

June 8, 2001

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 RE: AUTOMATIC VOLTAGE REGULATOR
(AVR) SURVEILLANCE REQUIREMENTS (TAC NOS. MB1685 AND MB1686)

Dear Mr. Ray:

The Commission has issued the enclosed Amendment No.179 to Facility Operating License No. NPF-10 and Amendment No. 170 to Facility Operating License No. NPF-15 for San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, respectively. The amendments are in response to your application dated April 6, 2001, and supplemented April 20, 2001, that proposed to revise the SONGS Units 2 and 3 Technical Specification Surveillance Requirements (SR) 3.8.1.2, 3.8.1.3, 3.8.1.9, 3.8.1.10, and 3.8.1.19 to assure that an emergency diesel generator AVR is operable and regularly tested. AVR operability would be demonstrated by conducting SR 3.8.1.2 and 3.8.1.3 within the past 60 days, and any one of SR 3.8.1.9, 3.8.1.10, or 3.8.1.19 within the past 24 months.

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

Sincerely,

/RA/

Joseph E. Donoghue, Senior Project Manager
Project Directorate IV, Section 2
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosures: 1. Amendment No. 179 to NPF-10
2. Amendment No. 170 to NPF-15
3. Safety Evaluation

cc w/encls: See next page

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San Onofre Nuclear Generating Station, Units 2 and 3

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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. 179
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 April 6, 2001, and supplemented April 20, 2001, 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. 179, 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 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Changes to the Technical
Specifications

Date of Issuance: June 8, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 179

FACILITY OPERATING LICENSE NO. NPF-10

DOCKET NO. 50-361

Replace the following pages of the Facility Operating License No. NPF-10 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3.8-5
3.8-6
3.8-8
3.8-14

INSERT

3.8-5
3.8-6
3.8-8
3.8-14

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. 170
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 April 6, 2001, and supplemented April 20, 2001, 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. 170, 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 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION
/RA/

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

Attachment: Changes to the Technical
Specifications

Date of Issuance: June 8, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 170

FACILITY OPERATING LICENSE NO. NPF-15

DOCKET NO. 50-362

Replace the following pages of the Facility Operating License No. NPF-15 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3.8-5
3.8-6
3.8-8
3.8-14

INSERT

3.8-5
3.8-6
3.8-8
3.8-14

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. NPF-10
AND AMENDMENT NO. 170 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 letter dated April 6, 2001 (PCN 525), and supplemented by letter dated April 20, 2001, Southern California Edison (SCE or the licensee) proposed changes to the Facility Operating Licenses No. NPF-10 and NPF-15 for the San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, respectively. The licensee proposes to revise SONGS Units 2 and 3 Technical Specifications (TSs) Surveillance Requirements (SRs) 3.8.1.2, 3.8.1.3, 3.8.1.9, 3.8.1.10, and 3.8.1.19 by adding notations to assure that an emergency diesel generator (DG) automatic voltage regulator (AVR) is operable and regularly tested. AVR operability would be demonstrated by conducting SR 3.8.1.2 and 3.8.1.3 within the past 60 days, and any one of SR 3.8.1.9, 3.8.1.10, or 3.8.1.19 within the past 24 months. Each of the SONGS DGs has 2 AVRs that are 100 percent redundant. Only 1 AVR is required for the associated DG to be operable and only 1 AVR can be in service at any given time. For an AVR to be placed in service and be considered operable, it is required to have undergone testing per the required surveillance tests.

The current SRs do not state whether both AVRs are required to be in service during performance of all of the DG surveillance tests. Requiring that both AVRs be in service would require performing all surveillance tests twice, thereby subjecting the DGs to excessive wear without a commensurate increase in assurance that both AVRs will perform their design function. Therefore, the licensee proposes to clarify the testing requirements for each AVR. Specifically, the following note would be added to SRs 3.8.1.2 and 3.8.1.3:

To ensure Operability of an AVR, it must have been aligned to the DG during the performance of SR 3.8.1.2 and SR 3.8.1.3 within the last 60 days, plus any allowance per SR 3.0.2.

Also, the following note would be added to SRs 3.8.1.9, and 3.8.1.10, and 3.8.1.19:

To ensure Operability of an AVR, it must have been aligned to the DG during the performance of either SR 3.8.1.9, SR 3.8.1.10, or SR 3.8.1.19 within the last 24 months, plus any allowance per SR 3.0.2.

2.0 BACKGROUND

To provide a reliable source of power for the design-basis accident (DBA) mitigation systems, nuclear power plants are provided with redundant offsite and onsite power sources such as emergency diesel generators (EDGs). The EDGs provide an alternate source of power to DBA mitigation systems if offsite power is lost. The SONGS design has 2 EDGs for each unit. Each EDG has 2 AVRs that are 100-percent redundant to each other. The AVR's function is to control the generator excitation system for maintaining the generator voltage from no-load to full-load conditions when operating in isochronous or droop mode and to respond dynamically under transient conditions. The SONGS TSs require that the AVRs be tested periodically to provide assurance that the AVRs will perform their intended function. Monthly surveillance tests of SR 3.8.1.2 and SR 3.8.1.3, and semiannual surveillance tests of SR 3.8.1.7 check to ensure that the AVRs can perform their intended function under no load and full load, or when operating in parallel with the offsite power system. SRs 3.8.1.9, 3.8.1.10, and 3.8.1.19 are performed at 24-month intervals and verify the dynamic response of the AVRs.

Since the AVRs are 100-percent redundant to each other, each AVR is aligned to its EDG every other month. Consequently, during the 1-month, 6-month, and 24-month EDG surveillance testing, only 1 AVR is tested (i.e., whichever AVR happens to be aligned to the EDG when the test is performed). As a result of an NRC inspection during February 2001, the licensee determined that the EDG surveillance tests were not conducted in literal compliance with the TS surveillance test requirements. For an AVR to be considered operable, all of the EDG SRs must be performed with that AVR in service. Subsequently, the licensee established TS compliance by selecting an AVR which had been tested and/or by completing the required surveillance testing.

The proposed changes are requested in accordance with Sections 2.101, 50.59, and 50.90 of Title 10 of the *Code of Federal Regulations*, to assure continued compliance with 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 17, "Electric Power Systems," and GDC 18, "Inspection and Testing of Electric Power Systems."

The staff has reviewed the proposed changes and finds them acceptable, as discussed in the following evaluation.

3.0 EVALUATION

Each of the SONGS Units 2 and 3 diesels has 2 AVRs that are redundant to each other. Only 1 of the 2 AVRs need be in service at a time. The AVRs have primarily solid state electronic components. There are only 4 moving parts in the AVRs used at SONGS. Solid state electrical components are normally not susceptible to aging failures except failures due to long-term thermal affects produced by power dissipation when the device is energized. When the EDG is not operating, the AVRs are completely de-energized, so that no power is dissipated in the AVRs. Since the EDGs are operated for short periods of time such as during required surveillance testing and during plant transients, it is unlikely that normal aging mechanisms

would cause failure of the AVR's solid-state components. Additionally, all of the solid-state electronic components perform active functions during the monthly load testing, and any degradation that may have occurred in the AVRs would likely be discovered during the monthly load testing. Any degradation of the 4 moving components would also be identified during the monthly DG testing, when the selected AVR is operated from no-load conditions to full-load conditions in parallel with the offsite power source. Adjustments to the moving parts of the AVR are made during initial operation and normally are not repeated during the life of the AVR. At SONGS the AVRs are mounted in a control panel away from the generator, although the vendor information states that the AVR can be mounted directly on the generator itself due to its rugged construction. The remote installation of the AVRs at SONGS provides an added level of reliability because the AVRs are not subjected to potential vibrations and possible drift, and as a result do not require any periodic adjustments. This fact is corroborated by SONGS experience of 15 years of service where no adjustments have been required to pass the surveillance tests.

In support of the proposed license amendment, the licensee reviewed the AVR maintenance history since 1990. Of the estimated 500 surveillance tests on the SONGS EDGs that were checked for proper operation of an associated AVR, corrective maintenance was required on an AVR only on 14 occasions. Ten of the 14 corrective maintenance actions required were in the motor-operated potentiometer and were accomplished by performing routine preventative maintenance. Personnel errors accounted for 2 of the 14 identified events. The remaining 2 events involved components within the AVR circuits. Most of the functional problems with AVRs involved controlling and adjusting the volt-ampere reactive (VARs) during the monthly parallel operations rather than a complete failure of the AVR to operate. Therefore, the required surveillance tests conducted on the AVRs adequately revealed any potential problems with their operation. Based on the maintenance history data, the NRC staff finds that the AVRs are generally reliable and that there is reasonable assurance that AVR degradation or malfunction would be detected during the required surveillance testing.

In addition to monthly testing, there are several other required EDG surveillance tests with a frequency of 6 months or longer to test the diesel output voltage. The monthly DG testing checks the no-load and full-load operation of the generator in parallel with the offsite power source. These surveillance tests, to a limited extent, check the dynamic response of the AVR. The 24-month load reject, single-largest-load reject, and load-sequencing tests subject the AVR to larger dynamic transients than any of the other surveillance tests. These tests provide reasonable assurance of proper dynamic operation of the AVRs.

Based on the above evaluation, the NRC staff concludes that the AVRs are reliable components. The NRC staff also concludes that bimonthly AVR tests will effectively identify AVR problems and degradation. The 24-month tests will provide additional assurance of proper operation under dynamic conditions. Any additional testing of the AVRs beyond that discussed in the above evaluation is not necessary to assure that the AVR is operable. The proposed surveillance tests should provide a high level of assurance that each AVR is capable of performing its intended design function without causing unnecessary wear on the EDGs.

The NRC staff has reviewed the proposed change request for testing of the 2 AVRs for each EDG on a staggered monthly basis. The NRC staff's determination is based on the redundancy of the AVRs, their design, and the maintenance history of the AVRs, as discussed above. Based on the NRC staff's evaluation of these factors, the NRC staff finds that the proposed

SRs are adequate to reveal any potential degradation and problems with the AVRs and assure that the AVRs will perform their intended function during their service life.

4.0 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.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change SRs. 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 (66 FR 22032). 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: Paul Gill

Date: June 8, 2001