June 4, 1993

Docket Nos. 50-361
and 50-362

Mr. Harold B. Ray
Senior Vice President
Southern California Edison Co.
Irvine Operations Center
23 Parker Street
Irvine, California 92718

Mr. Edwin A. Guiles
Vice President
Engineering and Operations
San Diego Gas & Electric Co.
101 Ash Street
San Diego, California 92112

Gentlemen:

SUBJECT: ISSUANCE OF AMENDMENT FOR SAN ONOFRE NUCLEAR GENERATING STATION, UNIT NO. 2 (TAC NO. M85275) AND UNIT NO. 3 (TAC NO. M85276)

The Commission has issued the enclosed Amendment No. 106 to Facility Operating License No. NPF-10 and Amendment No. 95 to Facility Operating License No. NPF-15 for San Onofre Nuclear Generating Station, Unit Nos. 2 and 3. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated December 24, 1992, designated by you as PCN-411.

These amendments will revise Technical Specifications (TS) 3/4.4.1.4.1, "Cold Shutdown - Loops Filled," TS 3/4.4.1.4.2, "Cold Shutdown - Loops Not Filled," TS 3/4.9.8.1, "Shutdown Cooling and Coolant Circulation-High Water Level," TS 3/4.9.8.2, "Shutdown Cooling and Coolant Circulation-Low Water Level," and associated Bases. This will allow for the use of Containment Spray (CS) pumps in place of Low Pressure Safety Injection (LPSI) pumps to perform Shutdown Cooling (SDC) during Modes 5 and 6 of operation.

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

Sincerely,
ORIGINAL SIGNED BY

Mel B. Fields, Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 106 to NPF-10
2. Amendment No. 95 to NPF-15
3. Safety Evaluation

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P PDR

OFC	LA/PDV	PM/PDV	OGC	OTSB	D/PDV
NAME	DFoster	MFields:lh		CGrimes	TQuay
DATE	5/6/93	5/7/93	5/10/93	6/3/93	6/4/93

OFFICIAL RECORD COPY DOCUMENT NAME: S085275.AMD

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

June 4, 1993

Docket Nos. 50-361
and 50-362

Mr. Harold B. Ray
Senior Vice President
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A copy of our related Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Mel B. Fields

Mel B. Fields, Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 106 to NPF-10
2. Amendment No. 95 to NPF-15
3. Safety Evaluation

cc w/enclosures:
See next page

Messrs. Ray and Guiles
Southern California Edison Company

San Onofre Nuclear Generating
Station, Unit Nos. 2 and 3

cc:

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

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 NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 106
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 December 24, 1992, 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.

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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. 106 , 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 must be fully implemented no later than 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R. Quay

Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 4, 1993

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 106 TO FACILITY OPERATING LICENSE NO. NPF-10

DOCKET NO. 50-361

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 areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 4-5	3/4 4-5
3/4 4-6	3/4 4-6
3/4 9-8	3/4 9-8
3/4 9-9	3/4 9-9
B 3/4 4-1	B 3/4 4-1
-------	B 3/4 4-1a
B 3/4 4-2	B 3/4 4-2
B 3/4 9-2a	B 3/4 9-2a

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.1 a. At least one of the following loop(s)/trains listed below shall be OPERABLE and in operation*:

1. Reactor Coolant Loop 1 and its associated steam generator and at least one associated Reactor Coolant Pump**
2. Reactor Coolant Loop 2 and its associated steam generator and at least one associated Reactor Coolant Pump**
3. Shutdown Cooling Train A***
4. Shutdown Cooling Train B***

b. One additional Reactor Coolant Loop/shutdown cooling train*** shall be OPERABLE, or

c. The secondary side water level of each steam generator shall be greater than 10% (wide range).

APPLICABILITY: MODE 5, with Reactor Coolant loops filled.

ACTION:

a. With less than the above required shutdown trains/loops OPERABLE or with less than the required steam generator level, immediately initiate corrective action to return the required trains/loops to OPERABLE status or restore the required level as soon as possible.

b. With no loop/train in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required loop/train to operation.

---

*All reactor coolant pumps and pumps providing shutdown cooling may be deenergized for up to 1 hour provided (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

**A Reactor Coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to that specified in Table 3.4-3 when the secondary water temperature of each steam generator is greater than 100°F above each of the Reactor Coolant System cold leg temperatures.

***A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow provided the reactor has been sub-critical for a period greater than 24 hours and the reactor coolant system is fully depressurized and vented in accordance with TS 3.4.8.3.1.b. (Subsequent to implementation of DCP 2-6863)

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.2 Two shutdown cooling trains shall be OPERABLE# and at least one shutdown cooling train shall be in operation.*, **

APPLICABILITY: MODE 5 with Reactor Coolant loops not filled.

ACTION:

a. With less than the above required trains OPERABLE, immediately initiate corrective action to return the required trains to OPERABLE status as soon as possible.

b. With no shutdown cooling trains in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required shutdown cooling train to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.4.2 At least one shutdown cooling train shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

#One shutdown cooling train may be inoperable for up to 2 hours for surveillance testing provided the other shutdown cooling train is OPERABLE and in operation.

*The pump providing shutdown cooling may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

**A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow provided the reactor has been sub-critical for a period greater than 24 hours and the reactor coolant system is fully depressurized and vented in accordance with TS 3.4.8.3.1.b. (Subsequent to implementation of DCP 2-6863)

3/4.9.8 SHUTDOWN COOLING AND COOLANT CIRCULATION

HIGH WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.1 At least one shutdown cooling train shall be OPERABLE and in operation.#*

APPLICABILITY: MODE 6 when the water level above the top of the reactor pressure vessel flange is greater than or equal to 23 feet.

ACTION:

With no shutdown cooling train OPERABLE and in operation, suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required shutdown cooling train to OPERABLE and operating status as soon as possible. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

SURVEILLANCE REQUIREMENTS

4.9.8.1 a. At least one shutdown cooling train shall be verified to be in operation and circulating reactor coolant at a flow rate of greater than or equal to 2200 gpm at least once per 12 hours.

#The shutdown cooling train may be removed from operation for up to 1 hour per 8-hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor pressure vessel hot legs.

*A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow. (Subsequent to implementation of DCP 2-6863)

LOW WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.2 Two independent shutdown cooling trains shall be OPERABLE and at least one shutdown cooling train shall be in operation.*

APPLICABILITY: MODE 6 when the water level above the top of the reactor pressure vessel flange is less than 23 feet.

ACTION:

a. With less than the required shutdown cooling trains OPERABLE, immediately initiate corrective action to return the required shutdown cooling trains to OPERABLE status, or to establish greater than or equal to 23 feet of water above the reactor pressure vessel flange as soon as possible.

b. With no shutdown cooling train in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required shutdown cooling train to operation. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

SURVEILLANCE REQUIREMENTS

4.9.8.2 At least one shutdown cooling train shall be verified to be in operation and circulating reactor coolant at a flow rate of greater than or equal to 2200 gpm at least once per 12 hours.

*A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow. (Subsequent to implementation of DCP 2-6863)

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with both reactor coolant loops and associated reactor coolant pumps in operation, and maintain DNBR greater than 1.31 during all normal operations and anticipated transients. As a result, in MODES 1 and 2 with one reactor coolant loop not in operation, this specification requires that the plant be in at least HOT STANDBY within 1 hour since no safety analysis has been conducted for operation with less than four reactor coolant pumps or less than two reactor coolant loops in operation.

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE.

In MODE 4, and in MODE 5 with reactor coolant loops filled, a single reactor coolant loop or shutdown cooling train provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops/trains (either RCS or shutdown cooling) be OPERABLE.

In MODE 5 with reactor coolant loops not filled, a single shutdown cooling train provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that at least two shutdown cooling trains be OPERABLE.

In MODE 5 (loops filled or loops not filled) a containment spray (CS) pump may be used in place of a low pressure safety injection (LPSI) pump in either or both shutdown cooling trains to provide shutdown cooling (SDC) flow based on the calculated heat load of the core 24 hours after the reactor is sub-critical with the reactor coolant system (RCS) fully depressurized and vented in accordance with TS 3.4.8.3.1.b.

The operation of one reactor coolant pump or one shutdown cooling pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reductions will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a reactor coolant pump in MODES 4 and 5 with one or more RCS cold legs less than or equal to that specified in Table 3.4-3 are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 100°F above each of the RCS cold leg temperatures.

3/4.4.2 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2750 psia. Each safety valve is designed to relieve 4.6×10^5 lbs per hour of saturated steam at the valve setpoint plus 3% accumulation. The relief capacity of a single safety valve is adequate to relieve any overpressure condition which could occur during shutdown with RCS cold leg temperature greater than that specified in Table 3.4-3. In the event that no safety valves are OPERABLE and for RCS cold leg temperature less than or equal to that specified in Table 3.4-3, the operating shutdown cooling relief valve, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization.

SAFETY VALVES (Continued)

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2750 psia. The combined relief capacity of these valves is sufficient to limit the System pressure to within its Safety Limit of 2750 psia following a complete loss of turbine generator load while operating at RATED THERMAL POWER and assuming no reactor trip until the first Reactor Protective System trip setpoint (Pressurizer Pressure-High) is reached (i.e., no credit is taken for a direct reactor trip on the loss of turbine) and also assuming no operation of the steam dump valves.

Demonstration of the safety valves' lift settings will occur only during shutdown and will be performed in accordance with the provisions of Section XI of the ASME Boiler and Pressure Vessel Code.

3/4.4.3 PRESSURIZER

The limit on the maximum water volume in the pressurizer assures that the parameter is maintained within the normal steady-state envelope of operation assumed in the SAR. A steam bubble in the pressurizer ensures that the RCS is not a hydraulically solid system and is capable of accommodating pressure surges during operation. The steam bubble also protects the pressurizer code safety valves against water relief. The requirement that a minimum number of pressurizer heaters be OPERABLE enhances the capability of the plant to control Reactor Coolant System pressure and establish natural circulation.

3/4.4.4 STEAM GENERATORS

The Surveillance Requirements for inspection of the steam generator tubes ensure that the structural integrity of this portion of the RCS will be maintained. The program for inservice inspection of steam generator tubes is based on a modification of Regulatory Guide 1.83, Revision 1. Inservice inspection of steam generator tubing is essential in order to maintain surveillance of the conditions of the tubes in the event that there is evidence of mechanical damage or progressive degradation due to design, manufacturing errors, or inservice conditions that lead to corrosion.

3/4.9.8 SHUTDOWN COOLING AND COOLANT CIRCULATION

The requirement that at least one shutdown cooling train be in operation ensures that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during the REFUELING MODE, and (2) sufficient coolant circulation is maintained through the reactor core to minimize the effects of a boron dilution incident and prevent boron stratification.

In MODE 6 a containment spray (CS) pump may be used in place of the low pressure safety injection (LPSI) pump in either or both shutdown cooling trains to provide shutdown cooling (SDC) flow.

The requirement to have two shutdown cooling trains OPERABLE when there is less than 23 feet of water above the reactor pressure vessel flange, ensures that a single failure of the operating shutdown cooling loop will not result in a complete loss of decay heat removal capacity. With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling train, adequate time is provided to initiate emergency procedures to cool the core.

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

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 NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 95
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 December 24, 1992, 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. 95 , 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 must be fully implemented no later than 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R. Quay

Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 4, 1993

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 95 TO FACILITY OPERATING LICENSE NO. NPF-15

DOCKET NO. 50-362

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 areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 4-5	3/4 4-5
3/4 4-5a	3/4 4-5a
3/4 4-6	3/4 4-6
3/4 9-8	3/4 9-8
3/4 9-9	3/4 9-9
B 3/4 4-1	B 3/4 4-1
-------	B 3/4 4-1a
B 3/4 4-2	B 3/4 4-2
B 3/4 9-2a	B 3/4 9-2a

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.1 a. At least one of the following loop(s)/trains listed below shall be OPERABLE and in operation*:

1. Reactor Coolant Loop 1 and its associated steam generator and at least one associated Reactor Coolant Pump**
2. Reactor Coolant Loop 2 and its associated steam generator and at least one associated Reactor Coolant Pump**
3. Shutdown Cooling Train A***
4. Shutdown Cooling Train B***

b. One additional Reactor Coolant Loop/shutdown cooling train*** shall be OPERABLE, or

c. The secondary side water level of each steam generator shall be greater than 10% (wide range).

APPLICABILITY: MODE 5, with Reactor Coolant loops filled.

ACTION:

a. With less than the above required shutdown trains/loops OPERABLE or with less than the required steam generator level, immediately initiate corrective action to return the required trains/loops to OPERABLE status or restore the required level as soon as possible.

b. With no loop/train in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required loop/train to operation.

---

*All reactor coolant pumps and pumps providing shutdown cooling may be de-energized for up to 1 hour provided (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

**A Reactor Coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to that specified in Table 3.4-3 when the secondary water temperature of each steam generator is greater than 100°F above each of the Reactor Coolant System cold leg temperatures.

***A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow provided the reactor has been sub-critical for a period greater than 24 hours and the reactor coolant system is fully depressurized and vented in accordance with TS 3.4.8.3.1.b. (Subsequent to implementation of MMP 3-6863)

COLD SHUTDOWN - LOOPS FILLED

SURVEILLANCE REQUIREMENTS

4.4.1.4.1.1 The required Reactor Cooling pump(s), if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.

4.4.1.4.1.2 The required steam generator(s) shall be determined OPERABLE by verifying the secondary side water level to be ≥10% (wide range) at least once per 12 hours.

4.4.1.4.1.3 At least one Reactor Coolant loop or shutdown cooling train shall be verified to be in operation and circulating Reactor Coolant at least once per 12 hours.

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.2 Two shutdown cooling trains shall be OPERABLE# and at least one shutdown cooling train shall be in operation.*, **

APPLICABILITY: MODE 5 with Reactor Coolant loops not filled.

ACTION:

a. With less than the above required trains OPERABLE, immediately initiate corrective action to return the required trains to OPERABLE status as soon as possible.

b. With no shutdown cooling trains in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required shutdown cooling train to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.4.2 At least one shutdown cooling train shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

#One shutdown cooling train may be inoperable for up to 2 hours for surveillance testing provided the other shutdown cooling train is OPERABLE and in operation.

*The pump providing shutdown cooling may be de-energized for up to 1 hour provided 1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

**A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow provided the reactor has been sub-critical for a period greater than 24 hours and the reactor coolant system is fully depressurized and vented in accordance with TS 3.4.8.3.1.b. (Subsequent to implementation of MMP 3-6863)

3/4.9.8 SHUTDOWN COOLING AND COOLANT CIRCULATION

HIGH WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.1 At least one shutdown cooling train shall be OPERABLE and in operation.#*

APPLICABILITY: MODE 6 when the water level above the top of the reactor pressure vessel flange is greater than or equal to 23 feet.

ACTION:

With no shutdown cooling train OPERABLE and in operation, suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required shutdown cooling train to OPERABLE and operating status as soon as possible. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

SURVEILLANCE REQUIREMENTS

4.9.8.1 a. At least one shutdown cooling train shall be verified to be in operation and circulating reactor coolant at a flow rate of greater than or equal to 2200 gpm at least once per 12 hours.

#The shutdown cooling train may be removed from operation for up to 1 hour per 8-hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor pressure vessel hot legs.

*A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow. (Subsequent to implementation of MMP 3-6863)

LOW WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.2 Two independent shutdown cooling trains shall be OPERABLE and at least one shutdown cooling train shall be in operation.#*

APPLICABILITY: MODE 6 when the water level above the top of the reactor pressure vessel flange is less than 23 feet.

ACTION:

a. With less than the required shutdown cooling trains OPERABLE, immediately initiate corrective action to return the required shutdown cooling trains to OPERABLE status, or to establish greater than or equal to 23 feet of water above the reactor pressure vessel flange as soon as possible.

b. With no shutdown cooling train in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required shutdown cooling train to operation. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

SURVEILLANCE REQUIREMENTS

4.9.8.2 At least one shutdown cooling train shall be verified to be in operation and circulating reactor coolant at a flow rate of greater than or equal to 2200 gpm at least once per 12 hours.

#Both shutdown cooling trains may be removed from operation for up to 1 hour per 8-hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor pressure vessel hot legs provided all operations involving a reduction in boron concentration of the RCS are suspended.

*A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow. (Subsequent to implementation of MMP 3-6863)

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with both reactor coolant loops and associated reactor coolant pumps (RCPs) in operation, and maintain DNBR greater than 1.31 during all normal operations and anticipated transients. As a result, in MODES 1 and 2 with one reactor coolant loop not in operation, this specification requires that the plant be in at least HOT STANDBY within 1 hour since no safety analysis has been conducted for operation with less than four reactor coolant pumps or less than two reactor coolant loops in operation.

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, single failure considerations require that two loops be OPERABLE.

In MODE 4, and in MODE 5 with reactor coolant loops filled, a single reactor coolant loop or shutdown cooling train provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops/trains (either RCS or shutdown cooling) be OPERABLE.

In MODE 5 with reactor coolant loops not filled, a single shutdown cooling train provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that at least two shutdown cooling trains be OPERABLE.

In MODE 5 (loops filled or loops not filled) a containment spray (CS) pump may be used in place of a low pressure safety injection (LPSI) pump in either or both shutdown cooling trains to provide shutdown cooling (SDC) flow based on the calculated heat load of the core 24 hours after the reactor is subcritical with the reactor coolant system (RCS) fully depressurized and vented in accordance with TS 3.4.8.3.1.b.

The operation of one reactor coolant pump or one shutdown cooling pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reductions
will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a reactor coolant pump in MODES 4 and 5 with one or more RCS cold legs less than or equal to that specified in Table 3.4-3 are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and

will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 100°F above each of the RCS cold leg temperatures.

3/4.4.2 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2750 psia. Each safety valve is designed to relieve 4.6×10^5 lbs per hour of saturated steam at the valve setpoint plus 3% accumulation. The relief capacity of a single safety valve is adequate to relieve any overpressure condition which could occur during shutdown with RCS cold leg temperature greater than that specified in Table 3.4-3. In the event that no safety valves are OPERABLE and for RCS cold leg temperature less than or equal to 285°F, the operating shutdown cooling relief valve, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization.

SAFETY VALVES (Continued)

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2750 psia. The combined relief capacity of these valves is sufficient to limit the System pressure to within its Safety Limit of 2750 psia following a complete loss of turbine generator load while operating at RATED THERMAL POWER and assuming no reactor trip until the first Reactor Protective System trip setpoint (Pressurizer Pressure-High) is reached (i.e., no credit is taken for a direct reactor trip on the loss of turbine) and also assuming no operation of the steam dump valves.

Demonstration of the safety valves' lift settings will occur only during shutdown and will be performed in accordance with the provisions of Section XI of the ASME Boiler and Pressure Vessel Code.

3/4.4.3 PRESSURIZER

The limit on the maximum water volume in the pressurizer assures that the parameter is maintained within the normal steady-state envelope of operation assumed in the SAR. A steam bubble in the pressurizer ensures that the RCS is not a hydraulically solid system and is capable of accommodating pressure surges during operation. The steam bubble also protects the pressurizer code safety valves against water relief. The requirement that a minimum number of pressurizer heaters be OPERABLE enhances the capability of the plant to control Reactor Coolant System pressure and establish natural circulation.

3/4.4.4 STEAM GENERATORS

The Surveillance Requirements for inspection of the steam generator tubes ensure that the structural integrity of this portion of the RCS will be maintained. The program for inservice inspection of steam generator tubes is based on a modification of Regulatory Guide 1.83, Revision 1. Inservice inspection of steam generator tubing is essential in order to maintain surveillance of the conditions of the tubes in the event that there is evidence of mechanical damage or progressive degradation due to design, manufacturing errors, or inservice conditions that lead to corrosion.

BASES

3/4.9.8 SHUTDOWN COOLING AND COOLANT CIRCULATION

The requirement that at least one shutdown cooling train be in operation ensures that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during the REFUELING MODE, and (2) sufficient coolant circulation is maintained through the reactor core to minimize the effects of a boron dilution incident and prevent boron stratification.

In MODE 6 a containment spray (CS) pump may be used in place of the low pressure safety injection (LPSI) pump in either or both shutdown cooling trains to provide shutdown cooling (SDC) flow.

The requirement to have two shutdown cooling trains OPERABLE when there is less than 23 feet of water above the reactor pressure vessel flange, ensures that a single failure of the operating shutdown cooling loop will not result in a complete loss of decay heat removal capacity. With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling train, adequate time is provided to initiate emergency procedures to cool the core.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 106 TO FACILITY OPERATING LICENSE NO. NPF-10

AND AMENDMENT NO. 95 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 December 24, 1992, Southern California Edison Company, et al. (SCE or the licensee) submitted a request for changes to the Technical Specifications (TS) for San Onofre Nuclear Generating Station, Unit Nos. 2 and 3. The proposed changes would revise TS 3/4.4.1.4.1, "Cold Shutdown - Loops Filled," TS 3/4.4.1.4.2, "Cold Shutdown - Loops Not Filled," TS 3/4.9.8.1, "Shutdown Cooling and Coolant Circulation-High Water Level," TS 3/4.9.8.2, "Shutdown Cooling and Coolant Circulation-Low Water Level," and associated Bases. This will allow for the use of Containment Spray (CS) pumps in place of Low Pressure Safety Injection (LPSI) pumps to perform Shutdown Cooling (SDC) during Modes 5 and 6 of operation.

The licensee has stated that these proposed modifications would provide flexibility for the operation and the maintenance of the SDC and SFP cooling systems and components during outages; would facilitate outage planning; and would potentially reduce the refueling outage duration by approximately 5 days.

2.0 EVALUATION

The SDC system is used to remove heat from the reactor coolant system (RCS) during shutdown and post-shutdown periods. During normal plant operation major components of the SDC system (the LPSI pumps and the SDC heat exchangers) are aligned for emergency core cooling and containment cooling functions. The LPSI system is not needed for emergency core cooling in Modes 5 and 6 and therefore is available to provide SDC. In their SDC function the LPSI pumps take suction from RCS hot leg number 2. Heat is removed by circulating this flow through the SDC heat exchangers. The cooled flow

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returns to the RCS through at least two of the four LPSI headers connected to the cold legs.

Currently, the SDC system at the San Onofre Nuclear Station, Units 2 and 3, may be aligned to be used as an alternate means of cooling the spent fuel pool (SFP) provided that the reactor vessel is in a full core offload condition. When the SDC system is aligned in the SFP cooling configuration, each 100% capacity SDC/SFP cooling train consists of one LPSI pump, one SDC heat exchanger, and the associated flow path to and from the SFP. Each train is powered by a separate safety grade source of AC power.

The proposed plant modifications detailed in the licensee's letter dated December 24, 1992, will add two basic changes to the operation of the SDC system. The first change will provide the capability to substitute a CS pump for a LPSI pump on either or both trains to provide SDC flow, provided that the reactor coolant system is fully depressurized and vented in accordance with TS Section 3.4.8.3.1.b. The second change will remove the restriction of requiring the reactor core to be fully offloaded before the SDC system can be utilized as a means for cooling the spent fuel pool. Plant modifications to support these operational modes is planned for the Cycle 7 refueling outages for each unit.

To support the requested TS changes, the licensee provided the following revisions to the description of the SDC the Updated Final Safety Analysis Report (UFSAR):

1) Revision to Section 9.1.3.2 of the UFSAR (shaded area indicates new text).

"The shutdown cooling system is a safety related, seismically qualified system which is powered by a class 1E electrical system. The cooling capacity of 1 train of the shutdown cooling system is sufficient to maintain the spent fuel pool temperature lower than ~~the spent fuel pool~~ can be maintained by the spent fuel pool cooling system. ~~During a full core offload from the reactor vessel~~ When components of the shutdown cooling system are not required to be OPERABLE by technical specifications ~~to be operable for reactor core cooling,~~ then one train of the shutdown cooling system (consisting of at least 1 LPSI pump or 1 containment spray pump, 1 heat exchanger, flow path to and from the SFP, and the associated Diesel Generator) may be aligned to cool the spent fuel pool. Additionally, during MODE 6 with the reactor refueling cavity water level greater than or equal to 23 feet above the reactor flange, the SDC system (consisting of at least 2 pumps (either 1 LPSI pump and 1 CS pump or 2 CS pumps), 1 SDC heat exchanger, flow paths to and from the RCS and SFP, and the associated Diesel Generator) may be aligned to cool both the SFP and the reactor core."

2) Revision to Section 9.1.3.3 of the UFSAR.

"The shutdown cooling system, if available, may be used as an alternative

means of cooling the spent fuel pool ~~when the full core is removed from the reactor vessel~~. This covers the possibility referred to under the remarks column of table 9.1-3."

To support use of the proposed SDC system, as outlined in the UFSAR change described above, the licensee proposes to make the following changes to the TS:

TS 3/4.4.1.4.1

1) Add a third footnote to the "Shutdown Cooling train" as it appears in items (a.3), (a.4) and (b) of the LCO to allow for use of CS pumps in place of LPSI pumps to provide SDC flow beginning no sooner than 24 hours after the reactor is subcritical and provided the reactor coolant system is fully depressurized and vented in accordance with TS 3.4.8.3.1.b.

2) Revise the first footnote in the present TS to recognize that the CS pump may be providing SDC flow.

3) Revise the associated Bases of TS 3/4.4.1.4.1 to document the basis for the above TS changes.

TS 3/4.4.1.4.2

1) Add a third footnote to the "Shutdown Cooling train" as it appears in items (a.3), (a.4) and (b) of the LCO to allow for use of CS pumps in place of LPSI pumps to provide SDC flow beginning no sooner than 24 hours after the reactor is subcritical and provided the reactor coolant system is fully depressurized and vented in accordance with TS 3.4.8.3.1.b.

2) Revise the second footnote in the present TS to recognize that the CS pump may be providing SDC flow.

3) Revise the associated Bases of TS 3/4.4.1.4.2 to document the basis for the above TS changes.

TS 3/4.9.8.1

1) Add a footnote to the LCO to allow use of CS pumps in place of LPSI pumps to provide shutdown cooling flow.

2) Revise the associated Bases of TS 3/4.9.8 to document the basis for the above TS changes.

TS 3/4.9.8.2

1) Add a footnote to the LCO to allow use of CS pumps in place of LPSI pumps to provide shutdown cooling flow.

The staff evaluated these proposed UFSAR changes, and the associated proposed changes to the TS, for the acceptability of utilizing CS pump(s) in lieu of LPSI pump(s) for SDC and SFP cooling purposes, and for the acceptability of using the proposed SDC system to provide cooling to both the reactor vessel and the spent fuel pool at the same time. The staff's evaluation is detailed below.

The CS pumps can deliver more cooling flow than the LPSI pumps, and their power supply, safety class, and connecting piping and valves are of equivalent quality to the existing LPSI pumps. To prevent the possibility of over-pressurizing the SDC system due to the higher discharge head of the CS pumps, the proposed TS will require that the RCS be fully depressurized and vented before the CS pumps can be aligned to the SDC system. This requirement will also prevent the CS pumps from being aligned to the SDC system during those operational modes when the CS pumps provide a containment atmosphere cooling safety function. In Modes 1, 2, and 3 operation, the manually operated valves in the cross-connection lines will be in the locked-closed positions, thus segregating the CS system from the SDC system. The proposed use of the CS pumps to perform shutdown cooling functions has been evaluated to verify that sufficient capacity to remove decay heat will be available for all single active failures. Shutdown cooling by the CS pumps will only be performed when the RCS is vented and the reactor coolant is equal to or less than 200°F. For this situation, only one complete train is required to provide sufficient decay heat removal capability. No electrical or instrumentation setpoints will be added, deleted, or revised due to the proposed modifications, and no TS setpoints or automatic trip functions will be modified. The staff concludes that the CS pumps will perform their intended function when aligned to the SDC system, and no adverse impact to the plant will result from the proposed plant modifications.

The new SDC system operational configuration proposed by the licensee will be capable of providing cooling to both the fuel in the reactor vessel and fuel in the spent fuel pool at the same time, and takes advantage of the extra two pumps available for SDC system usage. This operational configuration is not allowed by the existing TS and requires staff review and approval before it can be implemented. The staff considers this operational configuration to be acceptable because:

1) This SDC system configuration can only be utilized when the reactor refueling cavity water level is equal to or greater than 23 feet above the reactor flange. This large heat sink provides adequate time for the operators to initiate emergency procedures if a failure of a SDC train should occur;

2) The combined heat load from the fuel in the RCS and the spent fuel is well within the heat removal capacity of the two SDC trains required to operable, and;

3) Outage planning is used to mimimize risk during shutdown and to optimize safety system availability. If the results of the outage assessment

indicates a higher risk probability than is desired, compensatory measures are implemented. Components are not removed from service until their maintenance activities are ready to be initiated.

The licensee has revised the administrative controls to reflect the use of SDC system for reactor core and SFP cooling during Modes 5 or 6. Based on its review, the staff finds the licensee's revisions to the SFP cooling administrative controls acceptable. As part of its normal inspection activities, the staff will review the establishment and implementation of procedures and operator training for use of the new SDC system configuration.

Based on its review, the staff concludes that the licensee has adequately demonstrated that the SDC and the SFP cooling systems will continue to meet their design safety basis functions and satisfy the requirements of GDC 34 and GDC 44, respectively. The staff, therefore, finds the licensee's proposed plant modifications to the SDC system and the associated proposed TS changes, revisions to UFSAR, and administrative controls acceptable as stated in its December 24, 1992 letter.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

The 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 changes 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 (58 FR 8786). 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: David Shum

Date: June 4, 1993