October 31, 1994

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

SUBJECT: ISSUANCE OF AMENDMENTS FOR DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1 (TAC NO. M88828) AND UNIT NO. 2 (TAC NO. M88829)

Dear Mr. Rueger:

The Commission has issued the enclosed Amendment No. 96 to Facility Operating License No. DPR-80 and Amendment No. 95 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 February 16, 1994.

These amendments change TS 4.2.2, "Heat Flux Hot Channel Factor - $F_Q(z)$," and 6.9.1.8, "Core Operating Limits Report," to implement the revised methodology for calculating the penalty to $F_Q(z)$. This methodology is documented in Revision 1 to WCAP-10216-P-A, "Relaxation of Constant Axial Offset Control $F_Q(z)$ Surveillance Technical Specification," and was approved by the NRC in a letter dated November 26, 1993.

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 IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosures: 1. Amendment No. 96 to DPR-80
2. Amendment No. 95 to DPR-82
3. Safety Evaluation

cc w/encls: See next page

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NAME	DFoster-Curseen	SPeterson:pk	BJones*	JHull*
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 31, 1994

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Pacific Gas and Electric Company
77 Beale Street, Room 1451
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Docket Nos. 50-275 and 50-323

Enclosures: 1. Amendment No. 96 to DPR-80
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cc w/encls: See next page

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Diablo Canyon Nuclear Power Plant
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-275

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 96
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 February 16, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-80 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 96 , 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

Sheri R. Peterson

Sheri R. Peterson, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 31, 1994

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

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-323

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 95
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 February 16, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-82 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 95 , 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

Sheri R. Peterson

Sheri R. Peterson, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 31, 1994

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 96 TO FACILITY OPERATING LICENSE NO. DPR-80

AND AMENDMENT NO. 95 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 2-8	3/4 2-8
6-18	6-18

SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 $F_Q(z)$ shall be evaluated to determine if $F_Q(z)$ is within its limits by:

a. Using the moveable incore detectors to obtain a power distribution map at any THERMAL POWER greater than 5% of RATED THERMAL POWER.

b. Increasing the measured $F_Q(z)$ component of the power distribution map by 3% to account for manufacturing tolerances and further increasing the value by 5% to account for measurement uncertainties.

c. Satisfying the following relationship:

$$F_Q^M(z) \leq \frac{F_Q^{RTP} \times K(z)}{P \times W(z)} \text{ for } P > 0.5$$

$$F_Q^M(z) \leq \frac{F_Q^{RTP} \times K(z)}{W(z) \times 0.5} \text{ for } P \leq 0.5$$

where $F_Q^M(z)$ is the measured $F_Q(z)$ increased by the allowances for manufacturing tolerances and measurement uncertainty, F_Q^{RTP} is the F_Q limit, $K(z)$ is the normalized $F_Q(z)$ as a function of core height, P is the relative THERMAL POWER, and $W(z)$ is the cycle dependent function that accounts for power distribution transients encountered during normal operation. F_Q^{RTP}, $K(z)$, and $W(z)$ are specified in the COLR.

d. Measuring $F_Q^M(z)$ according to the following schedule:

1. Upon achieving equilibrium conditions after exceeding by 20% or more of RATED THERMAL POWER, the THERMAL POWER at which $F_Q(z)$ was last determined,* or

2. At least once per 31 Effective Full Power Days (EFPD), whichever occurs first.

e. With measurements indicating

$$\text{maximum over } z \quad \frac{F_Q^M(z)}{K(z)}$$

has increased since the previous determination of $F_Q^M(z)$ either of the following actions shall be taken:

*During power escalation at the beginning of each cycle, power level may be increased until a power level for extended operation has been achieved and a power distribution map obtained.

1) $F_Q^M(z)$ shall be increased over that specified in Specification 4.2.2.2.c by an appropriate factor specified in the COLR, or

2) $F_Q^M(z)$ shall be measured at least once per 7 EFPD until two successive maps indicate that

$$\text{maximum over } z \quad \frac{F_Q^M(z)}{K(z)} \quad \text{is not increasing.}$$

f. With the relationship specified in Specification 4.2.2.2.c above not being satisfied:

1) Calculate the percent $F_Q(z)$ exceeds it limit by the following expression:

$$\left\{\left(\text{maximum over } z \left[\frac{F_Q^M(z) \times W(z)}{\frac{F_Q^{RTP}}{P} \times K(z)}\right]\right) - 1\right\} \times 100 \quad \text{for } P \geq 0.5$$

$$\left\{\left(\text{maximum over } z \left[\frac{F_Q^M(z) \times W(z)}{\frac{F_Q^{RTP}}{0.5} \times K(z)}\right]\right) - 1\right\} \times 100 \quad \text{for } P < 0.5$$

2. Either one of the following actions shall be taken:

a) Place the core in an equilibrium condition where the limit in Specification 4.2.2.2.c is satisfied. Power level may then be increased provided the AFD limits of Specification 3.2.1 are reduced 1% AFD for each percent $F_Q(z)$ exceeds its limit, or

ANNUAL REPORTS (Continued)

rem exposure according to work and job functions,* e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignment to various duty functions may be estimates based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole body dose received from external sources shall be assigned to specific major work functions.

The results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8 will be included in the annual report. The following information shall be included: (1) reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; (2) results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; (3) clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; (4) graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of specific activity above the steady-state level; and (5) the time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT**

6.9.1.5 The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) the RMCP and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR Part 50.

*This tabulation supplements the requirements of 10 CFR 20.407.

**A single submittal may be made for a multiple unit plant.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT*

6.9.1.6 The Annual Radioactive Effluent Release Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in the RMCP and PCP, (2) in conformance with 10 CFR 50.36a and Section IV.B.1 Appendix I to 10 CFR Part 50.

MONTHLY OPERATING REPORT

6.9.1.7 Routine reports of operating statistics and shutdown experience, including documentation of all challenges and failures to the PORVs or safety valves, shall be submitted on a monthly basis to the NRC in accordance with 10 CFR 50.4, no later than the 15th of each month following the calendar month covered by the report.

CORE OPERATING LIMITS REPORT

6.9.1.8.a Core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT before each reload cycle or any remaining part of a reload cycle for the following:

1. Shutdown Rod Insertion Limits for Specification 3/4.1.3.5,
2. Control Rod Insertion Limits for Specification 3/4.1.3.6,
3. Axial Flux Difference for Specification 3/4.2.1,
4. Heat Flux Hot Channel Factor, K(Z) and W(Z) - $F_Q(z)$ (F_Q^{RTP} for Specification 3/4.2.2), and
5. RCS Flow Rate and Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}^N$ ($F_{\Delta H}^{RTP}$ and $PF_{\Delta H}$ for Specification 3/4.2.3).

b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in:

1. WCAP-10216-P-A, Revision 1A, Relaxation of Constant Axial Offset Control F_Q Surveillance Technical Specification, February 1994 (Westinghouse Proprietary),
2. WCAP-9272-P-A, Westinghouse Reload Safety Evaluation Methodology, July 1985 (Westinghouse Proprietary),

*A single submittal may be made for a multiple unit plant. The submittal should combine those sections that are common to all units at the plant; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 96 TO FACILITY OPERATING LICENSE NO. DPR-80

AND AMENDMENT NO. 95 TO FACILITY OPERATING LICENSE NO. DPR-82

PACIFIC GAS AND ELECTRIC COMPANY

DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2

DOCKET NOS. 50-275 AND 50-323

1.0 INTRODUCTION

By letter of February 16, 1994, Pacific Gas and Electric Company (or the licensee) submitted a request for changes to the Technical Specifications (TS) for Diablo Canyon Power Plant, Units 1 and 2 (DCPP). The proposed amendments would revise TS 4.2.2, "Heat Flux Hot Channel Factor - $F_Q(z)$," and 6.9.1.8, "Core Operating Limits Report," as follows:

(1) The 2-percent $F_Q(z)$ penalty listed in TS 4.2.2.2.e.1) would be deleted and the statement revised to indicate the use of an appropriate factor to be specified in the Core Operating Limits Report (COLR).

(2) TS 6.9.1.8.b.1. would be changed to reference Revision 1 of WCAP 10216-P-A, "Relaxation of Constant Axial Offset Control $F_Q(z)$ Surveillance Technical Specification," dated February 1994.

2.0 EVALUATION

$F_Q(z)$ is the maximum local heat flux on the surface of a fuel rod at core elevation z, divided by the average fuel rod heat flux. The $F_Q(z)$ limits specified in TS 3.2.2 preclude core power distributions that violate the following fuel design criteria at DCPP:

(a) during a large-break loss-of-coolant accident (LOCA), the peak cladding temperature must not exceed 2200°F;

(b) during a loss-of-forced-reactor-coolant-flow accident, there must be at least 95 percent probability at the 95 percent confidence level that the hot fuel rod in the core does not experience a departure from nucleate boiling (DNB);

(c) during an ejected rod accident, the fission energy input to the fuel must not exceed 280 cal/gm; and

(d) the control rods must be capable of shutting down the reactor with a minimum required shutdown margin with the highest worth control rod stuck fully withdrawn.

Limits on $F_Q(z)$ ensure that the value of the initial total peaking factor assumed in the accident analyses remains valid.

A full-core flux map is taken under equilibrium conditions to determine a measured $F_Q(z)$. This $F_Q(z)$ is then increased to account for manufacturing tolerances and measurement uncertainties. The resulting equilibrium-measured $F_Q(z)$ including uncertainties is called $F_Q^M(z)$. During normal operation, $F_Q^M(z)$ is shown to be within its limits by performing surveillances. $F_Q(z)$ surveillance must be performed when power has been increased by 20 percent of rated thermal power over the thermal power when $F_Q^M(z)$ was last determined, or at least every 31 effective full-power days (EFPDs), whichever occurs first.

To verify operation below the TS $F_Q(z)$ limit, $F_Q^M(z)$ is shown to be less than or equal to a more restrictive limit, which is the surveillance $F_Q(z)$ limit. The surveillance $F_Q(z)$ limit is the $F_Q(z)$ limit divided by the $W(z)$ transient function. $W(z)$ is a cycle-dependent function that accounts for power distribution transients encountered during normal operation. At DCPP, cycle-specific $W(z)$ is specified in the COLR, based on the Westinghouse Reload Safety Evaluation.

To account for the increases in $F_Q^M(z)$ that may occur between surveillances, DCPP TS 4.2.2.2.e requires that when the $F_Q(z)$ surveillance is performed, the resulting maximum $F_Q^M(z)/K(z)$ value be compared to the maximum $F_Q^M(z)/K(z)$ determined from the previous flux map, where $K(z)$ is the normalized $F_Q(z)$ as a function of core height. If the maximum $F_Q^M(z)/K(z)$ has increased since the previous determination of $F_Q(z)$, then TS 4.2.2.2.e allows two options: (1) either the current $F_Q^M(z)$ must be increased by an additional 2 percent to account for further increases in $F_Q(z)$ before the next surveillance, or (2) the surveillance must be performed every 7 EFPDs.

If it is then determined that $F_Q^M(z)$, with the 2 percent penalty applied, exceeds the surveillance $F_Q(z)$ limit, continued operation is acceptable provided operational restraints are applied. Either the axial flux difference (AFD) limits of DCPP TS 3.2.1 are to be reduced 1 percent for each percent that $F_Q(z)$ exceeds its limit, or the requirements of DCPP TS 3.2.2 must be met, which include reducing thermal power at least 1 percent for each 1 percent $F_Q(z)$ exceeds the limit and reducing the power range nuclear flux-high, trip setpoints.

The licensee adopted the $F_Q(z)$ surveillance recommendation in WCAP-10216-P-A, "Relaxation of Constant Axial Offset Control F_Q Surveillance Technical Specification," dated June 1983, in the fourth operating cycle of DCPP. WCAP-10216-P-A includes the assumption that the $F_Q(z)$ margin will decrease by no

more than 2 percent between monthly flux maps. This assumption was based on previous (pre-1983) core designs that predate low-low leakage loading patterns, high amounts of burnable poisons (such as integral fuel burnable absorbers), and 18-month fuel cycles.

A decrease in the $F_Q(z)$ margin of greater than 2 percent between monthly flux maps results in a nonconservative penalty being used to evaluate the $F_Q(z)$ margin for surveillances performed in accordance with TS 4.2.2.2.e. Therefore, $F_Q(z)$ could exceed the $F_Q(z)$ limit between monthly flux maps without implementation of the operational restraints of TS 3.2.1 or 3.2.2.

DCPP operating experience has shown that $F_Q^M(z)$ increases in the beginning of the fuel cycle, with a subsequent peak at a burnup of approximately 3000-megawatt days per metric ton uranium (MWD/MTU), and then exhibits a general decrease in $F_Q^M(z)$ throughout the remainder of the cycle.

The licensee submitted DCPP Licensee Event Report (LER) 1-93-004-00 on October 19, 1993, regarding the use of a nonconservative penalty for the $F_Q(z)$ surveillance.

Revision 1 to WCAP-10216-P-A was approved by the NRC on November 26, 1993. As an enhancement to the TS surveillance methodology, Revision 1 to WCAP-10216 accounts for $F_Q(z)$ margin decreases of greater than 2 percent between monthly flux maps. DCPP has experienced decreases in $F_Q(z)$ margin of more than 2 percent between monthly flux maps in the early portions of Unit 1 Cycle 6 and Unit 2 Cycles 4 and 5. For those DCPP core designs which are predicted to have margin decreases of greater than 2 percent in $F_Q(z)$ over certain burnup ranges, a larger penalty to $F_Q(z)$ will be provided by Westinghouse on a cycle-specific basis. Otherwise, a minimum $F_Q(z)$ penalty of 2 percent will be used.

The licensee has implemented administrative controls to apply a more conservative $F_Q(z)$ penalty than the current TS. These administrative controls will ensure that the $F_Q(z)$ penalty adequately bounds predicted margin decreases between surveillances.

The proposed changes would require an $F_Q(z)$ penalty of at least 2 percent, which is currently listed in TS 4.2.2.2.e.1), to be included in the COLR. For a core design which predicts margin decreases larger than 2 percent, a larger penalty would be included in the COLR on a cycle-specific basis. Thus, the proposed changes conservatively ensure that the $F_Q(z)$ penalty adequately bounds margin decreases of greater than 2 percent between surveillances.

Revisions to the COLR will be evaluated in accordance with 10 CFR 50.59. COLR revisions will assure conformance to 10 CFR 50.36. The NRC will be notified of all revisions to the COLR in accordance with TS 6.9.1.8. All COLR revisions will be based on NRC-approved methodologies. Revisions to the $F_Q(z)$ penalty will be based on the Westinghouse methodology, previously reviewed and approved by the NRC, in WCAP-10216-P-A, Revision 1. Calculating

this cycle-specific parameter in accordance with an approved NRC methodology ensures that the parameters are consistent with the applicable safety analysis addressed in the DCPP final safety analysis report (FSAR) update.

Therefore, the staff finds the proposed changes acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the California State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (59 FR 17603). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: S. Peterson

Date: October 31, 1994