

June 2, 2003

Mr. Gregory M. Rueger
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Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Nuclear Power Plant
P.O. Box 3
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SUBJECT: DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1 (TAC NO. MB8077)
AND UNIT NO. 2 (TAC NO. MB8078) - ISSUANCE OF AMENDMENT
RE: REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

Dear Mr. Rueger:

The Commission has issued the enclosed Amendment No. 157 to Facility Operating License No. DPR-80 and Amendment No. 157 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 (TSs) in response to your application dated February 6, 2003 (DCL-03-011).

The amendments revise Surveillance Requirements (SRs) 3.3.1.2 and 3.3.1.3 of the TSs on the RTS instrumentation. The proposed changes to SR 3.3.1.2 move Note 1 to the body of the SR, replace the reference to nuclear instrumentation system channel output by a reference to power range channel output, and delete the reference to the absolute difference. The change to SR 3.3.1.3 is editorial.

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/

Jack Donohew, Senior 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. 157 to DPR-80
2. Amendment No. 157 to DPR-82
3. Safety Evaluation

cc w/encls: See next page

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PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-275

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.157
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 February 6, 2003, 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. 157, 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 60 days of the date of issuance.

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: June 2, 2003

PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-323

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.157
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 February 6, 2003, 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. 157, 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 60 days of the date of issuance.

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: June 2, 2003

ATTACHMENT TO LICENSE AMENDMENT NO. 157

TO FACILITY OPERATING LICENSE NO. DPR-80

AND AMENDMENT NO. 157 TO FACILITY OPERATING LICENSE NO. DPR-82

DOCKET NOS. 50-275 AND 50-323

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

REMOVE

3.3-8

INSERT

3.3-8

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 157 TO FACILITY OPERATING LICENSE NO. DPR-80
AND AMENDMENT NO. 157 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 application dated February 6, 2003, Pacific Gas and Electric Company (the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License Nos. DPR-80 and DPR-82) for the Diablo Canyon Nuclear Power Plant, Units 1 and 2 (DCPP). The proposed changes would revise Surveillance Requirements (SRs) 3.3.1.2 and 3.3.1.3 on reactor trip system (RTS) instrumentation. The proposed changes to SR 3.3.1.2 would move Note 1 to the body of the SR, replace the reference to nuclear instrumentation system (NIS) channel output by a reference to power range channel output, and delete the reference to the absolute difference. The change to SR 3.3.1.3 is editorial. The licensee also provided the associated changes to the Bases of the TSs and low power NIS adjustment uncertainty calculation (NSSS file, Calculation No. N-212, Revision 1, dated October 8, 1997) in Attachments 4 and 5, respectively, to the February 6, 2003, application.

2.0 REGULATORY REQUIREMENTS

In accordance with Standard Review Plan (SRP) (NUREG-0800) Sections 7.1, "Instrumentation and Controls - Introduction," and 7.2, "Reactor Trip System," the acceptance criteria for the review of RTS instrumentation are the relevant requirements of the following regulations:

- 10 CFR 50.55a(h) which requires IEEE Standard 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations."
- General Design Criterion (GDC) 2, "Design Basis for Protection Against Natural Phenomena," of Appendix A to 10 CFR Part 50.
- GDC 4, "Environmental and Missile Design Basis."
- GDC 13, "Instrumentation and Control."
- GDC 20, "Protection Systems Functions."

- GDC 21, "Protection System Reliability and Testability."
- GDC 22, "Protective System Independence."
- GDC 23, "Protection System Failure Modes."
- GDC 24, "Separation of Protection and Control Systems."
- GDC 25, "Protection System Requirements for Reactivity Control Malfunctions."
- GDC 29, "Protection Against Anticipated Occurrences."

SRP 7.2 also gives the following major design considerations: (1) system redundancy requirements to assure that at least two redundant logic trains (i.e., a minimum degree of redundancy of one) are provided to initiate reactor trip, and (2) electrical and physical independence, and single failure criterion requirements.

3.0 BACKGROUND

The licensee adopted the Improved Technical Specifications (ITS) in License Amendment No. 135 (issued May 28, 1999) based on NUREG-1431, "Standard Technical Specifications [STS] for Westinghouse Plants," Revision 1, dated April 1995. Since then, industry and the NRC staff have been working to improve the ITS, in NUREG-1430 through NUREG-1434 for the different plant vendors, and as a result, generic changes have been developed for the standard ITS in NUREG-1431. Changes to NUREG-1431 would be applicable to DCPD because the TSs for DCPD are based on NUREG-1431.

The proposed changes adopt NRC-approved generic changes in the industry TSTF-371, Revision 1, "NIS Power Range Channel Daily SR TS Change to Address Low Power Decalibration," which was approved by the staff in a letter dated April 2, 2002. As stated by the staff in its discussion of TSTF-371, the TSTF revises SR 3.3.1.2 to resolve the undesirable condition that compliance with the current SR 3.3.1.2 may result in a non-conservative channel calibration during reduced power operations. The proposed SR 3.3.1.2 would only require adjustment of the NIS power range channels when the calorimetric heat balance calculated power is greater than the power range indicated power by +2 percent. The changes to SR 3.3.1.3 are editorial because of the changes to SR 3.3.1.2.

The NIS power range channels provide indications of reactor power to the RTS. These indications are, as shown in TS Table 3.3.1-1, for the RTS trip function on the power range neutron flux high. The daily surveillance of the NIS power range channels for the power range neutron flux high trip function, which is SR 3.3.1.2, is for the channels to accurately reflect the reactor power based on the calorimetric heat balance calculation. A low power indication in the NIS power range channels would non-conservatively affect the RTS, and thus the protection of the reactor.

In its application, the licensee stated that the proposed changes address the potential effects of decalibrating the NIS power range channels at less than 100 percent power operation as discussed in Westinghouse Technical Bulletin (TB) ESBUTB-92-14-R1, "Decalibration Effects

of Calorimetric Power Measurements on the NIS High Power Reactor Trip at Power Levels Less than 70% RTP [Rated Thermal Power]," dated February 6, 1996. The TB identified potential effects for such decalibration, which can occur due to the increased uncertainty of the secondary side power calorimetric when performed at reduced-power operation. The plant-specific reduced power level where this occurs can be determined following the guidance in the TB. The calculation of the power level below which NIS power range channel adjustments in a decreasing power direction become a concern is in Enclosure 5 to the February 6, 2003, application. The calculation was not reviewed by the staff.

As stated in the application, this power level for DCPD is less than 45 percent RTP (i.e., the nominal 109 percent RTP high flux trip setpoint, in TS Table 3.3.1-1, is considered adequately conservative for NIS calibrations performed at or above 45 percent RTP). The calculation has a table that shows that calibrating the NIS channels at calorimetric power levels less than 45 percent RTP would require the allowable NIS trip setpoint to be set below the TS value of 109 percent RTP. The 45 percent RTP was also determined by the licensees for Callaway and Wolf Creek in the same proposed amendments for the two plants, which were approved in the amendments dated February 5 and October 2, 2002, respectively.

The licensee stated that the Westinghouse TB recommends that caution should be exercised if the NIS power range channels are adjusted in the decreasing power direction when the power channels indicate a higher power than the secondary side power calorimetric measurement at power levels below a plant-specific value (which is the 45 percent RTP for DCPD discussed above). This recommendation is in conflict with SR 3.3.1.2, which requires channel adjustment when the absolute difference is greater than 2 percent RTP and the plant is greater than or equal to 15 percent RTP. In its application, the licensee stated that it had implemented administrative controls soon after it had discovered this issue involving SR 3.3.1.2.

The proposed amendment removes the requirement to adjust the NIS power range channels in the decreasing power direction when the indicated power is greater than the calorimetric heat balance calculation by more than 2 percent RTP. The licensee stated that compliance with SR 3.3.1.2 may result in a non-conservative channel calibration during reduced power operation. The licensee's presentation of the changes to TS Bases for SR 3.3.1.2 provides a description of the potential decalibration of the NIS power range channels at reduced-power operation.

4.0 TECHNICAL EVALUATION

The licensee's proposed changes to SR 3.3.1.2 would (1) move the requirement in Note 1 to the body of the SR, replace the reference to NIS channel by a reference to power range channel, and delete the reference to the absolute difference, and (2) editorially revise the SR to state the following:

Compare results of calorimetric heat balance calculation to power range channel output. Adjust power range channel output if calorimetric heat balance calculation results exceed power range channel output by more than +2% RTP.

The NIS channel for SR 3.3.1.2, as shown in item 2.a of TS Table 3.3.1-1, is the power range channel. The current SR 3.3.1.2 requires the power range channel output to be adjusted when

the absolute difference between the channel output and the calorimetric heat balance calculation is greater than 2 percent RTP. With the content of Note 1 moved to the SR and the reference to the absolute difference removed, the revised SR 3.3.1.2 is the same as the current SR 3.3.1.2 except that the revised SR would require the power range channel to be adjusted only when the calorimetric heat balance calculation results exceed the power range channel output by 2 percent RTP. Therefore, if the power range channels are underestimating reactor power by more than 2 percent RTP, the channels are required to be adjusted to indicate power more accurately. The 2 percent RTP limit and the 24-hour surveillance frequency is to ensure that the power range high neutron flux high setpoint reactor trip signal will be generated prior to the safety analysis limit. The calorimetric heat balance calculation is considered the more accurate determination of reactor power. This change does not affect the design of any NIS channel.

As stated above, the Westinghouse TB addresses potential effects of decalibrating the NIS power range channels at reduced power operation. The licensee has proposed to require the readjustment of the power range channel output only if the channel output is less than the calorimetric heat balance calculation result when the channel input to the RTS for reactor power could be too low for a reactor trip. The revised SR 3.3.1.2 would act to have the channel outputs overestimate the reactor power, which would be a conservative input to the RTS, and compensate for the potential decalibration addressed in the TB.

The licensee further stated in its application that it also considered the effect of the potential decalibration of the NIS power range channels addressed in the TB on the following RTS design functions: power range indications, power range RTS trip functions (other than the high neutron flux), power range RTS permissive functions, power range control functions, and miscellaneous alarm functions. The licensee stated that none of these RTS design functions were adversely impacted by the potential decalibration addressed in the TB.

There is the potential that the decalibration may cause the reset of the P-10 interlock to occur at a power level that is lower than the allowable value in TS Table 3.3.1-1 (i.e., the NIS channel indication is higher than the actual RTP). The automatic P-10 interlock reset is to enable reactor trips from the power range neutron flux-low and the intermediate and source range neutron flux functions which provide reactor protection for uncontrolled reactivity excursions from subcritical to low power (i.e., less than 10 percent RTP). The licensee addressed this in its application and stated that, for this case, the NIS power range channel would reach the reactor trip at the power range neutron flux-high trip setting well before the actual power reached the trip setting of 118 percent RTP and this event would remain bounded by the accident analyses in the DCPD Final Safety Analysis Report (FSAR) Update. As shown in Section 15.2.1 of the FSAR Update, for the analysis of the uncontrolled rod cluster control assembly bank withdrawal from a subcritical condition, the reactor trip is assumed to be initiated by the power range high neutron flux and not by any of the reactor trips enabled by the reset of the P-10 interlock. Therefore, the impact of the potential decalibration on the reset of the P-10 interlock does not change the accident analyses in the FSAR Update.

For SR 3.3.1.3, the licensee has proposed to move Note 1 to the body of SR 3.3.1.3 for consistency with the proposed change to SR 3.3.1.2. The proposed change to SR 3.3.1.3 is editorial in nature because the requirements of SR 3.3.1.3 are not being changed. The proposed change moves the requirement in Note 1 of SR 3.3.1.3 into the body of the SR and

the acronym NIS is spelled out because it no longer appears in SR 3.3.1.2. The surveillance requirement in SR 3.3.1.3 remains that the excore NIS channels are adjusted every 31 effective full power days if the absolute difference between the incore and excore axial flux difference is greater than or equal to 3 percent RTP.

Based on the above evaluation, the staff concludes that proposed change to SR 3.3.1.2 is conservative, accounts for potential effects of decalibrating the NIS power range channels during reduced-power operation, will ensure that the power range high neutron flux high setpoint reactor trip signal will be generated prior to the safety analysis limit, and does not change the design of any NIS channel and its conformance with the regulatory requirements stated in Section 2.0 of this safety evaluation. Because the proposed change will ensure that there are appropriate controls to maintain reactor power within prescribed operating ranges for normal operation, anticipated operational occurrences, and accidents to ensure adequate safety, the NIS power range channels continue to meet GDC 13. For the proposed change to SR 3.3.1.3, the staff concludes that the change is editorial in nature and does not change the requirement of SR 3.3.1.3. Based on these conclusions, the staff further concludes that the proposed amendments are acceptable.

In its application, the licensee presented the changes to be made to the TS Bases that address the potential decalibration of the NIS power range channels at reduced power operation. The staff does not have any disagreement with the changes to be made by the licensee to the TS Bases and concludes that it is necessary to have this description in the TS Bases for SR 3.3.1.2.

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

The amendments 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 (68 FR 18282). 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: Jack Donohew

Date: June 2, 2003

Diablo Canyon Power Plant, Units 1 and 2

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