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

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# RELATED TO AMENDMENT NO. 89 TO FACILITY OPERATING LICENSE NO. DPR-80

# AND AMENDMENT NO. 88 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 of January 10, 1994, as supplemented February 3, 1994, Pacific Gas and Electric Company (or the licensee) submitted a request for changes to the Technical Specifications (TS). The proposed amendments would revise Technical Specifications (TS) 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," and TS 3/4.6.2.3, "Containment Cooling System." TS 3/4.3.2, Table 3.3-3, "Engineered Safety Features Actuation System Instrumentation," and Table 4.3-2, "Engineered Safety Features Actuation System Instrumentation Surveillance Requirements," would be revised to include Mode 4 applicability requirements for the high-high containment pressure signal. TS 3/4.6.2.3 would be revised to clarify acceptable containment fan cooling unit (CFCU) configurations that satisfy the safety analysis requirements and to clarify the minimum required component cooling water (CCW) flow supplied to the CFCU cooling coils under normal plant operations and certain ASME Section XI tests.

The February 3, 1994 submittal provided clarifying information and did not affect the initial Federal Register notice and proposed no significant hazards consideration.

## 2.0 BACKGROUND

The Diablo Canyon Power Plant (DCPP) CCW system provides cooling to safety and nonsafety-related equipment and consists of three normally cross-tied headers. Two vital headers supply cooling water to safety-related equipment and one nonvital header supplies cooling water to equipment required for normal plant operation, but not required to shut down the plant or maintain it in a safe condition. The three headers are supplied by three pumps, two of which are in service during normal operation. Each of the three pumps is powered from a separate vital bus. Heat transferred to the CCW system can be removed via two CCW heat exchangers, one of which is usually in service during normal operation. These heat exchangers are cooled by the auxiliary saltwater (ASW) system, which discharges heat to the ultimate heat sink.

In the event of a loss of coolant accident (LOCA) or a main steam line break (MSLB), a protection system signal is generated. This signal causes all emergency core cooling system (ECCS) components to start and realign for injection into the reactor coolant system (RCS). Additionally, all three CCW pumps start, both ASW pumps start, and all five CFCUs start in, or shift to, slow speed. If a high-high containment pressure signal was generated due to containment pressure exceeding 22 psig, the nonvital CCW header would isolate and the containment spray pumps would also start and spray containment. However, the high-high containment pressure signal may not be generated during an event in Mode 4 since the signal is not required to be operable in Mode 4 in the current DCPP TS.

During the injection phase following a large break LOCA, the largest heat load on the CCW system is the CFCUs. The five CFCUs are powered from separate vital busses. Two CFCUs are powered from vital Bus G, two CFCUs are powered from vital Bus F, and one CFCU is powered from vital Bus H. The CFCUs are designed to remove heat from containment to prevent exceeding the maximum containment design pressure. The CFCUs cool the containment atmosphere by drawing air across coils cooled by CCW and discharging the air back to containment.

The worst case containment design basis accident (DBA) is a large break LOCA at full power, coincident with a failure of vital Bus G, as discussed in DCPP Final Safety Analysis Report (FSAR) Update Section 6.2B.3. The DBA analysis also conservatively assumes that the RHR pump and centrifugal charging pump powered from vital Bus G are operable. These nonmechanistic assumptions maximize the mass and energy addition to containment. All other ECCS equipment operates as designed, and the nonvital CCW header isolates as designed. If only the minimum equipment allowed by the current limiting conditions for operation (LCO) of TS 3.6.2.3 is assumed to be operable at the time of the LOCA and the failure of Bus G is assumed, one CCW pump, one containment spray pump, and three CFCUs may not be available. The DBA analysis demonstrated that one containment spray train and two CFCUs, each with 2000 gpm supplied to the cooling coils, are adequate to prevent exceeding the maximum containment design pressure. Currently, DCPP TS surveillance requirement 4.6.2.3a.2) assures that the accident analyses assumptions of at least 2000 gpm CCW flow to each CFCU is achieved.

Historically the licensee established at least 2000 gpm CCW flow to the CFCU cooling coils with the CCW system aligned for normal operation (nonvital header in service). In January 1991, the licensee identified that if 2000 gpm CCW flow to the CFCU cooling coils was established during normal plant operation with the nonvital CCW header in service, up to 2700 gpm CCW flow would be provided to the CFCU cooling coils following isolation of the nonvital CCW header and the start of the third CCW pump. As the CCW flow to the CFCU cooling coils increases, the heat transfer into the CCW system increases. The licensee determined that this increased heat transfer could potentially result in exceeding the maximum CCW temperature limits.

The worst case CCW temperature transients results from a large break LOCA coincident with a single failure of an ASW pump. If the CCW flow to the CFCUs was greater than 2500 gpm, and all five CFCUs operated as designed, the increased heat transfer rate could increase the CCW temperature above the allowable temperatures for the CCW system. The licensee reported this concern in Licensee Event Report (LER) 1-93-001.

In May 1993, as a result of the identification of the potential CCW overheating concern, the licensee rebalanced the CCW flow to the CFCUs. Due to this rebalancing, the CCW flow rates to the CFCUs during normal operation are less than 2000 gpm. In the event of a containment DBA, the nonvital CCW header would automatically isolate and the minimum required flow of 2000 gpm to each CFCU would be achieved. Additionally, in the event of the worst case CCW temperature transient, the CCW flow rates would not exceed 2500 gpm and the CCW temperature limits would not be exceeded.

In November 1993, PG&E design engineering identified that the CCW flow to the CFCUs required to mitigate the containment DBA could not have been satisfied when the residual heat removal (RHR) heat exchangers were placed in service for ASME Section XI testing. This is caused by RHR heat exchangers which do not automatically isolate during an accident. The Section XI testing, which is performed quarterly, includes CCW pump and check valve testing, and RHR heat exchanger CCW outlet valve testing. The pump and check valve testing can take up to 8 hours. The valve stroke time is typically less than 60 seconds. The licensee also concluded that the same issue could exist in Mode 4 prior to and after implementation of the new flow balance if the CCW flow to the CFCUs was not rethrottled prior to entering Mode 4.

The licensee also identified that TS 3.6.2.3 action statement b. is inconsistent with the containment DBA. Action statement b. allows for only one CFCU and two containment spray trains to be operable. The licensee's preliminary analysis indicates that the maximum design pressure of containment would be exceeded during the recirculation phase if a LOCA occurred when in this configuration and no operator action occurred. However, the licensee has reasonable assurance that the plant has never operated in the configuration allowed by action statement b. The licensee reported these concerns in LER 1-93-010.

## 3.0 EVALUATION

### High-High Containment Pressure Signal

The licensee proposes to revise TS 3.3.2, "Engineered Safety Features Actuation System," Table 3.3-3 and Table 4.3-2, Functional Units 2.c. and 3.b.3), to expand the mode applicability of the containment high-high pressure signal to include Mode 4.

The high-high pressure signal isolates containment and actuates the containment spray system when containment pressure exceeds 22 psig at DCPP. The high-high pressure signal also causes the nonvital CCW header to isolate. This signal is designed to provide protection from overpressurization of

containment during an accident through the initiation of containment spray and the diversion of flow from equipment supplied by the nonvital CCW header to equipment supplied by the vital headers, such as the CFCUs.

Revising the TS applicability of the high-high containment pressure signal to include Mode 4 at DCPP provides assurance that the containment spray system will automatically actuate and the nonvital CCW header will automatically isolate during an accident in Mode 4 if the containment pressure reaches the setpoint. The addition of Mode 4 to the TS applicability of the containment high-high pressure signal is conservative and will make this DCPP TS consistent with the bounding Mode 1 analysis. Therefore, the staff finds this change acceptable.

Equipment Requirements

The licensee's proposed changes to the equipment requirements in DCPP TS 3/4.6.2.3, "Containment Cooling System," are as follows:

1. TS LCO 3.6.2.3. would be revised to require that at least four containment fan cooling units (CFCUs), or three CFCUs, each supplied by a separate vital bus, be operable.

2. Action statement a. would be revised to clarify the equipment required to be operable when in the action statement.

3. Action statement b. would be deleted.

4. Action statement c. would be renumbered to action statement b. and revised to clarify the equipment required to be operable when in the action statement.

The proposed changes to the LCO are administrative changes that clarify the acceptable CFCU combinations that assure at least two CFCUs are operable following a DBA and a single failure.

The removal of action statement b. of TS 3.6.2.3 provides consistency between the plant TS and the design analyses. The licensee's preliminary analysis indicates that if only one CFCU and two containment spray pumps are operable, the maximum containment design pressure could be exceeded during the recirculation phase following a LOCA if operator action is not taken.

The LCO, action statement a., and new action statement b. are being revised to clarify equipment configurations required to satisfy the assumptions in the DBA analysis. The clarification is required because of the CFCU, CCW, and electrical system designs at DCPP.

Based on the above, the staff finds the proposed changes acceptable.

CCW Flow

The licensee's proposed changes to the CCW flow requirements in DCPP TS 3/4.6.2.3, "Containment Cooling System," are as follows:

1. TS 4.6.2.3a.2) would be revised to clarify the minimum component cooling water (CCW) flow to the CFCUs as 1650 gpm during normal operation which will assure that the required accident flow is satisfied.

2. A footnote would be added to the surveillance requirement of TS 4.6.2.3a.2) allowing all CFCUs to have low CCW flow for ASME Section XI testing and Mode 4 operation with the residual heat removal (RHR) heat exchangers in service for decay heat removal.

The proposed revision of the minimum required CCW flow to the CFCUs from 2000 gpm to 1650 gpm will allow operators to verify, during normal operation, that the CCW system is flow balanced to assure that the CCW flow requirements for the CFCUs assumed in the containment DBA described in DCPP FSAR Update Section 6.2B.3 are satisfied. The CCW system has been flow balanced such that, when in normal operation, the CCW flow to each CFCU is less than 2000 gpm. The DCPP design basis accident analysis, however, requires a CCW flow rate of 2000 gpm to each CFCU. In the event of the design basis accident with its nonmechanistic assumptions, the CCW system will realign and the required 2000 gpm flow rate to each CFCU will be achieved. The licensee performed an analysis of other mechanistic single failure assumptions, including those which would prevent the automatic isolation of the nonvital CCW header. The licensee stated that this analysis demonstrated that the CCW flow to each CFCU was sufficient to assure that the containment DBA remained limiting. Accordingly, the current peak pressure, peak temperature, long-term temperature profile, and maximum subcompartment pressure change calculations remain bounding. Therefore, the staff finds the proposed change in the minimum required CCW flow acceptable.

The proposed addition of a footnote to DCPP TS 4.6.2.3a.2) would clarify the acceptability of placing an RHR heat exchanger in service during Mode 4 operation or in all modes for ASME Section XI testing. This proposed change would also clarify the acceptability of performing required ASME Section XI testing in Modes 1 through 4. The licensee performed a calculation to verify that with the flow that would be available as a result of the both RHR heat exchangers in service, three CFCUs will be capable of removing the same amount of heat as two CFCUs with 2000 gpm CCW flow to the cooling coils if a single failure is not considered. Since three CFCUs are required to be operable per TS 3.6.2.3, operation of the plant with the RHR heat exchangers in operation for Mode 4 or Section XI testing will not jeopardize the integrity of containment. The licensee will implement administrative controls to prevent this footnote from being applied when in an action statement for the CFCUs. The staff finds the proposed footnote acceptable.

In addition, the licensee proposes to remove cycle specific information that is no longer applicable in TS 4.6.2.3a.3). This change is administrative, and, is therefore acceptable.

## 3.0 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.

## 4.0 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 and change surveillance requirements. 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 (59 FR 4121). 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.

## 5.0 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: S. Peterson

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