June 10, 2004

Mr. Harold B. Ray
Executive Vice President
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3 - ISSUANCE OF AMENDMENTS ON PEAK FUEL CENTERLINE TEMPERATURE SAFETY LIMIT (TAC NOS. MC0801 AND MC0802)

Dear Mr. Ray:

The Commission has issued the enclosed Amendment No. 192 to Facility Operating License No. NPF-10 and Amendment No. 183 to Facility Operating License No. NPF-15 for San Onofre Nuclear Generating Station, Units 2 and 3, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated September 15, 2003.

The amendments revise Technical Specification (TS) 2.1.1.2 of TS Section 2.0, "Safety Limits (SLs)." The amendments replace the peak linear heat rate SL with a peak fuel centerline temperature SL so that the SL in TS 2.1.2.2 adequately conforms to 10 CFR 50.36(c)(1)(ii)(A) which requires that limiting safety system settings prevent a SL from being exceeded.

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

Sincerely,

/RA/

Bo M. Pham, Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosures:
1. Amendment No. 192 to NPF-10
2. Amendment No. 183 to NPF-15
3. Safety Evaluation

cc w/encls: See next page

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SOUTHERN CALIFORNIA EDISON COMPANY

SAN DIEGO GAS AND ELECTRIC COMPANY

THE CITY OF RIVERSIDE, CALIFORNIA

THE CITY OF ANAHEIM, CALIFORNIA

DOCKET NO. 50-361

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 192
License No. NPF-10

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

   A. The application for amendment by Southern California Edison Company, et al. (SCE or the licensee), dated September 15, 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. NPF-10 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. 192, are hereby incorporated in the license. Southern California Edison Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days 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 10, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 192

FACILITY OPERATING LICENSE NO. NPF-10

DOCKET NO. 50-361

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	INSERT
2.0-1	2.0-1

SOUTHERN CALIFORNIA EDISON COMPANY

SAN DIEGO GAS AND ELECTRIC COMPANY

THE CITY OF RIVERSIDE, CALIFORNIA

THE CITY OF ANAHEIM, CALIFORNIA

DOCKET NO. 50-362

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 183
License No. NPF-15

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

   A. The application for amendment by Southern California Edison Company, et al. (SCE or the licensee) dated September 15, 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. NPF-15 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. 183, are hereby incorporated in the license. Southern California Edison Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days 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 10, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 183

FACILITY OPERATING LICENSE NO. NPF-15

DOCKET NO. 50-362

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	INSERT
2.0-1	2.0-1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 192 TO FACILITY OPERATING LICENSE NO. NPF-10

AND AMENDMENT NO. 183 TO FACILITY OPERATING LICENSE NO. NPF-15

SOUTHERN CALIFORNIA EDISON COMPANY

SAN DIEGO GAS AND ELECTRIC COMPANY

THE CITY OF RIVERSIDE, CALIFORNIA

THE CITY OF ANAHEIM, CALIFORNIA

SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3

DOCKET NOS. 50-361 AND 50-362

1.0 INTRODUCTION

By application dated September 15, 2003, Southern California Edison Company (SCE or the licensee), requested changes to the Technical Specifications (TSs) for San Onofre Nuclear Generating Station (SONGS), Units 2 and 3. The amendments would revise TS 2.1.1.2 of TS Section 2.0, "Safety Limits (SLs)." Specifically, they replace the peak linear heat rate (PLHR) SL with a peak fuel centerline temperature (PFCT) SL. These changes are requested so that SL 2.1.1.2 adequately conforms to 10 CFR 50.36(c)(1)(ii)(A), which requires that limiting safety system settings prevent a SL from being exceeded.

2.0 REGULATORY EVALUATION

General Design Criterion (GDC) 10, "Reactor Design," and GDC 20, "Protection System Functions," of Appendix A to *Title 10 of the Code of Federal Regulations*, Part 50 (10 CFR Part 50), state that the specified acceptable fuel design limits (SAFDLs) must not be exceeded during normal operation and anticipated operational occurrences (AOOs).

NUREG-0800, "Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants," specifies that the peak fuel centerline melting temperature can be used as a SAFDL. Specifically, item (II)(A)(2)(e) of SRP Section 4.2, "Fuel System Design," states that "it has also been traditional practice to assume that failure will occur if centerline melting takes place. . . . For normal operation and anticipated operational occurrences, centerline melting is not permitted. . . . The centerline melting criterion was established to assure that axial or radial relocation of molten fuel would neither allow molten fuel to come into contact with the cladding nor produce local hot spots. The assumption that centerline melting results in fuel failure is conservative."

Consistent with the SRP Section 4.2 guidance, TSTF-445, "Revision to Peak Linear Heat Rate Safety Limit" (NRC safety evaluation dated December 23, 2002), also provides guidance for replacing the PLHR SL with a PFCT SL as a SAFDL.

Section 50.36 specifies the Commission's regulatory requirements for the content of TSs. Specifically, 10 CFR 50.36(c)(1)(ii)(A) requires that TSs include limiting safety settings that are chosen so that automatic protective action will correct abnormal situations before safety limits are exceeded. Accordingly, SLs are required to be in the TSs. Since NUREG-1432, "Standard Technical Specifications - Combustion Engineering Plants," dated March 18, 2003, was developed based on these 10 CFR 50.36 requirements, and SONGS being Combustion Engineering (CE) designed units, the staff also utilized NUREG-1432 guidance during its review of the licensee's submittal.

3.0 TECHNICAL EVALUATION

The staff has reviewed the licensee's technical and regulatory analyses in support of its proposed license amendments which are described in Sections 4.0 and 5.0 of the licensee's submittal. The detailed evaluation below will support the conclusion 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.

In its letter dated September 15, 2003, SCE requested approval of changes to TS 2.0, "Safety Limits (SLs)." The proposed changes replace the current PLHR safety limit of 21 kW/ft currently specified in TS 2.1.1.2 with a PFCT limit of 5080°F. The proposed TS also adds a statement to indicate that this PFCT limit decreases by 58°F per 10,000 MWD/MTU and will be adjusted for effects of burnable absorbers.

A reference to the NRC-approved Topical Report (TR) CENPD-382-P-A, "Methodology for Core Designs Containing Erbium Burnable Absorbers," dated August 1993, which documents the methodology for the burnable absorber adjustment, is included in the TS as part of the SL. In order to reflect the new safety limit, changes are also made to the associated Bases of TSs 2.1.1, "Reactor Core SL," 3.2.1, "Linear Heat Rate (LHR)," 3.2.2, "Total Planar Radial Peaking Factors (F_{xy})," 3.2.3, "Azimuthal Power Tilt (T_q)," 3.2.4, "Departure from Nucleate Boiling Ratio (DNBR)," and 3.2.5, "Axial Power Index (ASI)."

The licensee indicated that its analysis of record (AOR) has exceeded the PLHR SL. However, its deposited energy calculations have demonstrated that the AOR did not exceed the design PFCT limit. The licensee's proposed TS changes will establish the PFCT limit as the basis for the PLHR SL, which will provide more flexibility to the licensee in setting peak linear heat rates while ensuring safety. The safety analyses will confirm the revised TS.

TS 2.1.1.2 currently requires that the PLHR be less than 21 kW/ft in Modes 1 and 2. As stated in the TS Bases 2.1.1, the intent of the PLHR safety limit is to prevent the fuel centerline temperature from reaching the melting point during normal operation and AOOs. The licensee has indicated that the current 21 kW/ft was chosen because it is the expected highest steady state linear heat rate at which the fuel can operate without causing centerline temperature to

reach melting point. In its submittal, the licensee identified where recent analyses have shown that calculated PLHRs can exceed 21 kW/ft for some AOOs (such as the uncontrolled control element assembly withdrawal from subcritical and low power transients). However, the licensee demonstrated that, due to the short duration of these AOOs, deposited energy calculations have shown that the design peak PFCT limit was not exceeded for the AOR. The licensee pointed out that the SAFDLs used for the design of the SONGS Units 2 and 3 reactors are listed in Section 4.4.1 of the Updated Final Safety Analysis Report (UFSAR), which states that "the peak temperature of the fuel shall be less than the melting point . . . during steady state operation and anticipated operational occurrences." The licensee, therefore, stated that: (1) the use of the PFCT limit as a SAFDL is consistent with the plant design criterion and SRP Section 4.2 guidance (discussed in Section 2.0 above); and (2) the results of the licensee's existing analysis confirmed that SONGS Units 2 and 3 comply with GDCs 10 and 20, which require that the SAFDLs must not be exceeded during normal operation and AOOs.

In order for the results of its analysis to be reflected in the TS, the licensee proposed to use the PFCT limit to replace the PLHR limit for TS 2.1.1.2. The proposed TS requires that the PFCT be less than the melting temperature of 5080°F in Modes 1 and 2. The melting point is adjusted downward from this temperature based on the amount of burnup, and amount and type of burnable poison in the fuel. In addition, this PFCT limit decreases by 58°F per 10,000 MWD/MTU and will be adjusted for effects of burnable absorbers in accordance with CENPD-382-P-A.

The staff has reviewed proposed TS 2.1.1.2 and found that proposed TS 2.1.1.2 is consistent with Standard Technical Specification 2.1.1.2 for CE plants in terms of its TS format, the values of the PFCT limits, and the methodology used to adjust the PFCT limits for effects of burnup and burnable absorbers. Specifically, CE STS 2.1.1.2 states that "in MODES 1 and 2, the peak fuel centerline temperature shall be maintained at < [5080°F], decreasing by [58°F per 10,000 MWD/MTU] and adjusted for burnable poison per [CENPD-275-P, Revision 1-P-A or CENPD-382-P-A]." The values in brackets are plant-specific requirements, and must be demonstrated by the licensee that these requirements are acceptable when they are used for the plant-specific application.

The staff has reviewed the licensee's supporting analysis in its September 15, 2003, submittal, and found that that:

- For SONGS Units 2 and 3, the design melting point of new fuel with no burnable poison is 5080°F, which is consistent with the value used as the SAFDL in the approved TSs for CE-designed plants such as Waterford and Palo Verde,

- The 58°F per 10,000 MWD/MTU adjustment for burnup was previously approved by the NRC in TR CEN-386-P-A, and

- Adjustments for burnable poisons are determined based on the NRC-approved TR CENPD-382-P-A for CE plants.

Therefore, the staff concluded that the specific values of PFCT limits and the associated methodology in proposed TS 2.1.1.2 are adequate and acceptable for application at SONGS Units 2 and 3.

In summary, the staff concluded that proposed TS 2.1.1.2 is acceptable because:

(1) The results of the licensee's analysis confirm that the analysis for SONGS Units 2 and 3 complies with GDCs 10 and 20, which require that the SAFDLs must not be exceeded during normal operation and AOOs.

(2) The SAFDL used in the analysis is consistent with the plant design criterion and the SRP Section 4.2 guidance that allows the PFCT limit used as a SAFDL.

(3) The TS adequately reflects the results of the licensee's analysis that show that the calculated PFCT is less than the proposed limit of the melting temperature of 5080°F.

(4) The proposed TS is consistent with STS 2.1.1.2 for CE plants in terms of the TS format, the values of the PFCT limits and the calculational methods.

(5) The value of the proposed PFCT SL of 5080°F is consistent with that specified in the approved TSs for similar CE plants.

(6) The 58°F per 10,000 MWD/MTU adjustment for burnup and the method used to calculate the effects of burnable poison on the PFCT limit were previously approved by the NRC for CE plants.

The staff also found that the changes to the associated Bases of TSs 2.1.1, 3.2.1, 3.2.2, 3.2.3, 3.2.4, and 3.2.5 adequately reflect the proposed PFCT SL in TS 2.1.1.2.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to 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 (68 FR 59219). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

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

Principal Contributor: S. B. Sun

Date: June 10, 2004