

September 7, 1999

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: RECIRCULATION ACTUATION SIGNAL
(RAS) AND EMERGENCY FEEDWATER ACTUATION SIGNAL (EFAS)
CHANNELS IN TRIPPED CONDITION (TAC NOS. MA4489 AND MA4490)

Dear Mr. Ray:

The Commission has issued the enclosed Amendment No. 157 to Facility Operating License No. NPF-10 and Amendment No. 148 to Facility Operating License No. NPF-15 for San Onofre Nuclear Generating Station, Units 2 and 3, respectively. The amendments consist of changes to Technical Specification (TS) 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," in response to your application dated December 31, 1998 (PCN 501), as supplemented June 14, 1999. The changes include restrictions on operation with a channel of the refueling water storage tank level-low input to the recirculation actuation signal and the steam generator pressure-low input or steam generator pressure difference-high input to the emergency feedwater actuation signal in the tripped condition.

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,

Original signed by:

L. Raghavan, Senior Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

9909160122 990907
PDR ADOCK 05000361
P PDR

Docket Nos. 50-361 and 50-362

- Enclosures: 1. Amendment No. 157 to NPF-10
- 2. Amendment No. 148 to NPF-15
- 3. Safety Evaluation

cc w/encls: See next page

ARC FILE CENTER COPY

DFO

DISTRIBUTION

Docket File	WBeckner	KDesai
PUBLIC	KBrockman, RIV	SMalik
PDIV-2 Reading	LHurley, RIV	HLi
SRichards(clo)	JKilcrease, RIV	
OGC	GHill(4)	
ACRS	RScholl (e-mail SE)	

*No major changes to SE

To receive a copy of this document, indicate "C" in the box							
OFFICE	PDIV-2/PM	C	PDIV-D/LA	C	SRXB/SC*	OGC <i>ES</i>	PDIV-2/SC
NAME	LRaghavan <i>LB</i>		CJamerson <i>J</i>		EWeiss	R Bachmann	SDembek <i>SD</i>
DATE	8/9/99		8/9/99		06/30/99	8/12/99	8/18/99

DOCUMENT NAME: G:\PDIV-2\SONGSV\Amd4489.wpd

100038

OFFICIAL RECORD COPY

CP-1



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

September 7, 1999

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: RECIRCULATION ACTUATION SIGNAL
(RAS) AND EMERGENCY FEEDWATER ACTUATION SIGNAL (EFAS)
CHANNELS IN TRIPPED CONDITION (TAC NOS. MA4489 AND MA4490)

Dear Mr. Ray:

The Commission has issued the enclosed Amendment No. 157 to Facility Operating License No. NPF-10 and Amendment No. 148 to Facility Operating License No. NPF-15 for San Onofre Nuclear Generating Station, Units 2 and 3, respectively. The amendments consist of changes to Technical Specification (TS) 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," in response to your application dated December 31, 1998 (PCN 501), as supplemented June 14, 1999. The changes include restrictions on operation with a channel of the refueling water storage tank level-low input to the recirculation actuation signal and the steam generator pressure-low input or steam generator pressure difference-high input to the emergency feedwater actuation signal in the tripped condition.

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,

A handwritten signature in black ink, appearing to read "L. Raghavan", written over a horizontal line.

L. Raghavan, Senior Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosures: 1. Amendment No. 157 to NPF-10
2. Amendment No. 148 to NPF-15
3. Safety Evaluation

cc w/encls: See next page

San Onofre Nuclear Generating Station, Units 2 and 3

cc:

Mr. R. W. Krieger, Vice President
Southern California Edison Company
San Onofre Nuclear Generating Station
P. O. Box 128
San Clemente, CA 92674-0128

Mayor
City of San Clemente
100 Avenida Presidio
San Clemente, CA 92672

Chairman, Board of Supervisors
County of San Diego
1600 Pacific Highway, Room 335
San Diego, CA 92101

Mr. Dwight E. Nunn, Vice President
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

Alan R. Watts, Esq.
Woodruff, Spradlin & Smart
701 S. Parker St. No. 7000
Orange, CA 92668-4720

Mr. Sherwin Harris
Resource Project Manager
Public Utilities Department
City of Riverside
3900 Main Street
Riverside, CA 92522

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Harris Tower & Pavilion
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Mr. Michael Olson
San Onofre Liaison
San Diego Gas & Electric Company
P.O. Box 1831
San Diego, CA 92112-4150

Mr. Steve Hsu
Radiologic Health Branch
State Department of Health Services
Post Office Box 942732
Sacramento, CA 94234

Resident Inspector/San Onofre NPS
c/o U.S. Nuclear Regulatory Commission
Post Office Box 4329
San Clemente, CA 92674



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 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 157
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 31, 1998, as supplemented June 14, 1999, 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. 157, 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 its date of issuance and shall be implemented within 30 days of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Date of Issuance: September 7, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 157

FACILITY OPERATING LICENSE NO. NPF-10

DOCKET NO. 50-361

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3.3-22
3.3-23
3.3-24
3.3-25

INSERT

3.3-22
3.3-23
3.3-24
3.3-25

3.3 INSTRUMENTATION

3.3.5 Engineered Safety Features Actuation System (ESFAS) Instrumentation

LC0 3.3.5 Four ESFAS trip and bypass removal channels for each Function in Table 3.3.5-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5-1.

ACTIONS

-----NOTES-----

1. Separate Condition entry is allowed for each ESFAS Function.
 2. If a channel is placed in bypass, continued operation with the channel in the bypassed condition for the Completion Time specified by Required Action A.2, B.2, or E.2.2 shall be reviewed by the Onsite Review Committee.
-

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one automatic ESFAS trip channel inoperable (other than RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function).	A.1 Place Functional Unit in bypass or trip. <u>AND</u> A.2 Restore channel to OPERABLE status.	1 hour Prior to entering MODE 2 following next MODE 5 entry
B. One automatic trip channel inoperable for RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function.	B.1 Place Functional Unit in bypass. <u>AND</u> B.2 Restore channel to OPERABLE status.	1 hour Prior to entering MODE 2 following next MODE 5 entry

(continued)

ACTIONS. (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. One or more Functions with two automatic ESFAS trip channels inoperable (other than RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS Function).</p>	<p>C.1 -----NOTE----- LCO 3.0.4 is not applicable. ----- Place one Functional Unit in bypass and the other in trip.</p>	<p>1 hour</p>
<p>D. Two automatic ESFAS trip channels inoperable for RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function.</p>	<p>D.1 -----NOTE----- LCO 3.0.4 is not applicable. ----- Place one Functional Unit in bypass and the other in trip. <u>AND</u> D.2 Restore one affected automatic trip channel to OPERABLE status.</p>	<p>1 hour 7 days</p>
<p>E. One or more Functions with one automatic bypass removal channel inoperable.</p>	<p>E.1 Disable bypass channel. <u>OR</u> E.2.1 Place affected automatic trip channel in bypass or trip. <u>AND</u> E.2.2 Restore bypass removal channel and associated automatic trip channel to OPERABLE status.</p>	<p>1 hour 1 hour Prior to entering MODE 2 following next MODE 5 entry (continued)</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>F. One or more Functions with two automatic bypass removal channels inoperable.</p>	<p>-----NOTE----- LCO 3.0.4 is not applicable. -----</p>	
	<p>F.1 Disable bypass channels.</p> <p><u>OR</u></p> <p>F.2 Place one affected automatic trip channel in bypass and place the other in trip.</p>	<p>1 hour</p> <p>1 hour</p>
<p>G. Required Action and associated Completion Time for Safety Injection Actuation Signal, Containment Spray Actuation Signal, Containment Isolation Actuation Signal, Main Steam Isolation Signal, or Emergency Feedwater Actuation Signal not met.</p>	<p>G.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>G.2 Be in MODE 4.</p>	<p>6 hours</p> <p>12 hours</p>
<p>H. Required Action and associated Completion Time for Recirculation Actuation Signal not met.</p>	<p>H.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>H.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform a CHANNEL CHECK of each ESFAS channel.	12 hours
SR 3.3.5.2	Perform a CHANNEL FUNCTIONAL TEST of each ESFAS channel.	30 days on a STAGGERED TEST BASIS
SR 3.3.5.3	Perform a CHANNEL FUNCTIONAL TEST of each ESFAS channel bypass removal function.	120 days
SR 3.3.5.4	Perform a CHANNEL CALIBRATION of Function 5, Recirculation Actuation Signal.	18 months
SR 3.3.5.5	Perform a CHANNEL CALIBRATION of each ESFAS channel, with the exception of Function 5, including bypass removal functions.	24 months
SR 3.3.5.6	Verify ESF RESPONSE TIME is within limits.	24 months on a STAGGERED TEST BASIS
SR 3.3.5.7	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal channel.	Once within 120 days prior to each reactor startup



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 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 148
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 31, 1998, as supplemented June 14, 1999, 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. 148 , 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 its date of issuance and shall be implemented within 30 days of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Date of Issuance: September 7, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 148

FACILITY OPERATING LICENSE NO. NPF-15

DOCKET NO. 50-362

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3.3-22
3.3-23
3.3-24
3.3-25

INSERT

3.3-22
3.3-23
3.3-24
3.3-25

3.3 INSTRUMENTATION

3.3.5 Engineered Safety Features Actuation System (ESFAS) Instrumentation

LCO 3.3.5 Four ESFAS trip and bypass removal channels for each Function in Table 3.3.5-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5-1.

ACTIONS

-----NOTES-----

1. Separate Condition entry is allowed for each ESFAS Function.
 2. If a channel is placed in bypass, continued operation with the channel in the bypassed condition for the Completion Time specified by Required Action A.2, B.2, or E.2.2 shall be reviewed by the Onsite Review Committee.
-

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one automatic ESFAS trip channel inoperable (other than RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function).	A.1 Place Functional Unit in bypass or trip.	1 hour
	<u>AND</u> A.2 Restore channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry
B. One automatic trip channel inoperable for RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function.	B.1 Place Functional Unit in bypass.	1 hour
	<u>AND</u> B.2 Restore channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. One or more Functions with two automatic ESFAS trip channels inoperable (other than RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS Function).</p>	<p>C.1 -----NOTE----- LCO 3.0.4 is not applicable. ----- Place one Functional Unit in bypass and the other in trip.</p>	<p>1 hour</p>
<p>D. Two automatic ESFAS trip channels inoperable for RWST Level-Low for the RAS function or SG Pressure-Low or SG Pressure Difference-High for the EFAS function.</p>	<p>D.1 -----NOTE----- LCO 3.0.4 is not applicable. ----- Place one Functional Unit in bypass and the other in trip.</p> <p><u>AND</u></p> <p>D.2 Restore one affected automatic trip channel to OPERABLE status.</p>	<p>1 hour</p> <p>7 days</p>
<p>E. One or more Functions with one automatic bypass removal channel inoperable.</p>	<p>E.1 Disable bypass channel.</p> <p><u>OR</u></p> <p>E.2.1 Place affected automatic trip channel in bypass or trip.</p> <p><u>AND</u></p> <p>E.2.2 Restore bypass removal channel and associated automatic trip channel to OPERABLE status.</p>	<p>1 hour</p> <p>1 hour</p> <p>Prior to entering MODE 2 following next MODE 5 entry</p> <p>(continued)</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>F. One or more Functions with two automatic bypass removal channels inoperable.</p>	<p>-----NOTE----- LCO 3.0.4 is not applicable. -----</p> <p>F.1 Disable bypass channels. <u>OR</u> F.2 Place one affected automatic trip channel in bypass and place the other in trip.</p>	<p>1 hour 1 hour</p>
<p>G. Required Action and associated Completion Time for Safety Injection Actuation Signal, Containment Spray Actuation Signal, Containment Isolation Actuation Signal, Main Steam Isolation Signal, or Emergency Feedwater Actuation Signal not met.</p>	<p>G.1 Be in MODE 3. <u>AND</u> G.2 Be in MODE 4.</p>	<p>6 hours 12 hours</p>
<p>H. Required Action and associated Completion Time for Recirculation Actuation Signal not met.</p>	<p>H.1 Be in MODE 3. <u>AND</u> H.2 Be in MODE 5.</p>	<p>6 hours 36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform a CHANNEL CHECK of each ESFAS channel.	12 hours
SR 3.3.5.2	Perform a CHANNEL FUNCTIONAL TEST of each ESFAS channel.	30 days on a STAGGERED TEST BASIS
SR 3.3.5.3	Perform a CHANNEL FUNCTIONAL TEST of each ESFAS channel bypass removal function.	120 days
SR 3.3.5.4	Perform a CHANNEL CALIBRATION of Function 5, Recirculation Actuation Signal.	18 months
SR 3.3.5.5	Perform a CHANNEL CALIBRATION of each ESFAS channel, with the exception of Function 5, including bypass removal functions.	24 months
SR 3.3.5.6	Verify ESF RESPONSE TIME is within limits.*	24 months on a STAGGERED TEST BASIS
SR 3.3.5.7	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal channel.	Once within 120 days prior to each reactor startup

*Verification of the RESPONSE TIME of the 30 subgroup relays identified in the February 18, 1997 Edison letter is not applicable until return to Mode 4 from the Unit 3 Cycle 9 refueling outage, with the additional commitments made in the February 18, 1997 letter. The safety justification for not performing this testing is also included in the February 18, 1997 letter.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 157 TO FACILITY OPERATING LICENSE NO. NPF-10
AND AMENDMENT NO. 148 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 31, 1998, as supplemented June 14, 1999, Southern California Edison Company (SCE or the licensee) requested Technical Specification (TS) 3.3.5, changes for San Onofre Nuclear Generating Station (SONGS) Units 2 and 3. The proposed changes to TS 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," would include restrictions on operation with a channel of the refueling water storage tank (RWST) level-low input to the recirculation actuation signal (RAS) and the steam generator (SG) pressure-low input or SG pressure difference-high input to the emergency feedwater actuation signal (EFAS) in the tripped condition. The current TS allows plant operation in this condition indefinitely. The licensee has determined that unacceptable consequences could result from a spurious trip of RAS or EFAS due to operation with a channel in trip condition. The proposed TS changes would improve the plant operational safety and, thereby, reduce plant risk.

The June 14, 1999, letter provided clarifications and additional information that were within the scope of the original *Federal Register* (64 FR 40907) notice and did not change the staff's initial proposed no significant hazards consideration determination.

2.0 EVALUATION

2.1 Deterministic Evaluation

The ESFAS initiation is based on a two-out-of-four logic. The ESFAS has a design feature that allows one of the four measurement channels to be placed in bypass indefinitely. When a channel is in bypass, the logic converts to a two-out-of-three configuration. If two channels are inoperable, then one channel is placed in bypass and the second inoperable channel must

be placed in a tripped condition to satisfy the single failure criterion. With one channel in a tripped condition it takes only one additional channel trip, either due to channel failure or in response to actual plant conditions, to initiate an ESFAS signal.

Previously, a spurious actuation signal due to channel failure had been considered failure in a safe condition. Now the licensee determined that there is a scenario in which a spurious RAS could lead to unacceptable results. The purpose of RAS is to change the mode of operation of the emergency core cooling system (ECCS) during a loss-of-coolant accident from the injection phase to the recirculation phase. It shifts the high-pressure safety injection pumps suction from the RWST to the containment emergency sump when the RWST is nearly depleted. The sump water supplies the inventory requirements for the ECCS pump suctions. However, a spurious RAS actuation (before the RWST level has reached the low level setpoint) will actuate the switchover action with the exception of closure of the ECCS miniflow valves because there is an interlock that prevents the miniflow valves closing unless there is sufficient water in the containment sump. If the miniflow lines remain open during the postulated scenario, it effectively breaches containment integrity, resulting in the unacceptable consequences for plant operation.

The licensee also determined that a spurious SG pressure-low or SG pressure difference-high signal could lead to undesirable consequences in the EFAS. A spurious SG pressure-low signal would block feedwater to the associated SG, as the system would treat that SG as ruptured. A spurious SG pressure difference-high could cause feeding of a ruptured SG, depleting condensate storage tank inventory and increasing the load on the containment cooling system and resulting in unacceptable consequences for plant operation.

TS 3.3.5 currently allows operation with one channel in bypass and one channel in trip for all ESFAS functions. Following identification of the RAS and EFAS issues discussed above, the licensee placed administrative limits on channel inoperable for RAS and EFAS signals. These administrative limits, which allow operation for only 1 hour with a channel in trip before requiring a plant shutdown, do not provide plant operational flexibility.

The licensee performed a risk-informed assessment to determine acceptable limits of allowable completion time (CT) for operation with a channel of RAS and EFAS in trip. Based on that assessment, the licensee proposed to include restrictions on operation of the RWST level-low for the RAS function and also restrictions on SG pressure-low or SG pressure difference-high for the EFAS function. When two automatic ESFAS trip channels inoperable for RWST level-low for the RAS function or SG pressure-low or SG pressure difference-high for the EFAS function, the proposed TS requires the restrictions on CT to restore the tripped channels of RAS and EFAS functions to operable status within 7 days which is more conservative than the current TS and will reduce plant risk.

2.2 Probabilistic Risk Assessment (PRA) Evaluation

SCE performed a quantitative risk-informed assessment to determine acceptable limits for operation with a channel of RAS in a tripped condition and a qualitative risk-informed assessment to determine acceptable limits for operation with a channel of EFAS in a tripped condition.

The staff used a three-tiered approach to gain risk insights and to evaluate the risk associated with the proposed risk-informed amendment. The first tier evaluated the PRA model and the impact of the change on plant operational risk. The second tier addressed the need to preclude potentially high risk configurations if additional equipment will be taken out of service simultaneously or other risk-significant operational factors such as the potential for concurrent system or equipment testing. The third tier evaluated the licensee's configuration risk management program (CRMP) to ensure that equipment removed from service prior to or during the proposed CT will be appropriately assessed from a risk perspective. Each tier and associated findings are discussed below.

2.2.1 Tier 1: PRA Evaluation of Proposed CT

The Tier 1 staff review of the licensee's PRA involved two aspects: (1) evaluation of the PRA model and its application to determine acceptable limits for operation with a channel of RAS or EFAS in a tripped condition, and (2) evaluation of PRA results and insights stemming from the application. The review did not warrant an assessment of any unconventional PRA practices or unique features that could impact the reasonableness of PRA findings and conclusions.

(1) Evaluation of PRA Model and Application to the CT

The staff's review consisted of an initial screening process that examined the attributes of the licensee's PRA including the plant protection system (PPS) model. However, this did not involve an in-depth review of the licensee's PRA to the extent necessary to validate the licensee's overall quantitative estimates.

The staff determined that the licensee actively uses PRA on a daily basis during at-power operation when making safety decisions of various plant activities. The licensee's PRA staff has used their PRA model extensively for this and other previous risk-informed applications.

The licensee used its "living" PRA model as the basis for the calculations to support the proposed changes. The licensee's current PRA model has been updated since the development of the individual plant examination. The current PRA model has undergone internal and external peer reviews, and the licensee utilizes a proceduralized change process to control modification of the PRA to reflect the as-built, as-operated, plant condition.

The licensee's PRA model contains a detailed PPS model based on generic Combustion Engineering (CE) fault-tree logic. The CE PPS model was adapted for SONGS Units 2 and 3.

The staff believes that the licensee's at-power PRA has adequate scope and detail to conclude that proposed restrictions will reduce plant risk and for evaluating acceptable limits for operation with a channel of RAS or EFAS in a tripped condition.

(2) Evaluation of PRA Results and Insights Associated with the Proposed Change

The proposed TS change limits the time during which an ESFAS trip channel for RWST level-low for the RAS function or SG pressure-low or SG pressure difference-high for the EFAS function is placed in a tripped condition. Since a spurious trip of the RAS or the EFAS may result in undesirable consequences, it can be concluded that the proposed TS amendment, which limits the allowable CT from an indefinite time period to 7 days, will reduce plant risk.

The licensee also used quantitative risk-informed assessment methods to determine acceptable limits for operation with a channel of RAS in a tripped condition. This risk-informed assessment followed the approach outlined in Regulatory Guide (RG) 1.174 and RG 1.177. The staff review of the licensee's risk analysis focused on the reasonableness of the overall approach and PRA technique. To analyze the risk of a spurious RAS trip signal, the licensee applied the PPS fault-tree logic using component failure rates from the SONGS Units 2 and 3 living PRA and the nuclear computerized library for assessing reactor reliability generic component failure rate database for light-water and liquid sodium reactor PRAs prepared by EG&G Idaho. The staff finds that there are no significant weaknesses or deficiencies associated with this approach, and PRA methodology used to determine acceptable limits for operation with a channel of RAS in a tripped condition is reasonable for this application.

Although instituting the proposed time limits during which an ESFAS trip channel for SG pressure-low or SG pressure difference-high for the EFAS function is placed in a tripped condition results in an overall increase in operational safety, the licensee used a qualitative assessment to determine acceptable limits for operation with a channel of EFAS in a tripped condition. The licensee concluded that the risk stemming from a spurious EFAS actuation during the proposed limits for operation is low. The staff finds that the licensee's conclusion is reasonable for this application.

The staff finds that the overall proposed limits will reduce risk and has, therefore, met the intent of the Tier 1 guidance in RG 1.174 and RG 1.177.

2.2.2 Tier 2: Avoidance of Risk-Significant Plant Configurations

The staff finds that SONG's risk-informed CRMP provides reasonable assurance that risk-significant plant equipment outage configurations will not occur when a channel of RAS or EFAS is in a tripped condition consistent with the proposed TS change. The CRMP has provisions for assessing the need for additional actions if additional equipment-out-of-service conditions exist while the plant is in the risk-informed completion time.

The staff, therefore, believes that the licensee's CRMP satisfies the intent of Tier 2 to avoid risk-significant plant configurations.

2.2.3 Tier 3: Risk-Informed Plant Configuration Management

The staff believes that the licensee's risk-informed CRMP will allow an evaluation of the risk associated with both scheduled and unscheduled plant activities with a channel of RAS or EFAS in a tripped condition. The licensee actively uses PRA to control risk using its online safety monitor. The licensee has already incorporated the CRMP descriptions into TS 5.5.2.14, "Configuration Risk Management Program," and the staff finds it acceptable. The licensee stated in its submittal that TS 5.5.2.14 is applicable to the proposed TS change since the proposed change is a risk-informed completion time. The staff concludes that the licensee has met the intent of the Tier 3 guidance.

3.0 SUMMARY

The proposed TS changes on allowable CT for tripped channels of the RAS and EFAS functions in TS 3.3.5 do not involve either a physical alteration of the plant or affect the design basis of the ESFAS and the engineered safety feature systems. When two automatic ESFAS trip channels are inoperable for RWST level-low for RAS function or SG pressure-low or SG pressure difference-high for the EFAS function, the additional restrictions on allowable CT to restore the tripped channels of RAS and EFAS functions to operable status within 7 days are more conservative than the current TS. It will improve the plant operational safety and reduce plant risk. Also, the staff believes that the licensee's CRMP provides a proceduralized risk-informed method to manage the risk associated with this risk-informed TS changes. Therefore, the staff concludes that PRA analysis supports the proposed limitations on ESFAS trip channels for RWST level-low for the RAS function and SG pressure-low or SG pressure difference-high for the EFAS function. The staff finds this proposal acceptable.

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 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. 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 (64 FR 40907). 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 Contributors: K. Desai
S. Malik
H. Li

Date: September 7, 1999