

April 21, 1988

Docket Nos.: 50-275
and 50-323

DISTRIBUTION
Docket File
NRC & LPDRs
HRood
GHolahan
JLee
DHagan
EJordan
EButcher

PDV Plant Files
JPartlow
TBarnhart-8
WJones
LFMB/ARM
ACRS-10
OGC-Bethesda
BGrimes
GPA/PA

Mr. J. D. Shiffer, Vice President
Nuclear Power Generation
c/o Nuclear Power Generation, Licensing
Pacific Gas and Electric Company
77 Beale Street, Room 1451
San Francisco, California 94106

Dear Mr. Shiffer:

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. 67006 AND 67007)

The Commission has issued the enclosed Amendment No. 28 to Facility Operating License No. DPR-80 and Amendment No. 27 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 in response to your application transmitted by letter dated January 22, 1988, and supplemented by letter dated March 25, 1988.

These amendments allow the minimum residual heat removal (RHR) system flow rate to be reduced from 3000 gpm to 1300 gpm, while the plant is in Mode 6 (Refueling), provided that the reactor has been subcritical for more than 57 hours.

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

Sincerely,

original signed by Harry Rood

Harry Rood, Senior Project Manager
Project Directorate V
Division of Reactor Projects - III,
IV, V and Special Projects

Enclosures:

1. Amendment No. 28 to DPR-80
2. Amendment No. 27 to DPR-82
3. Safety Evaluation

cc w/enclosures:
See next page

DRSP/PD5
JLee
04/18/88

DRSP/PD5
HROOD:cw
04/11/88

DEST/SRXB
MWHodges
04/21/88

OGC
04/18/88

DRSP/D:PD5
GKnighton
04/21/88

OFFICIAL RECORD COPY

8806030213 880421
PDR ADDCK 05000275
P PDR



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

April 21, 1988

Docket Nos.: 50-275
and 50-323

Mr. J. D. Shiffer, Vice President
Nuclear Power Generation
c/o Nuclear Power Generation, Licensing
Pacific Gas and Electric Company
77 Beale Street, Room 1451
San Francisco, California 94106

Dear Mr. Shiffer:

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. 67006 AND 67007)

The Commission has issued the enclosed Amendment No. 28 to Facility Operating License No. DPR-80 and Amendment No. 27 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 in response to your application transmitted by letter dated January 22, 1988, and supplemented by letter dated March 25, 1988.

These amendments allow the minimum residual heat removal (RHR) system flow rate to be reduced from 3000 gpm to 1300 gpm, while the plant is in Mode 6 (Refueling), provided that the reactor has been subcritical for more than 57 hours.

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

Sincerely,

A handwritten signature in black ink that reads "Harry Rood".

Harry Rood, Senior Project Manager
Project Directorate V
Division of Reactor Projects - III,
IV, V and Special Projects

Enclosures:

1. Amendment No. 28 to DPR-80
2. Amendment No. 27 to DPR-82
3. Safety Evaluation

cc w/enclosures:
See next page

Mr. J. D. Shiffer
Pacific Gas and Electric Company

Diablo Canyon

cc:
Richard F. Locke, Esq.
Pacific Gas & Electric Company
Post Office Box 7442
San Francisco, California 94120

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

Janice E. Kerr, Esq.
California Public Utilities Commission
350 McAllister Street
San Francisco, California 94102

Mr. Dick Blakenburg
Editor & Co-Publisher
South County Publishing Company
P. O. Box 460
Arroyo Grande, California 93420

Ms. Sandra A. Silver
660 Granite Creek Road
Santa Cruz, California 95065

Bruce Norton, Esq.
c/o Richard F. Locke, Esq.
Pacific Gas and Electric Company
Post Office Box 7442
San Francisco, California 94120

Mr. W. C. Gangloff
Westinghouse Electric Corporation
P. O. Box 355
Pittsburgh, Pennsylvania 15230

Dr. R. B. Ferguson
Sierra Club - Santa Lucia Chapter
Rocky Canyon Star Route
Creston, California 93432

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

Chairman
San Luis Obispo County Board of
Supervisors
Room 270
County Government Center
San Luis Obispo, California 93408

Mr. Leland M. Gustafson, Manager
Federal Relations
Pacific Gas and Electric Company
1726 M Street, N. W.
Washington, DC 20036-4502

Director
Energy Facilities Siting Division
Energy Resources Conservation and
Development Commission
1516 9th Street
Sacramento, California 95814

Dian M. Grueneich
Marcia Preston
Law Office of Dian M. Grueneich
380 Hayes Street, Suite 4
San Francisco, California 94102

Ms. Jacquelyn Wheeler
3033 Barranca Court
San Luis Obispo, California 93401

Pacific Gas & Electric Company

- 2 -

Diablo Canyon

cc:

Ms. Laurie McDermott, Coordinator
Consumers Organized for Defense
of Environmental Safety
731 Pacific Street, Suite 42
San Luis Obispo, California 93401

Mr. Jack McGurk, Acting Chief
Radiological Health Branch
State Department of Health
Services
714 P Street, Office Building #8
Sacramento, California 95814

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

Ms. Nancy Culver
192 Luneta Street
San Luis Obispo, California 93401

President
California Public Utilities
Commission
California State Building
350 McAllister Street
San Francisco, California 94102

Michael M. Strumwasser, Esq.
Special Assistant Attorney General
State of California
Department of Justice
3580 Wilshire Boulevard, Room 800
Los Angeles, California 90010



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

PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON NUCLEAR POWER PLANT, UNIT 1
DOCKET NO. 50-275
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 28
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 22, 1988 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 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.

8806030218 880421
PDR ADOCK 05000275
P PDR

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. 28, 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 becomes effective at the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

for E. A. Licitera
George W. Knighton, Director
Project Directorate V
Division of Reactor Projects - III,
IV, V and Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 21, 1988



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

PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON NUCLEAR POWER PLANT, UNIT 2
DOCKET NO. 50-323
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 27
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 22, 1988 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 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. 27, 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 becomes effective at the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

for *EA Knighton*
George W. Knighton, Director
Project Directorate V
Division of Reactor Projects - III,
IV, V and Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 21, 1988

ATTACHMENT TO LICENSE AMENDMENT NOS. 28 AND 27
FACILITY OPERATING LICENSE NOS. DPR-80 AND DPR-82
DOCKET NOS. 50-275 AND 50-323

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

<u>Remove</u>	<u>Insert</u>
3/4 4-6	3/4 4-6
3/4 9-8	3/4 9-8
3/4 9-9	3/4 9-9
B 3/4 9-2	B 3/4 9-2

REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.2 Two residual heat removal (RHR) trains shall be OPERABLE# and at least one RHR train shall be in operation.*

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

- a. With less than the above required RHR trains OPERABLE, immediately initiate corrective action to return the required trains to OPERABLE status as soon as possible.
- b. With no RHR train in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR train to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.4.2 At least one RHR train shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

#One RHR train may be inoperable for up to 2 hours for surveillance testing provided the other RHR train is OPERABLE and in operation.

*The RHR pump may be de-energized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, (2) core outlet temperature is maintained at least 10°F below saturation temperature, and (3) the reactor vessel water level is above the vessel flange.

REFUELING OPERATIONS

3/4.9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

HIGH WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.1 At least one residual heat removal (RHR) train shall be OPERABLE and in operation.*, **

APPLICABILITY: MODE 6 when the water level above the top of the reactor vessel flange is at least 23 feet.

ACTION:

With no RHR train OPERABLE and in operation, suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR train to OPERABLE and operating status as soon as possible. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

SURVEILLANCE REQUIREMENTS

4.9.8.1.1 With the reactor subcritical less than 57 hours, at least one RHR train shall be verified in operation and circulating reactor coolant at a flow rate of greater than or equal to 3000 gpm at least once per 12 hours.

4.9.8.1.2 With the reactor subcritical for 57 hours or more, at least one RHR train shall be verified in operation and circulating reactor coolant at a flow rate of greater than or equal to 1300 gpm at least once per 12 hours.

*The RHR train may be removed from operation for up to 1 hour per 8 hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor vessel hot legs.

**The RHR train may be removed from operation and OPERABLE status for up to 2 hours per 8 hour period for the performance of leak testing the RHR suction isolation valves.

REFUELING OPERATIONS

LOW WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.2 Two independent residual heat removal (RHR) trains shall be OPERABLE and at least one RHR train shall be in operation.*

APPLICABILITY: MODE 6, when the water level above the top of the reactor vessel flange is less than 23 feet.

ACTION:

- a. With less than the required RHR trains OPERABLE, immediately initiate corrective action to return the required RHR trains to OPERABLE status, or to establish at least 23 feet of water above the reactor vessel flange, as soon as possible.
- b. With no RHR train in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR train to operation. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

SURVEILLANCE REQUIREMENTS

4.9.8.2.1 With the reactor subcritical less than 57 hours, at least one RHR train shall be verified in operation and circulating reactor coolant at a flow rate of greater than or equal to 3000 gpm at least once per 12 hours.

4.9.8.2.2 With the reactor subcritical for 57 hours or more, at least one RHR train shall be verified in operation and circulating reactor coolant at a flow rate of greater than or equal to 1300 gpm at least once per 12 hours.

*Prior to initial criticality, the RHR train may be removed from operation for up to 1 hour per 8-hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor vessel hot legs.

REFUELING OPERATIONS

BASES

3/4.9.7 CRANE TRAVEL - FUEL HANDLING BUILDING

The restriction on movement of loads in excess of the nominal weight of a fuel and control assembly and associated handling tool, except the movable fuel handling building walls, over other fuel assemblies in the spent fuel pool ensures that in the event this load is dropped: (1) the activity release will be limited to that contained in a single fuel assembly, and (2) any possible distortion of the fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the safety analyses. The movable fuel handling building walls travel on rollers over the spent fuel pool and have been designed to remain in place during postulated seismic events.

3/4.9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

The requirement that at least one residual heat removal (RHR) train be in operation ensures that: (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor vessel below 140°F as required during the REFUELING MODE and (2) sufficient coolant circulation is maintained through the reactor core to minimize the effects of a boron dilution incident and prevent boron stratification. The requirement to maintain a 3000 gpm flowrate with the reactor subcritical less than 57 hours ensures that there is adequate decay heat removal capability. After the reactor is subcritical for 57 hours, the flowrate can be reduced to 1300 gpm and meet the decay heat removal requirements. The reduced flowrate provides additional margin to vortexing at the RHR pump suction while in partial drain operation.

The requirement to have two RHR trains OPERABLE when there is less than 23 feet of water above the reactor vessel flange ensures that a single failure of the operating RHR train will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 23 feet of water above the reactor vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR train, adequate time is provided to initiate emergency procedures to cool the core.

3/4.9.9 CONTAINMENT VENTILATION ISOLATION SYSTEM

The OPERABILITY of this system ensures that the containment ventilation penetrations will be automatically isolated upon detection of high radiation levels within the containment. The OPERABILITY of this system is required to restrict the release of radioactive material from the containment atmosphere to the environment.

3/4.9.10 and 3/4.9.11 WATER LEVEL - REACTOR VESSEL and SPENT FUEL POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the safety analysis.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 28 TO FACILITY OPERATING LICENSE NO. DPR-80
AND AMENDMENT NO. 27 TO FACILITY OPERATING LICENSE NO. DPR-82
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-275 AND 50-323

1.0 INTRODUCTION

By letter dated January 22, 1988 and supplemented by letter dated March 25, 1988, Pacific Gas and Electric Company (PG&E or the licensee) requested amendments to the Technical Specifications appended to Facility Operating License Nos. DPR-80 and DPR-82 for the Diablo Canyon Nuclear Power Plant, (DCNPP) Unit Nos. 1 and 2. The proposed amendments would change the DCNPP Combined Technical Specifications to allow reduced Residual Heat Removal (RHR) system flow during Mode 6 operation. Specifically, the proposed change would amend TS 4.9.8.1, "Residual Heat Removal and Coolant Circulation High Water Level," and TS 4.9.8.2, "Residual Heat Removal and Coolant Circulation Low Water Level," to allow the minimum RHR system flow rate to be reduced from 3000 gpm to 1300 gpm after the reactor has been subcritical for 57 hours or more. Also, the bases for TS 3/4.9.8 will be modified to state that the reduced RHR flow rate can provide adequate decay heat removal as well as increased margin to vortexing in the RHR system. Also, TS 3.4.1.4.2, "Cold Shutdown - Loops not Filled," which is applicable to Mode 5 partial drain operations, will be revised to prohibit deenergization of the RHR pump unless the RCS water level is above the reactor vessel flange.

The licensee states that it is proposing these changes to provide a greater margin to vortexing and to preclude an inadvertent loss of decay heat removal capability due to air entrainment and cavitation of the RHR pumps when the RCS water level is lowered to the mid-level of the hot leg piping.

2.0 EVALUATION

The NRC staff has evaluated the proposed changes and has concluded that they are acceptable. The staff's evaluation is given below.

Technical Specifications 4.9.8.1 and 4.9.8.2 currently require that the licensee verify at least once per 12 hours that at least one shutdown cooling train is in operation and circulating reactor coolant at a flow rate of greater than or equal to 3000 gpm during refueling operations. The objective of having a minimum RHR flow requirement is to assure that adequate flow is available to (1) remove decay heat, (2) minimize the effects of a boron dilution accident, and (3) prevent boron stratification. On the other hand, vortexing has been observed in the suction of the RHR pumps when the water level in the RCS was reduced to mid-loop. See NUREG-1269, "Loss of Residual Heat Removal System at Diablo Canyon Unit 2," April 10, 1987. As noted in NUREG-1269, the likelihood of vortexing is reduced as the flow rate is reduced.

In support of its requested TS change, the licensee has provided an analysis of the effects of reduced RHR flow, WCAP-11688, "Westinghouse Engineering Services Report for Diablo Canyon Power Plant Units 1 and 2 Concerning a RHR Minimum Flow Rate Reduction While in Mid-Loop Operation."

(a) Decay Heat Removal

The licensee has provided an analysis (WCAP-11688) which shows that the RHR flow rate may be reduced to 1300 gpm at 57 hours after reactor shutdown and still provide adequate heat removal capability, based on conservative analysis methods and assumptions. Further, by letter dated March 25, 1988, the licensee stated that the Diablo Canyon Operating Procedures require that during part-loop operation the RCS temperature be maintained less than 160 degrees F. This procedure provides additional assurance that adequate heat removal will be maintained during operation at 1300 gpm. Based on the above, the NRC staff finds decay heat removal capability at the proposed reduced RHR flow rate to be acceptable.

(b) Boron Dilution

The licensee states that the Boron Dilution Accident analyses in the FSAR are independent of RHR flow rate, but do depend on RCS water volume. Thus, the boron dilution accident is not affected by the proposed reduction in RHR flow rate. However, the licensee's January 22, 1988 submittal notes that the reduced volume of water during mid-loop operation results in a reduced time to dilute to criticality, from 41 minutes when the RCS is full, to 27 minutes when operating at mid-loop. This is slightly below the 30 minutes recommended by the Standard Review Plan, NUREG-0800, Section 15.4.6. By letter dated March 25, 1988, the licensee addressed this issue. The licensee states that the analysis that resulted in the 27 minutes time to criticality includes a number of conservatisms, such as not taking credit for the volume of RCS water beyond the RHR suction and injection points. The licensee states that on a best estimate basis, taking into account actual

RCS water volumes that would be involved, it believes the time to criticality would be greater than the 30 minute time recommended by the SRP. Further, the licensee notes that a number of procedures, indications, and alarms are in place that would quickly alert the plant operators in the event that inadvertent boron dilution occurred. Based on the above, the staff finds the boron dilution accident analyses for Diablo Canyon to be acceptable.

(c) Boron Stratification

The potential for boron stratification was evaluated in WCAP-11688, wherein it was shown that at flow rates greater than 1000 gpm, adequate mixing takes place within the RCS so that no significant amount of coolant with a boron content different from that in the core can accumulate in the coolant loops. Based on this analysis, the staff concludes that an RHR flow rate of 1300 gpm is acceptable from the standpoint of boron stratification.

In summary, the NRC staff has reviewed the proposed changes to TS 3/4.9.8 for Diablo Canyon Nuclear Power Plant Units 1 and 2, and the supporting analyses by Pacific Gas and Electric Company and by Westinghouse. The proposed changes would reduce the minimum flow requirement for operation of the Residual Heat Removal System during refueling operations from 3000 gpm to 1300 gpm, provided that the reactor has been shut down for more than 57 hours. As discussed in the preceding paragraphs, we find that the proposed changes are acceptable, and meet the applicable regulatory requirements.

3.0 ENVIRONMENTAL CONCLUSION

These amendments involve changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. We have 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. Accordingly, these 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 these amendments.