October 21, 2002

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

SUBJECT: DIABLO CANYON NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENT RE: REVISION OF TECHNICAL SPECIFICATIONS SECTION 3.9.4, CONTAINMENT PENETRATIONS (TAC NOS. MB3595 AND MB3596)

Dear Mr. Rueger:

The Commission has issued the enclosed Amendment No. 155 to Facility Operating License No. DPR-80 and Amendment No. 155 to Facility Operating License No. DPR-82 for the Diablo Canyon Nuclear Power Plant (DCPP), Unit Nos. 1 and 2, respectively. The amendments consist of changes to the technical specifications (TSs) in response to your application dated October 17, 2001, as supplemented by letters dated February 26, August 14 and September 13, 2002. The amendments revise (1) Section 1.1, "Definitions," for Dose Equivalent I-131, to allow the use of the thyroid dose conversion factors, listed in the International Commission on Radiological Protection Publication 30, "Limits for Intakes of Radionuclides by Workers," and (2) Section 3.9.4, "Containment Penetrations," to allow the equipment hatch, personnel air lock doors, and emergency air lock doors to remain open during core alterations and movement of irradiated fuel assemblies.

In your supplemental letter of February 26, 2002, regarding the severe weather conditions that might occur at the Diablo Canyon site, you committed to establish procedures requiring closure of the equipment hatch during any such severe weather conditions. These procedures must be in place prior to implementing these amendments. These procedures should require that all fuel handling activities are suspended and closure of the equipment hatch is initiated immediately, if tornado or severe weather warnings are in effect, or in the event of a fuel handling accident inside containment.

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

Sincerely,

/RA/

Girija S. Shukla, Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-275
and 50-323

Enclosures:
1. Amendment No. 155 to DPR-80
2. Amendment No. 155 to DPR-82
3. Safety Evaluation

cc w/encls: See next page

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

Sincerely,

/RA/

Girija S. Shukla, Project Manager, Section 2
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cc:
NRC Resident Inspector
Diablo Canyon Nuclear Power Plant
c/o U.S. Nuclear Regulatory Commission
P.O. Box 369
Avila Beach, CA 93424

Dr. Richard Ferguson, Energy Chair
Sierra Club California
1100 11th Street, Suite 311
Sacramento, CA 95814

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

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

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

Mr. Steve Hsu
Radiologic Health Branch
State Department of Health Services
P.O. Box 942732
Sacramento, CA 94327-7320

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

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Harris Tower & Pavilion
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Christopher J. Warner, Esq.
Pacific Gas & Electric Company
P.O. Box 7442
San Francisco, CA 94120

Mr. David H. Oatley, Vice President
Diablo Canyon Operations
Diablo Canyon Nuclear Power Plant
P.O. Box 3
Avila Beach, CA 93424

Telegram-Tribune
ATTN: Managing Editor
1321 Johnson Avenue
P.O. Box 112
San Luis Obispo, CA 93406

Mr. Ed Bailey, Radiation Program Director
Radiologic Health Branch
State Department of Health Services
P.O. Box 942732 (MS 178)
Sacramento, CA 94327-7320

Mr. Robert A. Laurie, Commissioner
California Energy Commission
1516 Ninth Street (MS 31)
Sacramento, CA 95814

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-275

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 155
License No. DPR-80

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

   A. The application for amendment by Pacific Gas and Electric Company (the licensee), dated October 17, 2001, as supplemented by letters dated February 26, August 14 and September 13, 2002, 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. 155, are hereby incorporated in the license. Pacific Gas and 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 its date of issuance and shall be implemented within 30 days from the date of issuance, including the completion of the administrative procedures that ensure that closure of the open containment penetrations, with direct access to the outside atmosphere during refueling operations with core alterations or irradiated fuel movement inside containment, will be initiated immediately in the event of a fuel handling accident inside containment, or if severe weather warnings are in effect.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Changes to the Technical Specifications

Date of Issuance: October 21, 2002

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-323

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 155
License No. DPR-82

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

   A. The application for amendment by Pacific Gas and Electric Company (the licensee) dated October 17, 2001, as supplemented by letters dated February 26, August 14 and September 13, 2002, 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. 155, are hereby incorporated in the license. Pacific Gas and 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 its date of issuance and shall be implemented within 30 days from the date of issuance, including the completion of the administrative procedures that ensure that closure of the open containment penetrations, with direct access to the outside atmosphere during refueling operations with core alterations or irradiated fuel movement inside containment, will be initiated immediately in the event of a fuel handling accident inside containment, or if severe weather warnings are in effect.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Changes to the Technical Specifications

Date of Issuance: October 21, 2002

ATTACHMENT TO

LICENSE AMENDMENT NO. 155 TO FACILITY OPERATING LICENSE NO. DPR-80

AND AMENDMENT NO. 155 TO FACILITY OPERATING LICENSE NO. DPR-82

DOCKET NOS. 50-275 AND 50-323

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE	INSERT
1.1-3	1.1-3
3.9-3	3.9-3
---	3.9-4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 155 TO FACILITY OPERATING LICENSE NO. DPR-80

AND AMENDMENT NO. 155 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 application dated October 17, 2001, as supplemented by letters dated February 26, August 14 and September 13, 2002, Pacific Gas and Electric Company (the licensee) requested changes to the Technical Specifications (TS) (Appendix A to Facility Operating License Nos. DPR-80 and DPR-82) for the Diablo Canyon Nuclear Power Plant (DCPP), Unit Nos. 1 and 2. The proposed changes would modify (1) Section 1.1, "Definitions," for Dose Equivalent I-131, to allow the use of the thyroid dose conversion factors, listed in the International Commission on Radiological Protection Publication 30, "Limits for Intakes of Radionuclides by Workers," and (2) Section 3.9.4, "Containment Penetrations," to allow the equipment hatch, personnel air lock doors, and emergency air lock doors to remain open during core alterations and movement of irradiated fuel assemblies.

Specifically, the following changes would be made to Section 3.9.4, Limiting Condition of Operation (LCO): (1) part "a" would be changed from requiring "the equipment hatch to be closed and held in place by four bolts" to "the equipment hatch being capable of being closed and held in place with four bolts," (2) part "b" would be changed from "one door in each air lock closed" to "one door in each air lock capable of being closed," and (3) a note would be added to part "c" allowing "penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls."

In addition, the definition of DOSE EQUIVALENT I-131 in TS 1.1, "Definitions," would be revised by adding the following at the end of the definition, "...or those listed in International Commission on Radiological Protection Publication 30, "Limits for Intakes of Radionuclides by Workers," 1979."

The supplemental letters dated February 26, August 14 and September 13, 2002, provided additional clarifying information, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination published in *Federal Register* on January 8, 2002 (67 FR 929).

2.0 EVALUATION

The containment equipment hatch is part of the containment pressure boundary and provides a means for moving large equipment and components into and out of the containment during plant outages, such as a refueling outage. Because it is part of the containment pressure boundary, the current TS 3.9.4 requires that the equipment hatch be closed and held in place by four bolts, and one door in each air lock be closed during core alterations and during movement of irradiated fuel assemblies within containment. The TS 3.9.4 requirement is to ensure that a release of radioactive material within the containment, because of fuel movements or core alterations, would be collected and filtered before being released from the containment to the environment.

The personnel air locks (PAL) and emergency air locks (EAL) are welded steel assemblies consisting of two doors with double gaskets in series. The PAL and EAL doors are mechanically interlocked so that one door cannot be opened unless the second door is sealed. A pressure-equalizing valve at each door is provided to equalize pressure across the doors when personnel are entering or leaving containment. Provisions are made to bypass the interlocks to permit both doors to be opened, when the containment pressure is zero psig and it is safe to do so.

The proposed change to allow the containment penetration flow path(s) to remain open, while under administrative controls, implements the NRC-approved Technical Specifications Task Force (TSTF) -312, Revision 1. Furthermore, this approach is consistent with the administrative controls currently allowed by the DCPP TS for higher operational modes. Current provisions in TS 3.6.3, "Containment Isolation Valves," allow penetration flow paths to be unisolated under administrative controls in Modes 1 through 4. These modes are more significant than during refueling operations due to the reactor coolant system energy and potential to provide a significant motive force for the expulsion of radionuclides subsequent to a design basis accident.

Based on the acceptability of administrative controls during higher modes of operation, a similar allowance should be acceptable for penetrations that are open during fuel movement or core alterations provided appropriate administrative controls are utilized. In addition, during core alterations and irradiated fuel movement inside containment, the refueling cavity water level is 23 feet or greater for TS 3.9.7, "Refueling Cavity Water Level." Under these conditions, the potential for an accident resulting in containment pressurization from core boiling is minimal and has been analyzed not to take place prior to the four-hour required containment closure of TS 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation – High Water Level."

During the performance of local leak rate testing (LLRT), certain containment isolation valves (i.e., those subject to Type C testing) are required to be opened in order to drain the penetration piping, providing direct access from the containment atmosphere to the outside atmosphere. Therefore, under current restrictions, LLRT tests cannot be performed during core alterations or fuel movement inside containment. This restriction complicates the logistics for performing LLRT and reduces overall refueling outage efficiency. The proposed change to TS 3.9.4 would allow containment penetrations to be open during core alterations or the movement of irradiated fuel assemblies within containment, provided that the penetrations are under administrative

controls and capable of being closed by a manual or automatic isolation valve, blind flange, or equivalent.

2.1 Administrative Controls

If the licensee would open the equipment hatch, PAL and EAL doors, and containment penetrations in outages during core alterations and/or the movement of irradiated fuel assemblies inside containment, the licensee has proposed to have these potentially open pathways under the following administrative controls:

(1) appropriate personnel are aware of the open status of the containment;

(2) specific individuals are designated, trained and readily available to effect the closure of the containment;

(3) equipment and tools required to support containment closure activities are easily located and available; and

(4) any potential obstruction (e.g., cables, hoses, etc.) that could prevent rapid closure of the containment can be quickly removed.

2.2 Tornado Missiles

In its supplemental letter of February 26, 2002, the licensee stated that although the historic severe weather patterns for DCPP do not require consideration of tornados as part of the design basis, severe weather conditions might occur at the site that could necessitate closure of the equipment hatch. To address this concern, the licensee committed to establish procedures requiring closure of the equipment hatch during any such severe weather conditions. These procedures must be in place prior to implementing these amendments. These procedures should require that all fuel handling activities are suspended and closure of the equipment hatch is initiated immediately, if tornado or severe weather warnings are in effect.

2.3 Postulated Accidents

The postulated accidents that could result in a release of radioactive material through the equipment hatch would be as follows: (1) an fuel handling accident (FHA) inside containment, and (2) a loss of residual heat removal (RHR) cooling to the core that leads to core boiling and uncovery. These are discussed below.

2.3.1 Fuel Handling Accident

An FHA inside containment is the limiting radiological event during refueling when there are core alterations or fuel handling inside containment. As a part of the proposed TS changes the licensee has performed a new radiological consequence analysis for the postulated FHA inside containment to ensure that the potential radiological releases resulting from an FHA to the environment are still "well within" the dose guidelines specified in 10 CFR Part 100 (75 rem to the thyroid and 6 rem to the whole body). In addition, the new analysis evaluated the control room dose consequences to assure that they also remain well below the General Design Criterion (GDC) 19, "Control Room" equivalent limits of 30 rem thyroid and beta skin, and 5 rem

whole body. These are consistent with the dose acceptance criteria provided in Standard Review Plan (SRP) Section 15.7.4 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants."

In their October 17, 2001, application, the licensee provided the tables to show the previous and new offsite boundary and new control room radiological dose consequences calculated for the FHA inside containment. Table 1 of the application provided the previous radiological dose consequences that were calculated with the containment closed. Table 2 of the application provided the new radiological dose consequences that were calculated with the equipment hatch, EAL/PAL doors, and containment penetrations open. The licensee concluded in the application that the radiological consequences resulting from the postulated FHA in the containment with the equipment hatch, EAL/PAL doors, and containment penetrations open are within the dose acceptance criteria specified in the SRP. The licensee reached this conclusion using the guidelines provided in Regulatory Guide (RG) 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors."

To verify the licensee's radiological consequence analysis, the staff performed its independent confirmatory dose calculations. The staff finds that the radiological consequences resulting from the postulated FHA in the containment with the equipment hatch, EAL/PAL doors, and containment penetrations open are also within the dose acceptance criteria specified in the SRP. Although, the staff performed its independent radiological consequence dose calculations as a means of confirming the licensee's results, the staff's acceptance is based on the licensee's analyses.

The staff further finds that adequate radiation protection is provided to permit access and occupancy of the Diablo Canyon control room under the postulated FHA with much greater unfiltered air inleakage rate of up to 3000 cfm than the normal control room air intake rate of 2100 cfm. In their letter dated September 13, 2002, in response to the staff's request for additional information, the licensee stated, and the staff agrees that the control room doses are relatively insensitive to the level of unfiltered air inleakage rates assumed for the postulated FHA.

Because the radiological consequences at the site exclusion area boundary and in the control room calculated by the licensee and by the staff for the postulated FHA inside containment with the equipment hatch, EAL/PAL doors, and containment penetrations open are within the dose acceptance criteria specified in Section 15.7.4 of the SRP and GDC 19, the NRC staff concludes that the TS changes requested by the licensee are acceptable.

2.3.2 Loss of Residual Heat Removal Cooling

A loss of RHR cooling is the other potential accident during core alterations and the movement of irradiated fuel assemblies which may provide a release of radioactive materials into the containment atmosphere due to core boiling, and may be released through the open doors and penetrations to the outside environment. However, the radiological consequences of this release of radioactive materials due to core boiling, with no consideration for core uncovery and core damage, would be less than the radiological consequences arising from a postulated FHA. This is due to the total release inventory being limited to the reactor coolant system activity (corresponding to a 1 percent fuel defect and TS activity limit) being less than the total gap

activities in the assumed damaged rods of an FHA at the earliest time core offloading may commence (100 hours after shutdown).

The time to core boil is estimated to be greater than 5 hours if a loss of RHR cooling event occurs at the beginning of the core offload with the water level in the refueling cavity at 23 feet or greater above the top of the reactor vessel flange. TS 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation – High Water," requires actions to be taken immediately to restore the RHR cooling capability if the RHR loop requirements are not met. In addition, operators are required to close all containment penetrations providing direct access from the containment atmosphere to the outside environment within the calculated time to boil or four hours. If an operator takes action to restore the RHR cooling capability or provides an alternative method of core cooling, then core boiling and subsequent containment pressurization would not take place. If the time to core boiling were exceeded, isolation of all containment penetrations per the TS 3.9.5 requirements would ensure that the release of radiation outside of the containment from this event would not be a concern.

Based on the administrative controls and other factors described in the licensee's application: the requirement in place to close the equipment hatch in the case of an accident inside containment; the acceptable potential consequences of the design basis FHA inside containment, with the equipment hatch, PAL and EAL doors, and containment penetrations with direct access from the containment atmosphere to the outside atmosphere open (including the doses to control room operators); and the protection of equipment needed to keep the plant safely shut down from severe weather conditions during refueling with the equipment hatch open; the NRC staff concludes that the proposed addition to LCO 3.9.4 is acceptable.

2.4 Dose Equivalent I-131 Definition

The proposed changes would also modify TS Section 1.1, "Definitions," for Dose Equivalent I-131, to allow the use of the thyroid dose conversion factors listed in the International Commission on Radiological Protection Publication 30 (ICRP-30), "Limits for Intakes of Radionuclides by Workers."

The use of the ICRP-30 dose conversion factors (DCFs) and the resulting licensee request to allow the use of ICRP-30 DCFs is consistent with the current industry trend of adopting improved source terms and radiological data. The benefit of utilizing a more realistic (not as conservative) DCF is that it would result in the reduction of the net calculated doses. The actual doses received by the public would be less than that calculated even if the actual design-basis inventory were to be released to the environment as postulated by the licensee.

The current DCFs are based on an earlier AEC technical publication, TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites," which established very conservative DCFs. More recent work in the health physics area has established improved dose conversion factors and the nuclear industry has been in the process of adopting them through the use of alternate source terms. This position was endorsed by the NRC with the issuance of RG 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Reactors." Therefore, the NRC staff concludes that the proposed revision to the Dose Equivalent I-131 Definition is 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. 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 (67 FR 929). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: G. S. Shukla
J. Lee

Date: October 21, 2002