



**Pacific Gas and
Electric Company®**

Donna Jacobs
Vice President
Nuclear Services

Diablo Canyon Power Plant
P. O. Box 56
Avila Beach, CA 93424

805.545.4600
Fax: 805.545.4234

October 2, 2007

PG&E Letter DCL-07-093

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

Docket Nos. 50-275 and 50-323
Diablo Canyon Power Plant (DCPP) Units 1 and 2
License Amendment Request 07-02
Revision to Technical Specification (TS) 3.5.4, "Refueling Water Storage Tank (RWST)"

In accordance with 10 CFR 50.90, enclosed is an application for amendment to Facility Operating License Nos. DPR-80 and DPR-82 for Diablo Canyon Power Plant Units 1 and 2, respectively. The enclosed License Amendment Request (LAR) proposes a change to TS 3.5.4, "Refueling Water Storage Tank (RWST)," Surveillance Requirement (SR) 3.5.4.2, to increase the minimum required borated water volume from "≥ 400,000 gallons (81.5% indicated level)" to "≥ 455,300 gallons (93.6% level)." This proposed change is required to meet commitments related to the resolution of issues raised in NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," dated September 13, 2004.

Enclosure 1 contains a description of the proposed change, the supporting technical analyses, and the no significant hazards consideration determination. Enclosures 2 and 3 contain marked-up and retyped (clean) TS pages, respectively. Enclosure 4 provides the marked-up TS Bases changes. The TS Bases changes are provided for information only, and will be implemented pursuant to TS 5.5.14, "Technical Specifications (TS) Bases Control Program," at the time the amendments are implemented

Pacific Gas and Electric Company (PG&E) has determined that this LAR does not involve a significant hazard consideration as determined per 10 CFR 50.92. Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of this amendment.

The proposed changes to the TS are not required to address an immediate safety concern. PG&E requests approval of this LAR no later than February 4, 2008

A001
NRR



when Unit 2 will be shut down for its Fourteenth Refueling Outage (2R14). PG&E further requests the license amendments be made effective upon NRC issuance, to be implemented prior to Mode 4 entry following 2R14.

There are no new or revised regulatory commitments in this letter.

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 October 2, 2007.

Donna Jacobs
Vice President – Nuclear Services

tcg/4231/A0690337

Enclosures

cc: Elmo E. Collins, Regional Administrator, NRC Region IV
Michael S. Peck, NRC Senior Resident Inspector
Sandra Shewry, Director, California Department of Health Services
Diablo Distribution
cc/enc: Alan B. Wang, Project Manager, Office of Nuclear Reactor Regulation

EVALUATION

1.0 DESCRIPTION

This letter is a request to amend Operating Licenses DPR-80 and DPR-82 for Units 1 and 2 of the Diablo Canyon Power Plant, respectively.

The proposed change would revise Technical Specification (TS) 3.5.4, "Refueling Water Storage Tank (RWST)," Surveillance Requirement (SR) 3.5.4.2, to increase the minimum required borated volume from "≥ 400,000 gallons (81.5% indicated level)" to "≥ 455,300 gallons (93.6% level)." This proposed change is required to meet commitments related to the resolution of issues raised in NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," dated September 13, 2004.

2.0 PROPOSED CHANGES

TS 3.5.4, "Refueling Water Storage Tank (RWST)," SR 3.5.4.2, states: "Verify RWST borated water volume is ≥ 400,000 gallons (81.5% indicated level)."

The proposed change would revise SR 3.5.4.2 to state: "Verify RWST borated water volume is ≥ 455,300 gallons (93.6% level)." Allowance for instrument uncertainty is not included in the proposed TS. The 400,000 gallons and 455,300 gallons represent contained borated water volumes in the RWST.

Proposed revisions to the TS Bases are also included in this application, and are submitted for information only. The changes to the affected TS Bases pages will be incorporated in accordance with TS 5.5.14, "Technical Specification (TS) Bases Control Program."

3.0 BACKGROUND

NRC Generic Letter (GL) 2004-02 (Reference 1) requested that licensees provide information regarding the potential impact of debris blockage on emergency recirculation during design basis accidents. GL 2004-02 required that addressees provide by September 1, 2005, a description of and implementation schedule for all corrective actions, including any plant modifications, that are identified while responding to the GL. The GL requested that all licensees complete actions related to the GL by December 31, 2007, or provide justification for continued operation until the actions are completed.

Among the corrective actions to respond to the GL is the installation of a new containment recirculation sump screen. By letters dated January 18, 2007 (Reference 2), and April 17, 2007 (Reference 3), the NRC extended the

December 31, 2007 completion date for Unit 2 to the Unit 2 Fourteenth Refueling Outage (2R14), and for Unit 1 to the Unit 1 Fifteenth Refueling Outage (1R15), currently scheduled to begin in February 2008 and January 2009, respectively. Pacific Gas and Electric Company (PG&E) also plans to replace the steam generators during those outages.

The Unit 1 replacement containment recirculation sump screen was installed in 1R14, which was completed in May 2007. The Unit 2 replacement screen will be installed during 2R14. The proposed change to increase the minimum RWST borated water volume is required because of the design of the new containment recirculation sump screen (i.e., the screen must be fully submerged). An increased RWST minimum borated water volume was administratively implemented for the new Unit 1 containment recirculation sump screen prior to startup from the 1R14 refueling outage, as a compensatory measure consistent with NRC Bulletin 2003-01 (Reference 4), and Generic Letter 2004-02.

4.0 TECHNICAL ANALYSIS

The RWST supplies borated water to the chemical and volume control system during abnormal operating conditions (boration flow path), to the refueling cavity during refueling, and to the emergency core cooling system (ECCS) and the containment spray system during accident conditions. During accident conditions it provides containment cooling and depressurization, core cooling, and replacement inventory, and is a source of negative reactivity for reactor shutdown.

During the initial phase of ECCS injection, the ECCS pumps take suction from the RWST and inject into the cold legs of the reactor coolant system (RCS). When the RWST has drained to the low-level setpoint, the residual heat removal pump suctions are realigned to the containment recirculation sump for recirculation of the sump water to the RCS.

Any event that results in safety injection (SI) initiation, including inadvertent ECCS actuation, results in delivery of RWST water to the reactor coolant system (RCS). However, the events for which the RWST provides mitigation and for which the RWST parameters are limiting are large and small break loss-of-coolant accidents (LOCAs) and steam line breaks. The feedwater line break and steam generator tube rupture also involve SI but the RWST parameters are less significant to the analysis results.

This License Amendment Request proposes a change to the minimum required RWST borated water volume. The TS requirements for RWST borated water temperature and boron concentration remain unchanged. The effect of the RWST borated water volume on the limiting accident analyses is discussed below. Available RWST volume is not an explicit assumption in analyses for

other than LOCA events since the required volume for those events is much less than that required for a LOCA.

Insufficient water in the RWST could result in insufficient borated water inventory in the containment recirculation sump when the changeover from the injection mode to the recirculation mode occurs following a design basis LOCA. The minimum required deliverable volume is set by the LOCA and containment analyses, and the containment recirculation sump and sump screen design. The total RWST volume includes unavailable inventory at the bottom of the tank which cannot be delivered to the RCS due to the tank design.

The new containment recirculation sump screen design requires that the screen be fully submerged to prevent vortexing and air ingestion during changeover from the injection mode to the cold-leg recirculation mode for a large break LOCA. The proposed minimum RWST borated water volume was established to ensure that this design requirement is met.

The impacts of the increased minimum RWST borated water volume on maximum containment flood level and sump pH were evaluated.

The calculated maximum containment flood level is based on the RWST water level associated with the RWST high-level alarm setpoint. Although the containment water level would be higher due to the proposed change, the resultant level would be less than the calculated maximum containment flood level. Therefore, the proposed change has no impact on the qualification of equipment above the maximum containment flood level.

The proposed change is bounded by the current analysis for post-LOCA sump pH. The calculation for minimum post-LOCA sump pH assumes the maximum RWST borated water volume. The calculation for the maximum post-LOCA sump pH assumes the TS minimum RWST borated water volume.

The proposed change is acceptable based on the above evaluation.

5.0 REGULATORY ANALYSIS

The proposed change would revise Technical Specification (TS) 3.5.4, "Refueling Water Storage Tank (RWST)," Surveillance Requirement (SR) 3.5.4.2 to increase the required borated volume from "≥ 400,000 gallons (81.5% indicated level)" to "≥ 455,300 gallons (93.6% level)," to reflect the new sump design requirements. This proposed change is required to meet commitments related to the resolution of issues raised in NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," dated September 13, 2004.

5.1 No Significant Hazards Consideration

PG&E has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed change revises the minimum RWST borated water volume. The RWST borated water volume is not an initiator of any accident previously evaluated. As a result, the probability of an accident previously evaluated is not affected. The proposed change does not alter or prevent the ability of structures, systems, and components from performing their intended function to mitigate the consequences of an initiating event within the assumed acceptance limits. The effect on containment flood level, equipment qualification, and containment sump pH remain within the limits assumed in the design and accident analyses. The proposed change does not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated. Further, the proposed change does not increase the types or amounts of radioactive effluent that may be released offsite, nor significantly increase individual or cumulative occupational/public radiation exposures. The proposed change is consistent with the safety analysis assumptions and resultant consequences.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different accident from any accident previously evaluated?

Response: No.

The change does not involve a physical alteration of the plant (i.e., no new or different components or physical changes are involved with this change) or a change in the methods governing normal plant operation. The change does not alter any assumptions made in the safety analysis.

Therefore, the proposed change does not create the possibility of a new or different accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed change to revise the required RWST minimum borated water volume does not alter the manner in which safety limits, limiting safety system settings or limiting conditions for operation are determined. The safety analysis acceptance criteria are not affected by this change. The proposed change will not result in plant operation in a configuration outside of the design basis.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluation, PG&E concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of no significant hazards consideration is justified.

5.2 Applicable Regulatory Requirements/Criteria

The ECCS is designed to cool the reactor core and provide additional shutdown capability following initiation of any of the following accident conditions: (1) a loss of coolant from the RCS in excess of the normal makeup capability, (2) a steam generator tube rupture, and (3) a pipe break in the main steam system.

The NRC's regulatory requirements related to the cooling capability of the ECCS during a LOCA are set forth in Title 10 of the Code of Federal Regulations Section 50.46 (10 CFR 50.46), "Acceptance Criteria for ECCS for Light-Water Nuclear Power Reactors." This regulation requires that licensees design their ECCS systems to meet five criteria, one of which is to provide the capability for long-term cooling. Following successful initial operation, the ECCS must possess the capability to remove decay heat such that the core temperature is maintained at an acceptably low value for the extended period of time required by the long-lived radioactivity remaining in the core.

The proposed increase in the minimum RWST borated water volume ensures that the ECCS will continue to meet applicable regulatory requirements related to long-term cooling.

Based on the considerations discussed above: (1) there is reasonable assurance that the health and safety of the public will not be endangered

by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

PG&E has evaluated the proposed amendment and has determined that the proposed amendment does not involve: (1) a significant hazards consideration, (2) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (3) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. NRC Generic Letter 2004-02. "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," dated September 13, 2004.
2. NRC Letter "Diablo Canyon Power Plant, Unit No. 2 – Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," Extension Request Approval (TAC No. MD3586), dated January 18, 2007.
3. NRC Letter "Diablo Canyon Power Plant, Unit No. 1 – Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," Extension Request Approval (TAC No. MD4584), dated April 12, 2007.
4. NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors," dated June 9, 2003.

Proposed Technical Specification Change (marked-up)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RWST boron concentration not within limits. <u>OR</u> RWST borated water temperature not within limits.	A.1 Restore RWST to OPERABLE status.	8 hours
B. RWST inoperable for reasons other than Condition A.	B.1 Restore RWST to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.4.1 -----NOTE----- Only required to be performed when ambient air temperature is < 35°F. ----- Verify RWST borated water temperature is ≥ 35°F.	24 hours
SR 3.5.4.2 Verify RWST borated water volume is ≥ 400,000 455,300 gallons (81.5% indicated 93.6 % level).	7 days
SR 3.5.4.3 Verify RWST boron concentration is ≥ 2300 ppm and ≤ 2500 ppm.	7 days

Proposed Technical Specification Changes (retyped)

Remove Page

3.5-7

Insert Page

3.5-7

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RWST boron concentration not within limits. <u>OR</u> RWST borated water temperature not within limits.	A.1 Restore RWST to OPERABLE status.	8 hours
B. RWST inoperable for reasons other than Condition A.	B.1 Restore RWST to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.4.1 -----NOTE----- Only required to be performed when ambient air temperature is < 35°F. ----- Verify RWST borated water temperature is ≥ 35°F.	24 hours
SR 3.5.4.2 Verify RWST borated water volume is ≥ 455,300 gallons (93.6% level).	7 days
SR 3.5.4.3 Verify RWST boron concentration is ≥ 2300 ppm and ≤ 2500 ppm.	7 days

**Changes to Technical Specification Bases Pages
(For information only)**

BASES

APPLICABLE
SAFETY
ANALYSES
(continued)

LOCA

Volume

Insufficient water in the RWST could result in insufficient borated water inventory in the containment recirculation sump when the transfer to the recirculation phase occurs. The deliverable volume limit is set by the LOCA and containment analyses. For the RWST, the deliverable volume is less than the total volume contained since, due to the design of the tank, the ECCS suction nozzle elevation is above the bottom of the tank, so more water can be contained than can be delivered. The contained water volume limit includes an allowance for water not usable because of tank discharge location or other physical characteristics.

Boration

During accident conditions, the RWST provides a source of borated water to the ECCS and CS System pumps. Improper boron concentrations could result in a reduction of SDM or excessive boric acid precipitation in the core following a LOCA, as well as excessive caustic stress corrosion of mechanical components and systems inside the containment. The minimum boron concentration limit ensures that the spray and the containment recirculation sump solutions, after mixing with the sodium hydroxide from the spray additive tank, will not exceed the maximum pH values. The maximum boron concentration limit ensures that the containment recirculation sump solution will not be less than the minimum pH requirement. The design basis transients and applicable safety analyses concerning each of these systems are discussed in the Diablo Canyon FSAR Update. These analyses are used to assess changes to the RWST in order to evaluate their effects in relation to the acceptance limits in the analyses.

For a large-break LOCA analysis, the RWST minimum contained water volume of 400,000 455,300 gallons (~~81.5% indicated~~ 93.6% level uncorrected for uncertainty), and the lower boron concentration limit of 2300 ppm are used to compute the post-LOCA sump boron concentration necessary to assure subcriticality. The large-break LOCA is the limiting case since the safety analysis assumes that all control rods are out of the core.

The upper limit on boron concentration of 2500 ppm is used to determine the maximum allowable time to initiate hot leg recirculation following a LOCA. The purpose of initiating hot leg recirculation is to avoid boron precipitation in the core following the accident when the break is in the cold leg.

(continued)

BASES

SURVEILLANCE
REQUIREMENTS
(continued)SR 3.5.4.2

The RWST water volume should be verified every 7 days to be above the required minimum level in order to ensure that a sufficient initial supply is available for ECCS injection and CS System pump operation and to support continued ECCS on recirculation. Since the RWST volume is normally stable and the contained volume required is protected by a computer alarm, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

~~The RWST water volume is administratively maintained at greater than the SR 3.5.4.2 limit in accordance with STP R-20. No allowance for instrument uncertainty is included in the SR limit.~~

SR 3.5.4.3

The boron concentration of the RWST should be verified every 7 days to be within the required limits. This SR ensures that the reactor will remain subcritical following a LOCA. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience.

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.
2. Surveillance Test Procedure R-20, "Boric Acid Inventory."
3. Calc STA-255, "Minimum Required RWST Level for GE Sump Strainers."