Letter PGE-08-45, "Minimum Condensate Storage Tank Water Storage Requirements," dated June 16, 2008, which summarizes the differences in the assumptions between the original and the revised CST minimum storage usable volume calculations.

The CST minimum storage usable volume calculation that provided the basis for the proposed TS 3.7.6 changes is Westinghouse Calculation CN-SEE-05-129, Revision 4. This calculation was performed to support replacement of the steam generators (SGs) at Diablo Canyon Power Plant (DCPP) Units 1 and 2 since the geometry of the SGs impacts a significant number of the inputs required for the calculation. The significant input assumptions and results of the calculation were previously summarized on pages 12 through 15 of PG&E Letter DCL-08-023, "License Amendment Request 08-02 Revision to Technical Specifications 3.7.5, 'Auxiliary Feedwater System,' and 3.7.6, 'Condensate Storage Tank and Fire Water Storage Tank,'" dated April 3, 2008.

The Calculation CN-SEE-05-129 uses the same methodology and COND2 computer Code as the previous calculation which was performed in 1996 to support the DCPP Unit 1 uprate to 3411 Megawatts thermal. The COND2 computer code evaluates condensate required following a loss of normal feedwater plus

loss-of-offsite power event. The COND2 code determines the minimum volume of condensate (SG feedwater) required to bring the plant from full-load to hot standby conditions, hold the plant at hot standby conditions, and then cooldown the reactor coolant system (RCS) to the residual heat removal (RHR) system entry temperature. The computer code models SG heat removal via the main steam safety valves.

The COND2 code considers the energy released due to a delay in reactor trip, the stored energy in the reactor fuel and cladding, the residual heat generated by the core following a reactor trip from 102 percent core thermal power, the sensible heat of the primary and secondary system (both water and thick metal) that must be removed in cooling from full load conditions to RHR entry conditions, and the energy absorbed by the charging flow entering the primary system. The initial secondary water mass in the SG is based on a plant trip at the SG low-low level setpoint, due to a loss of normal feedwater event, and the final mass is based on maintaining level at the lower narrow range level tap.

As identified in Enclosure 4 to this letter, a significant change was made regarding the secondary SG level restoration assumption between the original and the revised CST minimum storage usable volume calculations. The original calculation assumed level restoration to the no load programmed level, and the revised calculation assumed level restoration to the SG narrow range lower level tap. The volume utilized for refilling above the SG narrow range lower level tap is not required for safe operation of the plant.

Emergency Operating Procedure (EOP) E-0.2, "Natural Circulation Cooldown," provides the procedure to cooldown the RCS to RHR system entry conditions, and to continue RCS cooldown to cold shutdown conditions using the RHR system. During cooldown to RHR system entry conditions, EOP E-0.2 specifies to maintain SG narrow range level between 20 percent and 65 percent, which is above the level assumed in the revised CST minimum storage usable volume calculation. However, with the upgrade of the CST, the CST level is maintained above the CST low level alarm and condenser hotwell makeup valve (LCV-8) trip (closed) setpoint of 60.8 percent level, a level 24 inches above the top of the new plenums. In the event a control room annunciator alarm is received due to CST level below 60.8 percent level, Procedure AR PK10-01, "CST LVL HI-LO," is entered which requires to increase flow to the CST from the makeup water system and to investigation for a CST leak. Maintaining the CST level above the CST low level alarm setpoint provides over 18,000 additional gallons of CST water that is normally available to supplement the TS 3.7.6 required CST volume and to maintain SG narrow range level per EOP E-0.2. If the CST level decreases to less than the low-low level alarm at 10 percent level during RCS cooldown, then EOP E-0.2 contains a step to implement Procedure OP D-1:V, "Alternate AFW Supplies," to initiate alternate auxiliary feedwater (AFW) supply. The low-low level alarm provides the operator with at least a 20 minute supply of water for the AFW pumps at a net flowrate of 880 gallons per minute. After the RHR system is placed in service to remove RCS heat, EOP E-0.2 directs the SGs to be cooled by dumping steam from all SGs until

the SGs have stopped steaming. CST inventory does not need to be used to cool the SGs since the design basis for the CST is to supply water until the RHR system entry conditions are reached, after which the RHR system is placed in service to remove RCS heat.

NRC Request 2:

The licensee bases the TS change on the ability of the CST to hold an increased volume of water. The calculations or documentation supporting this premise is needed by the NRC staff for performance of this review. In particular, the NRC staff requests the licensee supplement the application with sufficient documentation and detailed analysis to justify how the CST usable volume has increased from 164,678 gallons to 220,600 gallons.

PG&E Response:

The upgrade to the CST does not involve a change to the total CST volume, except for a small reduction in volume taken up by the added plenums, and does not involve a change to the normal operating CST water level. The upgrade to the CST involves an increase in the portion of the CST volume dedicated to the safety-related AFW supply, and a decrease in the portion of the CST volume dedicated to the nonsafety-related condenser hotwell makeup water. With upgrade to the CST, the reduction in the portion of the CST volume dedicated to condenser hotwell makeup water is approximately 62,000 gallons, and 173,000 gallons of water remains available for nonsafety-related condenser hotwell makeup. The upgrade of the CST includes an increase to the CST low level alarm and condenser hotwell makeup valve (LCV-8) trip (closed) setpoint from 50.4 percent to 60.8 percent level (a level 24 inches above the top of the new plenums). This maintains the CST low level alarm and the condenser hotwell makeup valve trip setpoint at 24 inches above the elevation where loss of condenser hotwell makeup suction occurs, and provides an alert to operators to add make up water to the CST.

PG&E Calculation M-1095, Revision 0, "Plenum (funnel) Requirements for Condensate Storage Tanks," is contained in Enclosure 2. Calculation M-1095 determined the top elevation, displaced volume, and weights of the funnel assemblies (plenums) to support upgrade of the DCPP Unit 1 and 2 CSTs by installing plenums over the nozzles on the inside of the CSTs. The lengths of the plenums were sized in this calculation such that the upgraded CSTs would have an increase in dedicated safety-related AFW supply to at least 222,600 usable gallons each. The basis for the usable volume of 222,600 gallons used in the calculation was the total of the current TS 3.7.6 required CST volume of 164,678 gallons for each unit, and the TS 3.7.6 required fire water storage tank (FWST) volume of 57,922 gallons for each operating unit. The increase in the dedicated safety-related usable volume in each CST to 222,600 gallons allows the TS 3.7.6 FWST volume requirements to be removed.

The CSTs are nominally 40 feet in diameter and 47 feet in height. The capacity of each CST is 425,000 gallons. The bottom elevation of the CST is 115 feet 6 inches. The bottom of the CST contains a vortex breaker cage and the volume of approximately 18,000 gallons below the top of the vortex breaker cage at elevation 117 feet 6 inches is considered unusable for the purpose of TS 3.7.6 inventory. Prior to the CST upgrade, only 164,678 usable gallons (41.3 percent tank indicated level) is credited, which is at a level just below the 134 feet 2 inch elevation where four lines for nonsafety-grade consumers of the CST volume are connected to the CST. Prior to the CST upgrade, over 200,000 gallons of CST volume above the 134 feet 2 inch elevation is not credited as a safety-grade source because the four external connecting Design Class II lines are not seismic Category I and their integrity following a seismic event cannot be credited.

An upgrade to the Unit 2 CST in Spring 2008 installed new Seismic Category I seismically-qualified plenums to the inside of the CST where the nozzles for the four Design Class II lines are located. The plenums raise the suction level elevation of the four nozzles to approximately 141 feet 11 inches (56.4 percent indicated level) which provides at least 222,600 useable gallons based on the inside CST diameter of 39.6 ft, a height of 24 feet 5 inches above the top of the vortex cage, and a total displaced volume of the 4 plenums of 112 gallons. Above the elevation of 141 feet 11 inches, there is 173,000 gallons of CST inventory remaining for nonsafety-related condenser hotwell makeup. The same upgrade to the Unit 1 CST is planned for the Unit 1 Fifteenth Refueling Outage (1R15) scheduled to begin in January 2009. The upgrade of the CST ensures that the proposed TS required 200,000 usable gallons for Unit 1 and 166,000 usable gallons for Unit 2 can be provided.

NRC Request 3:

The LAR mentions modifications adding plenum inside the tank to raise the intake level for this piping in the event of a downstream pipe break, but does not explicitly address the concern of rupturing the non-seismic connections to the tank wall due to a seismic event. The licensee performed the modifications under 10 CFR 50.59. The NRC staff requests that sufficient documentation and design calculations for this modification be provided for review. In addition to the design calculations, please include information regarding how the tank and piping connections were modified and explain why, with the modification, the seismic event will no longer render the necessary volume of water above the break unusable.

PG&E Response:

Enclosure 3 provides PG&E Design Change Package C-50829, Revision 0, "Condensate Storage Tank Plenum Addition," and PG&E Calculation 52.21.14, Revision 0.

Design Change Package C-50829 is the design modification for the Unit 2 CST upgrade, and addresses the addition of the four plenums to the CST and the increase to the CST low level alarm and condenser hotwell makeup valve trip setpoint from 50.4 percent to 60.8 percent level. PG&E Calculation 52.21.14 contains the structural qualification of the plenums for the DCPP Unit 1 and 2 CST upgrades. The plenums are designed and constructed as safety-related since they are required to be functional after the Hosgri seismic event to ensure that there is adequate availability of CST water to support the safety-related AFW function.

The CST for each unit is a Design Class I tank, meeting the Seismic Category I criteria. The CSTs are totally encased with at least 1 foot of reinforced concrete. All nozzles attached to the tank are part of the tank design and are Design Class I and Seismic Category I. There are four nozzles (N2, N6, N11, and N14) that are connected to Design Class II piping. A fifth nozzle, N3, is no longer in use and is capped. The centerline of these nozzles are located at elevation 135 feet 8 inches, approximately 20 feet from the bottom of the tank. Nozzles N6, N11, and N14 are nominal 4 inch nozzles, whereas N2 is a 12 inch nozzle. The piping coming out of Nozzles N6 and N14 are further encased in concrete until they emerge in the piping vault, about 10 feet below the nozzles.

Design Change C-50829 for Unit 2 installed plenums inside the tank to enclose Nozzles N2, N6, N11, and N14. These plenums are constructed of half-pipes, attached to the internal surface of the tank, enclosing the nozzles at the bottom and sides and only open at the top at elevation 141 feet 11 inches. For Nozzles N6, N11, and N14, the plenum pipe size is 10-inch Schedule 40S with a nominal inner diameter of 10.02 inches and 6 feet 9-1/4 inches long. For Nozzle N2, the plenum is an 18-inch extra strong half-pipe with a nominal inner diameter of 17 inches and 7 feet 1-3/8 inches long. Calculation M-1095 determined the required length of the half pipe to provide 222,600 usable gallons. The new plenums are designed to Seismic Category I criteria. A similar Design Change C-49829 for Unit 1 will be implemented in 1R15.

The Class II external piping would not pull out of the CST during a seismic event due to the CST being Design Class I and the external piping being restricted by the concrete encasing the CST. The postulated scenario would be the Design Class II piping sever from the tank nozzles outside of the concrete casing during a seismic event. If the Design Class II piping was assumed to break away from the Design Class I CST nozzles resulting in holes on the side of the tank, the CST wall will not rupture because it is reinforced by the concrete casing on the outside and the new plenums on the inside. With the new internal plenums totally enclosing the nozzles associated with the potentially damaged Design Class II piping, water will only drain to the top of the plenums, thus preserving the design CST auxiliary feedwater usable volume of 222,600 gallons.