Pocket File

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 13, 1999

Mr. Gregory M. Rueger
Senior Vice President and General Manager
Pacific Gas and Electric Company
Diablo Canyon Nuclear Power Plant
P. O. Box 3
Avila Beach, CA 93424

SUBJECT: ISSUANCE OF AMENDMENTS FOR DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1 (TAC NO. M98829) AND UNIT NO. 2 (TAC NO. M98830) AND CLOSEOUT OF GENERIC LETTER 96-06 (TAC NOS. M96804 AND M96805)

Dear Mr. Rueger:

The Commission has issued the enclosed Amendment No. 134 to Facility Operating License No. DPR-80 and Amendment No. 132 to Facility Operating License No. DPR-82 for the Diablo Canyon Nuclear Power Plant (DCNPP), Unit Nos. 1 and 2, respectively. The amendments approve a modification to the DCNPP, Unit Nos. 1 and 2 component cooling water (CCW) system to install a nitrogen pressurization system in response to your application dated May 22, 1997, as supplemented by letters dated June 12, 1997, August 28, 1997, January 29, 1998, July 9, 1998, and March 12, 1999.

These amendments authorize the revision to the licensing basis as described in the Final Safety Analysis Report Update to incorporate the modification to the CCW system to pressurize the system with nitrogen.

The licensee's modification to the CCW system and its modification to the ball valves have addressed the waterhammer and two-phase flow elements of GL 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," as discussed in the Safety Evaluation.

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A copy of the related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Original Signed By

Steven D. Bloom, Project Manager, Section 2
Project Directorate IV and Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-275
and 50-323

Enclosures: 1. Amendment No. 134 to DPR-80
2. Amendment No. 132 to DPR-82
3. Safety Evaluation

cc w/encls: See next page

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A copy of the related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Steven D. Bloom, Project Manager, Section 2
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Docket Nos. 50-275
and 50-323

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3. Safety Evaluation

cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-275

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 134
License No. DPR-80

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Pacific Gas and Electric Company (the licensee) dated May 22, 1997, as supplemented by letters dated June 12, 1997, August 28, 1997, January 29, 1998, July 9, 1998, and March 12, 1999, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 134 , the license is amended to authorize revision of the Final Safety Analysis Report (FSAR) Update as set forth in the application for amendment by Pacific Gas and Electric Company dated May 22, 1997, as supplemented by letters dated June 12, 1997, August 28, 1997, January 29, 1998, July 9, 1998, and March 12, 1999. Pacific Gas and Electric Company shall update the FSAR Update to reflect the revised licensing basis authorized by this amendment in accordance with 10 CFR 50.71(e).

3. This license amendment is effective as of its date of issuance and shall be implemented in the next periodic update to the FSAR Update in accordance with 10 CFR 50.71(e). Implementation of the amendment is the incorporation into the Final Safety Analysis Report Update, the changes to the description of the facility as described in the licensee's application dated May 22, 1997, as supplemented by letters dated June 12, 1997, August 28, 1997, January 29, 1998, July 9, 1998, and March 12, 1999, and evaluated in the staff's Safety Evaluation attached to this amendment.

FOR THE NUCLEAR REGULATORY COMMISSION

Stephen Dembek, Chief, Section 2
Project Directorate IV and Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: May 13, 1999

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-323

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 132
License No. DPR-82

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Pacific Gas and Electric Company (the licensee) dated May 22, 1997, as supplemented by letters dated June 12, 1997, August 28, 1997, January 29, 1998, July 9, 1998, and March 12, 1999, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 132 , the license is amended to authorize revision of the Final Safety Analysis Report (FSAR) Update as set forth in the application for amendment by Pacific Gas and Electric Company dated May 22, 1997, as supplemented by letters dated June 12, 1997, August 28, 1997, January 29, 1998, July 9, 1998, and March 12, 1999. Pacific Gas and Electric Company shall update the FSAR Update to reflect the revised licensing basis authorized by this amendment in accordance with 10 CFR 50.71(e).

3. This license amendment is effective as of its date of issuance and shall be implemented in the next periodic update to the FSAR Update in accordance with 10 CFR 50.71(e). Implementation of the amendment is the incorporation into the Final Safety Analysis Report Update, the changes to the description of the facility as described in the licensee's application dated May 22, 1997, as supplemented by letters dated June 12, 1997, August 28, 1997, January 29, 1998, July 9, 1998, and March 12, 1999, and evaluated in the staff's Safety Evaluation attached to this amendment.

FOR THE NUCLEAR REGULATORY COMMISSION

Stephen Dembek, Chief, Section 2
Project Directorate IV and Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: May 13, 1999

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 134 TO FACILITY OPERATING LICENSE NO. DPR-80

AND AMENDMENT NO. 132 TO FACILITY OPERATING LICENSE NO. DPR-82

PACIFIC GAS AND ELECTRIC COMPANY

DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2

DOCKET NOS. 50-275 AND 50-323

1.0 INTRODUCTION

By letter dated May 22, 1997, as supplemented by letters dated June 12, 1997, August 28, 1997, January 29, 1998, July 9, 1998, and March 12, 1999, Pacific Gas and Electric Company (licensee) submitted a license amendment request to revise the Technical Specification (TS) requirements for the Diablo Canyon Power Plant, Units 1 and 2 (DCPP) component cooling water (CCW) systems. These TS requirements were being proposed following modifications that were made to change the CCW system from being normally vented, to being pressurized with nitrogen. While the NRC felt that the CCW system modifications should be reviewed and approved pursuant to 10 CFR 50.59 requirements, we concluded that the additional operational requirements that were identified should be addressed through the licensee's administrative control processes, and that additional TS requirements were not necessary for this particular application. Based on discussions with the staff and recommendations that were made, the licensee supplemented the license amendment request to eliminate the TS requirements that were being proposed and provided additional information about the CCW system modifications.

The July 9, 1998, and March 12, 1999, supplemental letters provided additional clarifying information, did not expand the scope of the application as originally noticed, and did not change the initial no significant hazards consideration determination published in the Federal Register on July 29, 1998 (63 FR 40558).

The licensee, with the modification to the CCW system, along with modifications to ball valves in the liquid radwaste system have adequately resolved the thermally-induced pressurization of piping runs penetrating the containment, as well as waterhammer and two-phase flow elements of Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions.".

2.0 BACKGROUND

Licensee Event Report (LER) 96-005, dated April 26, 1996, reported that localized boiling could occur in the CCW systems for DCPP in the vicinity of the containment fan coolers (CFCs) during a design-basis loss of coolant accident (LOCA), with a concurrent loss of offsite power (LOOP). Boiling in the containment fan coolers was not included in the design-basis of the DCPP CCW systems, and resultant waterhammer and two-phase flow conditions could place these systems in jeopardy during accident conditions. In order to resolve this issue, the licensee modified the CCW systems for DCPP so that instead of being vented to the atmosphere through the surge tanks, the surge tanks would be pressurized with a nitrogen cover gas to eliminate the potential for boiling. Incidentally, the NRC determined that this issue could be applicable to other power reactor licensees, and GL 96-06 was issued on September 30, 1996, requesting that licensees take action to address this and other related concerns.

The licensee's initial submittal proposed additional TS action and surveillance requirements for DCPP CCW systems. These additional requirements were proposed in order to address operability considerations related to CCW system surge tank overpressure requirements. While the staff felt that the modifications that were installed for pressurizing the CCW system surge tanks should be reviewed and approved pursuant to 10 CFR 50.59 requirements, additional TS requirements were considered to be unnecessary. Therefore, in response to the staff's recommendation, the license amendment request was revised to eliminate the additional TS requirements that had been proposed, and additional information was provided concerning the CCW system modifications that had been made.

3.0 EVALUATION

The DCPP CCW system surge tanks were originally designed to be normally vented to the atmosphere, and changing the design to one where the surge tanks are normally pressurized with nitrogen introduces potential failure modes and operability considerations that were not previously evaluated. Therefore, NRC review and approval of the modifications that were made to the CCW system is necessary to assure that the modifications are acceptable. This safety evaluation focuses specifically on those elements of the modification that constitute an unreviewed safety question or otherwise deviate from the original design and licensing basis of the CCW system. This evaluation also constitutes the staff's review of the licensee's resolution of the waterhammer and two-phase flow concerns discussed in GL 96-06.

3.1 System Design and Modification Details

The CCW system for the each of the DCPP units consists of two vital trains and a non-vital train that share a common surge tank. The surge tank was originally vented to the atmosphere through normally open valve RCV-16. In the event of radioactive leakage into the CCW system, RCV-16 (located in the surge tank vent line) is designed to close and isolate the surge tank to minimize radiological releases to the environment. Based on system design considerations and postulated worst-case conditions, the licensee determined that a minimum pressure of 17 psig is required in the surge tank in order to prevent boiling and two-phase flow from occurring in the CCW system. Consequently, the surge tank was modified to one that is normally pressurized by adding a nitrogen supply line at drain valve CCW-89. The nitrogen

supply line ties into the nitrogen header that supplies the Class II backup nitrogen for steam dump valves PCV-21/22. The 85 psig nitrogen supply from this header is reduced to a nominal pressure of 20 psig by parallel pressure regulators PCV-2020A/B (one of which is normally isolated) located near the surge tank. Two Class I nitrogen bottles and parallel pressure regulators PCV-2021A/B (one of which is normally isolated) provide a backup source of nitrogen pressure for the CCW surge tank. The bottle pressure is reduced to about 75 psig, and ties in upstream of the 20 psig pressure regulator referred to earlier. The plant instrument air system also serves as a normally isolated backup source of pressure for the surge tank, and ties in upstream of the 75 psig pressure regulator. In order to limit pressure increases due to normal surge tank level fluctuations, a back-pressure regulator (PCV-2022) was installed in the surge tank vent line downstream of RCV-16.

3.2 Design Review

Pressure is only required to be maintained in the CCW surge tanks up to the point of accident initiation (i.e., LOCA with concurrent LOOP), and it is not necessary for the pressurization function to work after the accident has occurred. Therefore, the primary design consideration in this particular case is to assure that safety systems and accident response capability will not be compromised by the modification, or by postulated failures that could occur. From a functional perspective, the modification should be able to maintain surge tank pressure within the operability limits that have been established for the CCW system without routine and frequent entry into TS Limiting Conditions for Operation (LCOs), and without posing a challenge to the integrity of the CCW system. The staff has reviewed the information provided by the licensee relative to these criteria, and has determined that the CCW system modification is acceptable based on the following considerations:

The licensee's submittals indicate that the modification satisfies all CCW system design requirements. This is acceptable to the staff and provides assurance that the design criteria stated above will be satisfied in most respects. For example, satisfying the CCW system seismic design criteria assures that newly installed components will be adequately anchored and supported, and will not adversely affect CCW system components (or other components) during a seismic event.

Pressurizing the CCW system surge tanks with nitrogen can lead to failure modes that were not previously considered, such as vapor binding of the CCW pumps, or diminished heat transfer capability. The licensee has evaluated this concern and has determined that nitrogen will not pose a problem at the pressures and temperatures involved. The staff finds the licensee's assessment of this issue to be acceptable.

Increasing the pressure in the CCW system surge tanks can result in increased leakage from the CCW system from what was originally assumed. Using assumptions that are reasonable and appropriate, the licensee has evaluated the potential impact of surge tank pressurization on CCW system leakage and has determined that the effect is negligible for the range of pressures that are involved. The staff considers the licensee's assessment to be acceptable.

The licensee's submittal discusses the waterhammer vulnerability in terms of both the large break LOCA, and the limited displacement break LOCA. As a point of clarification, the large break LOCA is the applicable scenario for design and licensing basis considerations. The limited displacement break LOCA scenario would only be applicable for specific applications that have been approved by the NRC.

Specific design requirements, criteria, and setpoints that have been established either for, or as a result of, the modification (such as nitrogen supply and backup sources, pressure regulator and back pressure regulator sizing and setpoint requirements, placement of the back pressure regulator downstream of RCV-16, and changes to water level instrumentation) appear to be appropriate for satisfying the design and functional requirements stated above, and are acceptable to the staff. The modification has been installed on both Diablo Canyon units and no specific problems have been reported, which provides assurance that the modification is adequate for the intended function.

3.3 GL 96-06 Considerations

Along with the review of the modification to the CCW system, the staff reviewed the licensee's January 28, 1997, March 17, 1997, July 28, 1997, and May 26, 1998, submittals, providing its response to the Generic Letter GL 96-06, "Assurance of Equipment Operability and Containment Integrity During Design Basis Accident Conditions" for DCPP.

In its submittal of January 28, 1997, the licensee identified 15 piping segments, 12 penetrations and 3 piping segments inside containment, potentially vulnerable to a water solid volume that may be subjected to an increase in pressure due to heating of the trapped fluid. The licensee determined that with the exception of one, all affected 14 piping segments are operable based on the criteria in Appendix F of Section III of the ASME Code. The licensee in its March 17, 1997, submittal, stated that based on its further review, the remaining piping segment is also operable.

In its submittal of July 28, 1997, the licensee stated that with the exception of two piping segments, the remaining 13 piping segments do not require any physical modification. The licensee determined that of the 13 piping segments, one piping segment met the design basis allowable stresses, eight piping segments have valves (one air-operated diaphragm valve, one solenoid valve, and six air-operated globe valves) whose design prevents overpressurization, and four piping segments can be drained and thereafter will be maintained drained by administrative controls to prevent overpressurization. The licensee drained the affected Unit 1 piping segments during the April 1997 refueling outage and Unit 2 piping segments during the February 1998 refueling outage. The two piping segments which require modification are isolated by ball valves. The licensee proposed to modify the ball valves by drilling a small hole through the ball to allow for unidirectional pressure relief by exposing one side of the hole to the environment inside the pipe and the other side (of the hole) to the inside of the valve body . The licensee installed modified balls in Unit 2 valves during the February 1998 refueling outage, and in Unit 1 valves during the January 1999 refueling outage.

In its response to the staff's request for additional information of March 16, 1998, the licensee, in its submittal of May 26, 1998, provided design criteria for piping, methodology to calculate maximum pipe pressures, test documentation for the air-operated diaphragm valve and a representative globe valve, methodology to estimate pressure at which the valve was determined to lift off its seat or leak, and documentation of the valve specific post-modification

testing on the Unit 2 modified ball valves to demonstrate the effectiveness of its pressure relief capability. The staff finds the licensee's criteria, calculation methodologies, and test documentation for diaphragm, globe, and ball valves reasonable and acceptable.

The staff finds that the licensee's evaluations, and corrective actions provide an acceptable resolution of the GL 96-06 issue of thermally-induced pressurization of piping runs penetrating the containment.

In order to eliminate the potential for boiling in the CCW system (thereby eliminating the potential for waterhammer and two-phase flow), the licensee has determined that a minimum pressure of 17 psig is required to be maintained in the CCW system surge tank. The licensee's analysis (Calculation M-998) is based on a limiting containment temperature of 260 °F, which is derived from the LOCA temperature profile for the containment. The staff has reviewed the licensee's calculation, and agrees with the licensee's assessment of this issue.

Therefore, the licensee's resolution of the GL 96-06 waterhammer and two-phase flow concerns by maintaining at least 17 psig pressure in the CCW surge tank is acceptable.

3.4 Technical Specification Surveillance and Operability Considerations

The licensee has established administrative controls to assure that the required pressure is maintained in the surge tank, and to assure that the nitrogen leak rate from the surge tank does not exceed design assumptions. The licensee's administrative procedures recognize and correct for any measurement uncertainties that exist. Annunciation is also available in the control room to alert the operators of any problems that might occur associated with surge tank pressure. The licensee's use of administrative controls to assure that surge tank pressure requirements are satisfied during plant operation is acceptable to the staff, and additional TS surveillance requirements are considered to be unnecessary for this purpose.

TS 3.7.3.1 requires at least two vital CCW loops to be operable. In order for the CCW loops to be operable, the licensee has determined that at least 17 psig must be maintained in the CCW system surge tank. For each of the DCPP units, the CCW system surge tank is common to both of the vital CCW loops. Therefore, failure to satisfy surge tank pressure requirements would require entry into TS 3.0.3. This is recognized in the licensee's Licensing Basis Impact Evaluation, which is an enclosure to the June 12, 1997, submittal. The actions required by TS 3.0.3 for degraded CCW system surge tank pressure are considered to be appropriate and are acceptable to the staff. Additional TS operability requirements are considered to be unnecessary.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the California State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is

no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (63 FR 40558). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (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 issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: J. Tatum
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Date: May 13, 1999