March 2, 1994

Docket Nos. 50-275
and 50-323

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SPeterson

Mr. Gregory M. Rueger
Nuclear Power Generation, B14A
Pacific Gas and Electric Company
77 Beale Street, Room 1451
P.O. Box 770000
San Francisco, California 94177

Dear Mr. Rueger:

SUBJECT: ISSUANCE OF AMENDMENTS FOR DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1 (TAC NO. M88522) AND UNIT NO. 2 (TAC NO. M88523)

The Commission has issued the enclosed Amendment No. 89 to Facility Operating License No. DPR-80 and Amendment No. 88 to Facility Operating License No. DPR-82 for the Diablo Canyon Nuclear Power Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated January 10, 1994, as supplemented February 3, 1994.

These amendments revise 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," to include new mode applicability requirements for the high-high containment pressure signal. In addition, TS 3/4.6.2.3, "Containment Cooling System," is 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 flow supplied to the CFCU cooling coils.

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

Sincerely,
Original signed by:
Sheri R. Peterson, Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 89 to DPR-80
2. Amendment No. 88 to DPR-82
3. Safety Evaluation

cc w/enclosures:
See next page

*See previous concurrence.

OFC	LA/PDV	PM/PDV	BC/DSSA	BC/DSSA	OGC	D/PDV
NAME	DFoster-Curseen	SPeterson	RBarrett	CMcCracken	C Marco	TQuay
DATE	2/17/94	2/17/94	3/1/94	2/23/94	2/22/94	3/2/94

DF01

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

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Sincerely,

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3. Safety Evaluation

cc w/enclosures:
See next page

Mr. Gregory M. Rueger
Pacific Gas and Electric Company

Diablo Canyon

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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. 89
License No. DPR-80

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

   A. The application for amendment by Pacific Gas & Electric Company (the licensee) dated January 10, 1994, as supplemented February 3, 1994, 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, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-80 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 89 , are hereby incorporated in the license. Pacific Gas & Electric Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R. Quay

Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 2, 1994

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. 88
License No. DPR-82

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

   A. The application for amendment by Pacific Gas & Electric Company (the licensee) dated January 10, 1994, as supplemented February 3, 1994, 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, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-82 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 88 , are hereby incorporated in the license. Pacific Gas & Electric Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R. Quay

Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical Specifications

Date of Issuance: March 2, 1994

ATTACHMENT TO LICENSE AMENDMENTS

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

AND AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NO. DPR-82

DOCKET NOS. 50-275 AND 50-323

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf pages are also included, as appropriate.

REMOVE	INSERT
3/4 3-16	3/4 3-16
3/4 3-17	3/4 3-17
3/4 3-32	3/4 3-32
3/4 3-33	3/4 3-33
3/4 6-13	3/3 6-13
3/4 6-14	3/4 6-14
B 3/4 6-3	B 3/4 6-3
-------	B 3/4 6-3a
-------	B 3/4 6-3b
-------	B 3/4 6-3c
-------	B 3/4 6-3d
-------	B 3/4 6-3e

TABLE 3.3-3

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Safety Injection (Reactor Trip, Feedwater Isolation, Start Diesel Generators, Containment Fan Cooler Units, and Component Cooling Water)					
a. Manual Initiation	2	1	2	1, 2, 3, 4	19
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
c. Containment Pressure-High	3	2	2	1, 2, 3, 4	20
d. Pressurizer Pressure-Low	4	2	3	1, 2, 3#	20
e. DELETED					
f. Steam Line Pressure-Low	3/steam line	2/steam line in any steam line	2/steam line	1, 2, 3#	20

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
2. Containment Spray					
a. Manual	2	2 with 2 coincident switches	2	1, 2, 3, 4	19
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
c. Containment Pressure-High-High	4	2	3	1, 2, 3, 4	17
3. Containment Isolation					
a. Phase "A" Isolation					
1) Manual	2	1	2	1, 2, 3, 4	19
2) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
3) Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
b. Phase "B" Isolation					
1) Manual	2	2 with 2 coincident switches	2	1, 2, 3, 4	19

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
3. Containment Isolation (Continued)					
2) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
3) Containment Pressure-High-High	4	2	3	1, 2, 3, 4	17
c. Containment Ventilation Isolation					
1) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	18
2) Plant Vent Noble Gas Activity-High (RM-14A and 14B)[a]	2	1	2	1, 2, 3, 4	18
3) Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
4) Containment Ventilation Exhaust Radiation-High (RM-44A and 44B)[b]	2	1	2	1, 2, 3, 4	18
4. Steam Line Isolation					
a. Manual	1 manual switch/steam line	1 manual switch/steam line	1 manual switch/operating steam line	1, 2, 3, 4	24

(a) The requirements for Plant Vent Noble Gas Activity-High (RM-14A and 14B) are not applicable following installation of RM-44A and 44B.
(b) The requirements for Containment Ventilation Exhaust Radiation-High (RM-44A and 44B) are applicable following installation of RM-44A and 44B.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. Steam Line Isolation (Continued)					
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	22
c. Containment Pressure-High-High	4	2	3	1, 2, 3	17
d. Steam Line Pressure-Low	3/steam line	2/steam line in any steam line	2/steam line	1, 2, 3#	20
e. Negative Steam Line Pressure Rate-High	3/steam line	2/steam line in any steam line	2/steam line	3##	20
5. Turbine Trip & Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2	25
b. Steam Generator Water Level-High-High	3/stm. gen.	2/stm. gen. in any operating stm. gen.	2/stm. gen. in each operating stm. gen.	1, 2	20

TABLE 3.3-5 (Continued)

TABLE NOTATIONS

(1) Diesel generator starting delay not included because offsite power available.

(2) Notation deleted.

(3) Diesel generator starting and loading delays included.

(4) Diesel generator starting delay not included because offsite power is available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps (where applicable). Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is included.

(5) Diesel generator starting and sequence loading delays included. Offsite power is not available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps. Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is included.

(6) The maximum response time of 48.5 seconds is the time from when the containment pressure exceeds the High-High Setpoint until the spray pump is started and the discharge valve travels to the fully open position assuming off-site power is not available. The time of 48.5 seconds includes the 28-second maximum delay related to ESF loading sequence. Spray riser piping fill time is not included. The 80-second maximum spray delay time does not include the time from LOCA start to "P" signal.

(7) Diesel generator starting and sequence loading delays included. Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is not included. Response time limit includes opening of valves to establish SI flow path and attainment of discharge pressure for centrifugal charging pumps, SI, and RHR pumps (where applicable).

(8) Does not include Trip Time Delays. Response times include the transmitters, Eagle-21 Process Protection cabinets, Solid State Protection System cabinets and actuation devices only. This reflects the response times necessary for THERMAL POWER in excess of 50% RTP.

TABLE 4.3-2

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALI-BRATION	ANALOG OPERA-TIONAL TEST	TRIP ACTUATING OPERA-TIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Safety Injection, (Reactor Trip Feedwater Isolation, Start Diesel Generators, Containment Fan Cooler Units, and Component Cooling Water)								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
c. Containment Pressure-High	S	R	Q	N.A.	N.A	N.A.	N.A.	1, 2, 3, 4
d. Pressurizer Pressure-Low	S	R	Q	N.A	N.A.	N.A.	N.A.	1, 2, 3
e. Differential Pressure Between Steam Lines-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
f. Steam flow in Two Steam Lines-High Coincident With Either	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
1) T_{avg}-Low-Low, or	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
2) Steam Line Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
2. Containment Spray								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
c. Containment Pressure-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALI-BRATION	ANALOG OPERA-TIONAL TEST	TRIP ACTUATING OPERA-TIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. Containment Isolation								
a. Phase "A" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
3) Safety Injection		See Item 1. above for all Safety Injection Surveillance Requirements.						
b. Phase "B" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
3) Containment Pressure-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
c. Containment Ventilation Isolation								
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
2) Plant Vent Noble Gas Activity-High (RM-14A and 14B)[a]	S	R	M(2)	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
3) Safety Injection		See Item 1. above for all Safety Injection Surveillance Requirements.						
4) Containment Ventilation Exhaust Radiation-High (RM-44A and 44B)[b]	S	R	M(2)	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4

(a) The requirements for Plant Vent Noble Gas Activity-High (RM-14A and 14B) are not applicable following installation of RM-44A and 44B.

(b) The requirements for Containment Ventilation Exhaust Radiation-High (RM-44A and 44B) are applicable following installation of RM-44A and 44B.

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALI-BRATION	CHANNEL OPERA-TIONAL TEST	TRIP ACTUATING DEVICE OPERA-TIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
4. Steam Line Isolation								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3
c. Containment Pressure-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
d. Steam Line Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Negative Steam Line Pressure Rate-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	3(3)
5. Turbine Trip and Feedwater Isolation								
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2
b. Steam Generator Water Level-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2
6. Auxiliary Feedwater								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3
c. Steam Generator Water Level-Low-Low								
1) Steam Generator Water Level-Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
2) RCS Loop ΔT	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3

CONTAINMENT SYSTEMS

CONTAINMENT COOLING SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.3 The Containment Cooling System shall be OPERABLE with either:

a. At least four containment fan cooler units (CFCUs), or

b. At least three CFCUs, each of the three supplied from a different vital bus.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With the requirements of the above specification not satisfied, but at least two CFCUs OPERABLE and both Containment Spray Systems OPERABLE, restore the Containment Cooling System to OPERABLE status within 7 days, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With the requirements of the above specification not satisfied and one Containment Spray System inoperable, but at least two CFCUs OPERABLE, restore the inoperable Containment Spray System to OPERABLE status within 72 hours otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore the Containment Cooling System to OPERABLE status within 7 days of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.3 Each containment fan cooler unit shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1) Starting each containment fan cooler unit and verifying that each containment fan cooler unit operates for at least 15 minutes,

SURVEILLANCE REQUIREMENTS (Continued)

2) Verifying a cooling water flow rate of greater than or equal to 1650* gpm to each cooler, and

3) Verifying that each containment fan cooler unit starts on low speed.

b. At least once per 18 months by verifying that each containment fan cooler unit starts automatically on a Safety Injection test signal.

*The CFCU cooling water flow rate requirement of TS 4.6.2.3a.2) may not be met during Section XI testing and in Mode 4 during residual heat removal heat exchanger operation.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the Containment Spray System ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The Containment Spray System and the Containment Cooling System are redundant to each other in providing post accident cooling of the containment atmosphere. However, the Containment Spray System also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable Spray System to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

3/4.6.2.2 SPRAY ADDITIVE SYSTEM

The OPERABILITY of the Spray Additive System ensures that sufficient NaOH is added to the containment spray in the event of a LOCA. The limits on NaOH minimum volume and concentration ensure a pH value of between 8.0 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics. These assumptions are consistent with the iodine removal efficiency assumed in the safety analyses.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM

BACKGROUND

The OPERABILITY of the Containment Fan Cooler Units (CFCUs) ensures that: (1) the containment air temperature will be maintained within limits during normal operation, and (2) adequate heat removal capacity is available when operated in conjunction with the Containment Spray System during post loss of coolant accident (LOCA) conditions.

The five CFCUs are provided with power from the three vital busses as follows:

CFCU 1 - Bus F
CFCU 2 - Bus F
CFCU 3 - Bus G
CFCU 4 - Bus H
CFCU 5 - Bus G

Any two CFCUs, in conjunction with one train of containment spray are capable of providing adequate containment heat removal to assure that the

3/4.6.2.3 CONTAINMENT COOLING SYSTEM (Continued)

maximum containment design pressure is not exceeded following a LOCA. Each CFCU is supplied with cooling water from one of the two vital component cooling water headers. Air is drawn into the coolers by the fan across cooling coils supplied with component cooling water. The air is discharged to the steam generator compartments, pressurizer compartment, instrument tunnel, and outside the secondary shield in the lower areas of containment.

During normal operation, three CFCUs are operating. The fans are normally operated at high speed with component cooling water supplied to the cooling coils. The CFCUs are designed to limit the ambient containment air temperature during normal unit operation to less than the limit specified in Technical Specification (TS) 3.6.1.5, "Air Temperature." This temperature limitation ensures that the containment temperature does not exceed the initial temperature conditions assumed for design basis accidents (DBAs).

In post accident operation, following an actuation signal, the CFCUs are designed to start automatically in slow speed if not already running. If running in high speed, the fans automatically shift to slow speed. The fans are operated at the lower speed during accident conditions to prevent motor overload from the higher density atmosphere caused by the steam introduced by the DBA. The temperature of the component cooling water flow to the CFCU cooling coils is an important factor in the heat removal capability of the CFCUs.

APPLICABLE SAFETY ANALYSES

The CFCUs, in conjunction with the containment spray system, limit the temperature and pressure that could be experienced following a DBA. The limiting DBAs considered are the LOCA and the main steam line break (MSLB). The LOCA and MSLB are analyzed using computer codes designed to predict the resultant containment pressure and temperature transients. No DBAs are assumed to occur simultaneously or consecutively.

The postulated LOCA is analyzed with regard to containment ESF systems, assuming the single failure of vital Bus G, which is the worst case single active failure and results in only two CFCUs and one containment spray train available to mitigate the containment pressure and temperature transient, assuming only the minimum equipment allowed by the LCO is available. Although nonmechanistic, the ECCS pumps supplied by vital Bus G are assumed to operate.

The postulated MSLB assumes the single failure of a main feedwater regulating valve and main steam isolation valve.

The analysis and evaluation show that under the worst case scenario, the highest peak containment pressure is less than 47 psig (experienced during LOCA). The analysis shows that the peak containment temperature is 345°F (experienced during an MSLB). Both results satisfy the design basis.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM (Continued)

The most limiting analysis assumes a power level of 102%, one containment spray train and 2 CFCUs operating, and initial (pre-accident) containment conditions of 120°F and 1.2 psig. The analysis also assumes a response time delayed initiation to provide conservative peak calculated containment pressure and temperature responses.

LIMITING CONDITION FOR OPERATION

During a DBA, at least two CFCUs are required to operate. LCO a. requires that four CFCUs be OPERABLE. This provides assurance that given any bus failure, at least two CFCUs will operate during a DBA. LCO b. allows only three CFCUs to be OPERABLE provided that each of three CFCUs is supplied from a different vital bus. With one CFCU supplied by each vital bus, the failure of any vital bus will only disable one of the three CFCUs, and ensure that two CFCUs will operate during the DBA.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment and an increase in containment pressure and temperature requiring the operation of the CFCUs.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Thus, the Containment Spray System and the Containment Cooling System are not required to be OPERABLE in MODES 5 and 6.

ACTIONS

Action Statement a.

Action statement a. requires at least two CFCUs and both containment spray trains to be OPERABLE. When in this action statement, as many as three CFCUs can be inoperable. This configuration provides more than the minimum equipment required to assure that adequate containment heat removal is maintained, although a single failure cannot be assumed. However, since the condition is permitted only when in an action statement, a single failure is not required to be considered. Requiring both containment spray trains to be OPERABLE provides containment heat removal margin.

The 7 day allowed outage time was developed taking into account the redundancy available in the containment spray system when in the action statement, and the low probability of DBA occurring during this period.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM (Continued)

Action Statement b.

Action statement b. permits operation with one train of containment spray and two CFCUs OPERABLE for up to 72 hours. The action statement requires that the inoperable containment spray system be restored to OPERABLE status within 72 hours. From the time that the containment cooling system initially became inoperable, up to 7 days are available to restore the containment cooling system to OPERABLE status.

In the configuration allowed by this action statement, adequate containment iodine removal is still available through the one OPERABLE train of containment spray, and adequate heat removal from containment to prevent the maximum containment design pressure from being exceeded is available through the two CFCUs and one containment spray train.

SURVEILLANCE REQUIREMENTS

Surveillance Requirement 4.6.2.3a.1)

TS Surveillance 4.6.2.3a.1) requires that each CFCU be started and operated at least once every 31 days for greater than or equal to 15 minutes. Operating each CFCU for 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The 31 day frequency is based on the known reliability of the fan units and controls, redundancy available, and the low probability of significant degradation of the CFCUs occurring between surveillances.

Surveillance Requirement 4.6.2.3a.2)

TS Surveillance 4.6.2.3a.2) requires verification every 31 days of cooling water flow of greater than or equal to 1650 gpm to demonstrate the CFCU is operable. The 1650 gpm includes 1600 gpm required flow to the CFCU cooling coils and 50 gpm cooling flow for the CFCU motor cooler. The cooling water flow is supplied by the CCW system. CFCU OPERABILITY assures that adequate containment heat removal capacity is available when operated in conjunction with the containment sprays during post-LOCA conditions.

Final Safety Analysis Report (FSAR) Update Section 6.2B.3 specifies the basis for the surveillance requirement. FSAR Update Section 6.2B.3 specifies that for the design basis containment analysis, a LOCA occurs simultaneously with a failure of Bus G, and the minimum allowable CFCUs are OPERABLE. In the analysis, all emergency core cooling system (ECCS) pumps are conservatively assumed to operate to maximize the mass and energy addition rates to containment. Additionally, the nonvital CCW header isolates since it is powered from vital Bus H. As a result of the failure of Bus G, two CFCUs and one containment spray system are available to mitigate the pressure effects of the LOCA.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM (Continued)

In order for the two CFCUs to remove sufficient heat to perform their intended function, 2000 gpm CCW flow must be supplied to the CFCU cooling coils. Analysis has determined that if 1600 gpm flow is supplied to the CFCU cooling coils during normal operation with the nonvital CCW header in service, at least 2000 gpm will be supplied to the CFCU cooling coils during LOCA coincident with a failure of vital Bus G.

The CCW system configuration during normal operation is different from the configuration during emergency core cooling system actuation. Nonvital header C is automatically isolated in most accident scenarios. This results in increased flow to the remaining components supplied by the two vital headers. Cooling water flow to the CFCU of 1650 gpm established in the normal plant configuration with non vital header C in service and the RHR heat exchangers isolated will result in CCW flow greater than or equal to 2000 gpm during accident conditions coincident with a Bus G failure.

One postulated single failure, the failure of vital Bus H, will prevent automatic isolation of nonvital header C because the power supply for the isolation valve is provided from Bus H. Nonvital header C being open is a different condition from that for the license basis containment pressure analysis described in supplemental safety evaluation report (SSER) 16 and FSAR, Section 6.2B.3, page 6.2B-5. For this accident scenario, the CCW flow to the CFCU coils following the accident will not change significantly from the observed flow during normal operation.

The effects of this case on containment integrity have been analyzed. The H Bus failure consequences, using mechanistic assumptions (ie., the components on other powered buses are assumed to operate and the components on Bus H have no power and are assumed to not operate) and a single failure, show that a CFCU cooling flow rate of 1650 gpm is adequate to perform the CFCU heat removal function for this scenario. The consequences of this scenario remain bounded by the license basis analysis.

If a single failure of Bus F is assumed, nonvital CCW header C will isolate and at least 2000 gpm CCW flow will be supplied to the CFCUs.

A footnote to the surveillance requirement specifies that operation of the CFCUs is permitted with low component cooling water (CCW) flow to the CFCUs due to ASME Section XI testing required by TS 4.0.5 or decay heat removal in Mode 4 with the residual heat removal heat exchangers in service. To support this conclusion, a calculation was performed. This calculation evaluated containment heat removal with one train of containment spray OPERABLE and reduced CCW flow to three CFCUs. The calculation concluded that this configuration would provide adequate heat removal to ensure that the maximum design pressure of containment was not exceeded during a DBA in Mode 1. This analysis also determined that a single failure could not be tolerated during this condition and still assure that the maximum design pressure of containment would not be

3/4.6.2.3 CONTAINMENT COOLING SYSTEM (Continued)

exceeded. Since a single failure cannot be tolerated, the footnote limits the acceptability of low CCW flow to the CFCU cooling coils to Mode 4 with the RHR system in service and ASME Section XI testing in Modes 1 through 4.

In order to support the analysis that permits operation with low CCW flow to the CFCUs, both containment spray trains must be OPERABLE and at least three CFCU must be verified OPERABLE prior to opening an RHR heat exchanger outlet valve for Section XI testing.

Surveillance Requirement 4.6.2.3a.3)

TS 4.6.2.3a.3) requires that each CFCU be started in low speed every 31 days. The purpose of this requirement is to assure that the CFCU and the associated control equipment is capable of operating in the configuration required for the DBA. The surveillance frequency of 31 days is based on the known reliability of the fan units and controls, redundancy available, and the low probability of significant degradation of the CFCUs occurring between surveillances.

Surveillance Requirement 4.6.2.3b.

TS 4.6.2.3b. requires that each CFCU be started on a safety injection signal once very 18 months. This surveillance provides assurance that the circuitry required to start the CFCU during a DBA is OPERABLE. The 18 month frequency is based on the need to perform these surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the surveillances when performed at the 18 month frequency. Therefore, the frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 38, GDC 40, GDC 41, GDC 42, and GDC 43.

2. 10 CFR 50, Appendix K.

3. FSAR Section 6.2B.3

4. FSAR Section 6.2.1.3.6

5. FSAR Table 6.2-5

6. FSAR Section 6.2.2.2.2.2

7. FSAR Section 9.2.2

8. FSAR Section 15.4

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

Date: March 2, 1994