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

June 19, 1998

SUBJECT: ISSUANCE OF AMENDMENT FOR SAN ONOFRE NUCLEAR GENERATING STATION, UNIT NO. 2 (TAC NOS. M94934 AND M94936) AND UNIT NO. 3 (TAC NOS. M94935 AND M94937)

Dear Mr. Ray:

The Commission has issued the enclosed Amendment No. 139 to Facility Operating License No. NPF-10 and Amendment No. 131 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 applications dated November 6, 1995, as supplemented by letters dated January 9, 1998, and February 3, 1998, for the safety injection tanks (SITs), and November 8, 1995, as supplemented by letters dated January 9, 1998, and February 3, 1998, for the low pressure safety injection (LPSI).

These amendments modify the technical specifications (TSs) to extend the allowed outage times (AOTs) for a single inoperable SIT from one hour to 24 hours, and for a single inoperable SIT specifically due to malfunctioning SIT water level or nitrogen cover pressure instrumentation inoperability from one hour to 72 hours. In addition, the amendments extend the AOT for a single inoperable LPSI train from 72 hours to 7 days. The amendments also add a Configuration Risk Management Program to the TSs that puts a proceduralized probabilistic risk assessment-informed process in place that ensures the licensee assesses the overall impact of plant maintenance on plant risk.

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
James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

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Docket Nos. 50-361
and 50-362

Enclosures: 1. Amendment No. 139 to NPF-10
2. Amendment No. 131 to NPF-15
3. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

Docket File	EPeyton
PUBLIC	EAdensam
PDIV-2 Reading	GHill, (4) T5C3
ACRS, T2E26	JKilcrease, RIV
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JClifford	OGC, O15B18
WBeckner, O13H14	TLH1 (SE)
LHurley, RIV	KPerkins, WCFO
RHuey, WCFO	PGwynn, RIV
TCollins	JFlack

DOCUMENT NAME: SO94934.AMD

OFC	PDIV-2/PM	PDIV-2/LA	BC/SRXB	BC/SPSB(A)	BC/TSB	OGC
NAME	JClifford	EPeyton	E/R for TEC with TCollins comment	JRubin & JFlack & EB	WBeckner WDB	NLO SE input
DATE	4/17/98	4/28/98	5/26/98	5/7/98	5/12/98	6/1/98

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#65 NOTE: FRANK ORR SRXB reviewer does not concur in proposed AOT extension for the SIT

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

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

Alan R. Watts, Esq.
Woodruff, Spradlin & Smart
701 S. Parker St. No. 7000
Orange, California 92668-4702

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

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

Mr. Terry Winter
Manager, Power Operations
San Diego Gas & Electric Company
P.O. Box 1831
San Diego, California 92112-4150

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

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

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

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

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. 139
License No. NPF-10

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

   A. The applications for amendment by Southern California Edison Company, et al. (SCE or the licensee) dated November 6, 1995 and November 8, 1995, as supplemented by letters dated January 9, 1998, and February 3, 1998, comply 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. 139, 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 is to be implemented within 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: June 19, 1998

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 139 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 Amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
3.5-1	3.5-1
3.5-4	3.5-4
5.0-20	5.0-20
—	5.0-20a

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Safety Injection Tanks (SITs)

LCO 3.5.1 Four SITs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with pressurizer pressure ≥ 715 psia.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One SIT inoperable due to boron concentration not within limits.	A.1	Restore boron concentration to within limits.	72 hours
B. One SIT inoperable due to inability to verify level or pressure.	B.1	Restore SIT to OPERABLE status.	72 hours
C. One SIT inoperable for reasons other than Condition A or B.	C.1	Restore SIT to OPERABLE status.	24 hours
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 AND D.2	Be in MODE 3. Reduce pressurizer pressure to < 715 psia.	6 hours 12 hours
E. Two or more SITs inoperable.	E.1	Enter LCO 3.0.3.	Immediately

3.5.2 ECCS – Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with pressurizer pressure ≥ 400 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LPSI subtrain inoperable.	A.1 Restore subtrain to OPERABLE status.	7 days
B. One or more ECCS trains inoperable due to reason(s) other than Condition A. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	B.1 Restore ECCS train(s) to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Reduce pressurizer pressure to < 400 psia.	6 hours 12 hours

5.5 Procedures, Programs, and Manuals

5.5.2.12 Ventilation Filter Testing Program (VFTP) (continued)

The provisions of Technical Specification Surveillance Requirement 3.0.2 and Technical Specification Surveillance Requirement 3.0.3 are applicable to the VFTP test frequencies.

5.5.2.13 Diesel Fuel Oil Testing Program

This program implements required testing of both new fuel oil and stored fuel oil. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM standards. The purpose of the program is to establish the following:

a. At least once per 92 days and from new fuel oil prior to addition to the storage tanks by verifying that a sample obtained in accordance with ASTM-D4057-81 has a water and sediment content of less than or equal to 0.05 volume percent, an API gravity or an absolute specific gravity within limits, and a kinematic viscosity @ 40 C of greater than or equal to 1.9 but less than or equal to 4.1 when tested in accordance with ASTM-D975-81.

b. At least once every 92 days by obtaining a sample of fuel oil in accordance with ASTM-D4057-81 and verifying that particulate contamination is less than 10mg/liter when checked in accordance with ASTM-D2276-83, Method A.

5.5.2.14 Configuration Risk Management Program (CRMP)

The Configuration Risk Management Program (CRMP) provides a proceduralized risk-informed assessment to manage the risk associated with equipment inoperability. The program applies to technical specification structures, systems, or components for which a risk-informed Completion Time has been granted. The program shall include the following elements:

a. Provisions for the control and implementation of a Level 1 at power internal events PRA-informed methodology. The assessment shall be capable of evaluating the applicable plant configuration.

b. Provisions for performing an assessment prior to entering the LCO Condition for preplanned activities.

c. Provisions for performing an assessment after entering the LCO Condition for unplanned entry into the LCO Condition.

5.5 Procedures, Programs, and Manuals

5.5.2.14 Configuration Risk Management Program (CRMP) (Continued)

d. Provisions for assessing the need for additional actions after the discovery of additional equipment out of service conditions while in the LCO Condition.

e. Provisions for considering other applicable risk significant contributors such as Level 2 issues, and external events, qualitatively or quantitatively.

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. 131
License No. NPF-15

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

   A. The applications for amendment by Southern California Edison Company, et al. (SCE or the licensee) dated November 6, 1995 and November 8, 1995, as supplemented by letters dated January 9, 1998, and February 3, 1998, comply 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. 131, 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 is to be implemented within 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: June 19, 1998

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 131 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 Amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
3.5-1	3.5-1
3.5-4	3.5-4
5.0-20	5.0-20
—	5.0-20a

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Safety Injection Tanks (SITs)

LCO 3.5.1 Four SITs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with pressurizer pressure ≥ 715 psia.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One SIT inoperable due to boron concentration not within limits.	A.1	Restore boron concentration to within limits.	72 hours
B. One SIT inoperable due to inability to verify level or pressure.	B.1	Restore SIT to OPERABLE status.	72 hours
C. One SIT inoperable for reasons other than Condition A or B.	C.1	Restore SIT to OPERABLE status.	24 hours
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Reduce pressurizer pressure to < 715 psia.	12 hours
E. Two or more SITs inoperable.	E.1	Enter LCO 3.0.3.	Immediately

3.5.2 ECCS–Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with pressurizer pressure ≥ 400 psia.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One LPSI subtrain inoperable.	A.1	Restore subtrain to OPERABLE status.	7 days
B. One or more ECCS trains inoperable due to reason(s) other than Condition A. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	B.1	Restore ECCS train(s) to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 AND C.2	Be in MODE 3. Reduce pressurizer pressure to < 400 psia.	6 hours 12 hours

5.5 Procedures, Programs, and Manuals

5.5.2.12 Ventilation Filter Testing Program (VFTP) (continued)

The provisions of Technical Specification Surveillance Requirement 3.0.2 and Technical Specification Surveillance Requirement 3.0.3 are applicable to the VFTP test frequencies.

5.5.2.13 Diesel Fuel Oil Testing Program

This program implements required testing of both new fuel oil and stored fuel oil. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM standards. The purpose of the program is to establish the following:

a. At least once per 92 days and from new fuel oil prior to addition to the storage tanks by verifying that a sample obtained in accordance with ASTM-D4057-81 has a water and sediment content of less than or equal to 0.05 volume percent, an API gravity or an absolute specific gravity within limits, and a kinematic viscosity @ 40 C of greater than or equal to 1.9 but less than or equal to 4.1 when tested in accordance with ASTM-D975-81.

b. At least once every 92 days by obtaining a sample of fuel oil in accordance with ASTM-D4057-81 and verifying that particulate contamination is less than 10mg/liter when checked in accordance with ASTM-D2276-83, Method A.

5.5.2.14 Configuration Risk Management Program (CRMP)

The Configuration Risk Management Program (CRMP) provides a proceduralized risk-informed assessment to manage the risk associated with equipment inoperability. The program applies to technical specification structures, systems, or components for which a risk-informed Completion Time has been granted. The program shall include the following elements:

a. Provisions for the control and implementation of a Level 1 at power internal events PRA-informed methodology. The assessment shall be capable of evaluating the applicable plant configuration.

b. Provisions for performing an assessment prior to entering the LCO Condition for preplanned activities.

c. Provisions for performing an assessment after entering the LCO Condition for unplanned entry into the LCO Condition.

(continued)

5.5 Procedures, Programs, and Manuals

5.5.2.14 Configuration Risk Management Program (CRMP) (Continued)

d. Provisions for assessing the need for additional actions after the discovery of additional equipment out of service conditions while in the LCO Condition.

e. Provisions for considering other applicable risk significant contributors such as Level 2 issues, and external events, qualitatively or quantitatively.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 139 TO FACILITY OPERATING LICENSE NO. NPF-10

AND AMENDMENT NO. 131 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 applications dated November 6, 1995, for the safety injection tanks (SITs), and November 8, 1995, for the low pressure safety injection (LPSI) system, with additional information submitted by the licensee through the Combustion Engineering Owners Group (CEOG), on June 14, 1996, Southern California Edison Company, et al. (SCE or the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License Nos. NPF-10 and NPF-15) for San Onofre Nuclear Generating Station, Unit Nos. 2 and 3. Both applications were subsequently supplemented by letters dated January 9, 1998, and February 3, 1998.

The proposed changes would modify the technical specifications (TSs) to extend the allowed outage times (AOTs) for a single inoperable SIT from one hour to 24 hours, and for a single SIT inoperable specifically due to malfunctioning SIT water level or nitrogen cover pressure instrumentation inoperability from one hour to 72 hours. In addition, the amendments extend the AOT for a single LPSI train from 72 hours to 7 days. The amendments also add a Configuration Risk Management Program (CRMP) to the TSs that puts a proceduralized probabilistic risk assessment-informed process in place that ensures the licensee assesses the overall impact of plant maintenance on plant risk.

2.0 BACKGROUND

Since the mid-1980s, the NRC has been reviewing and granting improvements to TS that are based, at least in part, on probabilistic risk assessment (PRA) insights. In its final policy statement on TS improvements of July 22, 1993 , the NRC stated that it:

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> "expects that licensees, in preparing their Technical Specification related submittals, will utilize any plant-specific PSA [probabilistic safety assessment][1] or risk survey and any available literature on risk insights and PSAs. . . . Similarly, the NRC staff will also employ risk insights and PSAs in evaluating Technical Specifications related submittals. Further, as a part of the Commission's ongoing program of improving Technical Specifications, it will continue to consider methods to make better use of risk and reliability information for defining future generic Technical Specification requirements."

The NRC reiterated this point when it issued the revision to 10 CFR 50.36, "Technical Specifications," in July 1995 (60 FR 36953). In August 1995, the NRC adopted a final policy statement on the use of PRA methods in nuclear regulatory activities that encouraged greater use of PRA to improve safety decisionmaking and regulatory efficiency (60 FR 42622). The PRA policy statement included the following points:

1. The use of PRA technology should be increased in all regulatory matters to the extent supported by the state of the art in PRA methods and data and in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy.

2. PRA and associated analyses (e.g., sensitivity studies, uncertainty analyses, and importance measures) should be used in regulatory matters, where practical within the bounds of the state of the art, to reduce unnecessary conservatism associated with current regulatory requirements.

3. PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review.

In August 1995, the Combustion Engineering Owners Group (CEOG) submitted several Joint Application Reports for the staff's review. Two of the CEOG Joint Application Reports provided justifications for extensions of the TS AOTs for SITs and for the LPSI system.[2] The justifications for these extensions are based on a balance of probabilistic considerations, traditional engineering considerations, including defense-in-depth, and operating experience. Risk assessments for all of the Combustion Engineering (CE) plants are contained in the reports. The staff first reviewed the Joint Application Reports and then reviewed the licensee's plant-specific amendment request which incorporated the Joint Application Reports by reference.

Arkansas Nuclear One, Unit 2 (ANO-2) had been the lead CE plant for the SIT and LPSI system TS changes. The staff performed an in-depth review of the ANO-2 PRA methodology

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[1]PSA and PRA are used interchangeably herein.

[2]CE NPSD-994, "Joint Application Report for Safety Injection Tank AOT/STI Extension," May 1995, and CE NPSD-995, "Joint Application Report for Low Pressure Safety Injection System AOT Extension," May 1995.

relating to these changes, as the lead plant for all of the CEOG. Therefore, a portion of the review of the SONGS amendment request was based on a comparison of the SONGS PRA results with those from ANO-2.

In addition, one of the proposed changes would revise TS 3.5.1, "Safety Injection Tanks (SITs)" to incorporate recommendations and suggestions from Generic Letter (GL) 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operations."

3.0 PROPOSED CHANGES

3.1 TS 3.5.1 - Safety Injection Tanks

The licensee proposes extending the TS completion time for one SIT that is inoperable for the inability to verify level or pressure from 1 to 72 hours. The licensee also proposes extending the TS completion time for one SIT that is inoperable for reasons other than boron concentration being outside of limits or the inability to verify level or pressure from 1 to 24 hours.

3.2 TS 3.5.2 - ECCS - Operating

The licensee proposes extending the TS completion time for one inoperable LPSI train from 72 hours to 7 days.

3.3 TS 5.5.2.14 - Configuration Risk Management Program

The licensee proposes adding TS 5.5.2.14, "Configuration Risk Management Program (CRMP)," to Section 5.5, "Procedures, Programs, and Manuals," of the Administrative Controls Chapter. The purpose of the CRMP is to ensure that a proceduralized PRA-informed process is in place that assesses the overall impact of plant maintenance on plant risk.

4.0 EVALUATION

The staff evaluated the licensee's proposed amendment to the TS using a combination of traditional engineering analysis, PRA methods, and a review of operating experience. The staff's traditional analysis evaluated the capabilities of the plant to mitigate design basis events with one SIT or one LPSI train inoperable. The staff then used insights derived from the use of PRA methods to determine the risk significance of the proposed changes. The results of these evaluations were used in combination by the staff to determine the safety impact of extending the AOTs for one inoperable SIT and for one inoperable LPSI train.

4.1 Justification for Proposed Changes

4.1.a Justification for Proposed Change to SIT Completion Time from 1 to 72 Hours when SIT is Inoperable Due to Inability to Verify Level or Pressure

The NRC issued GL 93-05 on September 27, 1993, and recommended that licensees add a condition to the SIT TS for the case where one SIT is inoperable due to the inoperability of water level and pressure channels in which the completion time to restore the SIT to operable status would be 72 hours. GL 93-05 stated that the NRC staff and industry efforts to develop new STS recognized that SIT instrumentation operability was not directly related to the capability of the SITs to perform their safety function. Therefore, surveillance requirements for SIT pressure and level instrumentation were relocated from the new STS and the only surveillance that was retained was that surveillance required to confirm that the parameters defining SIT operability are within their specified limits. At the time of the development of the STS, the staff did not include a separate condition in the SIT TS for a SIT inoperable due to the inability to verify level or pressure, as was recommended in GL 93-05. However, the staff believes this is appropriate based on the analysis done during the development of NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements," which formed the basis for the issuance of GL 93-05.

4.1.b Justification for Proposed Change to SIT Completion Time from 1 to 24 Hours when SIT is Inoperable for Other Reasons

Industry operating experience has demonstrated that many of the causes of SIT inoperability have been diagnosed and corrected within a relatively short period, but one that is often longer than the existing 1-hour completion time. In several cases, the diagnosis of an inoperable SIT has resulted in plant shutdowns.

If a single SIT were to be diagnosed as inoperable for reasons other than boron concentration being outside of limits (which is already addressed under a separate Action with a 72-hour completion time), TS 3.5.1, Action B, would allow 1 hour for operators to restore the SIT to operability. If the action were not completed within 1 hour, the plant would have to be placed in Mode 3 within the next 6 hours and brought to less than 715 psia within the next 12 hours, in accordance with Action C. The extension of the existing SIT completion time from 1 to 24 hours should provide the licensee with sufficient time in which to diagnose and possibly repair minor SIT system malfunctions at power, thereby averting an unplanned plant shutdown. Since risk analyses demonstrate that the increased risk of operating with a single SIT out of service is negligible, increasing the completion time can be beneficial by possibly avoiding unplanned shutdowns associated with an inoperable SIT. Unnecessary plant shutdowns associated with the outage of non-risk-significant equipment are undesirable because mode changes have the potential to increase the risk above that of steady state operation.

4.1.c Justification for Proposed Change to LPSI Train Completion Time from 72 Hours to 7 Days

The current SONGS TS address the LPSI system as a portion of the emergency core cooling system (ECCS). TS 3.5.2 requires two ECCS trains to be operable. With one ECCS train inoperable, on the basis of any component inoperability but at least 100 percent of the ECCS flow equivalent to a single operable ECCS train available, the train must be returned to operable status within 72 hours or a plant shutdown is required. The proposed change will allow up to 7 days for the licensee to restore operability to an inoperable LPSI train that is the cause of ECCS train inoperability.

The primary role of LPSI trains during power operation is to contribute to the mitigation of a large loss-of-coolant accident (LOCA). The postulated frequency of a large LOCA event is on the order of 10^{-4} per year. In contrast, during Modes 5 and 6, the operability of at least one LPSI train operating in the shutdown cooling mode is required at all times for reactor coolant system (RCS) heat removal. Thus, in the broad view, performing preventive and corrective maintenance at power on LPSI trains can contribute to an overall enhancement of plant safety by increasing the availability of the LPSI train for shutdown cooling (SDC) during Modes 5 and 6, when it is most needed.

In some instances, corrective maintenance of the LPSI pump and valves and testing of valves may require taking one train of LPSI out of service for more than several days. Thus, repair within the existing completion time cannot be ensured and may result in an unscheduled shutdown or a request for temporary relief to allow continued plant operation while repairs are completed. To avoid these situations, the licensee is requesting a longer completion time. On the basis of the review of maintenance requirements of the LPSI train for CE pressurized water reactors (PWRs), the licensee determined that a 7-day completion time would provide sufficient margin to effect most anticipated preventive and corrective maintenance activities and LPSI train valve surveillance tests at power.

4.2 Traditional Engineering Evaluation

4.2.a Current Traditional Analysis

The performance of all of the ECCS, including SITs and the LPSI system, is calculated in accordance with 10 CFR Part 50, Appendix K, such that the ECCS ensures that the acceptance criteria of 10 CFR 50.46 are satisfied. These criteria were established in order to define deterministic acceptance criteria that could be used to judge the acceptability of a given ECCS design. The methodology defined in Appendix K conservatively represents LOCA thermohydraulic and hydrodynamic phenomenology to calculate fuel peak clad temperature. As a result, the methodology may well overstate the minimum equipment requirements for adequate response to an event.

4.2.b SIT Evaluation

The SITs are passive pressure vessels partially filled with borated water and pressurized with a cover gas (nitrogen) to facilitate injection into the reactor vessel during the blowdown phase of a large break LOCA. This action provides inventory to assist in accomplishing the refill stage following blowdown. The SITs also provide reactor coolant system (RCS) makeup for a small break LOCA.

Each SIT is piped into an associated RCS cold leg via an ECCS line also utilized by HPSI and LPSI. Each SIT is isolated from the RCS during full pressure operations by two series check valves. Each SIT also has a normally deenergized open motor-operated isolation valve utilized to isolate the SIT from the RCS during normal cooldown and depressurization evolutions. Each of these valves receive a safety injection actuation signal to open. The SIT gas pressure and volume, water volume, and outlet pipe size are designed to allow three of the four SITs to inject the inventory necessary to keep clad melt and zirconium-water reaction within design assumptions following a design basis LOCA. The design assumes the loss of inventory from one SIT through the LOCA break.

LCO 3.5.1 requires that all SITs be operable whenever the plant is in Modes 1, 2, or 3, with pressurizer pressure greater than or equal to 715 psia. The LCO is based on the assumption that when the plant is in any of these modes of operation, the SITs must have the same functionality that would be required for a LOCA at full rated thermal power. When the plant is in any of the applicable modes, a SIT is considered operable when the following conditions exist:

- The associated isolation valve is fully open.
- Electric power has been interrupted to the motor for the associated isolation valve.
- Water inventory in the tank is within the assumed band.
- The boric acid concentration of the water inventory of the tank is within the assumed band.
- The nitrogen cover pressure within the tank is within the assumed band.

In the past, a justification for the short completion time for one inoperable SIT has been that the perceived severity of the consequences of not having all SITs available to provide passive injection during a design basis LOCA warranted the severity of the requirement to return the SIT to operable status within 1 hour or shut down the unit. However, the current SIT completion time was based solely on engineering judgment and did not take into consideration a quantitative assessment of risk.

The SIT operational parameters are set by the design basis licensing large break LOCA analysis. Since the SIT is a passive device and provides a limited function, operability has been restricted to mean that the equipment's initial conditions are within a band supported by 10 CFR Part 50, Appendix K, design basis analysis. Analytical models of Appendix K to 10 CFR Part 50

are devised so as to overestimate the amount of liquid lost from the break and to underestimate the residual inventory in the reactor vessel lower plenum. Consequently, inventory discharge requirements are conservatively set at a high level. Extending the completion time from 1 to 24 hours for one SIT that is inoperable for reasons other than boron concentration being outside of limits or the inability to verify level or pressure will allow time for the licensee to correct minor problems with a SIT. Considering the short time frame that a SIT is allowed to be out of service, the low likelihood of a large break LOCA during this short time frame, and the potential risk associated with plant shutdowns, extending the SIT completion time will allow defense in depth to be maintained while not significantly affecting overall safety margins assumed in the design basis analysis.

The current SONGS TS do not differentiate between a SIT that is inoperable due to tank inventory or nitrogen gas pressure discrepancies and a SIT whose inventory or gas pressure cannot be verified due solely to malfunctioning water level instrumentation or pressure instrumentation. Because these instruments provide no safety actuation, it is reasonable to extend the completion time to 72 hours under these conditions since the SIT is available to perform its safety function during this time. This change is consistent with the staff's recommendations in GL 93-05.

4.2.c LPSI System Evaluation

The two trains of the LPSI system, in combination with the two trains of the high pressure safety injection (HPSI) system, form two redundant ECCS trains. The two LPSI pumps are high volume, low head centrifugal pumps designed to supplement the SIT inventory in reflooding the reactor vessel to ensure core cooling during the early stages of a large break LOCA. The LPSI pumps take suction from the refueling water storage tank (RWST), during the injection phase of a LOCA event, and pump the water through a common discharge header. Once inside containment, the LPSI headers combine with HPSI and SIT discharge piping, and flow is directed through independent injection headers into each of the four RCS cold legs and into the reactor vessel. The LPSI system pumps start and valves open upon receipt of a safety injection actuation signal. When the RWST level is drawn down by inventory transfer during the injection phase, a low RWST level actuates a recirculation actuation signal which stops the LPSI pumps. This step is necessary to ensure adequate net positive suction head remains available for the HPSI pumps and the containment spray pumps. By design, post-LOCA long term core cooling is supplied by the HPSI pumps and containment spray pumps taking suction from the containment emergency sump.

Another role of the LPSI system is defining the end state for a design basis steam generator tube rupture (SGTR) event. In this design basis event, the HPSI functions to keep the core covered at all times, and the LPSI system is required to effect SDC and thereby terminate the event. SDC is initiated after the break has been isolated and the radioactive releases have been controlled.

In the event that one LPSI train is out of service and the second LPSI train fails, the operator can continue to control the plant during a SGTR event by drawing steam off of the unaffected steam generator. Even though loss of both LPSI trains is beyond the design basis accident

assumptions, this cooling mechanism can be maintained indefinitely, provided condensate is available to the unaffected steam generator. Without considering condensate storage tank refill, SONGS has sufficient inventory to steam the unaffected steam generator for greater than 24 hours. SONGS also has the ability to realign the containment spray pumps to provide RCS SDC capability. Therefore, having one LPSI train out of service should not affect the licensee's ability to mitigate a SGTR event, including conditions beyond design basis.

In addition to responding to accidents, the most common use of the LPSI system is during normal shutdown operations (Modes 4, 5, and 6), when the LPSI system is used for decay heat removal in the SDC alignment.

The fact that the LPSI system is required for decay heat removal every time the plant is placed in cold shutdown indicates that it would be prudent to perform maintenance on the LPSI system during power operations rather than during shutdown when the demand for the system is at its highest.

Based on the above, the staff concludes that extending the completion time for one inoperable LPSI train from 72 hours to 7 days should continue to ensure defense-in-depth is maintained and sufficient safety margin exists to meet the design basis analysis for the SONGS ECCS.

4.3 Evaluation of the PRA Used to Support the Proposed TS Changes

The staff used a three-tiered approach to evaluate the risk associated with the proposed TS changes. The first tier evaluated the PRA model and the impact of the completion time extensions for the LPSI system and SITs on plant operational risk. The second tier addressed the need to preclude potentially high risk configurations, should additional equipment outages occur during the time when one SIT or one LPSI train is out of service. The third tier evaluated the licensee's configuration risk management program to ensure that the applicable plant configuration will be appropriately assessed from a risk perspective before entering into or during the proposed AOTs. Each tier and the associated findings are discussed below.

4.3.a Cross Comparison Approach

After completing a detailed evaluation for the tentative approval of SIT and LPSI TS AOT extensions for Arkansas Nuclear One, Unit 2 (ANO-2), the original CEOG lead plant for the risk-informed TS pilot project, the staff used a cross comparison approach to consider the viability of similar AOT relaxations for other participating CEOG plants, including SONGS. The pilot technical evaluation report[3] used in support of the staff's draft safety evaluation for ANO-2[4] focused on:

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[3]SCIE-NRC-318-97, "Technical Evaluation of Combustion Engineering Owners Group (CEOG) Joint Application for Safety Injection Tanks and Low Pressure Safety Injection System Allowed Outage Time (AOT) Extension," July 21, 1997.

[4]SECY-97-095, "Probabilistic Risk Assessment Implementation Plan Pilot Application for Risk-Informed Technical Specifications," April 30, 1997.

- the process adopted by the CEOG to assess single AOT risk,
- the identification of ANO-2 accident sequences in which credit was taken for SITs and LPSI,
- independent verification of the single AOT risk [essentially equivalent to incremental conditional core damage probability (ICCDP)[5]], and
- determination of the significance of single AOT risk relative to an acceptance guideline value.

The objective of this cross comparison evaluation is to use insights derived from the ANO-2 technical evaluation to examine the validity of the conclusions drawn in the joint submittals. Because a common methodology was employed by the CEOG to quantify AOT risk and because CE plants generally have similar design characteristics, the staff believes that the findings of the lead pilot plant evaluation will be generally applicable to other CE plants. The staff confirmed that differences in the underlying PRA models are chiefly attributed to:

- minor design differences,
- operational differences,
- success criteria assumptions, and
- common cause failure β-factor assumptions.

The cross comparison draws on information contained in the CEOG Joint Application Reports, the licensees' responses to the staff's requests for additional information, the licensees' individual plant examinations (IPEs) performed in response to Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities," and the corresponding IPE evaluations performed by the staff.

4.3.b Impact of SITs on Tier 1, 2, and 3 Requirements (Risk Measures)

The following factors are chiefly responsible for the differences in SIT AOT risks among the CE plants:

- modeling for success criteria for SITs,
- initiating event (IE) frequency assumed for the initiators challenging the SITs, and
- credit for SITs in mitigating medium LOCAs.

The SIT single AOT risk (or essentially equivalently, ICCDP) for SONGS is 1.03E-06 and is slightly in excess of the acceptance guideline value of 5.0E-07 published in DG-1065, "An Approach for Plant-Specific Risk-Informed Decisionmaking: Technical Specifications," (62 FR 34321, June 25, 1997), due largely to the use of conservative 3-out-of-4 success criteria (ANO-2 used 2-out-of-4). In addition, the change in the SONGS updated baseline core damage frequency (CDF) (as reported in the CEOG Joint Application Report) due to the SIT AOT change is about 3%, i.e., from 2.74E-05 per year to 2.85E-05 per year. The change in CDF of 1.1E-06 is within the acceptance guidelines published in DG-1061, "An Approach for Using

[5]ICCDP = [(conditional CDF with the subject equipment out of service) - (baseline CDF with nominal expected equipment unavailabilities)] X (duration of single AOT under consideration).

Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis" (62 FR 34321, June 25, 1997).

In the context of integrated decisionmaking, the acceptance guidelines should not be interpreted as being overly prescriptive. They are intended to provide an indication, in numerical terms, of what is considered acceptable. As such, the numerical acceptance guideline is an approximate value that provides an indication of the changes that are generally acceptable. Furthermore, the state of knowledge, or epistemic, uncertainties associated with PRA calculations preclude a definitive decision with respect to the acceptance of the proposed change based purely on the numerical results. The intent in making the comparison of the PRA results with the acceptance guidelines is to demonstrate with reasonable assurance that the increase in risk is small and consistent with the intent of the Commission's Safety Goal Policy Statement. Given the licensee's use of conservative 3-out-of-4 success criteria, the staff believes that the proposed change to the SONGS SIT TS meets this principle.

The Tier 2 evaluation did not identify the need for any additional constraints or compensatory actions that, if implemented, would avoid or reduce the probability of a risk-significant configuration. Because the SIT sequence modeling is relatively independent of that for other systems, the staff concludes that application of Tier 3 to the proposed SIT AOT is not necessary.

4.3.c Impact of LPSI on Tier 1, 2, and 3 Requirements

The following factors are chiefly responsible for the differences in LPSI AOT risks among the CE plants:

- use of LPSI to mitigate multiple initiating events,
- HPSI redundancies, and
- LPSI common cause β-factor assumptions.

The LPSI preventive and corrective maintenance weighted average single AOT risk for SONGS is 2.53E-07 and is less than the acceptance guideline value 5.0E-07 from DG-1065. In addition, the change in the SONGS updated baseline core damage frequency (CDF) (as reported in the CEOG Joint Application Report) due to the LPSI AOT change is about 1%, i.e., from 2.74E-05 per year to 2.78E-05 per year. The change in CDF of 4.0E-07 per year is within the acceptance guidelines published in DG-1061.

The Tier 2 evaluation did not identify the need for any additional constraints or compensatory actions that, if implemented, would avoid or reduce the probability of a risk-significant configuration.

The Tier 3 requirements for configuration risk management are considered to be adequately satisfied, since the licensee has an on-line PRA-based monitor, called the Safety Monitor, to analyze the risk impact of outage configurations in a timely manner. Procedures related to use of the Safety Monitor are SONGS Work Process Procedure, "SONGS Work Scheduling and Coordination Process" and MPG-SO123-G-31, "Utilization of the Safety Monitor in Support of

Work Control." The licensee has proposed adding TS 5.5.2.14, "Configuration Risk Management Program (CRMP)," to provide a means of implementing and controlling their Tier 3 process. The licensee and the staff have agreed to implementation of the CRMP as described below.

Purpose of CRMP

The purpose of the CRMP is to ensure that a proceduralized PRA-informed process is in place that assesses the overall impact of plant maintenance on plant risk. Implementation of the CRMP will enable appropriate actions to be taken or decisions to be made to minimize and control risk when performing on-line maintenance for systems, structures, and components (SSCs) with a risk-informed completion time.

Scope of CRMP

The scope of the SSCs included in the CRMP are those SSCs modeled in the licensee's plant PRA in addition to those SSCs considered of high safety significance per Regulatory Guide 1.160, Revision 2, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," that are not modeled in the PRA.

The Configuration Risk Management Program (CRMP) includes the following components and key elements:

Components

a. Risk Assessment Tool
b. Tier 2 Restrictions
c. Level 2 and External Events
d. Decision Making Process
e. Associated Procedures

Key Element 1. Implementation of CRMP

The intent of the CRMP is to implement Maintenance Rule, Section 10 CFR 50.65a(3) with respect to on-line maintenance for risk-informed technical specifications, with the following additions and clarifications:

a. The scope of the SSCs to be included in the CRMP will be those SSCs modeled in the licensee's plant PRA in addition to those SSCs considered to be of high safety significance per Regulatory Guide 1.160, Revision 2, that are not modeled in the PRA.

b. The CRMP assessment tool is PRA informed, and may be in the form of either a risk matrix, an on-line assessment, or a direct PRA assessment.

c. CRMP will be invoked as follows for:

Risk-Informed Inoperability: A risk assessment will be performed prior to entering the LCO condition for preplanned activities. For unplanned entry into the LCO condition, a risk assessment will be performed in a time frame consistent with the plant's Corrective Action Program.

Additional SSC Inoperability and/or Loss of Functionality: When in the risk-informed completion time, if an additional SSC within the scope of the CRMP becomes inoperable/non-functional, a risk assessment shall be performed in a time frame consistent with the plant's Corrective Action Program.

d. Tier 2 commitments apply for planned maintenance only, but will be evaluated as part of the Tier 3 assessment for unplanned occurrences.

Key Element 2. Control & Use of the CRMP Assessment Tool

a. Plant modifications and procedure changes will be monitored, assessed, and dispositioned.

- Evaluation of changes in plant configuration or PRA model features can be dispositioned by implementing PRA model changes or by the qualitative assessment of the impact of the changes on the CRMP assessment tool. This qualitative assessment recognizes that changes to the PRA take time to implement and that changes can be effectively compensated for without compromising the ability to make sound engineering judgments.

- Limitations of the CRMP assessment tool are identified and understood for each specific completion time extension.

b. Procedures exist for the control and application of CRMP assessment tools, including description of the process when outside the scope of the CRMP assessment tool.

Key Element 3. Level 1 Risk-Informed Assessment

The CRMP assessment tool is based on a Level 1, at power, internal events PRA model. The CRMP assessment may use any combination of quantitative and qualitative input. Quantitative assessments can include reference to a risk matrix, pre-existing calculations, or new PRA analyses.

a. Quantitative assessments should be performed whenever necessary for sound decision making.

b. When quantitative assessments are not necessary for sound decision making, qualitative assessments will be performed. Qualitative assessments will consider applicable, existing insights from quantitative assessments previously performed.

Key Element 4. Level 2 Issues/External Events

External events and Level 2 issues are treated qualitatively and/or quantitatively.

Guidance for implementing the CRMP is provided by plant procedures.

4.3.d Conclusions Regarding the Licensee's LPSI and SIT Design Similarities to ANO-2 and PRA Used to Support the Proposed Amendment

SONGS, Units 2 and 3 have strong LPSI and SIT design similarities to ANO-2, the original CEOG lead pilot plant for this project. Therefore, the staff believes that, on the basis of the three-tiered approach, cross comparative results provide sufficient validation for the following conclusions:

- The proposed TS AOT modifications have only a minimal quantitative impact on plant risk. The calculated ICCDPs are small, primarily because of the association of SITs and LPSI with low probability initiating events and limited impact on the success criteria of other mitigation systems (Tier 1).

- The review did not identify the need for any additional constraints or compensatory actions that, if implemented, would avoid or reduce the probability of a risk-significant configuration (Tier 2).

- The licensee has implemented a risk-informed Configuration Risk Management Program to assess the risk associated with the removal of equipment from service during the proposed LPSI AOT. The program provides the necessary assurances that appropriate assessments of plant risk configurations using the Safety Monitor, augmented by additional analysis, when appropriate, are sufficient to support the present AOT extension requests for the LPSI system (Tier 3). Because the SIT sequence modeling is relatively independent of that for other systems, the staff concludes that application of Tier 3 to the proposed SIT AOT is not necessary.

4.4 Implementation and Monitoring

The staff expects the licensee to implement these TS changes in accordance with the three-tiered approach described above. In addition, the licensee has stated through endorsement of the CEOG Joint Application Reports that the maintenance rule (10 CFR 50.65) will be the vehicle that controls the actual equipment maintenance cycle by defining unavailability performance criteria for the SITs and the LPSI systems. The AOT extensions will allow efficient scheduling of maintenance within the boundaries established by implementing the maintenance rule. The effect of the AOT extensions should be considered if any adverse trends in meeting established performance criteria are identified for the SITs and the LPSI systems. The maintenance rule will thereby be the vehicle that monitors the effectiveness of the AOT extensions. Application of these implementation and monitoring strategies will help to ensure that extension of TS AOTs for SITs and the LPSI system does not degrade operational safety

over time and that the risk incurred when a SIT or a LPSI system is taken out of service is minimized.

5.0 Summary

The staff has evaluated the licensee's proposed changes for compliance with regulatory requirements as documented in this evaluation and has determined that they are acceptable. This determination is based on the following:

1. The need to maintain reliable safety systems.

2. Consideration of the design basis requirements for the SITs and the LPSI systems.

3. Staff recommendations contained in GL 93-05 regarding SIT TS requirements.

4. Insights gained from the quantitative evaluation of the risk associated with having one LPSI train out of service.

5. A three-tiered implementation strategy that ensures that the risk incurred when a SIT or LPSI system is taken out of service is minimized.

6. Performance monitoring through the maintenance rule to ensure that extension of TS AOTs for SITs and the LPSI system does not degrade operational safety over time.

The staff therefore finds that the AOT for one SIT that is inoperable for the inability to verify level or pressure may be extended to 72 hours, the AOT for one SIT that is inoperable for reasons other than boron concentration not within limits or inability to verify level or pressure may be extended to 24 hours, and that the AOT for one inoperable LPSI system may be extended to 7 days, with a negligible impact on risk.

6.0 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.

7.0 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 (61 FR 15995 and 63 FR 6991). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). The amendments also involve changes in

recordkeeping, reporting or administrative procedures or requirements. Accordingly, with respect to these items, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(10). 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.

8.0 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: N. Gilles

Date: June 19, 1998