Docket Nos. 50-275
and 50-323

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. M85258) AND UNIT NO. 2 (TAC NO. M85259)

The Commission has issued the enclosed Amendment No. 86 to Facility Operating License No. DPR-80 and Amendment No. 85 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 December 22, 1992, as supplemented July 19, 1993.

These amendments revise the second level undervoltage trip setpoint and allowable values in TS section 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," and the diesel generator (DG) steady state voltage surveillance requirements in TS section 3/4.8.1, "A.C. Sources".

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. 86 to DPR-80
2. Amendment No. 85 to DPR-82
3. Safety Evaluation

cc w/enclosures:
See next page

9401130148 940106
PDR ADOCK 05000275
P PDR

DISTRIBUTION

Docket File	NRC & Local PDRs
EAdensam	EBarnhill
DHagan, 3206	GHill (4), P1-37
OPA, 2G5	OC/LFDCB, 4503
JRoe	PDV Reading File
TQuay	OGC, 15B18
CGrimes, 11E22	ACRS (10), P-315
Region V (8)	SPeterson
KPerkins, RV	

OFC	LA/PDV	PM/PDV	OGC	D/PDV
NAME	EBarnhill	SPeterson:mc		TQuay
DATE	11/10/93	11/29/93	12/1/	1/6/94

OFFICIAL RECORD COPY DOCUMENT NAME: DC85258.AMD

120015

NRC FILE CENTER COPY

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

January 6, 1994

Docket Nos. 50-275
and 50-323

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. M85258) AND UNIT NO. 2 (TAC NO. M85259)

The Commission has issued the enclosed Amendment No. 86 to Facility Operating License No. DPR-80 and Amendment No. 85 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 December 22, 1992, as supplemented July 19, 1993.

These amendments revise the second level undervoltage trip setpoint and allowable values in TS section 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," and the diesel generator (DG) steady state voltage surveillance requirements in TS section 3/4.8.1, "A.C. Sources".

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,

Sheri R. Peterson

Sheri R. Peterson, Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 86 to DPR-80
2. Amendment No. 85 to DPR-82
3. Safety Evaluation

cc w/enclosures:
See next page

Mr. Gregory M. Rueger
Pacific Gas and Electric Company

Diablo Canyon

cc:
NRC Resident Inspector
Diablo Canyon Nuclear Power Plant
c/o U.S. Nuclear Regulatory Commission
P. O. Box 369
Avila Beach, California 93424

Dr. Richard Ferguson, Energy Chair
Sierra Club California
6715 Rocky Canyon
Creston, California 93432

Ms. Nancy Culver
San Luis Obispo
Mothers for Peace
P. O. Box 164
Pismo Beach, California 93448

Ms. Jacquelyn C. Wheeler
3303 Barranca Court
San Luis Obispo, California 93401

Managing Editor
The County Telegram Tribune
1321 Johnson Avenue
P. O. Box 112
San Luis Obispo, California 93406

Chairman
San Luis Obispo County Board of
Supervisors
Room 370
County Government Center
San Luis Obispo, California 93408

Mr. Truman Burns
Mr. Robert Kinosian
California Public Utilities Commission
505 Van Ness, Rm. 4102
San Francisco, California 94102

Diablo Canyon Independent Safety Committee
ATTN: Robert R. Wellington, Esq.
Legal Counsel
857 Cass Street, Suite D
Monterey, California 93940

Mr. Steve Hsu
Radiologic Health Branch
State Department of Health Services
Post Office Box 942732
Sacramento, California 94234

Regional Administrator, Region V
U.S. Nuclear Regulatory Commission
1450 Maria Lane, Suite 210
Walnut Creek, California 94596

Mr. Peter H. Kaufman
Deputy Attorney General
State of California
110 West A Street, Suite 700
San Diego, California 92101

Christopher J. Warner, Esq.
Pacific Gas & Electric Company
Post Office Box 7442
San Francisco, California 94120

Mr. John Townsend
Vice President and Plant Manager
Diablo Canyon Power Plant
P. O. Box 56
Avila Beach, California 93424

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

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-275

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 86
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 December 22, 1992, as supplemented July 19, 1993, 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:

9401130153 940106
PDR ADOCK 05000275
P PDR

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 86 , 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 60 days from 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: January 6, 1994

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

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-323

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 85
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 December 22, 1992, as supplemented July 19, 1993, 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. 85 , 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 60 days from 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: January 6, 1994

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 86 TO FACILITY OPERATING LICENSE NO. DPR-80

AND AMENDMENT NO. 85 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 3-27*	3/4 3-27*
3/4 8-3	3/4 8-3
3/4 8-4	3/4 8-4
3/4 8-5	3/4 8-5
B 3/4 3-1a	B 3/4 3-1a
B 3/4 8-2	B 3/4 8-2
B 3/4 8-3	B 3/4 8-3
B 3/4 8-3a	B 3/4 8-3a

*Due to Amendment Nos. 84 and 83, which become effective after the Eagle 21 reactor protection system upgrade, two versions of page 3/4 3-27 have been provided in this amendment. The page marked "before Eagle 21 installation," should be inserted and not removed until both units have completed the subject modification. The second page 3/4 3-27 provided in this amendment should be used after Eagle 21 installation, in lieu of the same page provided in Amendment Nos. 84 and 83 dated October 7, 1993.

TABLE 3.3-4 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
7. Loss of Power (4.16 kV Emergency Bus Undervoltage)		
a. First Level		
1) Diesel Start	≥ 0 volts with a ≤ 0.8 second time delay and ≥ 2583 volts with a ≤ 10 second time delay	≥ 0 volts with a ≤ 0.8 second time delay and > 2583 volts with a ≤ 10 second time delay
2) Initiation of Load Shed	One relay ≥ 0 volts with a ≤ 4 second time delay and ≥ 2583 volts with a ≤ 25 second time delay with one relay ≥ 2870 volts, instantaneous	One relay ≥ 0 volts with a ≤ 4 second time delay and > 2583 volts with a ≤ 25 second time delay with one relay ≥ 2870 volts, instantaneous
b. Second Level		
1) Diesel Start	≥ 3785 volts with a ≤ 10 second time delay	≥ 3785 volts with a ≤ 10 second time delay
2) Initiation of Load Shed	≥ 3785 volts with a ≤ 20 second time delay	≥ 3785 volts with a ≤ 20 second time delay
8. Engineered Safety Features Actuation System Interlocks		
a. Pressurizer Pressure, P-11	≤ 1915 psig	≤ 1920.6 psig
b. DELETED		
c. Reactor Trip, P-4	N.A.	N.A.

NOTE 1: Time constants utilized in the lead-lag controller for Steam Pressure - Low are r_1 = 50 seconds and r_2 = 5 seconds.

NOTE 2: Steam Generator Water Level Low-Low Trip Time Delay

$$TD = [B1(P)^3 + B2(P)^2 + B3(P) + B4][0.99]$$

Where: P = RCS loop ΔT Equivalent to Power (%RTP), P ≤ 50% RTP

TD = Time Delay for Steam Generator Water Level Low-Low Reactor Trip (in seconds)

Generators affected

B1 = -0.0072
B2 = +0.8181
B3 = -31.72
B4 = +468.8

TABLE 3.3-5

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
1. Manual Initiation	
a. Safety Injection (ECCS)	N.A.
1) Feedwater Isolation	N.A.
2) Reactor Trip	N.A.
3) Phase "A" Isolation	N.A.
4) Containment Ventilation Isolation	N.A.
5) Auxiliary Feedwater	N.A.
6) Component Cooling Water	N.A.
7) Containment Fan Cooler Units	N.A.
8) Auxiliary Saltwater Pumps	N.A.
b. Phase "B" Isolation	
1) Containment Spray (Coincident with SI Signal)	N.A.
2) Containment Ventilation Isolation	N.A.
c. Phase "A" Isolation	
1) Containment Ventilation Isolation	N.A.
d. Steam Line Isolation	N.A.
2. Containment Pressure-High	
a. Safety Injection (ECCS)	≤ 27[7]/25[4]
1) Reactor Trip	≤ 2
2) Feedwater Isolation	≤ 63
3) Phase "A" Isolation	≤ 18[1]/28[3]
4) Containment Ventilation Isolation	N.A.
5) Auxiliary Feedwater	≤ 60[3]
6) Component Cooling Water	≤ 38[1]/48[3]
7) Containment Fan Cooler Units	≤ 40[3]
8) Auxiliary Saltwater Pumps	≤ 48[1]/58[3]
3. Pressurizer Pressure-Low	
a. Safety Injection (ECCS)	≤ 27[7]/25[4]/35[5]
1) Reactor Trip	≤ 2
2) Feedwater Isolation	≤ 63
3) Phase "A" Isolation	≤ 18[1]
4) Containment Ventilation Isolation	N.A.
5) Auxiliary Feedwater	≤ 60[3]
6) Component Cooling Water	≤ 48[3]/38[1]
7) Containment Fan Cooler Units	≤ 40[3]
8) Auxiliary Saltwater Pumps	≤ 58[3]/48[1]

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
7. Loss of Power		
(4.16 kV Emergency Bus Undervoltage)		
a. First Level		
1) Diesel Start	≥ 0 volts with a ≤ 0.8 second time delay and ≥ 2583 volts with a ≤ 10 second time delay	≥ 0 volts with a ≤ 0.8 second time delay and > 2583 volts with a ≤ 10 second time delay
2) Initiation of Load Shed	One relay ≥ 0 volts with a ≤ 4 second time delay and ≥ 2583 volts with a ≤ 25 second time delay with one relay ≥ 2870 volts, instantaneous	One relay ≥ 0 volts with a ≤ 4 second time delay and > 2583 volts with a ≤ 25 second time delay with one relay ≥ 2870 volts, instantaneous
b. Second Level		
1) Diesel Start	≥ 3785 volts with a ≤ 10 second time delay	≥ 3785 volts with a ≤ 10 second time delay
2) Initiation of Load Shed	≥ 3785 volts with a ≤ 20 second time delay	≥ 3785 volts with a ≤ 20 second time delay
8. Engineered Safety Features Actuation System Interlocks		
a. Pressurizer Pressure, P-11	≤ 1915 psig	≤ 1925 psig*
*b. Low-Low T_{avg}, P-12 increasing	543°F	≤ 545.8°F
decreasing	543°F	≥ 540.2°F
c. Reactor Trip, P-4	N.A.	N.A.

*Before Eagle 21 installation.

TABLE 3.3-5

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
1. Manual Initiation	
a. Safety Injection (ECCS)	N.A.
1) Feedwater Isolation	N.A.
2) Reactor Trip	N.A.
3) Phase "A" Isolation	N.A.
4) Containment Ventilation Isolation	N.A.
5) Auxiliary Feedwater	N.A.
6) Component Cooling Water	N.A.
7) Containment Fan Cooler Units	N.A.
8) Auxiliary Saltwater Pumps	N.A.
b. Phase "B" Isolation	
1) Containment Spray (Coincident with SI Signal)	N.A.
2) Containment Ventilation Isolation	N.A.
c. Phase "A" Isolation	
1) Containment Ventilation Isolation	N.A.
d. Steam Line Isolation	N.A.
2. Containment Pressure-High	
a. Safety Injection (ECCS)	≤ 27[7]/25[4]
1) Reactor Trip	≤ 2
2) Feedwater Isolation	≤ 63
3) Phase "A" Isolation	≤ 18[1]/28[3]
4) Containment Ventilation Isolation	N.A.
5) Auxiliary Feedwater	≤ 60[3]
6) Component Cooling Water	≤ 38[1]/48[3]
7) Containment Fan Cooler Units	≤ 40[3]
8) Auxiliary Saltwater Pumps	≤ 48[1]/58[3]
3. Pressurizer Pressure-Low	
a. Safety Injection (ECCS)	≤ 27[7]/25[4]/35[6]
1) Reactor Trip	≤ 2
2) Feedwater Isolation	≤ 63
3) Phase "A" Isolation	≤ 18[1]
4) Containment Ventilation Isolation	N.A.
5) Auxiliary Feedwater	≤ 60[3]
6) Component Cooling Water	≤ 48[3]/38[1]
7) Containment Fan Cooler Units	≤ 40[3]
8) Auxiliary Saltwater Pumps	≤ 58[3]/48[1]

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the Onsite Class 1E Distribution System shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and

b. Demonstrated OPERABLE at least once per 18 months during shutdown by:

1) Transferring 4 kV vital bus power supply from the normal circuit to the alternate circuit (manually and automatically) and to the delayed access circuit (manually), and

2) Verifying that on a Safety Injection test signal, without loss of offsite power, the preferred, immediate access offsite power source energizes the emergency busses with permanently connected loads and energizes the auto-connected emergency (accident) loads through sequencing timers.

4.8.1.1.2 Each diesel generator* shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:**

1) Verifying the fuel level in the engine-mounted fuel tank,

2) Verifying the diesel starts from ambient condition and accelerates to at least 900 rpm in less than or equal to 10 seconds. The generator voltage and frequency shall be 4160 + 240/-375 volts and 60 * 1.2 Hz within 13 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:

a) Manual, or

b) Simulated loss of offsite power by itself (Startup bus undervoltage), or

c) A Safety Injection actuation test signal by itself.

---

*For a five diesel generator configuration, tests of Diesel Generator 3 to satisfy the frequency specified in Table 4.8-1 and in Surveillance Requirement 4.8.1.1.2b for one unit may be counted in determining whether the frequency specified in Table 4.8-1 and in Surveillance Requirement 4.8.1.1.2b for the other unit is satisfied. Unit-specific portions of this Surveillance Requirement for Diesel Generator 3 shall be performed on an alternating schedule with signals from Units 1 and 2.

**All diesel generator starts for the purpose of this surveillance test may be preceded by an engine prelube period. Further, all surveillance tests, with the exception of once per 184 days, may also be preceded by warmup procedures (e.g., gradual acceleration and/or gradual loading > 150 sec) as recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.

SURVEILLANCE REQUIREMENTS (Continued)

3) Verifying the generator is synchronized, loaded to greater than or equal to 2484 kW in less than or equal to 60 seconds, and operates for greater than or equal to 60 minutes,

4) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses,* and

5) Verifying the diesel engine protective relay trip cutout switch is returned to the cutout position following each diesel generator test.

b. At least once per 18 months during shutdown**, by:

1) Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service;

2) Verifying that the load sequence timers are OPERABLE with each load sequence timer within the limits specified in Table 4.8-2;

3) Verifying the generator capability to reject a load of greater than or equal to 508 kW while maintaining voltage at 4160 + 240/-375 volts and frequency at 60 ± 3 Hz;

4) Verifying the generator capability to reject a load of greater than or equal to 2484 kW without tripping. The generator voltage shall not exceed 4580 volts during and following the load rejection;

5) Simulating a loss of offsite power by itself, and:

a) Verifying de-energization of the emergency busses and load shedding from the emergency busses, and

b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the required auto-connected loads through sequencing timers and operates for greater than or equal to 5 minutes while its generator is loaded with the permanent and auto-connected loads. After energization of these loads, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 + 240/-375 volts and 60 * 1.2 Hz during this test.

*For a five diesel generator configuration, this may be the associated bus in the other unit if that unit is in MODE 1, 2, 3 or 4.

**For a five diesel generator configuration, these surveillance requirements can be performed on the third (common) diesel generator with only one unit shutdown.

SURVEILLANCE REQUIREMENTS (Continued)

6) Verifying that on a Safety Injection test signal without loss of offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be 4160 + 240/-375 volts and 60 * 1.2 Hz within 13 seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test;

7) Simulating a loss of offsite power in conjunction with a Safety Injection test signal, and:

   a) Verifying de-energization of the emergency busses and load shedding from the emergency busses;

   b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected emergency (accident) loads through sequencing timers and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization of these loads, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 + 240/-375 volts and 60 * 1.2 Hz during this test; and

   c) Verifying that all automatic diesel generator trips, except engine overspeed, low lube oil pressure and generator differential, are bypassed when the diesel engine trip cutout switch is in the cutout position and the diesel is aligned for automatic operation.

8) Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to greater than or equal to 2750 kW and during the remaining 22 hours of this test, the diesel generator shall be loaded to greater than or equal to 2484 kW. The generator voltage and frequency shall be 4160 + 240/-375 volts and 60 * 1.2 Hz within 13 seconds after the start signal. Within 5 minutes after completing this 24 hour test, perform Specification 4.8.1.1.2b.5)b);*

9) Verifying that the auto-connected loads to each diesel generator do not exceed the maximum rating of 2750 kW;

10) Verifying the diesel generator's capability to:

*If Specification 4.8.1.1.2b.5)b) is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead the diesel generator may be operated at 2484 kW for 1 hour or until operating temperature has stabilized.

SURVEILLANCE REQUIREMENTS (Continued)

a) Synchronize its isolated bus with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,

b) Transfer its loads to the offsite power source, and

c) Be restored to its standby status.

11) Verifying that with the diesel generator operating in a test mode, connected to its bus, a simulated Safety Injection signal opens the auxiliary transformer breaker and automatically sequences the emergency loads onto the diesel generator; and

12) Verifying that the shutdown relay lockout feature prevents diesel generator starting only when required:

a) Generator differential current-high, or

b) Engine lube oil pressure-low, or

c) Emergency stop button actuated, or

d) Overspeed trip actuated.

c. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting all diesel generators simultaneously, during shutdown, and verifying that all diesel generators accelerate to at least 900 rpm in less than or equal to 10 seconds.

d. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day tank.

4.8.1.1.3 The Diesel Fuel Oil Storage and Transfer System shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1) Verifying the fuel level in the fuel storage tank, and

2) Verifying that each fuel transfer pump starts and transfers fuel from the storage system to each engine-mounted tank via installed lines.

b. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;

c. By sampling new fuel oil in accordance with ASTM-D4057 prior to addition to the storage tanks and:

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, where applicable, and 1.137 "Fuel Oil Systems for Standby Diesel Generators," Revision 1, October 1979, where applicable. For the five diesel genera-tor configuration, the third (common) diesel generator is designed to respond to a Safety Injection Signal from either Unit 1 or Unit 2. If the capability to respond to a Safety Injection Signal from one unit is maintained during surveillance testing on the other unit, then the third (common) diesel generator shall be considered to be OPERABLE for that unit.

The steady state voltage and frequency Surveillance Requirements for demon-strating the OPERABILITY of the diesel generators are consistent with the second level undervoltage relay allowable values. This is the minimum steady state voltage needed on the 4160 volt vital buses to ensure adequate 4160 volt, 480 volt and 120 volt levels. The maximum steady state output voltage of 4400 V is the maximum operating voltage for 4000 V motors specified in ANSI C84.1. The maximum steady state output voltage of 4400 V ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9.

The Surveillance Requirements for demonstrating the OPERABILITY of the batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage onfloat charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-3 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

A.C. Sources, D.C. Sources, and ONSITE POWER DISTRIBUTION (Continued)

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-3 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

The OPERABILITY of the A.C. electrical power sources requires maintaining a supply of fuel oil to support the operation of the emergency diesel generators. The stored fuel oil supports the function of the A.C. power sources to provide power for the operation of emergency systems and engineered safety features (ESF) during and following the shutdown of the reactor in the event that offsite power sources are not available. The specified fuel oil quantity is based on the calculated fuel oil consumption necessary to support the operation of the emergency power source to power the minimum required ESF systems. Operation of minimum ESF systems is required to mitigate a design basis accident (LOCA) in one unit and those minimum required systems for a concurrent non-LOCA safe shutdown in the remaining unit (both units initially in Mode 1 operation). The fuel oil consumption is calculated for a period of 7 days operation of minimum ESF systems. This requirement provides a sufficient operating period within which offsite power can be restored and/or additional fuel can be delivered to the site.

The Surveillance Requirements applicable to diesel generator fuel oil storage requires cleaning the fuel oil storage tanks on a 10-year frequency. Conducting this surveillance requires the tank to be taken out of service. For this infrequent event, the inventory in the remaining tank is sufficient to support operation of the emergency diesel generator to power the minimum required loads to maintain safe conditions for a time period of 4 days, considering one unit in Mode 1 through 6 operation and one unit in Mode 6 operation with at least 23 feet of water above the reactor vessel flange or with the reactor defueled.

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

The OPERABILITY of the motor operated valves thermal overload protection and bypass devices ensures that these devices will not prevent safety related valves from performing their function. The Surveillance Requirements for demonstrating the OPERABILITY of these devices are in accordance with

ELECTRICAL EQUIPMENT PROTECTIVE DEVICES (Continued)

Regulatory Guide 1.106, "Thermal Overload Protection for Electric Motors on Motor Operated Valves," Revision 1, March 1977.

A list of the TS-controlled MOV thermal overload protection and bypass devices is maintained in the Diablo Canyon plant procedures. The administration of the list shall be conducted in accordance with Section 50.59 of 10 CFR Part 50 and the provisions in the Administrative Controls Section of the TS. Records of the changes to the valve list are maintained, and an annual report is made that includes a brief description of changes and a summary of the safety evaluation of each in accordance with 10 CFR 50.59.

Containment electrical penetrations and penetration conductors are protected by either deenergizing circuits not required during reactor operation or by demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers during periodic surveillance.

The Surveillance Requirements applicable to lower voltage circuit breakers provide assurance of breaker reliability by testing at least one representative sample of each manufacturer's brand of circuit breaker. Each manufacturer's molded case and metal case circuit breakers are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers are tested. If a wide variety exists within any manufacturer's brand of circuit breakers, it is necessary to divide that manufacturer's breakers into groups and treat each group as a separate type of breaker for surveillance purposes.

A list of containment penetration conductor overcurrent protective devices, with information on location and size and equipment powered by the protected circuit, is maintained and controlled at the plant site. The list is limited to those overcurrent devices installed for the purpose of keeping circuit fault current below the penetration rating. It does not apply to other overcurrent devices associated with containment penetrations. The addition or deletion of any containment penetration conductor overcurrent protective device is governed by Section 50.59 of 10 CFR Part 50.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 86 TO FACILITY OPERATING LICENSE NO. DPR-80

AND AMENDMENT NO. 85 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

Pacific Gas and Electric Company (PG&E), by letter dated December 22, 1992, as supplemented July 19, 1993, proposed that the Facility Operating License Nos. DRP-80 and DRP-82 be amended to modify Diablo Canyon Unit 1 and 2 Technical Specification (TS). Specifically, TS Section 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," would be revised to change the second level undervoltage trip setpoint and allowable values. Technical Specification 3/4.8.1, "A.C. Sources," would also be changed to revise the diesel generator (DG) steady state voltage surveillance requirements. The second level undervoltage relay TS setpoint and allowable values will be changed to maintain acceptable voltages at the 480 volt and 120 volt buses during sustained degraded voltage conditions. The DG steady state voltage surveillance requirements will be changed to ensure that the diesel generators provide adequate voltage when required to power the vital loads.

The supplemental letter dated July 19, 1993, provided additional 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) electrical power system consists of an offsite system and an onsite system. The offsite power system is comprised of a 230 kV and 500 kV transmission system. The onsite power system consists of a distribution system normally supplied by the offsite power system. In the event of a loss of offsite power, the onsite power system will be available to supply power to the safety loads via emergency diesel generators (EDGs).

The onsite 4160 volt power system is a three-phase system that serves motors from 200 to 3000 hp and transformers for the smaller loads at the lower voltages. The 4160 volt vital buses can be supplied power from the main generator (or the offsite 500 kV system) or from the emergency diesel generators (EDGs). During normal operation, the 4160 volt vital buses are

9401130154 940106
PDR ADOCK 05000275
P PDR

supplied from the auxiliary transformer, which is powered from the main generator. In the event of a loss of vital bus voltage or degraded grid voltage conditions, the 4160 volt vital buses are provided with two levels of undervoltage protection, the First Level Undervoltage Relays (FLURs) and the Second Level Undervoltage Relays (SLURs). The FLURs detect the loss of bus voltage (less than 69% bus voltage). The SLURs provide a second level of undervoltage protection which protects all Class 1E loads from short-term or long-term degradation in the offsite power system. TS 3/4.3.2 currently requires the SLURs setpoint and allowable value to be greater than or equal to 3600 volts.

3.0 EVALUATION

SLURs Setpoint

In 1985, the original SLURs T.S. minimum setpoint was 3600 volts at the 4160 volt buses, or 90% of the 4000 volt rating of motors. This setpoint was found acceptable in the NRC's supplement No. 9 to the Safety Evaluation Report (SSER9), section 4(3). Although the SLURs setpoint was actually set conservatively at 3700 volts and ensured that the safety-related 4000 volt motors would not experience sustained degraded voltage, the maintenance of adequate voltage had not been assured for the 460 volt motors and essential 120 volt control circuits for the Class 1E components.

As part of a "re-establish the design basis program" PG&E performed an evaluation to determine the effect of the 3700 volt SLURs setpoint on plant safety and provide the basis for operation during reevaluation and implementation of the new setpoint. PG&E determined that under normal operations the worst case voltage the 4160 volt buses could experience is 3916 volts or 98% of the 4000 volt motor rating. Thus, the SLURs setpoints would not be approached on a sustained basis when the buses are in the normal configuration. However, during start-up and shutdown of the units, the buses are connected to the start-up transformer, which is powered from the 230 kV switchyard. It was determined that in this configuration a safety concern could result if the grid voltage was to degrade to a point just above the SLURs setpoint and maintain that same voltage level for a lengthy period of time. Inadequate voltages may be seen at the 480 volt and 120 volt levels and could impact the ability of safety equipment to operate. PG&E determined that a new SLURs setpoint needed to be calculated but the consequences of this scenario on present plant operations was not significant based on the following rationale:

1. For the 480 volt motor starters, the contactor drop-out and inadvertent de-energizing of a device is not a concern during a degraded voltage condition based on the drop-out characteristics of the contactor. Typically, the drop-out characteristics of the contactor are in the voltage range of 60% of nominal voltage. The postulated degraded voltage condition would maintain a minimum steady state voltage in the range of 85% to 86% at the 480 volt buses.

2. For the 480 volt motor starters, the contactor pick-up and ability to energize a service is reasonably assured for motors and MOVs based on the design of the control circuits which utilize low current inrush along with larger size control wires. At DCPP, #10 and #12 AWG wire sizes and a minimum of 100VA control power transformers are used, thereby minimizing voltage drop in the transformers and cable. Based on PG&E calculations, a maximum length of 1100 ft. and 1800 ft. for #12 AWG and #10 AWG wire sizes respectively could be allowed for a NEMA size 1 starter to pickup at 86% of 480 volts at the motor control center (MCC). A majority of control circuits for loads located within the power block would typically not exceed a circuit length of 500 ft.

3. The potential for the control power transformer secondary fuses to open due to degraded voltage at MCCs is also mitigated because of oversized fuses selected by the MCC vendor. The maximum continuous current for a 100VA control power transformer under a degraded voltage condition is no more than 1.5 ampere.

4. The grid would have to remain in this condition for 20 to 30 minutes before any of the motors at the 480 volt level would trip on thermal overload. Thermal overloads for continuous duty motors would see higher current at reduced voltage and, because of the inverse time tripping characteristics, it would require a 20- to 30-minute heatup before actuation.

Furthermore, this is not considered to be a likely event and, therefore, not a safety concern while the new SLURs setpoints are being calculated because of the following:

1. Based on the operating record at DCPP, a sustained degraded grid voltage is in itself not a likely event. There have been no cases of degraded grid conditions at DCPP during the 6 years the plant has been operating. PG&E standard practices require a minimum of 230kV to be maintained on the DCPP switchyard. Voltages below these values can only occur as a result of a major system disturbance. The design of the system incorporates frequency controlled automatic load shedding combined with generation excitation to assure a stable operation and restoration to the minimum voltage within 10 to 15 minutes.

2. Even if the above were to occur, the system voltage would have to degrade from 227.5kV to 217kV (just above the SLUR setpoint) and remain there for this scenario to proceed.

3. Also during this scenario, an accident has to occur so that Class 1E loads, such as motors and MOVs, are called upon to start and run under a degraded bus voltage condition.

Nonetheless, as a conservative measure, interim actions were taken by PG&E to establish administrative controls to ensure adequate voltage for all vital

motor loads until a new SLURs setpoint could be calculated and implemented. Emergency Procedure EP E-0, "Reactor Trip or Safety Injection," was changed to confirm 3870 volts (this voltage was based on preliminary calculations and includes inherent inaccuracies in the meter and reading the meter), corresponding to 111 volts as read from the control room vertical board, is maintained on the 4160 volt vital buses following bus transfer to 230kV source during a loss-of-coolant accident (LOCA). Should the 4160 volt vital bus voltage drop below 3870 volts, Emergency Procedure EP E-0 directs the operator to transfer the 4160 volt vital bus loads to the diesel generators.

The adequacy of the DCPP SLUR setpoint was reviewed in the NRC electrical distribution safety functional inspection (EDSFI) at DCPP. PG&E had performed calculations to determine the new SLUR setpoint prior to the NRC EDSFI. The EDSFI report indicated that the interim actions discussed in the previous paragraph ensure operation of all Class 1E equipment until the SLURs setpoint change is implemented. Also, it is important to note, that after the setpoint change has been implemented the interim measure of manually transferring to the emergency diesel generator is no longer considered to be an appropriate action. The transfer from the offsite power source to the EDG should be automatic.

PG&E performed a new calculation to establish an allowable value of 3785 for the SLURs setpoint, replacing the old value of 3700 volts. The new value will ensure adequate voltage to 480 volt and 120 volt levels, including the 460 volt motor-operated valves and 120 volt control circuits. Field verification results obtained in 1985 will be used to support the new calculation because the licensee stated that there have been no significant design changes since 1985 that would invalidated the data. For any future design changes the licensee will use both administrative and computer programs to monitor changes and update the SLURs setpoint calculation.

EDG Steady State Voltage Surveillance

The licensee is proposing to make two additional changes regarding EDG surveillance testing. The first change would be to raise the minimum voltage requirement (from 3740 to 3785) and lowering the maximum voltage requirement (from 4580 to 4400) for the EDG steady state voltage TS requirement. Raising the minimum EDG steady state voltage TS requirement from 3740V to 3785V would ensure the EDGs provide adequate voltage to all levels in the unlikely event of a sustained EDG operation to support vital loads. Lowering the maximum EDG steady state voltage TS requirement from 4580V to 4400V would ensure the EDGs do not exceed the allowable voltage limits on motor terminals, in the event of sustained EDG operation. Test data from EDG surveillance testing indicated that the EDGs currently meet the proposed maximum and minimum EDG steady state voltage TS surveillance requirement of 4160 +240/-375 volts. Therefore, there are no current or past safety concerns with EDG operability with respect to maximum and minimum steady state voltage.

The second change to the EDG surveillance test would be the elimination of the voltage and frequency limit on the EDG during the 24-hour test. During the

24-hour test, the EDG is loaded to greater than or equal to 2750 kW during the first 2 hours and greater than or equal to 2484 kW for the subsequent 22 hours. For the EDG to be loaded to this capacity, it is necessary to parallel the EDG to either the auxiliary or startup transformer. In this alignment, the EDG voltage regulator does not control the 4160 volt vital bus voltage. The 4160 volt vital bus voltage is controlled by either the 500 kV or 230 kV system voltage, and by the loads on the system. Since the 24-hour test is performed during a unit's refueling outage, when plant loads are lower, the 4160 volt vital bus is expected to be higher than the 4160 volt vital bus voltage during normal operation. Assurance that adequate voltage is available to vital loads when powered by a EDG is verified by the proper response of the EDG voltage regulator during the surveillance tests. In the alignment used for the 24-hour test, however, the EDG is paralleled to the auxiliary or startup transformer which would have more control over the voltage and frequency for the EDG than the voltage regulator. Since voltage and frequency are not controlled by the EDG, PG&E is proposing to delete this requirement in their current TS for the 24-hour test when the EDG is paralleled to the auxiliary or startup transformer. This deletion from the TS is consistent with the NRC-approved Westinghouse Owners Group Standard TS (NUREG-1431, Revision 0) for the 24-hour test.

CONCLUSION

The proposed changes to increase the SLURs TS minimum setpoint and allowable value provides additional conservatism for the 4160 volt vital buses to provide safety-related equipment adequate voltage at the 4160 volt, 480 volt and 120 volt levels, and therefore, reduce the risk of tripping or damaging the vital equipment associated with accident mitigation. The proposed changes to increase the minimum and decrease the maximum EDG steady state voltage TS surveillance requirement would ensure that (1) adequate voltage is provided by the EDGs for all voltage levels and (2) allowable voltage limits at the motor terminals are not exceeded. Finally, the elimination of the voltage and frequency limit for the EDG during the 24-hour test will not prevent the EDG from providing the adequate voltage to the vital buses and is consistent with the NRC-approved Westinghouse Owner Group Standard TS for the 24-hour test. Therefore, the proposed changes are found to be acceptable to the staff.

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 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 (58 FR 7002). 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: M. Pratt

Date: January 6, 1994