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

November 28, 2008

Mr. Ross T. Ridenoure
Senior Vice President and
Chief Nuclear Officer
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: BATTERY AND DC SOURCES UPGRADES AND CROSS-TIE (TAC NOS. MD8213 AND MD8214)

Dear Mr. Ridenoure:

The Commission has issued the enclosed Amendment No. 218 to Facility Operating License No. NPF-10 and Amendment No. 211 to Facility Operating License No. NPF-15 for San Onofre Nuclear Generating Station, Units 2 and 3, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated November 30, 2007, as supplemented by letters dated June 5 and November 14, 2008.

The proposed changes would revise TS 3.8.1, "AC Sources - Operating," TS 3.8.4, "DC Sources - Operating," TS 3.8.5, "DC Sources - Shutdown," TS 3.8.6, "Battery Cell Parameters," TS 3.8.7, "Inverters - Operating, TS 3.8.9, "Distribution Systems - Operating," and TS 3.8.10, "Distribution Systems - Shutdown." The proposed change will also add new TS Section 5.5.2.17, "Battery Monitoring and Maintenance Program" and new Licensee Controlled Specifications (LCS) 3.8.104, 3.8.105, and 3.8.106.

The TS changes provide operational flexibility supported by direct current (DC) electrical subsystem design upgrades that are in progress. These upgrades provide increased capacity batteries, additional battery chargers, and the means to cross-connect DC subsystems while meeting all design battery loading requirements. With these modifications in place, it will be feasible to perform routine surveillances as well as battery replacements online.

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,

Jack Donohew for

N. Kalyanam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosures: 1. Amendment No. 218 to NPF-10
2. Amendment No. 211 to NPF-15
3. Safety Evaluation

cc/w encl: Distribution via ListServ

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

DOCKET NO. 50-361

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 218
License No. NPF-10

1. The U.S. 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 November 30, 2007, as supplemented by letters dated June 5 and November 14, 2008, 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.

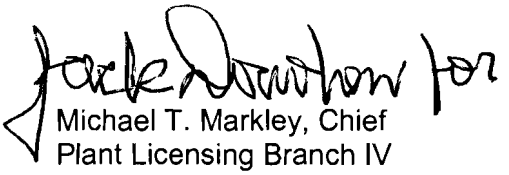
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C(2) of Facility Operating License No. NPF-10 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 218, are hereby incorporated in the license. Southern California Edison Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the Facility
Operating License No. NPF-10
and Technical Specifications

Date of Issuance: November 28, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 218

FACILITY OPERATING LICENSE NO. NPF-10

DOCKET NO. 50-361

Replace the following pages of the Facility Operating License No. NPF-10 and 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.

Facility Operating License

REMOVE	INSERT
3	3

Technical Specifications

REMOVE	INSERT
iv	iv
3.8-4	3.8-4
3.8-23	3.8-23
--------	3.8-23a
3.8-24	3.8-24
3.8-25	3.8-25
3.8-26	3.8-26
3.8-26a	--------
3.8-26b	--------
3.8-27	3.8-27
3.8-27a	3.8-27a
3.8-28	3.8-28
3.8-29	3.8-29
3.8-30	3.8-30
3.8-30a	--------
3.8-30b	--------
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3.8-33	3.8-33
3.8-34	3.8-34
3.8-38	3.8-38
3.8-39	3.8-39
3.8-40	3.8-40
3.8-41	3.8-41
5.0-20c	5.0-20c
--------	5.0-20d

(3) SCE, pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(4) SCE, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) SCE, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(6) SCE, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of San Onofre Nuclear Generating Station, Units 1 and 2 and by the decommissioning of San Onofre Nuclear Generating Station Unit 1.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Southern California Edison Company (SCE) is authorized to operate the facility at reactor core power levels not in excess of full power (3438 megawatts thermal).

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 218 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.

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and Associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours
G. Three or more required AC sources inoperable.	G.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	----------NOTES---------- 1. Bus 3A04 is required when unit crosstie breaker 3A0416 is used to provide a source of AC power. 2. Bus 3A06 is required when unit crosstie breaker 3A0603 is used to provide a source of AC power. ---------- Verify correct breaker alignment and power availability for each required offsite circuit.	7 days

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------NOTE------- Only applicable to 1800 amp-hour rated batteries. ---------- One or two required battery charger(s) on one train inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current $\leq$ 1.50 amps. AND A.3.1 Restore required battery charger(s) to OPERABLE status. OR A.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND A.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. --------NOTE------- Only applicable to 1260 amp-hour rated batteries. ---------- One or two required battery charger(s) on one train inoperable.	B.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND B.2 Verify battery float current $\leq$ 0.75 amp. AND B.3.1 Restore required battery charger(s) to OPERABLE status. OR B.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND B.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Declare associated battery inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One DC electrical power subsystem inoperable for reasons other than Condition A or B.	D.1 Restore DC electrical power subsystem to OPERABLE status. OR D.2 Cross connect with same train DC subsystem (1800 amp-hour rated battery required).	2 hours 2 hours
E. DC Subsystem Buses cross connected (1800 amp-hour rated battery required).	E.1 Restore DC Subsystem Buses to non-cross-connected configuration.	-----NOTE----- Completion Time is 14 days when cross connected for battery replacement. ---------- 4 days
F. Required Action and Associated Completion Time of Condition D or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	7 days
SR 3.8.4.2	----------NOTES---------- 1. The dedicated battery charger is rated at 300 amps. 2. The swing battery charger is rated at 400 amps. ---------- Verify each battery charger supplies ≥ rated amps at ≥ the minimum established float voltage for ≥ 8 hours.	24 months
SR 3.8.4.3	----------NOTE---------- The battery performance discharge test in SR 3.8.6.7 may be performed in lieu of SR 3.8.4.3 once per 48 months for batteries rated at 1260 amp-hours. ---------- Verify capacity of the 1260 amp-hour rated battery is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	24 months
SR 3.8.4.4	----------NOTES---------- 1. The modified performance discharge test in SR 3.8.6.7 will be performed for batteries rated at 1800 amp-hours. 2. Completed service tests and performance discharge tests remain valid until the new modified performance discharge test is performed at its required frequency. ---------- Verify capacity of the 1800 amp-hour rated battery is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a modified performance discharge test.	30 months

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3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources—Shutdown

LCO 3.8.5 The DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems—Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

---NOTE---

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---NOTE--- Only applicable to 1800 amp-hour rated batteries. --- One or two required battery charger(s) on one train inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current $\leq$ 1.50 amps. AND A.3.1 Restore required battery charger(s) to OPERABLE status. OR A.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND A.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------NOTE--------- Only applicable to 1260 amp-hour rated batteries. ---------- One or two required battery charger(s) on one train inoperable.	B.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND B.2 Verify battery float current $\leq$ 0.75 amp. AND B.3.1 Restore required battery charger(s) to OPERABLE status. OR B.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND B.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Declare associated battery inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more required DC electrical power subsystem(s) inoperable for reasons other than Condition A or B.	D.1 Declare affected required feature(s) inoperable. OR	Immediately
	D.2.1 Suspend CORE ALTERATIONS. AND	Immediately
	D.2.2 Suspend movement of irradiated fuel assemblies. AND	Immediately
	D.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. AND	Immediately
	D.2.4 Initiate action to restore required DC electrical power subsystem(s) to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	----------NOTE---------- The following SRs are not required to be performed: SR 3.8.4.2, SR 3.8.4.3, and SR 3.8.4.4. ---------- For DC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1, SR 3.8.4.2, SR 3.8.4.3, and SR 3.8.4.4.	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

LCO 3.8.6 Battery parameters for the Train A and Train B batteries shall be within limits.

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or two batteries on one train with one or more battery cells with float voltage <2.07 V.	A.1	Perform SR 3.8.4.1.	2 hours
	AND		
	A.2.1	Perform SR 3.8.6.1.	2 hours
		OR	
	A.2.2	Perform SR 3.8.6.2.	2 hours
	AND		
	A.3	Restore affected cell voltage ≥ 2.07 V.	24 hours
B. --------NOTE-------- Only applicable to 1800 amp-hour rated batteries. ---------- One or two batteries on one train with float current > 1.50 amps.	B.1	Perform SR 3.8.4.1.	2 hours
	AND		
	B.2	Restore battery float current to ≤ 1.50 amps.	12 hours
C. --------NOTE-------- Only applicable to 1260 amp-hour rated batteries. ---------- One or two batteries on one train with float current > 0.75 amp.	C.1	Perform SR 3.8.4.1.	2 hours
	AND		
	C.2	Restore battery float current to ≤ 0.75 amp.	12 hours

(continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or two batteries on one train with one or more cells with electrolyte level less than minimum established design limits.	----------NOTES---------- 1. Required Actions D.1 and D.2 are only applicable if electrolyte level is below the top of the plates. 2. Required Action D.2 shall be completed if electrolyte level was below the top of the plates. ---------- D.1 Restore electrolyte level to above the top of the plates. AND D.2 Verify no evidence of leakage. AND D.3 Restore electrolyte level to greater than or equal to minimum established design limits.	 8 hours 12 hours 31 days
E. One or two batteries on one train with pilot cell electrolyte temperature less than minimum established design limits.	E.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours
F. One or more batteries in redundant trains with battery parameters not within limits.	F.1 Restore battery parameters for batteries in one train to within limits.	2 hours

(continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. --------NOTE-------- Only applicable to 1800 amp-hour rated batteries. ---------- Required Action and associated Completion Time of Condition A, B, D, E, or F not met. OR One or two batteries on one train with one or more battery cells with float voltage < 2.07 V and float current > 1.50 amps.	G.1 Declare associated battery inoperable.	Immediately
H. --------NOTE-------- Only applicable to 1260 amp-hour rated batteries. ---------- Required Action and associated Completion Time of Condition A, C, D, E, or F not met. OR One or two batteries on one train with one or more battery cells with float voltage < 2.07 V and float current > 0.75 amp.	H.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	----------NOTE---------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ 1.50 amps for batteries rated at 1800 amp-hours.	7 days
SR 3.8.6.2	----------NOTE---------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ 0.75 amp for batteries rated at 1260 amp-hours.	7 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.3	Verify each battery pilot cell voltage is ≥ 2.07 V.	31 days
SR 3.8.6.4	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.5	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.6	Verify each battery connected cell voltage is ≥ 2.07 V.	92 days
SR 3.8.6.7	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	60 months AND 12 months when the battery shows degradation or has reached 85% of the expected life with capacity < 100% of the manufacturer's rating AND 24 months when the battery has reached 85% of the expected life with capacity ≥ 100% of the manufacturer's rating

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters—Operating

LCO 3.8.7 The required Channel A, B, C, and D AC inverters shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9 with one AC vital bus de-energized. ----------	
A. One required inverter inoperable.	A.1 Power AC vital bus from its Class 1E constant voltage source transformer. AND	2 hours
	A.2 Restore inverter to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND	6 hours
	B.2 Be in MODE 5.	36 hours

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems—Operating

LCO 3.8.9 Train A and Train B AC, Subsystems A, B, C, and D DC, and Channels A, B, C, and D AC vital bus electrical power distribution systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One AC electrical power distribution system inoperable.	A.1 Restore AC electrical power distribution system to OPERABLE status.	8 hours AND 16 hours from discovery of failure to meet LCO
B. One or more AC vital bus inoperable.	B.1 Restore AC vital bus to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO
C. One or more DC electrical power distribution subsystem inoperable.	C.1 Restore DC electrical power distribution subsystem to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution systems.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems—Shutdown

LCO 3.8.10 The necessary portion of AC, DC, and AC vital bus electrical power distribution systems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6.
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution systems inoperable.	A.1 Declare associated supported required feature(s) inoperable. OR	Immediately
	A.2.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2.2 Suspend movement of irradiated fuel assemblies. AND	Immediately
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. AND	Immediately
		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution system(s) to OPERABLE status.	Immediately
	AND	
	A.2.5 Declare associated required shutdown cooling system(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution systems.	7 days

5.5 Procedures, Programs, and Manuals (continued)

5.5.2.16 Control Room Envelope Habitability Program (Continued)

c. Requirements for (i) determining the unfiltered air inleakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

The following is an exception to Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

Appropriate application of ASTM E-741 shall include the ability to take minor exceptions to the test methodology. These exceptions shall be documented in the test report.

d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one train of the CREACUS, operating at the flow rate required by the VFTP, at a Frequency of 24 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 24 month assessment of the CRE boundary.

e. The quantitative limits on unfiltered air inleakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.

f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

(continued)

5.5 Procedures, Programs, and Manuals (continued)

5.5.2.17 Battery Monitoring and Maintenance Program

This program provides for battery restoration and maintenance, which includes the following:

a. Actions to restore battery cells with float voltage < 2.13 V, and

b. Actions to verify that the remaining cells are above 2.07 V when a battery cell or cells have been found less than 2.13 V, and

c. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates.

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

DOCKET NO. 50-362

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 211
License No. NPF-15

1. The U.S. 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 November 30, 2007, as supplemented by letters dated June 5 and November 14, 2008, 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. 211, are hereby incorporated in the license. Southern California Edison Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the Facility
Operating License No. NPF-15
and Technical Specifications

Date of Issuance: November 28, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 211

FACILITY OPERATING LICENSE NO. NPF-15

DOCKET NO. 50-362

Replace the following pages of the Facility Operating License No. NPF-15 and 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.

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Technical Specifications

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3.8-26a	--------
3.8-26b	--------
3.8-27	3.8-27
3.8-27a	3.8-27a
3.8-28	3.8-28
3.8-29	3.8-29
3.8-30	3.8-30
3.8-30a	--------
3.8-30b	--------
3.8-31	3.8-31
3.8-32	3.8-32
3.8-32a	3.8-32a
3.8-33	3.8-33
3.8-34	3.8-34
3.8-38	3.8-38
3.8-39	3.8-39
3.8-40	3.8-40
3.8-41	3.8-41
5.0-20c	5.0-20c
--------	5.0-20d

(3) SCE, pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(4) SCE, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source and special nuclear materials as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) SCE, pursuant to the Act and 10 CFR Parts 30, 40, and 70 to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(6) SCE, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of San Onofre Nuclear Generating Station, Units 1 and 3 and by the decommissioning of San Onofre Nuclear Generating Station Unit 1.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Southern California Edison Company (SCE) is authorized to operate the facility at reactor core power levels not in excess of full power (3438 megawatts thermal).

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 211 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.

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and Associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours
G. Three or more required AC sources inoperable.	G.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	----------NOTES---------- 1. Bus 2A04 is required when unit crosstie breaker 2A0417 is used to provide a source of AC power. 2. Bus 2A06 is required when unit crosstie breaker 2A0619 is used to provide a source of AC power. ---------- Verify correct breaker alignment and power availability for each required offsite circuit.	7 days

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------NOTE-------- Only applicable to 1800 amp-hour rated batteries. ---------- One or two required battery charger(s) on one train inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current $\leq$ 1.50 amps. AND A.3.1 Restore required battery charger(s) to OPERABLE status. OR A.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND A.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. --------NOTE-------- Only applicable to 1260 amp-hour rated batteries. ---------- One or two required battery charger(s) on one train inoperable.	B.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND B.2 Verify battery float current $\leq$ 0.75 amp. AND B.3.1 Restore required battery charger(s) to OPERABLE status. OR B.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND B.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Declare associated battery inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One DC electrical power subsystem inoperable for reasons other than Condition A or B.	D.1 Restore DC electrical power subsystem to OPERABLE status. OR D.2 Cross connect with same train DC subsystem (1800 amp-hour rated battery required).	2 hours 2 hours
E. DC Subsystem Buses cross connected (1800 amp-hour rated battery required).	E.1 Restore DC Subsystem Buses to non-cross-connected configuration.	------NOTE----- Completion Time is 14 days when cross connected for battery replacement. ---------- 4 days
F. Required Action and Associated Completion Time of Condition D or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	7 days
SR 3.8.4.2	----------NOTES---------- 1. The dedicated battery charger is rated at 300 amps. 2. The swing battery charger is rated at 400 amps. ---------- Verify each battery charger supplies ≥ rated amps at ≥ the minimum established float voltage for ≥ 8 hours.	24 months
SR 3.8.4.3	----------NOTE---------- The battery performance discharge test in SR 3.8.6.7 may be performed in lieu of SR 3.8.4.3 once per 48 months for batteries rated at 1260 amp-hours. ---------- Verify capacity of the 1260 amp-hour rated battery is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	24 months
SR 3.8.4.4	----------NOTES---------- 1. The modified performance discharge test in SR 3.8.6.7 will be performed for batteries rated at 1800 amp-hours. 2. Completed service tests and performance discharge tests remain valid until the new modified performance discharge test is performed at its required frequency. ---------- Verify capacity of the 1800 amp-hour rated battery is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a modified performance discharge test.	30 months

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3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources—Shutdown

LCO 3.8.5 The DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems—Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

----------NOTE----------

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE--------- Only applicable to 1800 amp-hour rated batteries. ---------- One or two required battery charger(s) on one train inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current $\leq$ 1.50 amps. AND A.3.1 Restore required battery charger(s) to OPERABLE status. OR A.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND A.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------NOTE--------- Only applicable to 1260 amp-hour rated batteries. ---------- One or two required battery charger(s) on one train inoperable.	B.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND B.2 Verify battery float current $\leq$ 0.75 amp. AND B.3.1 Restore required battery charger(s) to OPERABLE status. OR B.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source. AND B.3.2.2 Restore required battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours 72 hours 7 days
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Declare associated battery inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more required DC electrical power subsystem(s) inoperable for reasons other than Condition A or B.	D.1 Declare affected required feature(s) inoperable.	Immediately
	OR	
	D.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	D.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	AND	
	D.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	D.2.4 Initiate action to restore required DC electrical power subsystem(s) to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	----------NOTE---------- The following SRs are not required to be performed: SR 3.8.4.2, SR 3.8.4.3, and SR 3.8.4.4. ---------- For DC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1, SR 3.8.4.2, SR 3.8.4.3, and SR 3.8.4.4.	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

LCO 3.8.6 Battery parameters for the Train A and Train B batteries shall be within limits.

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two batteries on one train with one or more battery cells with float voltage < 2.07 V.	A.1 Perform SR 3.8.4.1. AND A.2.1 Perform SR 3.8.6.1. OR A.2.2 Perform SR 3.8.6.2. AND A.3 Restore affected cell voltage ≥ 2.07 V.	2 hours 2 hours 2 hours 24 hours
B. ---NOTE--- Only applicable to 1800 amp-hour rated batteries. --- One or two batteries on one train with float current > 1.50 amps.	B.1 Perform SR 3.8.4.1. AND B.2 Restore battery float current to ≤ 1.50 amps.	2 hours 12 hours
C. ---NOTE--- Only applicable to 1260 amp-hour rated batteries. --- One or two batteries on one train with float current > 0.75 amp.	C.1 Perform SR 3.8.4.1. AND C.2 Restore battery float current to ≤ 0.75 amp.	2 hours 12 hours

(continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or two batteries on one train with one or more cells with electrolyte level less than minimum established design limits.	----------NOTES---------- 1. Required Actions D.1 and D.2 are only applicable if electrolyte level is below the top of the plates. 2. Required Action D.2 shall be completed if electrolyte level was below the top of the plates. ---------- D.1 Restore electrolyte level to above the top of the plates. AND D.2 Verify no evidence of leakage. AND D.3 Restore electrolyte level to greater than or equal to minimum established design limits.	 8 hours 12 hours 31 days
E. One or two batteries on one train with pilot cell electrolyte temperature less than minimum established design limits.	E.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours
F. One or more batteries in redundant trains with battery parameters not within limits.	F.1 Restore battery parameters for batteries in one train to within limits.	2 hours

(continued)

ACTIONS (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. ---------NOTE--------- Only applicable to 1800 amp-hour rated batteries. ---------- Required Action and associated Completion Time of Condition A, B, D, E, or F not met. OR One or two batteries on one train with one or more battery cells with float voltage < 2.07 V and float current > 1.50 amps.	G.1 Declare associated battery inoperable.	Immediately
H. ---------NOTE--------- Only applicable to 1260 amp-hour rated batteries. ---------- Required Action and associated Completion Time of Condition A, C, D, E, or F not met. OR One or two batteries on one train with one or more battery cells with float voltage < 2.07 V and float current > 0.75 amp.	H.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.6.1	----------NOTE---------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ 1.50 amps for batteries rated at 1800 amp-hours.	7 days
SR 3.8.6.2	----------NOTE---------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ 0.75 amp for batteries rated at 1260 amp-hours.	7 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.6.3	Verify each battery pilot cell voltage is ≥ 2.07 V.	31 days
SR 3.8.6.4	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.5	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.6	Verify each battery connected cell voltage is ≥ 2.07 V.	92 days
SR 3.8.6.7	Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	60 months AND 12 months when the battery shows degradation or has reached 85% of the expected life with capacity < 100% of the manufacturer's rating AND 24 months when the battery has reached 85% of the expected life with capacity ≥ 100% of the manufacturer's rating

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters—Operating

LCO 3.8.7 The required Channel A, B, C, and D AC inverters shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9 with one AC vital bus de-energized. ----------	
A. One required inverter inoperable.	A.1 Power AC vital bus from its Class 1E constant voltage source transformer. AND A.2 Restore inverter to OPERABLE status.	2 hours 24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems—Operating

LCO 3.8.9 Train A and Train B AC, Subsystems A, B, C, and D DC, and Channels A, B, C, and D AC vital bus electrical power distribution systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One AC electrical power distribution system inoperable.	A.1 Restore AC electrical power distribution system to OPERABLE status.	8 hours AND 16 hours from discovery of failure to meet LCO
B. One or more AC vital bus inoperable.	B.1 Restore AC vital bus to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO
C. One or more DC electrical power distribution subsystem inoperable.	C.1 Restore DC electrical power distribution subsystem to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution systems.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems—Shutdown

LCO 3.8.10 The necessary portion of AC, DC, and AC vital bus electrical power distribution systems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6.
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution systems inoperable.	A.1 Declare associated supported required feature(s) inoperable. OR	Immediately
	A.2.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2.2 Suspend movement of irradiated fuel assemblies. AND	Immediately
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. AND	Immediately
		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution system(s) to OPERABLE status.	Immediately
	AND	
	A.2.5 Declare associated required shutdown cooling system(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution systems.	7 days

5.5 Procedures, Programs, and Manuals (continued)

5.5.2.16 Control Room Envelope Habitability Program (Continued)

c. Requirements for (i) determining the unfiltered air inleakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

The following is an exception to Sections C.1 and C.2 of regulatory Guide 1.197, Revision 0:

Appropriate application of ASTM E-741 shall include the ability to take minor exceptions to the test methodology. These exceptions shall be documented in the test report.

d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one train of the CREACUS, operating at the flow rate required by the VFTP, at a Frequency of 24 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 24 month assessment of the CRE boundary.

e. The quantitative limits on unfiltered air inleakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.

f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

(continued)

5.5 Procedures, Programs, and Manuals (continued)

5.5.2.17 Battery Monitoring and Maintenance Program

This program provides for battery restoration and maintenance, which includes the following:

a. Actions to restore battery cells with float voltage < 2.13 V, and

b. Actions to verify that the remaining cells are above 2.07 V when a battery cell or cells have been found less than 2.13 V, and

c. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 218 TO FACILITY OPERATING LICENSE NO. NPF-10

AND AMENDMENT NO. 211 TO FACILITY OPERATING LICENSE NO. NPF-15

SOUTHERN CALIFORNIA EDISON COMPANY

SAN DIEGO GAS AND ELECTRIC COMPANY

THE CITY OF RIVERSIDE, CALIFORNIA

SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3

DOCKET NOS. 50-361 AND 50-362

1.0 INTRODUCTION

By application dated November 30, 2007, to the U.S. Nuclear Regulatory Commission (NRC) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML073380042), and as supplemented by letters dated June 5 (ADAMS Accession No. ML081630203), and November 14 (ADAMS Accession No. ML083230045), 2008, Southern California Edison (SCE, the licensee) requested changes to the technical specifications (TSs), for the San Onofre Nuclear Generating Station, Units 2 and 3 (SONGS, Units 2 and 3) in accordance with Part 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR). The supplements provided additional information that clarified the application, but did not expand the scope of the application as originally noticed, and did not change the NRC staff original proposed no significant hazards consideration determination as published in the *Federal Register* on May 6, 2008 (73 FR 25045).

The proposed changes would revise TS 3.8.1, "AC [alternating current] Sources - Operating," TS 3.8.4, "DC [direct current] Sources - Operating," TS 3.8.5, "DC Sources - Shutdown," TS 3.8.6, "Battery Cell Parameters," TS 3.8.7, "Inverters - Operating, TS 3.8.9, "Distribution Systems - Operating," and TS 3.8.10, "Distribution Systems - Shutdown." The proposed change will also add new TS Section 5.5.2.17, "Battery Monitoring and Maintenance Program" and new Licensee Controlled Specifications (LCS) 3.8.104, 3.8.105, and 3.8.106.

The input for this safety evaluation (SE) consists of two parts, one regarding the electrical design and the second regarding the probabilistic risk assessment (PRA), arranged in this order.

1.1 BACKGROUND

The SONGS, Units 2 and 3 125 volts (V) direct current (DC) Class 1E batteries have a design life of 20 years. Institute of Electrical and Electronics Engineers (IEEE) Codes and U.S. Nuclear Regulatory Commission (NRC) regulations require Technical Specifications (TS) Surveillance Requirement (SR) 3.8.4.8 to decrease the required interval for the performance discharge test (to verify capacity) from 60 months to 12 months, whenever a battery reaches 85% of service life or falls below 90% of its rated capacity. The licensee indicates that these batteries will approach their 85% service life within the next two fuel cycles and that some batteries are approaching their 90% capacity. This process of testing the capacity of the battery renders the battery inoperable, until recharged, and these tests cannot be performed on-line within the current completion time (CT) associated with limiting condition for operation (LCO) 3.8.4, Condition A. To avoid the need to shutdown annually to conduct this testing, the licensee is proposing to replace these batteries. In addition, the licensee is proposing to upgrade the class 1E DC power system to provide the capability to: (1) cross-tie subsystems A and C of Train A of the DC System, or subsystems B and D of Train B of the DC system, whenever a subsystem's battery is removed from service and (2) install and align swing chargers (one for each train) to either of the two subsystems associated with each DC system train.

In its letter dated November 30, 2007, the licensee stated that the first added feature permits an operator to align two DC buses from the same train together and to remove a battery from service for testing or maintenance and that this configuration would allow all four DC buses to remain energized with sufficient battery support. The licensee also notes that the second added feature permits online battery charger testing or maintenance by first aligning a swing battery charger to the supported bus. The licensee is proposing a revised CT that would permit a battery to be removed for up to 30 days (subsequently revising its request to 4 days with a note allowing 14 days for battery replacement), provided that the supported DC bus is realigned within two hours via the new cross-tie capability to its companion same-train bus supported by a battery. The crosstie of two DC subsystems on each DC system train was not requested by the licensee. The swing battery charger and the dedicated battery charger are equally qualified. The proposed TSs allow a swing battery charger to substitute for the normal dedicated charger and stay in service indefinitely.

1.2 Description of Structures, Systems, and Components (SSCs)

1.2.1 Structures Systems and Components - Current System

In Section 3 of the licensee's submittal dated November 30, 2007, SCE states that the current SONGS, Units 2 and 3 125V DC electrical power system consists of four independent and redundant Class 1E DC electrical power subsystems. Subsystems A and C support the Train A Class 1E engineered safety features (ESF) equipment and subsystems B and D support the independent and redundant Train B Class 1E ESF equipment. Each subsystem consists of one 125V DC battery, a battery charger for the battery, inverter, and miscellaneous connected loads. During normal operation, the 125V DC load is powered from battery chargers that also maintain the batteries in a fully charged condition. In case of loss of alternating current (AC) power to a battery charger, the DC load is automatically powered from the associated battery. TS 3.8.4 require Train A and Train B DC power subsystems to be operable.

In the SCE letter dated November 30, 2007, the licensee notes that provisions in the existing design allow for temporarily cross-connecting DC subsystems of the same safety train during Modes 5 and 6 to facilitate maintenance on the batteries and to maintain operability of the operating unit's 4.16 kilovolts (kV) Class 1E ESF buses. The Mode 5 and 6 crosstie design includes permanently installed molded case isolation switches provided for each DC bus that can be connected via temporarily installed cable to a spare breaker on the DC bus. This spare breaker position is also utilized when necessary to connect a spare battery charger via temporary cable to the bus in the event the normal charger is inoperable.

1.2.2 Structures Systems and Components - Proposed System

The DC system is being upgraded by the licensee by replacing each of the existing batteries with larger 1800 amperes (amp)-hour rated batteries and by adding two 400 amp rated swing battery chargers with 600 amp, 250 V rated breakers. The change also includes upgraded circuit breakers in DC switchboards and distribution panels. The train A swing battery charger is shared between DC subsystems A and C and the Train B swing charger is shared between DC subsystems B and D. In addition, the Train B swing charger can be aligned to non-safety-related bus D5. The swing battery chargers will have mechanically interlocked, dedicated DC breakers that will allow each swing charger to feed only one subsystem at a time. To maintain separation and isolation an additional breaker is installed between the swing charger and the associated battery. The licensee has installed a temporary new spare class 1E battery that can be used to replace existing batteries at the end of their service life on-line. The licensee stated that the spare batteries will be removed when no longer needed.

3.1 ELECTRICAL EVALUATION

3.1.1 REGULATORY EVALUATION

The following NRC requirements and guidance documents are applicable to the NRC staff review of the licensee's amendment request:

Title 10 of the Code of Federal Regulations (10 CFR), Appendix A of Part 50, General Design Criterion (GDC) 17, "Electric power systems," requires, in part, that

> [A]n onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety ... The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure. Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions ... Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies.

GDC 18, "Inspection and testing of electric power systems," requires, in part, that

> [E]lectric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features...

Paragraph 50.36(c)(2)(ii) of 10 CFR, "Technical specifications," requires that

> [a] technical specification limiting condition for operation [LCO] of a nuclear reactor must be established for each item meeting one or more of the [criteria set forth in 10 CFR 50.36(c)(2)(ii)(A)-(D)].

Paragraph 50.36(c)(3) of 10 CFR, "Technical specifications," requires that TSs include Surveillance Requirements (SRs), which

> [a]re requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

Section 50.63 of 10 CFR, "Loss of all alternating current power," requires, in part, that

> [E]ach light-water-cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout as defined in §50.2 ...

Paragraph 50.65(a)(3) of 10 CFR, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," requires, in part, that

> [P]erformance and condition monitoring activities and associated goals and preventive maintenance activities shall be evaluated at least every refueling cycle provided the interval between evaluations does not exceed 24 months ... Adjustments shall be made where necessary to ensure that the objective of preventing failures of structures, systems, and components through maintenance is appropriately balanced against the objective of minimizing unavailability of structures, systems, and components due to monitoring or preventive maintenance.

Regulatory Guide (RG) 1.129, Revision 2, "Maintenance, Testing, and Replacement of Vented Lead-Acid Storage Batteries for Nuclear Power Plants," provides guidance for complying with GDCs 1, 17, and 18 with respect to the maintenance, testing, and replacement of vented lead-acid storage batteries in nuclear power plants.

RG 1.32, Revision 3, "Criteria for Power Systems for Nuclear Power Plants," provides guidance for complying with GDCs 17 and 18 with respect to the design, operation, and testing of safety-related electric power systems of all types of nuclear power plants.

3.1.2 ELECTRICAL TECHNICAL EVALUATION

3.1.2.1 Design Features of SONGS, Units 2 and 3, Class 1E 125 V DC Power Systems

The licensee has proposed changes to its TS in order to provide operational flexibility supported by DC electrical subsystem design upgrades that are currently in progress. These upgrades will provide increased capacity batteries, additional battery chargers, and the means to cross-connect DC subsystems.

The proposed TS changes include improvements reflected in Technical Specification Task Force (TSTF) - 360, Revision 1, "DC Electrical Rewrite," and an upgrade of the battery maintenance practices to conform to the Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," which is endorsed, in part, by NRC RG 1.129, Revision 2. The licensee also proposed revising the terminology of trains, channels, systems and subsystems to make the SONGS, Units 2 and 3 licenses consistent with industry convention.

Currently, SONGS, Units 2 and 3 TS 3.8.4 requires the Train A and Train B DC electrical power subsystems to be operable. The 125 V DC electrical power system consists of four independent and redundant Class 1E DC electrical power subsystems. Subsystems A and C support the Train A Class 1E engineered safety features (ESF) equipment while subsystems B and D support the Train B Class 1E ESF equipment. Each subsystem consists of one 125 V DC battery, a battery charger, an inverter, and miscellaneous connected loads. During normal operation, the 125 V DC load is powered from battery chargers that also maintain the batteries in a fully charged condition. In case of loss of alternating current (AC) power to a battery charger, the DC load is automatically powered from the associated battery.

The current DC system configuration has two independent and redundant trains; each train consists of two subsystems, each with a battery and battery charger. Subsystems A and C support Train A while Subsystems B and D support Train B. Subsystem C also provides control power for the turbine driven auxiliary feedwater pump P140. Provisions in the existing design allow for temporarily cross-connecting DC subsystems of the same safety train during Modes 5 and 6 to facilitate maintenance on batteries and to maintain operability of the operating unit's 4.16 kV Class 1E ESF buses. The Mode 5 and 6 cross-connect design includes permanently installed molded case isolation switches provided for each DC bus that can be connected via temporarily installed cable to a spare breaker on the DC bus. When necessary, the licensee also utilizes this spare breaker position to connect a spare non-Class 1E battery charger via temporary cable to the bus in the event the normal charger is inoperable.

The licensee is currently upgrading the DC system to replace each of the existing 1260 ampere (amp)-hour batteries with larger 1800 amp-hour rated batteries, add two 400 amp rated swing battery chargers and 600 amp, 250 V rated disconnect switches, and upgrade several circuit breakers in DC switchboards and distribution panels. Additionally, one swing battery charger will be shared between DC Subsystems A and C, and a second swing charger will be shared between DC Subsystems B and D. The second swing charger can be aligned to non-safety-related bus D5. The licensee stated that each swing battery charger will have mechanically interlocked dedicated DC circuit breakers to allow it to feed only one subsystem at a time. To maintain separation and isolation, the licensee has added an additional 600 amp circuit breaker

between the swing battery charger and the associated 1E battery bank. The licensee also installed a new Class 1E 1800 amp-hour rated spare battery bank (BOOX) in order to replace the existing 1260 amp-hour batteries online. The licensee plans to remove the BOOX battery when it is no longer needed. The NRC staff finds the use of the BOOX battery as a replacement for the existing 1260 amp-hour batteries an acceptable approach provided that electrical isolation and separation continues to be maintained and that the BOOX battery is subjected to routine maintenance and testing consistent with the surveillances for the permanently installed Class 1E batteries, per 10 CFR 50.65, "Maintenance Rules." Thus, the BOOX battery is ensured to perform its minimum design function. If the BOOX battery were to fail a particular surveillance test related to operability (e.g., battery discharge test), the BOOX battery is not credited as a suitable replacement.

3.1.2.2 Evaluation of Proposed Changes

In its letter dated November 30, 2007, the licensee proposed a license amendment to the TSs for SONGS, Units 2 and 3, using TSTF-360, Revision 1. The proposed changes would revise TS 3.8.1, "AC Sources - Operating," 3.8.4, "DC Sources - Operating," 3.8.5, "DC Sources - Shutdown," 3.8.6, "Battery Cell Parameters," 3.8.7, "Inverters - Operating," 3.8.9, "Distribution Systems - Operating," and 3.8.10, "Distribution Systems -Shutdown." This change will also add a new TS Section 5.5.2.17, "Battery Monitoring and Maintenance Program."

The NRC staff reviewed and evaluated each of the proposed changes to the SONGS, Units 2 and 3, TSs as follows:

3.1.2.2.1 TS 3.8.1 (AC Sources - Operating) Changes

The licensee has proposed revising the NOTES to SR 3.8.1.1. Specifically, the licensee has proposed rewording the NOTES from "Buses 3A04 and 3D1 are" and "Buses 3A06 and 3D2 are" to "Bus 3A04 is" and "Bus 3A06 is," respectively (wording is an example of the SONGS Unit 2 TS).

Evaluation of Proposed Changes to TS 3.8.1

The purpose of this SR is to ensure proper circuit continuity for the offsite ac electrical power supply to the onsite distribution network and availability of offisite ac electrical power. Removing the references to the DC buses (i.e., 3D1 or 3D2 for SONGS Unit 2) in the Note will not affect the licensee's ability to ensure that distribution buses and loads are connected to their preferred power source, and that availability of independent offsite circuits is maintained. Based on this information, the NRC staff concludes that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.1.2.2.2 TS 3.8.4 (DC Sources - Operating) Changes

The licensee has proposed revising the LCO for TS 3.8.4, and to modify and relocate TS 3.8.4 Conditions, Required Actions, and SRs.

3.1.2.2.2.1 TS 3.8.4 Change (1)

The licensee has proposed revising LCO 3.8.4 from "The Train A, Train B, Train C, and Train D DC electrical power subsystems shall be OPERABLE" to "The Train A and Train B DC electrical power subsystems shall be OPERABLE."

Evaluation of TS 3.8.4 Change (1)

The NRC staff reviewed the proposed change and has determined that the change more appropriately reflects the SONGS, Units 2 and 3 electrical system design (i.e., two trains of equipment each with two subsystems). The NRC staff finds the change does not alter any substantive requirement, and therefore, is acceptable."

3.1.2.2.2.2 TS 3.8.4 Change (2)

Condition C will be relabeled as Condition A and modified as follows:

One or two required battery charger(s) on one train inoperable.

This Condition will be modified by a new NOTE:

Only applicable to 1800 amp-hour rated batteries.

Condition A includes the following Required Actions and Completion Times (CTs) (the existing Required Action C.1 and its CT will be deleted):

A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.
CT: 2 hours

AND

A.2 Verify battery float current $\leq$1.50 amps.
CT: Once per 12 hours

AND

A.3.1 Restore required battery charger(s) to OPERABLE status.
CT: 72 hours

OR

A.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source.
CT: 72 hours

AND

A.3.2.2 Restore required battery charger(s) to OPERABLE status.
CT: 7 days

Evaluation of TS 3.8.4 Change (2)

The licensee has proposed relabeling Condition C as Condition A to be consistent with the Standard TSs. The NRC staff considers this change to be administrative in nature and does not change any substantive requirement, and therefore, is acceptable.

The licensee also proposed modifying this Condition to read "one or two" required battery charger(s) from "one" required battery charger and adding the statement "on one train" to clarify that the Condition applies to each train separately. As previously mentioned, each SONGS, Units 2 and 3 DC Train consists of two subsystems. Each subsystem has a full capacity dedicated battery charger. The NRC staff finds that the proposed Required Actions are conservative since the licensee would be required to take action when "one" required battery charger becomes inoperable.

Additionally, the licensee has proposed increasing the battery charger CT from 1 hour to 72 hours provided that they are able to restore battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours, and are able to verify that battery float current for the affected battery does not exceed 1.5 amps once per 12 hours. The licensee also proposed inserting an optional 'OR' statement that would allow a battery charger CT of up to 7 days provided the spare battery charger is capable of being supplied from a diesel-backed source within the 72-hour CT. The licensee stated that the purpose for this provision is to enable the spare battery charger to be connected to a diesel-backed source in less than or equal to 4 hours if non-Class 1E power is lost. The 4-hour period is based on the licensee's station blackout analysis.

The battery charger, in addition to maintaining battery operability, provides DC control power to AC circuit breakers and thus supports the recovery of AC power following events such as a loss of offsite power or station blackout. Therefore, it is essential that each battery charger has the capability to be supplied by a back-up power source (e.g., Class 1E diesel generator). New Required Action A.1 would provide assurance that a battery discharge is terminated, by requiring that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage (i.e., 129 V DC for a 58-cell battery) in 2 hours. This time period provides an allowance for returning an inoperable charger to operable status or for establishing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage.

New Required Action A.1 would provide assurance that the battery will be restored to its fully charged condition from any discharge that might have occurred due to the battery charger being inoperable. At the end of the 2 hours, a terminal voltage of at least the minimum established float voltage provides an indication that the battery is on the exponential charging current portion of its recharging cycle.

New Required Action A.2 would require that once per 12 hours, the battery float current be verified to be less than or equal to 1.5 amps. This would provide an indication that, if the battery has been discharged as the result of an inoperable battery charger, it has now been fully charged. If, at the expiration of the 12-hour period, the battery float current is not less than or equal to 1.5 amps, there may be additional problems and the battery must be declared inoperable (see Section 3.1.2.2.4.1 below for a more detailed discussion on the 1.5-amp float

current value). This verification provides assurance that the battery has sufficient capacity to perform its safety function.

New Required Action A.3 would allow a 72-hour CT for the battery chargers provided that the battery float voltage is restored to meet or exceed the minimum established float voltage by using an alternate method. The licensee described this alternate method as being a 100 percent capacity spare battery charger, which is identical to the dedicated Class 1E charger.

Given that (1) the DC bus remains energized, (2) the battery discharge is terminated based on restoration of the battery terminal voltage (New Required Action A.1), and (3) the battery is fully recharged based upon battery float current (New Required Action A.2), the licensee has established a reasonable basis for allowing a 72-hour restoration time for an inoperable battery charger (New LCO Action A.3). In addition, the NRC staff approval of the 72-hour CT for the SONGS, Units 2 and 3 battery chargers is based on the availability of a fully capable spare battery charger (i.e., alternate method). The NRC staff finds that the 7-day battery charger CT is acceptable based on the licensee establishing the ability to power the spare battery charger from a diesel-backed power source within the 72-hour CT (i.e., all preparations to be able to power the spare battery charger must be complete prior to 72 hours). Furthermore, the NRC staff verified that the 4-hour period to connect the spare battery charger to a diesel-backed source is bounded by the licensee's station blackout analysis.

Based on the above, the NRC staff concludes that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.1.2.2.2.3 TS 3.8.4 Change (3)

New Condition B will be added:

> One or two required battery charger(s) on one train inoperable.

This Condition will be modified by a NOTE:

> Only applicable to 1260 amp-hour rated batteries.

Condition B includes the following Required Actions and CTs:

B.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.
CT: 2 hours

AND

B.2 Verify battery float current $\leq$ 0.75 amp.
CT: Once per 12 hours

AND

B.3.1 Restore required battery charger(s) to OPERABLE status.
CT: 72 hours

OR

B.3.2.1 Provide ability to power the spare battery charger from a diesel-backed source.
CT: 72 hours

AND

B.3.2.2 Restore required battery charger(s) to OPERABLE status.
CT: 7 days

Evaluation of TS 3.8.4 Change (3)

The requirements for this Condition and Condition A are the same but are applicable to the 1260 amp-hour rated batteries. Furthermore, for these batteries, a float current of less than or equal to 0.75 amp would provide an indication that the battery is fully charged (see Section 3.1.2.2.4.1 below for a more detailed discussion on the 0.75-amp float current value).

Therefore, based on the evaluation provided in Section 3.1.2.2.2.2 of this SE report, the NRC staff concludes that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.1.2.2.2.4 TS 3.8.4 Change (4)

Condition D will be relabeled as Condition C and modified as follows:

Required Action and associated Completion Time of Condition A or B not met.

Evaluation of TS 3.8.4 Change (4)

The NRC staff reviewed the proposed change and has determined that the change re-labels the Condition and does not change any requirement, and therefore, is acceptable.

3.1.2.2.2.5 TS 3.8.4 Change (5)

Condition A will be relabeled as Condition D and modified as follows:

Condition D includes the following Required Actions and CTs:

One DC electrical power subsystem inoperable for reasons other than Condition A or B.

D.1 Restore DC electrical power subsystem to OPERABLE status.
CT: 2 hours

OR

D.2 Cross connect with same train DC subsystem (1800 amp-hour rated battery required).
CT: 2 hours

Evaluation of TS 3.8.4 Change (5)

The NRC staff reviewed the proposed changes to rename the above Conditions and associated Required Actions and to modify the wording of the Condition and has determined that the changes more appropriately reflect the SONGS, Units 2 and 3 electrical system design. The NRC staff also finds that the changes are administrative in nature and do not change any substantive requirements, and therefore, are acceptable.

The licensee has also proposed adding new Required Action D.2 to allow battery cross-connection within the same train (i.e., Subsystems A and C of Train A or Subsystems B and D of Train B). Either Required Actions D.1 or D.2 will require restoration of the DC subsystem train to OPERABLE status. The licensee proposed adding this new Required Action to address the recent upgrade of the SONGS, Units 2 and 3 DC system design. The new design includes 1800 amp-hour (8-hour rating) batteries in lieu of 1260 amp-hour batteries.

The SONGS, Units 2 and 3 Class 1E batteries are sized in accordance with the guidance of IEEE Std. 485, "IEEE Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications," using the design basis event (loss of voltage signal/safety injection actuation signal) and station blackout duty cycle profiles. The NRC staff verified that the new 1800 amp-hour batteries and supporting equipment are adequately sized to support the cross-connected configuration. In fact, the combined Subsystem A and C or B and D load demands on these batteries are significantly less than the battery rating. It should also be noted, that neither the licensee nor the NRC staff analyzed the cross-connection of two subsystems on two trains simultaneously; therefore, this configuration is not acceptable.

Based on the above, the NRC staff concludes that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.1.2.2.2.6 TS 3.8.4 Change (6)

New Condition E will be added:

"DC Subsystem Buses cross connected (1800 amp-hour rated battery required)."

Condition E includes the following Required Action and CT:

E.1 Restore DC Subsystem Buses to non-cross-connected configuration.
CT: 4 days

The CT will be modified by a NOTE:

Completion Time is 14 days when cross connected for battery replacement.

Evaluation of TS 3.8.4 Change (6)

The proposed change to add new Condition E to TS 3.8.4 addresses the condition where DC Subsystem Buses A and C or B and D are cross-connected. The licensee proposed adding Required Action E.1 to require restoring the DC Subsystem Buses A and C or B and D to the preferred non-cross-connected configuration.

Condition E represents one train with one subsystem battery out-of-service and two subsystems cross-connected with one battery. The licensee proposed a 4-day CT with a note allowing a 14-day CT when replacing a battery. The licensee provided a risk-informed evaluation in accordance with RGs 1.174 and 1.177 as the basis for extending the battery CT from 2 hours to either 4 or 14 days, depending on whether a battery is being replaced. The Electrical Engineering Branch staff reviewed the deterministic portion of the licensee's risk-informed evaluation. The 4-day duration is based on the licensee's evaluation of routine maintenance/testing activities (e.g., battery discharge testing) and implementation of emerging corrective actions (e.g., bypass of individual degraded cells) of shorter durations. Based on its review of the licensee's outage duration assumptions (Enclosure 1 of the licensee's November 14, 2008 supplemental letter), the NRC staff finds that the 4-day CT should provide sufficient time to perform routine maintenance/testing activities. Furthermore, the NRC staff finds the extended CT acceptable based on the licensee's ability to cross-connect the subsystems within a train (see Section 3.1 of this safety evaluation for further details). The NRC staff also finds that the CT extension from 2 hours to 4 days is reasonable based on its knowledge of industry operating experience with routine maintenance and testing.

As previously mentioned, the 14-day CT would be applicable when the DC subsystem is in a cross-connected configuration during battery replacement projects. Based on its review of the licensee's outage duration assumptions, the NRC staff finds that the 14-day CT should provide sufficient time to replace a battery online. Furthermore, the NRC staff finds that the DC system design (i.e., the ability to cross-connect two subsystems within a train) (see Section 3.1 of this safety evaluation for further details), provides adequate isolation, separation, capability, capacity, redundancy, and defense-in-depth to support the proposed change. The NRC staff also finds that the CT extension from 2 hours to 14 days is reasonable based on the staff's knowledge of industry operating experience with replacing batteries.

Based on the above, the NRC staff finds that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.1.2.2.2.7 TS 3.8.4 Change (7)

Condition B will be relabeled as Condition F and modified as follows:

Required Action and Associated Completion Time of Condition D or E not met.

Existing Required Actions B.1 and B.2 are relabeled to F.1 and F.2.

Evaluation of TS 3.8.4 Change (7)

The NRC staff reviewed the proposed change and has determined that the change is administrative in nature and does not change any substantive requirement, and therefore, is acceptable.

3.1.2.2.2.8 TS 3.8.4 Change (8)

Existing SR 3.8.4.1 will be modified as follows:

> Verify battery terminal voltage is greater than or equal to the minimum established float voltage.

Evaluation of TS 3.8.4 Change (8)

The licensee proposed relocating the specific terminal voltage criteria currently identified in SR 3.8.4.1 to the TS Bases. The purpose of SR 3.8.4.1 is to verify the battery terminal voltage while the system is on float charge which helps to ensure the effectiveness of the battery chargers. The battery manufacturer establishes the appropriate battery terminal voltage as the minimum established float voltage to provide optimum charge on the battery. The SONGS battery manufacturer identified the appropriate voltage range as 127.6 V to 132.2 V. This voltage will maintain the battery plates in a condition that supports maintaining the battery grid life. The licensee has listed a minimum established float voltage of > 129.0 V in the proposed TS Bases and Licensee Controlled Specifications (LCS), which is incorporated by reference in the SONGS FSAR. This value represents the existing SONGS licensing bases.

10 CFR 50.36 does not explicitly require inclusion of acceptance criteria in the TS SR. The stated definition of an SR in 10 CFR 50.36 is " . . .to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

The staff finds that the proposed TS SR satisfies 10 CFR 50.36(d)(3) and that any changes to the acceptance criteria will be adequately controlled by 10 CFR 50.59, "Changes, tests, and experiments."

Based on the above, the staff finds that the minimum established float voltage values can be adequately controlled outside of the TSs, therefore the proposed change to SR 3.8.4.1 is acceptable.

3.1.2.2.2.9 TS 3.8.4 Change (9)

Requirements of existing SRs 3.8.4.2 (Visual inspection and connection resistance), 3.8.4.3 (Visual inspection for physical damage), 3.8.4.4 (Remove visible corrosion and ensure that connections are clean and tight), and 3.8.4.5 (Verification of connection resistance) will be removed and relocated to the LCS.

Evaluation of TS 3.8.4 Change (9)

In accordance with SR 3.0.1, when any SR is not met, associated LCO is not met. This is based on the SRs representing the minimum acceptable requirements for operability of the required equipment. However, for SR 3.8.4.2, SR 3.8.4.3, SR 3.8.4.4, and SR 3.8.4.5, failure to meet the SR does not necessarily mean that the equipment is not capable of performing its safety function. Furthermore, the corrective action is generally a routine or preventive maintenance-type activity. These activities are inappropriate for SRs and can be controlled in the maintenance programs for batteries.

With regard to the resistance verifications of SR 3.8.4.2 and SR 3.8.4.5, the values are nominal values and represent limits at which some action should be taken, not necessarily when the operability of the battery is in question. The licensee's safety analyses do not assume a specific battery resistance value, but typically assume the batteries will supply adequate power. Therefore, the key issue is the overall battery resistance. Between surveillances, the resistance of each battery cell connection varies independently from all the others. Some of these connection resistance values may be higher or lower than others, and the battery may still be able to perform its function and should not be considered inoperable. Overall resistance has a direct impact on operability and is adequately determined as acceptable through completion of the battery service and discharge tests. Therefore, these activities are more appropriately controlled under the maintenance program for batteries. Specifically, the licensee stated that these surveillances will be addressed by the LCS and new TS 5.5.2.17 (see Section 3.2.8 of this safety evaluation for more details).

Based on the above, the NRC staff concludes that the proposed changes meet the 10 CFR 50.36 requirements, are reasonable, maintain safe conditions, and therefore, are acceptable.

3.1.2.2.2.10 TS 3.8.4 Change (10)

Existing SR 3.8.4.6 will be modified and renumbered to SR 3.8.4.2:

"Verify each battery charger supplies ≥ rated amps at ≥ the minimum established float voltage for ≥ 8 hours."

The NOTE will be modified to read:

1. The dedicated battery charger is rated at 300 amps.
2. The swing battery charger is rated at 400 amps.

Evaluation of TS 3.8.4 Change (10)

The NRC staff finds that renumbering SR 3.8.4.6 to SR 3.8.4.2 does not alter anything technical, and therefore, is acceptable.

SR 3.8.4.2 specifies battery charger test requirements to verify the design capacity of each battery charger. SR 3.8.4.2 requires that each required Train A and B battery charger be capable of supplying greater than or equal to rated amps at greater than or equal to minimum established float voltage for greater than or equal to 8 hours.

The licensee proposed reducing the duration for this surveillance from 12 hours to 8 hours. Currently, SR 3.8.4.6 requires this surveillance test be conducted at the charger's rated output at the float voltage for 12 hours. When at rated output, steady state maximum temperature of all components within a charger will be reached much sooner than the 12-hour interval. Continuous operation for two hours after reaching the maximum steady state temperature demonstrates a charger's rated capability since once a battery charger reaches the steady-state condition, temperatures will typically stabilize within 2 hours. If the battery charger is able to maintain steady-state condtions (i.e., steady-state rated output and float voltage), then the capability of the battery charger could be considered demonstrated

The licensee conservatively estimated that a battery charger would reach a maximum steady state temperature under rated output at a float voltage near its rated voltage in 6 hours or less. Therefore, testing for 8 hours should be sufficient for the charger temperature to stabilize and be maintained for approximately 2 hours.

The licensee proposed modifying this SR consistent with SR 3.8.4.1 by replacing the specific voltage limits of the battery charger with "greater than or equal to rated amps at greater than or equal to minimum established float voltage" and relocating the voltage limits to the LCS. The voltage requirements are based on the battery terminal voltage level after a response to a loss of AC power.

As stated in the discussion of SR 3.8.4.1, the battery manufacturer establishes this voltage limit to provide the optimum charge on the battery and to maintain the battery plates in a condition that supports maintaining the battery life. Maintaining this voltage limit should ensure that the battery will be capable of providing its designed safety function. The minimum established float voltage of ≥ 129.0 V represents the existing SONGS, Units 2 and 3 licensing bases. These values will be defined in the TS Bases and LCS. Based on this, the NRC staff finds that the minimum established float voltage values are adequately controlled.

In its June 5, 2008, response to a NRC staff request for additional information, the licensee proposed adding two notes to SR 3.8.4.2 to specify the rated amps of the two different sizes of battery chargers. The notes identify the rated amps (300 A and 400 A) of the required battery chargers. The ampere requirements are based on the output rating of the chargers. The rated amps for the dedicated SONGS, Units 2 and 3 battery chargers remain unchanged. The proposed rated amps for the SONGS, Units 2 and 3 swing battery chargers represents the output rating of the battery chargers, which is consistent with the intent of the SR. Based on this, the NRC staff finds that there is reasonable assurance that safe plant conditions will continue to be maintained and, therefore, the proposed changes involving the dedicated and swing battery charger rated amps are acceptable. The NRC staff finds the licensee's proposal to delete the note that credits unplanned events due to limited resources to fulfill this SR's requirements online to be conservative and, therefore, is acceptable.

3.1.2.2.2.11 TS 3.8.4 Change (11)

Existing SR 3.8.4.7 will be modified and renumbered to SR 3.8.4.3:

> Verify capacity of the 1260 amp-hour rated battery is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.

NOTE 1 will be modified as follows:

> The battery performance discharge test in SR 3.8.6.7 may be performed in lieu of SR 3.8.4.3 once per 48 months for batteries rated at 1260 amp-hours.

NOTES 2 and 3 will be deleted:

Evaluation of TS 3.8.4 Change (11)

The licensee proposed removing Note 2 of this SR to allow this surveillance test to be performed during any MODE of operation. Based on the ability of a spare Class 1E 1800 amp-hour rated battery bank (BOOX) or the cross tie to substitute for any 1260 amp-hour battery at SONGS, Units 2 and 3 (see Section 3.1 of this safety evaluation for further details), the NRC staff finds that the MODE restrictions are no longer needed as adequate isolation, separation, capability, capacity, redundancy, and defense-in-depth continue to be maintained.

Based on the above, the NRC staff concludes that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

The NRC staff finds that the other changes to this SR are administrative in nature and do not change any substantive requirement, and therefore, are acceptable.

3.1.2.2.2.12 TS 3.8.4 Change (12)

New SR 3.8.4.4 will be added:

"Verify capacity of the 1800 amp-hour rated battery is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a modified performance discharge test."
Frequency: 30 months

This SR will be modified by adding the following notes:

1. The modified performance discharge test in SR 3.8.6.7 will be performed for batteries rated at 1800 amp-hours.

2. Completed service tests and performance discharge tests remain valid until the new modified performance discharge test is performed at its required frequency.

Evaluation of TS 3.8.4 Change (12)

The licensee has proposed adding new SR 3.8.4.4 to address testing of the 1800 amp-hour batteries. The purpose of SR 3.8.4.4 is to test the battery's capability to satisfy the design requirements (battery duty cycle) of the DC electrical power system. According to IEEE Std. 450-2002, a modified performance discharge test is a test, in the "as found" condition, of battery

capacity and the ability to satisfy the duty cycle. In addition to testing the battery's capability to support the duty cycle, the modified performance discharge test also provides an indication of the battery's capacity and state-of-health. In its June 5, 2008, response to a staff request for additional information, the licensee stated that the same-train cross-connected load profile will be used for the modified performance discharge test.

The licensee also proposed extending the frequency of this SR to 30 months. The licensee contends that the 30-month frequency would better correspond with scheduling of the modified performance discharge test that is also prescribed in new TS SR 3.8.6.7. Performing the modified performance discharge test will provide the licensee with critical data for determining the battery's capability, capacity, and state-of-health. Furthermore, the frequency of 30 months will provide a better indication of the battery's overall condition at a more frequent interval when compared to the current performance discharge test SR frequency of once per 60 months.

Based on the above, the NRC staff concludes that the proposed changes are reasonable, maintain safe conditions, and therefore, are acceptable.

3.1.2.2.2.13 TS 3.8.4 Change (13)

Existing SR 3.8.4.8 will be modified and relocated to new SR 3.8.6.7.
Evaluation of TS 3.8.4 Change (13)

The licensee proposed modifying and relocating SR 3.8.4.8 to new SR 3.8.6.7. The purpose of this SR is to demonstrate the operability of the battery. Based on this information, the NRC staff finds that it would be more suitably located in new TS 3.8.6, "Battery Parameters." Therefore, the NRC staff finds that relocating this SR does not change any substantive requirement, and therefore, is acceptable. The NRC staff evaluation of the proposed modifications to new SR 3.8.6.7 can be found in Section 3.1.2.2.4.19 of this safety evaluation report.

3.1.2.2.3 TS 3.8.5 (DC Sources - Shutdown) Changes

The licensee has proposed revising the LCO, and to modify and relocate TS 3.8.5 Conditions, Required Actions, and SRs.

3.1.2.2.3.1 TS 3.8.5 Change (1)

A.1. LCO 3.8.5 is revised by adding "The" at the beginning of the existing statement.

Evaluation of TS 3.8.5 Change (1)

The NRC staff reviewed the proposed change and has determined that the change does not change any substantive requirement, and therefore, is acceptable.

3.1.2.2.3.2 TS 3.8.5 Change (2)

Condition B will be relabeled as Condition A and modified.

Evaluation of TS 3.8.5 Change (2)

This change is identical to the proposed change described in Section 3.2.2.2 of this safety evaluation report with the exception that this Condition prescribes the limitations during shutdown conditions. The NRC staff evaluation of this proposed change can be found in Section 3.2.2.2 of this safety evaluation report.

3.1.2.2.3.3 TS 3.8.5 Change (3)

New Condition B will be added.
Evaluation of TS 3.8.5 Change (3)

This change is identical to the proposed change described in Section 3.2.2.3 of this safety evaluation report with the exception that this Condition prescribes the limitations during shutdown conditions. The NRC staff evaluation of this proposed change can be found in Section 3.2.2.3 of this safety evaluation report.

3.1.2.2.3.4 TS 3.8.5 Change (4)

Existing Condition C will be modified as follows:

> Required Action and associated Completion Time of Condition A or B not met.

Evaluation of TS 3.8.5 Change (4)

The purpose of this change is to reflect the addition of new Condition B. The staff reviewed the proposed change and has determined that the change more appropriately reflects the SONGS electrical system design. The staff also finds that the change does not change any substantive requirement, and therefore, is acceptable.

3.1.2.2.3.5 TS 3.8.5 Change (5)

Condition A will be relabeled as Condition D and modified as follows:

"One or more required DC electrical power subsystem(s) inoperable for reasons other than Condition A or B."

Evaluation of TS 3.8.5 Change (5)

The purpose of this change is to add clarity to new Condition D. The NRC staff reviewed the proposed change and has determined that the change does not change any substantive requirement, and therefore, is acceptable.

3.1.2.2.3.6 TS 3.8.5 Change (6)

A new NOTE will be added under ACTIONS:

> LCO 3.0.3 is not applicable.

Evaluation of TS 3.8.5 Change (6)

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If the licensee moves irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If the licensee moves irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

Based on the above, the NRC staff concludes that there is reasonable assurance that safe plant conditions will continue to be maintained and unnecessary plant transients associated with a unit shutdown are avoided, and, therefore, the proposed changes are acceptable.

3.1.2.2.3.7 TS 3.8.5 Change (7)

SR 3.8.5.1 will be modified to reflect changes previously described in Section 3.2.2 of this safety evaluation report:

> For DC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1, SR 3.8.4.2, SR 3.8.4.3, and SR 3.8.4.4.

The NOTE will be modified as follows:

> The following SRs are not required to be performed: SR 3.8.4.2, and SR 3.8.4.3, and SR 3.8.4.4.

Evaluation of TS 3.8.5 Change (7)

The licensee proposed modifying SR 3.8.5.1 to be consistent with the proposed changes to TS 3.8.4. The revised SR 3.8.5.1 would require the licensee to perform all Surveillances required by SR 3.8.4.1 through SR 3.8.4.4. The NRC staff reviewed the proposed changes and determined that the changes are consistent with the proposed changes to TS 3.8.4 and meet the intent of the SR.

The purpose for the revised Note is to preclude requiring the OPERABLE DC sources from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. The intent of these SRs is that they must still be capable of being met, but actual performance is not required.

Based on the above, the NRC staff concludes that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.1.2.2.4 TS 3.8.6 (Battery Parameters) Changes

The licensee has proposed replacing battery specific gravity monitoring with float current monitoring for state-of-charge (OPERABILITY) determination. The licensee has also proposed revising the LCO, and to modify and relocate TS 3.8.6 Conditions, Required Actions, and SRs.

3.1.2.2.4.1 TS 3.8.6 Change (1)

The specific gravity limits of existing Table 3.8.6-1 and the associated footnotes will be deleted. (Table 3.8.6-1 will be deleted). Currently, verification of battery cell specific gravity is required by existing SR 3.8.6.1 and SR 3.8.6.2.

Evaluation of TS 3.8.6 Change (1)

The licensee has proposed replacing the requirements to measure specific gravity with requirements to monitor float current to determine a battery's state-of-charge. Float current monitoring has been recognized by the battery industry to provide a more direct and expeditious method for determining state-of-charge than specific gravity monitoring. Understanding that specific gravity monitoring is appropriate for troubleshooting activities and for periodic trending of the battery's state-of-health, the licensee stated that battery specific gravity monitoring will continue to be performed periodically during maintenance and testing activities prior to performing a battery service test, battery performance discharge test, or modified performance discharge test in accordance with SONGS, Units 2 and 3 plant procedures and the battery manufacturer's recommendations. The licensee provided a regulatory commitment to ensure that specific gravity monitoring would be relocated to proposed TS Section 5.5.2.17, and is performed prior to each battery discharge test. Furthermore, the licensee stated that they will continue to perform battery specific gravity monitoring on an annual basis in accordance with IEEE Std. 450-2002.

In its November 30, 2007, submittal, the licensee provided a letter from its battery manufacturer (Enersys), that acknowledged concurrence with the use of float current monitoring for the purpose of determining the state-of-charge of the batteries. The battery manufacturer stated that the specific values of float current, which are relatively stable throughout the battery's useful life, are normally indicative of the battery's state-of-charge when the battery is near full charge and the pilot cell parameters of voltage, temperature, and level are within bounds. The battery manufacturer further noted that the specific value that represents a state-of-charge in excess of 98% of the SONGS, Units 2 and 3 batteries available capacity is 0.75 amp for the 2GN-15 batteries (1260 amp-hour) and 1.50 amps for the 2GN-23 batteries (1800 amp-hour). The licensee has made a regulatory commitment to maintain a 2-percent capacity margin to account for the uncertainty in the battery capacity assigned by the battery manufacturer for allowed float current limit of 1.50 amps for the 1800 amp-hour batteries and 0.75 amp for the 1260 amp-hour batteries.

In its November 14, 2008, submittal, the licensee provided an additional regulatory commitment to ensure that the float current monitoring equipment that will be used to monitor float current will have the necessary accuracy and capability to measure electrical currents in the expected range.

The NRC staff finds that the concurrence of the battery manufacturer coupled with the licensee's regulatory commitments provides adequate assurance that the deletion of the requirement for specific gravity measurements will not have a significant impact on safety or the ability to accurately determine the operability of the SONGS, Units 2 and 3 batteries. The proposed changes will also ensure the battery parameters (maintenance, testing, and monitoring) are performed in accordance with TS Section 5.5.2.17.

Based on the above, the NRC staff concludes that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.1.2.2.4.2 TS 3.8.6 Change (2)

The title of TS 3.8.6 will be revised from "Battery Cell Parameters" to "Battery Parameters." A corresponding change to the TS Table of Contents will be made to be consistent with the revised TS 3.8.6 title.

Evaluation of TS 3.8.6 Change (2)

The NRC staff reviewed the proposed change and has determined that the change does not change any substantive requirement, and therefore, is acceptable.

3.1.2.2.4.3 TS 3.8.6 Change (3)

LCO 3.8.6 will be revised from "Battery cell parameters for the Train A, Train B, Train C, and Train D batteries shall be within the Category A and B limits of Table 3.8.6-1" to "Battery parameters for the Train A and Train B batteries shall be within limits."

Evaluation of TS 3.8.6 Change (3)

The NRC staff reviewed the proposed change and has determined that the change more appropriately reflects the SONGS, Units 2 and 3 electrical system design. The NRC staff also finds that the change does not change any substantive requirement, and therefore, is acceptable.

3.1.2.2.4.4 TS 3.8.6 Change (4)

Existing Table 3.8.6-1, Battery SRs, will be deleted in its entirety while its requirements will be included in new SRs in the TSs and LCS.

Evaluation of TS 3.8.6 Change (4)

TS Table 3.8.6-1 specifies the battery cell parameter requirements, including electrolyte level, float voltage, and specific gravity. The licensee has proposed deleting TS Table 3.8.6-1 while maintaining its requirements in new SRs in the TSs and LCS.

The Category A and B values of TS Table 3.8.6-1 represent appropriate monitoring levels and appropriate preventive maintenance levels for long-term battery quality and extended battery life. Paragraph 50.36(c)(2)(i) of 10 CFR states, in part "[LCOs] are the lowest functional capability or performance levels of equipment required for safe operation of the facility." As such, the Category A and B values for cell voltage and electrolyte level do not reflect the 10 CFR 50.36 criteria for LCOs. The licensee proposed relocating these parameters and the Required Actions associated with restoration to a licensee-controlled program. In its November 30, 2007, letter, the licensee provided a regulatory commitment to relocate battery parameters of cell voltage, electrolyte level, electrolyte temperature, and float voltage from TS 3.8.6 to proposed TS 5.5.2.17. The licensee provided an additional regulatory commitment to relocate the requirements of existing SRs 3.8.4.2 (connection resistance and visible corrosion), 3.8.4.3

(physical damage or deterioration), 3.8.4.4 (terminal connections), and 3.8.4.5 (connection resistance) from the TSs to the LCS.

Based on its review, the NRC staff has reasonable assurance that the above mentioned battery parameter values will continue to be controlled at their current level, and that actions to restore deficient values will be implemented in accordance with the licensee's corrective action program. Furthermore, the battery and its preventive maintenance and monitoring program are under the regulatory requirements of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants." This relocation will continue to assure that the battery is maintained at current levels of performance, and that operators appropriately focus on monitoring the battery parameters for degradation.

The licensee also proposed relocating the Category C specific limiting values of TS Table 3.8.6-1 for the battery electrolyte levels to a licensee-controlled program. However, new TS 3.8.6, Conditions D and E, will require the electrolyte temperature (pilot cell only) and level (any battery cell) to be greater than or equal to minimum established design limits. The licensee proposed to relocate the electrolyte temperature and level criteria (i.e., the minimum established design limits) to the SONGS, Units 2 and 3 LCS and TS Bases. Depending on the available excess capacity of the associated battery, the minimum temperature necessary to support operability of the battery can vary. Relocating these values to a licensee-controlled program will provide the licensee with added flexibility to monitor and control this limit at values directly related to the battery's ability to perform its assumed function. The NRC staff concludes that the Category C specific limiting values for TS Table 3.8.6-1 for the battery electrolyte levels do not meet the criteria of 10 CFR 50.36(c)(2)(ii) for inclusion in the TSs and may be relocated to a licensee-controlled program. Proposed changes to the program will be subject to evaluation under 10 CFR 50.59, "Changes, tests, and experiments," to whether the proposed changes require prior NRC review and approval, as discussed below in Section 3.2.8. Therefore, the NRC staff finds that these changes are acceptable.

See Section 3.1.2.2.4.1 of this safety evaluation for the NRC staff evaluation of the licensee's proposal to relocate the specific gravity requirements to TS 5.5.2.17 and the SONGS, Units 2 and 3 LCS.

The proposed changes discussed above ensure the battery parameters (maintenance, testing, and monitoring) are performed in accordance with the Battery Monitoring and Maintenance Program, as specified in TS Section 5.5.2.17. Based on this information, the NRC staff finds that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

The NRC staff evaluation of the new SRs relative to this change can be found in the following sections of this safety evaluation report.

3.1.2.2.4.5 TS 3.8.6 Change (5)

New Condition A will be added:

> One or two batteries on one train with one or more battery cells with float voltage < 2.07 V.

Existing Condition A (and its associated Required Actions and CTs) will be deleted:

New Condition A includes the following new Required Actions and CTs:

A.1 Perform SR 3.8.4.1.
CT: 2 hours

AND

A.2.1 Perform SR 3.8.6.1.
CT: 2 hours

OR

A.2.2 Perform SR 3.8.6.2.
CT: 2 hours

AND

A.3 Restore affected cell voltage ≥ 2.07 V.
CT: 24 hours

Evaluation of TS 3.8.6 Change (5)

The licensee proposed adding new TS 3.8.6 Condition A to address what was formerly the Category C limit for float voltage in TS Table 3.8.6-1. This new Condition would be applicable when one or two batteries on one train are found with one or more battery cells with a float voltage less than 2.07 V. Once Condition A has been entered, the battery cell is considered degraded and the Required Actions are to verify: (a) the battery terminal voltage to be greater than or equal to the minimum established float voltage (SR 3.8.4.1), and (b) each battery's float current is less than or equal to 1.50 amps for batteries rated at 1800 amp-hours (SR 3.8.6.1) or 0.75 amp for batteries rated at 1260 amp-hours (SR 3.8.6.2). The above actions assure that there is still sufficient capacity for the battery to perform its intended function without considering it to be inoperable. Continued operations for up to 24 hours are proposed to allow the restoration of the affected cell(s) voltage to greater than or equal to 2.07 V.

Based on this information, the NRC staff finds that there is reasonable assurance that safe plant conditions will continue to be maintained; therefore, the proposed changes are acceptable.

3.1.2.2.4.6 TS 3.8.6 Change (6)

New Condition B will be added (existing Condition B will be modified and relabeled as Condition G):

One or two batteries on one train with float current > 1.50 amps.

This Condition is modified by a NOTE: Only applicable to 1800 amp-hour rated batteries.

Condition B includes the following Required Actions and CTs:

B.1 Perform SR 3.8.4.1.
CT: 2 hours

AND

B.2 Restore battery float current to ≤ 1.50 amps.
CT: 12 hours

Evaluation of TS 3.8.6 Change (6)

The licensee proposed adding new TS 3.8.6, Condition B to address battery state-of-charge for the 1800 amp-hour batteries. This new Condition would be applicable when one or two batteries on one train are found with a float current greater than 1.5 amps. A float current of greater than 1.5 amps provides an indication that a partial discharge has occurred. The Required Action is to verify within 2 hours that the battery terminal voltage is greater than or equal to the minimum established float voltage (SR 3.8.4.1), thus confirming battery charger operability. If the terminal voltage is satisfactory and there are no battery cells with a voltage less than 2.07 V, Required Action B.2 of Condition B assures that within 12 hours the battery will be restored to its fully-charged condition from any discharge that might have occurred due to a temporary loss of the battery charger.

If the terminal voltage is found to be less than the minimum established float voltage, it indicates that the battery charger is either inoperable or is operating in the current limit mode. If the battery charger is operating in the current limit mode for 2 hours, it is an indication that the battery has been substantially discharged and likely cannot perform its required design functions.

If the float voltage is found to be satisfactory, but there are one or more battery cells with a float voltage less than 2.07 V, the associated "OR" statement in the revised Condition G of TS 3.8.6 would be applicable, and the battery must immediately be declared inoperable. If float voltage is satisfactory and there are no cells less than 2.07 V, and the out-of-limit float current condition is due to one or more battery cells with low voltage, the battery is not substantially discharged and the 12-hour CT to restore battery float current to within limits is reasonable. The NRC staff finds that adding new TS 3.8.6 Condition B is reasonable, maintains safe plant conditions and, therefore, is acceptable.

3.1.2.2.4.7 TS 3.8.6 Change (7)

New Condition C will be added:

"One or two batteries on one train with float current > 0.75 amp."

This Condition will be modified by a NOTE: Only applicable to 1260 amp-hour rated batteries.

Condition C includes the following Required Actions and CTs:

C.1 Perform SR 3.8.4.1.
CT: 2 hours

AND

C.2 Restore battery float current to ≤ 0.75 amp.
CT: 12 hours

Evaluation of TS 3.8.6 Change (7)

The licensee proposed adding new TS 3.8.6 Condition C to address battery state-of-charge for the 1260 amp-hour batteries. This new Condition would be applicable when one or two batteries on one train are found with a float current greater than 0.75 amp. A float current of greater than 0.75 amp provides an indication that a partial discharge has occurred. The Required Action is to verify within 2 hours that the battery terminal voltage is greater than or equal to the minimum established float voltage (SR 3.8.4.1), thus confirming battery charger operability. If the terminal voltage is satisfactory and there are no battery cells with a voltage less than 2.07 V, Required Action C.2 of Condition C assures that within 12 hours the battery will be restored to its fully-charged condition from any discharge that might have occurred due to a temporary loss of the battery charger.

If the terminal voltage is found to be less than the minimum established float voltage, it indicates that the battery charger is either inoperable or is operating in the current limit mode. If the battery charger is operating in the current limit mode for 2 hours, it is an indication that the battery has been substantially discharged and likely cannot perform its required design functions.

If the float voltage is found to be satisfactory, but there are one or more battery cells with a float voltage less than 2.07 V, the associated "OR" statement in the revised Condition H of TS 3.8.6 would be applicable, and the battery must immediately be declared inoperable. If float voltage is satisfactory and there are no cells less than 2.07 V, and the out-of-limit float current condition is due to one or more battery cells with low voltage, the battery is not substantially discharged and the 12-hour CT to restore battery float current to within limits is reasonable. The NRC staff finds that adding new TS 3.8.6 Condition C is reasonable, maintains safe plant conditions and, therefore, is acceptable.

3.1.2.2.4.8 TS 3.8.6 Change (8)

New Condition D will be added:

"One or two batteries on one train with one or more cells with electrolyte level less than minimum established design limits."

Condition D includes the following Required Actions and CTs:

D.1 Restore electrolyte level to above the top of the plates.
CT: 8 hours

AND

D.2 Verify no evidence of leakage.
CT: 12 hours

AND

D.3 Restore electrolyte level to greater than or equal to minimum established design limits.
CT: 31 days

The Required Actions will be modified by two NOTES: 1) Required Actions D.1 and D.2 are only applicable if electrolyte level is below the top of the plates, and 2) Required Action D.2 shall be cornpleted if electrolyte level was below the top of the plates.

Evaluation of TS 3.8.6 Change (8)

The licensee proposed adding new TS 3.8.6 Condition D to address the electrolyte level in a cell. This new Condition would be applicable when one or two batteries on one train are found with one or more cells with an electrolyte level less than the minimum established design limits. If the level is above the top of the battery plates, but below the minimum limit (i.e., minimum level indication mark on the battery cell jar), the battery still has sufficient capacity to perform its intended safety function and it is considered operable. With the electrolyte level below the top of the plates, there is a potential for dry-out and plate degradation. New Required Actions D.1 and D.2 (as well as provisions in new TS 5.5.2.17) restore the electrolyte level, ensure that the cause of the loss of the electrolyte level is not due to a leak in the battery cell jar, and equalize and test the battery cells that have been discovered with an electrolyte level below the top of the plates. The NRC staff finds that these changes are adequate to ensure that minimum electrolyte levels are maintained and, therefore, are acceptable.

3.1.2.2.4.9 TS 3.8.6 Change (9)

New Condition E will be added:

"One or two batteries on one train with pilot cell electrolyte temperature less than minimum established design limits."

Condition E includes the following Required Action and CT:

E.1. Restore battery pilot cell temperature to greater than or equal to minimum established design limits.
CT: 12 hours

Evaluation of TS 3.8.6 Change (9)

The licensee proposed adding new TS 3.8.6 Condition E which applies to a battery found with a pilot cell electrolyte temperature less than the minimum established design limit. This new Condition would be applicable when one or two batteries on one train have a pilot cell electrolyte temperature less than minimum established design limits.

A low electrolyte temperature limits the current and power available from the battery. The limiting design temperature for the SONGS, Units 2 and 3 battery cells when cross-tied is 60 degrees Fahrenheit (°F). Each SONGS, Units 2 and 3 Class 1E battery is sized with correction factors that include temperature and aging.

The licensee stated that battery room temperature is alarmed and periodically monitored by SONGS, Units 2 and 3 Operations as part of the operator's rounds. The SONGS, Units 2 and 3 battery rooms are contained in a separate environmentally controlled area outside the engineered safety feature switchgear rooms. The licensee stated that the first indication of a problem with battery temperature would be the actuation of a Control Room alarm when room temperature approaches 66 °F. According to the licensee, Operators would implement corrective measures in accordance with plant procedures and operating instructions. Based on these procedures and the fact that batteries have very large thermal inertia, the NRC staff finds that it is highly likely that a room temperature excursion would be corrected by the licensee prior to the battery electrolyte reaching its minimum temperature. Furthermore, SONGS, Units 2 and 3 operating experience has demonstrated a negligible difference in operating temperature (i.e., well within the 5 °F guidelines for temperature stability per IEEE Std. 450-2002) between the different battery cells.

The NRC staff finds that the pilot cell temperature is a sufficiently accurate representation of the temperature of the battery bank because: 1) the batteries have very large thermal inertia; 2) the SONGS, Units 2 and 3 batteries are designed with sufficient margins (i.e., temperature, aging, and design); and 3) procedures are available to monitor and correct the cause of low battery room temperature. The 12-hour CT provides a reasonable time to restore the electrolyte temperature within established limits.

Based on the above, the NRC staff concludes that the proposed change is adequate to ensure that the minimum electrolyte temperature is maintained and, therefore, is acceptable.

3.1.2.2.4.10 TS 3.8.6 Change (10)

New Condition F will be added:

> One or more batteries in redundant trains with battery parameters not within limits.

Condition F includes the following Required Action and CT:

> F.1 Restore battery parameters for batteries in one train to within limits.
> CT: 2 hours

Evaluation of TS 3.8.6 Change (10)

The licensee proposed adding new TS 3.8.6 Condition F to address the condition where one or more batteries in redundant trains with battery parameters not within limits. If this condition exists, there is not sufficient assurance that the batteries will be capable of performing their intended safety function. With redundant batteries involved, loss of function is possible for multiple systems that depend upon the batteries. The licensee proposed that battery parameters for the affected battery in one train be restored to limits within 2 hours. Based on this information, the NRC staff finds that the proposed change is reasonable, maintains safe plant conditions and, therefore, is acceptable.

3.1.2.2.4.11 TS 3.8.6 Change (11)

Condition B will be relabeled as Condition G and modified as follows:

> Required Action and associated Completion Time of Condition A, B, D, E, or F not met.

OR

One or two batteries on one train with one or more battery cells with float voltage < 2.07 V and float current > 1.50 amps

This Condition will be modified by a new NOTE:

> Only applicable to 1800 amp-hour rated batteries.

Evaluation of TS 3.8.6 Change (11)

The licensee proposed modifying and relabeling existing TS 3.8.6 Condition B as new Condition G to provide a default condition for battery parameters that fall outside the allowance of the Required Actions for Condition A, B, C, D, E or F. Under this condition, it is assumed that there is not sufficient capacity to supply the maximum expected load requirements. New Condition G also addresses the case where one or more batteries is found with one or more battery cells having a float voltage less than 2.07 V and a float current greater than 1.5 amps. The licensee proposed revising "One or more batteries" to "One or two batteries" to limit the Condition to only one train which comprises a maximum of two batteries. Based on this information, the NRC staff finds that the proposed changes are reasonable, maintains safe plant conditions and, therefore, are acceptable.

3.1.2.2.4.12 TS 3.8.6 Change (12)

New Condition H will be added:

> Required Action and associated Completion Time of Condition A, C, D, E, or F not met.
>
> OR
>
> One or two batteries on one train with one or more battery cells with float voltage < 2.07 V and float current > 0.75 amp."

This Condition is modified by a NOTE:

> Only applicable to 1260 amp-hour rated batteries.

Condition H includes the following Required Action and CT:

> H. 1 Declare associated battery inoperable.

CT: Immediately

Evaluation of TS 3.8.6 Change (12)

The licensee proposed adding new Condition H to provide a default condition for battery parameters that fall outside the allowance of the Required Actions for Condition A, B, C, D, E or F. Condition H is the same as Condition G but is applicable to 1260 amp-hour rated batteries (float current > 0.75 amp). Under this condition, it is assumed that there is not sufficient capacity to supply the maximum expected load requirements. New Condition H also addresses the case where one or two batteries is found with one or more battery cells having a float voltage less than 2.07 V and a float current greater than 0.75 amp. Based on this information, the NRC staff finds that the proposed change is reasonable, maintains safe plant conditions and, therefore, is acceptable.

3.1.2.2.4.13 TS 3.8.6 Change (13)

C.1. New SR 3.8.6.1 will be added (existing SR 3.8.6.1 will be deleted):

The existing SR 3.8.6.1 "Verify battery cell parameters meet Table 3.8.6-1 Category A limits" and Table 3.8.6-1 are deleted and replaced with the following:

"Verify each battery float current is ≤ 1.50 amps for batteries rated at 1800 amp-hours.
Frequency: 7 days

This new SR is modified by a NOTE:

> Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1.

Evaluation of TS 3.8.6 Change (13)

The licensee proposed adding new SR 3.8.6.1, which will require verification that the float current for each battery is less than or equal to 1.50 amps every 7 days. The purpose of this SR is to determine the state-of-charge of the battery. Float charge is the condition in which the battery charger is supplying the continuous small amount of current (i.e., less than 1.50 amps) required to overcome the internal losses of a battery to maintain the battery in a fully charged state. The float current requirements are based on the float current indicative of a charged battery. As stated in the NRC staff evaluation of Section 3.1.2.2.4.1 [TS 3.8.6 change (1)], the use of float current to determine the state-of-charge of the battery is consistent with SONGS, Units 2 and 3 battery manufacturer recommendations and assures that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. Based on this information, the NRC staff finds that this change is reasonable, maintains safe plant conditions and, therefore, is acceptable.

3.1.2.2.4.14 TS 3.8.6 Change (14)

New SR 3.8.6.2 will be added (existing SR 3.8.6.2 will be deleted):

The existing SR 2.8.6.2 "Verify battery cell parameters meet Table 3.8.6-1 Category B limits" and Table 3.8.6-1 are deleted and replaced with the following:

> Verify each battery float current is ≤ 0.75 amp for batteries rated at 1260 amp-hours.
> Frequency: 7 day

This new SR is modified by a NOTE:

> Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1.

Evaluation of TS 3.8.6 Change (14)

The licensee proposed adding new SR 3.8.6.2, which will require verification that the float current for each battery is less than or equal to 0.75 amp every 7 days. The purpose of this SR is to determine the state of charge of the battery. Float charge is the condition in which the battery charger is supplying the continuous small amount of current (i.e., less than 0.75 amp) required to overcome the internal losses of a battery to maintain the battery in a fully charged state. The float current requirements are based on the float current indicative of a charged battery. As stated in the NRC staff evaluation of Section 3.1.2.2.4.1 [TS 3.8.6 change (1)], the use of float current to determine the state of charge of the battery is consistent with SONGS, Units 2 and 3 battery manufacturer recommendations and assures that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. Based on this information, the NRC staff finds that this change is reasonable, maintains safe plant conditions and, therefore, is acceptable.

3.1.2.2.4.15 TS 3.8.6 Change (15)

New SR 3.8.6.3 will be added:

> Verify each battery pilot cell voltage is ≥ 2.07 V.
> Frequency: 31 days

Evaluation of TS 3.8.6 Change (15)

The licensee proposed adding new SR 3.8.6.3, which will require verification that the float voltage of pilot cells are greater than or equal to 2.07 V every 31 days. This voltage level represents the point where battery operability is in question. In its June 5, 2008, response to a staff request for additional information, the licensee stated that it will modify its pilot cell selection process to select the two lowest voltage cells in the battery. The Battery Monitoring and Maintenance Program (in new TS Section 5.5.2.17) includes actions to restore battery cells with float voltage less than 2.13 V and actions to verify that the remaining cells are greater than or equal to 2.07 V when a cell or cells have been found to be less than 2.13 V and assures that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. The NRC staff finds that these changes are reasonable, maintain safe plant conditions and, therefore, are acceptable.

3.1.2.2.4.16 TS 3.8.6 Change (16)

New SR 3.8.6.4 will be added:

"Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits."
Frequency: 31 days

Evaluation of TS 3.8.6 Change (16)

The licensee proposed adding SR 3.8.6.4, which will require verification that the connected cell electrolyte level of each battery is greater than or equal to the minimum established design limits every 31 days. Operation of the batteries at electrolyte levels greater than the minimum established design limit ensures that the battery plates do not suffer physical damage and continue to maintain adequate electron transfer capability. The NRC staff finds that this change is adequate to ensure that minimum electrolyte levels are maintained and, therefore, is acceptable.

3.1.2.2.4.17 TS 3.8.6 Change (17)

Existing SR 3.8.6.3 will be modified and renumbered to SR 3.8.6.5:

"Verify each battery pilot cell temperature is greater than or equal to minimum established design limits."
Frequency: 31 days (revised from 92 days)

Evaluation of TS 3.8.6 Change (17)

The licensee proposed adding SR 3.8.6.5, which will require verification that the temperature of each battery pilot is greater than or equal to the minimum established design limits every 31 days.

As mentioned previously, the limiting design temperature for the SONGS, Units 2 and 3 battery cells when cross-tied is 60 °F. Each SONGS, Units 2 and 3 Class 1E battery is sized with correction factors that include temperature and aging. The licensee stated that battery room temperature is alarmed and periodically monitored by SONGS, Units 2 and 3 Operations as part of the operator's rounds. The SONGS, Units 2 and 3 battery rooms are contained in a separate environmentally controlled area outside the engineered safety feature switchgear rooms. The licensee stated that the first indication of a problem with battery temperature would be the actuation of a Control Room alarm when room temperature approaches 66 °F. According to the licensee, Operators would implement corrective measures in accordance with plant procedures and operating instructions. Based on these procedures and the fact that batteries have very large thermal inertia, the NRC staff finds that it is highly likely that a room temperature excursion would be corrected by the licensee prior to the battery electrolyte reaching its minimum temperature. Furthermore, SONGS, Units 2 and 3 operating experience has demonstrated a negligible difference in operating temperature (i.e., well within the 5 °F guidelines for temperature stability per IEEE Std. 450-2002) between the different battery cells. The

surveillance frequencies are consistent with the recommendations provided in IEEE Std. 450-2002 which is endorsed, in part, by RG 1.129, Rev. 2.
Based on this information, the NRC staff concludes that the pilot cell temperature is an accurate representation of the temperature of the battery bank. Therefore, the NRC staff concludes that this change is adequate to ensure that the minimum electrolyte temperature is maintained and, therefore, is acceptable.

3.1.2.2.4.18 TS 3.8.6 Change (18)

New SR 3.8.6.6 will be added:

> Verify each battery connected cell voltage is ≥ 2.07 V.
> Frequency: 92 days

Evaluation of TS 3.8.6 Change (18)

See Section 3.1.2.2.4.17 of this safety evaluation for the NRC staff evaluation of the licensee's proposal to add new SR 3.8.6.6.

3.1.2.2.4.19 TS 3.8.6 Change (19)

SR 3.8.4.8 will be renumbered and relocated as SR 3.8.6.7 and modified as follows:

> Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.

NOTES 1 and 2 are deleted:
The Frequency is modified:

> 60 months
>
> AND
>
> 12 months ---NOTE --- Only applicable when the battery shows degradation or has reached 85% of the expected life with capacity < 100% of the manufacturer's rating
>
> AND
>
> 24 months when the battery has reached 85% of the expected life with capacity > 100% of the manufacturer's rating

Evaluation of TS 3.8.6 Change (19)

The licensee proposed relocating existing SR 3.8.4.8 to new SR 3.8.6.7. The purpose of this SR is to demonstrate operability of the battery and is therefore more appropriate to be included in TS 3.8.6. The NRC staff finds that relocating SR 3.8.4.8 to new SR 3.8.6.7 is administrative and does not change any substantive requirement, and therefore, is acceptable.

The licensee proposed revising the wording of this SR to allow performance of a modified performance discharge test. In its June 5, 2008, response to a staff request for additional information, the licensee stated that intent for this modification was to perform the modified performance discharge test on 1800 amp-hour rated batteries in lieu of a performance discharge test. The licensee further noted that, in the future, only the modified performance discharge test will be performed on the 1800 amp-hour rated batteries. Performing the modified performance discharge test will provide the licensee with critical data for determining the battery's capability, capacity, and state-of-health and assures that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. Based on this information, the NRC staff finds that this change is reasonable, maintains safe plant conditions and, therefore, is acceptable.

The licensee proposed deleting Note 1. The NRC staff finds that Note 1 is no longer needed due to the upgraded capabilities of the DC system design (i.e., ability to cross-connect batteries and the availability of the BOOX battery) and the revised TS requirements that will be implemented as a result of this license amendment request. The licensee also proposed deleting Note 2 due to limited resources to fulfill this SR's requirements online; thus, the licensee will not credit unplanned events to satisfy this SR.

The acceptance criteria for this Surveillance are consistent with IEEE Std. 450-2002 which is endorsed, in part, by RG 1.129, Rev. 2. RG 1.129, Rev. 2, recommends that a vented lead-acid battery be replaced if its capacity is below 80% of the manufacturer rating. A capacity of 80% indicates that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this 80% limit.

The frequency for this surveillance test is normally 60 months. However, if the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the surveillance frequency is reduced to 12 months. If the battery shows no degradation but has reached 85% of its expected life, the surveillance frequency is reduced to 24 months for batteries that have capacity > 100% of the manufacturer's rating.

According to IEEE Std. 450-2002, degradation is indicated when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is > 10% below the manufacturer's rating.

Based on this information, the NRC staff finds that this change is reasonable, maintains safe plant conditions and assures that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met and, therefore, is acceptable.

3.1.2.2.5 TS 3.8.7 (Inverters - Operating) Changes

The licensee has proposed revising LCO 3.8.7 from "The required Train A, Train B, Train C, and Train D inverters shall be OPERABLE" to "The required Channel A, B, C, and D AC inverters shall be OPERABLE."

Evaluation of TS 3.8.7 Changes

The NRC staff reviewed the proposed change and has determined that the change more appropriately reflects the SONGS, Units 2 and 3 electrical system design, does not change any substantive requirement, and, therefore, is acceptable.

3.1.2.2.6 TS 3.8.9 (Distribution Systems - Operating) Changes

LCO 3.8.9 is revised from "Train A and Train B AC; Trains A, B, C, and D DC; and Trains A, B, C, and D AC vital bus electrical power distribution subsystems shall be OPERABLE" to "Train A and Train B AC, Subsystems A, B, C, and D DC, and Channels A, B, C, and D AC vital bus electrical power distribution systems shall be OPERABLE."

Condition A, Required Action A.1, and SR 3.8.9.1 are revised to change "electrical power distribution subsystem" to "electrical power distribution system." Required Action B.1 is revised as follows: "Restore AC vital bus to OPERABLE status."

Evaluation of TS 3.8.9 Changes

The NRC staff reviewed the proposed change and has determined that the change more appropriately reflects the SONGS, Units 2 and 3 electrical system design. The NRC staff also finds that the change is administrative in nature and does not change any substantive requirement, and therefore, is acceptable.

3.1.2.2.7 TS 3.8.10 (Distribution Systems - Shutdown) Changes

LCO 3.8.10 is revised to change "electrical power distribution subsystems" to "electrical power distribution systems."

Condition A, Required Actions A.2.4, and SR 3.8.10.1 are revised to change "electrical power distribution subsystem" to "electrical power distribution system."

Required Action A.2.5 is revised to change "shutdown cooling subsystem(s)" to "shutdown cooling system(s)."

Evaluation of TS 3.8.10 Changes

The NRC staff reviewed the proposed changes and has determined that the changes are administrative in nature and do not change any substantive requirement, and therefore, are acceptable.

3.1.2.2.8 TS 5.5 (Procedures, Programs, and Manuals)

SCE proposes adding new Battery Monitoring and Maintenance Program, TS Section 5.5.2.17. New TS Section 5.5.2.17 will state:

"This Program provides for battery restoration and maintenance, which includes the following:

a. Actions to restore battery cells with float voltage < 2.13 V, and

b. Actions to verify that the remaining cells are above 2.07 V when a battery cell or cells have been found less than 2.13 V, and
c. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates."

Evaluation of TS 5.5 Changes

The licensee proposed adding a new program, the Battery Monitoring and Maintenance Program, to be specified in new TS Section 5.5.2.17. The licensee stated that this program will be contained in the LCS, which is incorporated by reference in the SONGS, Units 2 and 3 FSAR. Thus, proposed changes to the program will be subject to evaluation under 10 CFR 50.59, "Changes, tests, and experiments," to whether the proposed changes require prior NRC review and approval. Additionally, any changes to the program would be required to be reported to the NRC in accordance with 10 CFR 50.71(e), "Maintenance of records, making of reports."

As noted above, the licensee provided a regulatory commitment in its November 30, 2007, letter, to relocate battery parameters of cell voltage, electrolyte level, electrolyte temperature, and float voltage from TS 3.8.6 to the proposed Battery Monitoring and Maintenance Program. The licensee provided an additional regulatory commitment to relocate the requirements of existing SRs 3.8.4.2 (connection resistance and visible corrosion), 3.8.4.3 (physical damage or deterioration), 3.8.4.4 (terminal connections), and 3.8.4.5 (connection resistance) from the TSs to the LCS.

Based on the above, the NRC staff has reasonable assurance that the battery parameter values will continue to be controlled at their current level, and actions to restore deficient parameters will be implemented in accordance with the licensee's corrective action program. Furthermore, the battery and its preventive maintenance and monitoring program continue to be subject to the regulatory requirements of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants."

The NRC staff finds that this change will continue to assure the battery is maintained at current levels of performance, and appropriately focuses operators on the monitoring of battery parameter degradations including provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner and, therefore, is acceptable.

3.1.3 SUMMARY

In its application, the licensee addressed the compliance of the proposed changes to the DC batteries with respect to the regulatory requirements in GDC 17 and 18.

Compliance with GDC 17 requires that onsite and offsite electrical power be provided to facilitate the functioning of structures, systems, and components important to safety. Each electric power system, assuming the other system is not functioning, must provide sufficient capacity and capability to ensure that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and that the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents. In addition, these onsite power

supplies and onsite electrical distribution systems have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure. The license e stated that the proposed changes to the TSs do not alter the basic alignment and operation of the existing Class 1 E 4kV, 480V, and 120VAC systems nor the 125VDC systems and, therefore the proposed design continues to comply with GDC 17.

With respect to the compliance with GDC 18, GDC 18 requires that electric power systems important to safety be designed to permit appropriate periodic inspection and testing of key areas and features to assess their continuity and the condition of their components. The licensee stated that the proposed changes to the TS continue to allow the flexibility and testability of the systems both during power and shutdown operations in order to meet the requirements of GDC 18 and, therefore, continues to comply with GDC 18.

Based on its review of the proposed changes to the DC batteries, the NRC staff agrees with the statements made above by the licensee that the DC batteries continue to comply with the requirements in GDC 17 and 18.

With respect to the requirements in 10 CFR 50.36, based on the electrical power evaluation in Section 3.1.2 above of this safety evaluation, the NRC staff finds that the proposed revisions to the SONGS, Units 2 and 3, TSs provide reasonable assurance of the continued availability of the required DC power to shut down the reactor and to maintain the reactor in a safe condition after an anticipated operational occurrence or a postulated design-basis accident. Therefore, based on this conclusion, the NRC staff further concludes that the proposed TS changes are in accordance with 10 CFR 50.36.

In Section 3.1.2 of this safety evaluation the NRC staff also concluded that the proposed changes to the DC batteries continue to meet 10 CFR 50.65.

Therefore, in summary, based on the electrical power review of the proposed changes to the DC batteries, the NRC staff concludes that these meet the regulatory requirements that are listed in Section 3.1.1 of this safety evaluation.

3.2 PROBABILISTIC RISK ANALYSES ASSESSMENT

3.2.1 Applicable Regulations

General guidance for evaluating the technical basis for proposed risk-informed changes is provided in Chapter 19.0, "Use of Probabilistic Risk Assessment (PRA) in Plant-Specific, Risk-Informed Decisionmaking: General Guidance," of the NRC Standard Review Plan (SRP), NUREG-0800. Guidance on evaluating PRA technical adequacy is provided in Chapter 19.1, "Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities." More specific guidance related to risk-informed TS changes is provided in SRP Section 16.1, "Risk-Informed Decisionmaking: Technical Specifications," which includes CT changes as part of risk-informed decisionmaking. Chapter 19.0 of the SRP states that a risk-informed application should be evaluated to ensure that the proposed changes meet the following key principles:

- The proposed change meets the current regulations, unless it explicitly relates to a requested exemption or rule change.

- The proposed change is consistent with the defense-in-depth philosophy.
- The proposed change maintains sufficient safety margins.
- When proposed changes increase core damage frequency or risk, the increase(s) should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.
- The impact of the proposed change should be monitored using performance measurement strategies.

RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Permanent Plant-Specific Changes to the Licensing Basis," dated November 2002, describes a risk-informed approach, acceptable to the NRC, for licensees to assess the nature and impact of proposed permanent licensing basis changes by considering engineering issues and applying risk insights.

RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated August 1998, identifies an acceptable risk-informed approach, including additional guidance geared toward the assessment of proposed TS CT changes. Specifically, RG 1.177 identifies a three-tiered approach for the licensees evaluation of the risk associated with a proposed CT TS change, as discussed below.

- Tier 1 assesses the risk impact of the proposed change in accordance with acceptance guidelines consistent with the Commission's Safety Goal Policy Statement, as documented in RG 1.174 and RG 1.177. The first tier assesses the impact on operational plant risk based on the change in ΔCDF and change in ΔLERF. It also evaluates plant risk while equipment covered by the proposed CT is out of service (OOS), as represented by ICCDP and ICLERP. Tier 1 also addresses PRA quality, including the technical adequacy of the licensee's plant-specific PRA for the subject application. Cumulative risk of the present TS change in light of past related applications or additional applications under review are also considered along with uncertainty/sensitivity analysis with respect to the assumptions related to the proposed TS change.
- Tier 2 identifies and evaluates any potential risk-significant plant equipment outage configurations that could result if equipment, in addition to that associated with the proposed license amendment, are taken OOS simultaneously, or if other risk-significant operational factors, such as concurrent system or equipment testing, are also involved. The purpose of this evaluation is to ensure that there are appropriate restrictions in place such that risk-significant plant equipment outage configurations will not occur when equipment associated with the proposed CT is implemented.
- Tier 3 addresses the licensee's overall configuration risk management program (CRMP) to ensure that adequate programs and procedures are in place for identifying risk-significant plant configurations resulting from maintenance or other operational activities and appropriate compensatory measures are taken to avoid risk significant configurations that may not have been considered when the Tier 2 evaluation was

configurations that may not have been considered when the Tier 2 evaluation was performed. Compared with Tier 2, Tier 3 provides additional coverage to ensure risk-significant plant equipment outage configurations are identified in a timely manner and that the risk impact of OOS equipment is appropriately evaluated prior to performing any maintenance activity over extended periods of plant operation. Tier 3 guidance can be satisfied by the Maintenance Rule (10 CFR 50.65(a)(4)), which requires a licensee to assess and manage the increase in risk that may result from activities such as surveillance testing and corrective and preventive maintenance, subject to the guidance provided in RG 1.177, Section 2.3.7.1, and the adequacy of the licensee's program and PRA model for this application. The CRMP is to ensure that equipment removed from service prior to or during the proposed extended CT will be appropriately assessed from a risk perspective.

More specific methods and guidelines acceptable to the NRC staff are also outlined in RG 1.177 for assessing risk-informed TS changes. Specifically, RG 1.177 provides recommendations for utilizing risk information to evaluate changes to TS CTs and surveillance test intervals (STIs), with respect to the impact of the proposed change on the risk associated with plant operation.

RG 1.174 and RG 1.177 also describe acceptable implementation strategies and performance monitoring plans to help ensure that the assumptions and analysis used to support the proposed TS changes will remain valid. The monitoring program should include means to adequately track the performance of equipment that, when degraded, can affect the conclusions of the licensee's evaluation for the proposed licensing basis change. RG 1.174 states that monitoring performed in accordance with the Maintenance Rule,10 CFR50.65, can be used when the monitoring performed under the Maintenance Rule is sufficient for the SSCs affected by the risk-informed application.

Additional applicable regulatory criteria/guidelines are identified in Section 5.2 of the licensee's submittal.

3.2.2 PRA TECHNICAL EVALUATION

The NRC staff has reviewed the licensee's analysis in support of its proposed license amendment, which are described in the original submittal dated December 17, 2004, as superceded by letter dated February 28, 2006 and as supplemented by letters dated January 26, February 9, and June 19, 2006.

The NRC staff has reviewed the licensee's analysis in support of its proposed license amendment, which are described in the original submittal dated December 17, 2004, as superseded by Revision 1 dated February 28, 2006, Revision 2 dated March 30, 2007, and Revision 3 dated November 30, 2007. The PRA branch completed its evaluation described below based on Revision 1, as supplemented by letter dated June 19, 2006. After completion of this review, the PRA branch evaluated the revised submittals including requests for additional information and has concluded that the evaluation below (which assumes a maximum 30 day completion time) is bounding for the 14 day CT requested in the letter dated November 14, 2008.

3.2.2.1 Detailed Description of the Proposed Change

The proposed TS change would permit a 125V DC 1E battery CT for up to 30 days (subsequently shortened to 14 days). The CT is dependent on the supported DC bus being realigned within two hours using the new battery crosstie capability to its same train bus that is supported by an operable battery. The ability to crosstie subsystems allows the plant to align two DC buses within the same train and remove a battery from service to perform testing or maintenance.

The licensee provided in Section 2, and attachments A, B, C, D, E, and F, of Revision 1 of the submittal the following information for SONGS, Units 2 and 3:

- The existing TSs proposed for change in this license amendment.
- Markups of the existing TSs proposed for change in this license amendment showing how the revised TSs would change the existing TSs.
- The proposed revised TSs.

The licensee also provided, for information, the bases for SONGS, Units 2 and 3, which were similarly modified to reflect the above changes.

3.2.2.2 Review of Methodology

Per SRP Chapter 19 and Section 16.1, the NRC staff reviewed the submittal using the three-tiered approach and the five key principles of risk-informed decisionmaking presented in RG 1.174 and RG 1.177. The APLA review scope and findings are limited to the evaluation of the risk impacts and did not evaluate the traditional engineering analysis, which is the responsibility of another division.

3.2.2.3 Key Information Used in the Review

The key information used in the NRC staff's review is contained in Sections 2, 3, 4, and 5 and Attachments I and K of Revision 1 of the LAR dated February 28, 2006, as supplemented by letter dated June 19, 2006. Revision 1 to the original December 17, 2004, submittal incorporated changes described in RAI responses dated January 26, 2006, and, February 9, 2006. The NRC staff also utilized the licensee's individual plant examination (IPE) and individual plant examination of external events (IPEEE) and the associated Staff Evaluation Reports (SERs).

3.2.2.4 Comparison Against Regulatory Criteria/Guidelines

The NRC staff's evaluation of the licensee's proposed LAR for changes to TSs 3.8.1, "AC Sources - Operating," 3.8.4, "DC Sources - Operating," 3.8.5, "DC Sources - Shutdown," 3.8.6, "Battery Cell Parameters," 3.8.7, "Inverters - Operating" and 3.8.9, "Distribution Systems - Operating" as well as the addition of TS 5.5.2.16, "Battery Monitoring and Maintenance Program," using the three-tier approach and the five key principles outlined in RGs 1.174 and 1.177, are presented in the following sections.

3.2.3 Traditional Engineering Evaluation

The traditional engineering evaluation addresses 5 key principles: 1) Compliance With Current Regulations, 2) Evaluations of Defense-in-Depth, 3) Evaluation of Safety Margins, 4) Risk Evaluation, and 5) Performance Measurement Strategies - Implementation and Monitoring Program. Key Principles 1, 2, 3, and 5 are addressed in Section 3.1 of the SE.

Key Principle 4: Risk Evaluation

The changes proposed by the licensee employ a risk-informed approach using risk insights to justify changes to CTs. The risk metrics ΔCDF, ΔLERF, ICCDP, and ICLERP, used by the licensee to evaluate the impact of the proposed changes, are consistent with those presented in RGs 1.174 and 1.177. The evaluation of the licensee's risk evaluation is provided in the following sections of this safety evaluation.

The evaluation presented below addresses the NRC staff philosophy of risk-informed decisionmaking, that when the proposed changes result in a change in CDF or risk, the increase should be small and consistent with the intent of the Commission's Safety Goal Policy Statement (i.e., Key Principle 4).

3.2.3.1 Tier 1: PRA Capability and Insights

The first tier evaluates the impact of the proposed changes on plant operational risk using the SONGS, Units 2 and 3 PRA model. The Tier 1 NRC staff review involves two aspects: (1) evaluation of the validity of the PRA and its application to the proposed changes and (2) evaluation of the PRA results and insights based on the licensee's proposed application.

PRA Quality

The objective of the PRA quality review is to determine whether the SONGS, Units 2 and 3 PRA used in evaluating the proposed 30-day battery CT is of sufficient quality, scope, and level of detail for this application. The NRC staff review evaluated the PRA quality information provided by the licensee in their submittal, including industry peer reviews results. The NRC staff also considered previous staff reviews, including the SONGS, Units 2 and 3 IPE and the IPEEE.

The SONGS, Units 2 and 3 IPE was submitted to the NRC on April 29, 1993. The IPE estimated a CDF due to internal events of 3E-05/yr. The licensee did not identify any vulnerabilities. A plant improvement related to the DC system was identified and implemented that added high-temperature annunciators to the ESF inverter/distribution rooms. The SER of the IPE, dated February 7, 1995, concluded (1) that the IPE was complete with regard to the information requested by Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities" and (2) that the results were reasonable given the SONGS, Units 2 and 3 design, operation, and history. The SER did not identify any significant weaknesses with the IPE and noted that station blackout and internal flooding are not dominant contributors to CDF. The NRC staff also reviewed the SONGS, Units 2 and 3 IPEEE. The SONGS, Units 2 and 3 IPEEE was developed in response to Generic Letter (GL) 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities." The NRC staff concluded in the SER dated September 29, 1999 that the SONGS, Units 2 and 3 IPEEE process was capable of identifying the most likely

severe accidents and severe accident vulnerabilities and, therefore, met the intent of GL 88-20, supplement 4. The licensee found no vulnerabilities associated with external events. The licensee provided a Level-1 seismic PRA assessment with a qualitative and quantitative Level-2 seismic containment analysis. The IPEEE estimated a mean seismic CDF of 1.7E-5/yr. The IPEEE fire analysis used a combination of the Electric Power Research Institute (EPRI) fire-induced vulnerability evaluation methodology fire frequency and fire protection system data and fire PRA methods. The IPEEE estimated a fire CDF of 1.65E-5/yr. High winds, floods, transportation, and other external events (HFO) were screened out consistent with staff guidance. Improvements noted in the IPEEE included: improving the reliability of cross-connecting the emergency diesel generators (EDG) between the two units, improving the seismic capacity of the Unit 2 EDG fuel oil transfer piping, and the coupling of adjacent electrical cabinets and panels to prevent interactions and relay chatter. No improvements were noted in the IPEEE with respect to fire initiators but the licensee indicated that additional improvements were planned based on previous studies and were credited in the IPEEE. The licensee confirmed through their RAI response that the seismic and fire models reflect the plant, including implemented improvements.

The SONGS, Units 2 and 3 PRA underwent an independent peer review by outside consultants between August 1996 and April 1997. The guidance documents used to perform the peer review included NUREG/CR-2300, "PRA Procedures Guide: A Guide to the Performance of PRAs for Nuclear Power Plants," NUREG/CR-4550, Revision1, "Analysis of Core Damage Frequency," EPRI TR-105396, "PSA Applications Guide," and NUREG-1489, "Review of Staff Uses of PRA." The licensee stated that the results of the peer review were documented in the SONGS, Units 2 and 3 PRA change package process and tracked in the PRA punch list database.

The SONGS, Units 2 and 3 PRA was evaluated again in June 2003 as a pilot application of the American Society of Mechanical Engineers (ASME) PRA Standard, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," ASME RA-S-2002, dated April 2002. The results of the ASME PRA Standard peer review were documented in WCAP-16165, Revision 0, "Pilot Application of ASME PRA Standard Peer Review Process For the San Onofre Nuclear Generating Station Units 2 and 3 PRA."

The licensee established that a capability category 2 for all supporting requirements was adequate for a risk-informed application, including this LAR. For capability categories found by the peer review to be less than category 2, the resolution of the associated facts and observations (F&O) provides the technical adequacy justification for the proposed LAR. The ASME peer review generated F&Os based on a review of the SONGS, Units 2 and 3 PRA against the ASME PRA standard. A total of 75 type A and B F&Os were identified by the review team. The licensee defined the A and B F&Os as, "[i]mportant and necessary to address to assure the technical adequacy of the PRA, the capability of the PRA or the robustness of the PRA update process." This definition is similar and appears to be bounded by industry guidance included in Nuclear Energy Institute (NEI) 00-02, "Industry PRA Peer Review Process Guidance (Rev. A3) Table C.7-4," "Level of Significance for Facts and Observations," as endorsed by RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities." Each F&O was classified by type of finding and its applicability to the licensee's proposed LAR. All 75 A and B F&OS were reviewed for impact on the proposed LAR. The licensee concluded that 10 F&Os had the potential to impact the LAR results. The licensee evaluated the impact on the LAR by

performing sensitivity analyses on the remaining 10 F&Os. Based on this evaluation, the licensee concluded that none of the F&Os impact the proposed LAR results or conclusions.

In addition, the licensee identified three supporting requirements with a peer review capability category 1 that were not associated with an F&O and required further evaluation by the licensee. The licensee concluded that for two of the supporting requirements, the impact to the base case and maintenance case would be equivalent for the proposed battery crosstie CT and therefore category 1 was acceptable for this LAR. The third F&O was associated with the comparison of PRA cutsets and dominant contributors for similar plants. The licensee addressed this F&O by comparing the SONGS, Units 2 and 3 results with other Combustion Engineering plants and confirming the similarity in plant results satisfying the capability category for this application.

In 2004, the NRC staff, with industry and NEI support, initiated a RG 1.200 implementation pilot program of which SONGS, Units 2 and 3 was a participant. The purpose of the RG 1.200 audit was to: (1) determine whether RG 1.200 and SRP 19.1 provide adequate guidance to demonstrate the technical adequacy of a PRA, (2) improve RG 1.200 and SRP 19.1, (3) identify additional technical issues requiring guidance, (4) determine whether ASME RA-S-2002, including the RA-Sa-2003 Addendum, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," as endorsed by RG 1.200, provides a sufficient basis for assessing technical adequacy, and (5) to assess the industry self assessment and peer review process in identifying weaknesses in PRAs. As part of the audit, the NRC staff independently assigned capability categories to each supporting requirement. Once completed the audit results were compared to the licensee's peer review results. The peer review team concluded that the SONGS, Units 2 and 3 PRA was adequate for addressing issues related to the proposed LAR, with some enhancements, as identified in the licensee's submittal.

During the NRC staff RG 1.200 pilot, the NRC staff noted that the licensee used the SONGS, Units 2 and 3 Safety Monitor risk model to develop the risk estimates for the proposed LAR risk evaluation, instead of quantified results from the SONGS, Units 2 and 3 PRA. The NRC staff was concerned that the Safety Monitor risk model technical adequacy was not adequately represented by the licensee self assessments and industry peer review. The licensee stated that both the SONGS, Units 2 and 3 PRA model and the Safety Monitor model are essentially the same. The differences identified were: (1) the Safety Monitor model logically subsumes some event tree sequences in a conversion to a "one-top" model, (2) the Safety Monitor model has allowances for code-specific differences and (3) the Safety Monitor model provides the ability for specific model configurations. To address the technical adequacy of the Safety Monitor for this LAR request, the licensee stated that the results from both models are compared regularly to ensure consistency between models. Models or data changes are incorporated into both the PRA and Safety Monitor codes and the results are confirmed to be consistent before general release. The licensee also confirmed that the peer review did include a review of the PRA and Safety Monitor results. The F&Os identified in the peer review pertaining to the Safety Monitor were unrelated to technical adequacy. However, the NRC staff RG 1.200 pilot and the peer review did express concern that the conversion of the SONGS, Units 2 and 3 PRA into a top logic model (Safety Monitor) raises the potential for eliminating valid results in the CDF and LERF quantification. The licensee provided additional information in their RAI response that demonstrated that sequence subsuming and cutset deletion in the SONGS, Units 2 and 3 top logic model were appropriate and did not adversely influence the risk estimates for this LAR.

Based on review of the above information, the NRC staff finds that the licensee has satisfied the intent of RG 1.177 (Sections 2.3.1, 2.3.2, and 2.3.3), RG 1.174 (Section 2.2.3 and 2.5), and SRP Chapter 19.1, and that the quality of the SONGS, Units 2 and 3 PRA is sufficient to support the risk evaluation provided by the licensee in the proposed license amendment.

PRA Results and Insights

The SONGS, Units 2 and 3 PRA was modified to incorporate the proposed design changes including the battery cross-tie extended CT for the class 125V DC 1E batteries. Changes to the model include the addition of circuit breakers, cross-tie switches, swing battery chargers, upgraded batteries, and associated maintenance data. Common cause factors were revised to reflect the additional equipment. The failure probabilities for the batteries and battery chargers were based on generic failure probabilities, updated with plant-specific data. The licensee, in their RAI response, revised the analysis to incorporate switches instead of breakers to help limit the potential for spurious actuation of the bus cross-tie feature. Operator actions for failing to cross-tie and to align the swing battery chargers were also incorporated for the proposed change. For this LAR, the swing battery chargers were not credited, with the corresponding operator action failed (i.e., 1). Truncation levels were confirmed by sensitivity analysis to be adequate for this LAR. There was very little asymmetry in the four battery subsystems. The licensee evaluated the LAR applicability to modes 2 through 4 by performing sensitivity studies for cross-tie operation during these modes. The evaluation results showed that performing the battery cross-tie during modes 2 through 4 provided risk estimates for ΔCDF, ΔLERF, ICCDP, and ICLERP within the acceptance guidelines of RG 1.174 and RG 1.177.

The above risk metrics were determined by adjusting the "average" PRA model, (i.e., a PRA model that includes contributions from nominal equipment maintenance unavailability). The risk estimates for ΔCDF and ΔLERF were estimated using mean outage times and a maintenance frequency that included service test and planned battery replacements. The estimates for ICCDP and ICLERP were also based on a nominal maintenance model, but incorporating the proposed 30-day duration of the CT. The licensee's methodology is consistent with the guidance of RG 1.177, Section 2.3.4 and Section 2.4 and is, therefore, acceptable to the NRC staff. The licensee's estimates for both preventive and corrective maintenance are given below in Table 1.

Table 1: Risk Results for Battery Cross-tie 30-Day Completion Time

Preventive Maintenance			
ΔCDF	ΔLERF	ICCDP	ICLERP
<2E-9/yr	<1E-10/yr	2E-9	<9E-11
Corrective Maintenance			
ΔCDF	ΔLERF	ICCDP	ICLERP
9.03E-8/yr	9.71E-9/yr	*3.76E-6**	*4.04E-7**

**Estimate does not meet the RG 1.177 acceptance guidelines.*

The risk impacts for the proposed extended battery crosstie CT were found to be within the RG 1.174 acceptance guidelines for very small changes of less than 1.0E-6/year for ΔCDF and less than 1E-7/year for ΔLERF for the proposed CT when in a preventive or corrective maintenance condition. The preventive maintenance condition ICCDP and ICLERP estimates are also within the RG 1.177 acceptance guideline of less than 5E-7 and 5E-8, respectively. However, the ICCDP and ICLERP for corrective maintenance are greater than the RG 1.177 acceptance guidelines. The ICCDP and ICLERP estimates are linear with respect to CT and reducing the maximum CT from 30 to 14 days would result in values about half the values reported in Table 1. Consequently the Corrective Maintenance values while smaller are still above RG 1.177 guidelines. The ΔCDF and ΔLERF are not linear with respect to CT but the estimates in Table 1 are bounding for the 14 day CT and well below the acceptance guidelines.

Based on the licensee's submittal and RAI response, the difference in the preventive and corrective modeling and risk metrics is attributable to the increased potential for common cause failure of the available batteries with a battery in corrective maintenance since the licensee did not credit an operability determination for the remaining available batteries in their risk analysis. In justifying the corrective maintenance results as conservative, the licensee indicated that instances of battery corrective maintenance have been infrequent with the majority of maintenance being preventive in nature. The licensee identified only one case during commercial operation where corrective maintenance on a battery was implemented under a TS action statement, but this maintenance was minor (jumper to available spare cell) and completed within the current battery CT of two hours. Other corrective maintenance activities, as identified by the licensee, did not require entry into the TS action or did not involve a battery that could not perform its safety function. The licensee also stated that the SONGS, Units 2 and 3 battery trending and surveillance program is proactive in nature and is based on predictive battery replacement intervals. As such, a battery does not normally exhibit rapid failure, but degrades over time allowing replacement based on trending and surveillance results. Based on this program, and the observed infrequent entry into corrective maintenance, an immediate failure of a battery involving corrective maintenance is unlikely. Additionally, the licensee's downtime frequency, mean outage duration, and no credit for a common cause evaluation (i.e., operability assessment of the other batteries) appear to be conservative estimates with respect to plant corrective maintenance experience.

To address the increased common cause potential for the remaining available batteries under corrective maintenance, the licensee committed to perform an operability assessment of the remaining available batteries to verify that a common cause condition does not exist when any 1E battery is made inoperable due to failure. Procedures and operating instructions will also include confirmation that the appropriate subsystems are available prior to crosstie implementation. The addition of an operability assessment should limit the impact of battery common cause failure for corrective maintenance and make the configuration risk results similar to preventive maintenance.

The licensee, as part of the DC system upgrade and incorporation of TSTF-360 and IEEE 450-2002 standard practice also proposed additional TS changes that were not risk-informed per TSTF-360. The risk impact of these additional changes (including STIs and CTs were qualitatively evaluated by the licensee and confirmed to be addressed specifically by TSTF-360 and IEEE 450-2002 on a deterministic basis and were not specifically part of the risk-informed evaluation of the proposed battery cross-tie 30-day CT. The licensee, in their RAI response, identified eight associated TS changes that may have a risk impact on the proposed

LAR. Four of the TS changes involved CT extensions and four of the changes involve additional battery requirements, reduced surveillance intervals and a new TS section for battery monitoring and maintenance. To confirm that the risk impact of the additional TS changes that were not risk informed per TSTF-360, the licensee performed a sensitivity study to evaluate the risk impact of the four CT changes. The licensee's risk evaluation estimated an insignificant increase in CDF and LERF. With all eight changes implemented, the licensee qualitatively estimated the risk to be risk neutral to risk beneficial. Shortening the maximum CT from 30 to 14 days reduces all potential risk increases associated with implementing this TS change and therefore the sensitivity study's conclusions remain valid.

Based on the above, although the calculated ICCDP and ICLERP for an extended battery crosstie of 14 days for corrective maintenance is not within the acceptance guidance of RG 1.177, the performance of an operability assessment of the unaffected batteries would address the potential for common cause failure and provide results similar to the preventive maintenance condition, which are well within the RG 1.177 acceptance guidelines. Therefore, The NRC staff finds the licensee's risk assessment, including the licensee's operability assessment for corrective maintenance reasonable and therefore acceptable to the NRC staff.

Cumulative Risk

Cumulative risk of the present TS change in light of past applications or additional applications under review were also considered by SONGS, Units 2 and 3. The licensee confirmed that all previous changes have been implemented in the plant and incorporated into the SONGS, Units 2 and 3 PRA. Changes include previous risk-informed CT extensions and the risk-informed in-service testing program.

External Events

The licensee evaluated the proposed battery CT extensions for their potential impact on external events including fire, seismic events, and HFO events. These events are discussed below:

Seismic

The licensee's evaluation of seismic risk contribution in the SONGS, Units 2 and 3 PRA is based on the SONGS, Units 2 and 3 IPEEE. The licensee stated that, based on the analysis done in the IPEEE the batteries were screened from further analysis and were not explicitly included in the PRA model. Because the new B009 and B010 batteries are of higher capacity and therefore heavier, the licensee reevaluated the battery racks and concluded that the seismic fragility is still greater than that estimated for the batteries in the IPEEE. However, batteries B007 and B008 have yet to be evaluated. The licensee committed that when these batteries are upgraded, the associated battery racks will be reevaluated and confirmed to be seismically robust (i.e., greater than that estimated in the IPEEE) or revise the seismic risk contribution and confirm the preventive maintenance results remain within the RG 1.174 and RG 1.177 acceptance guidelines. No seismic modeling changes were required for the replacement batteries.

The licensee's seismic PRA was independently peer reviewed against the ANSI[American National Standards Institute]/[American Nuclear Society]ANS-58.21-2003, External-Events PRA

Methodology. Although the NRC staff has not endorsed ANSI/ANS-58.21-2003, the NRC staff considers the licensee's peer review of the seismic PRA a positive attribute of the SONGS, Units 2 and 3 external event PRA development. The review was documented in EPRI 100907, "Trial Plant Review of an ANS External Event PRA Standard" dated 2003. The review concluded that the SONGS, Units 2 and 3 seismic PRA met the requirements of Capability Category 2 in most cases, with some supporting requirements at Capability Category 1. Based on the licensee stating the peer review comments with respect to meeting Capability Category 2 were centered on uncertainty analysis there should be little impact on the proposed 14 day battery crosstie CT evaluation with respect to seismic risk. The seismic PRA results are quantitatively included in the licensee's overall risk estimate for this LAR.

Fires

The licensee stated that the fire PRA was also independently reviewed in October 2000 as part of the licensee's fire protection self assessment. This review identified the following two issues.

- The original fire analysis assumed that any fire would result in the maximum consequential damage independent of the fire location in the room resulting in an overly conservative analysis. The licensee stated that this issue was identified with the safety-related Train A and B switchgear rooms.

- Only a large fire was analyzed for the auxiliary feedwater (AFW) pump room with smaller damaging fires excluded, which was considered non-conservative.

The licensee revised the risk analysis for both the switchgear rooms and AFW rooms to address the findings, which resulted in revised fire CDF estimates for each zone. Changes to the switchgear room analysis included the elimination of overly conservative assumptions. The AFW analysis was revised to include additional fire scenarios. Based on the licensee's RAI responses, these changes are reflected in the proposed extended battery CT LAR.

In addition, the licensee increased the event frequencies for the DC bus rooms D1 and D2 from 2.1E-5/year to 4.2E-5/year based on the additional swing battery chargers (i.e., DC buses D1 and D2) based on the increased fire load with the new chargers installed per the proposed LAR. The above revisions to the fire PRA are quantitatively included in the licensee's overall risk estimate, provided previously in Table 1 for the proposed extended battery CT LAR.

HFO External Events

The SONGS, Units 2 and 3 IPEEE SER states that non-tornado high winds were screened based on the SONGS, Units 2 and 3 plant design conforming to the 1975 SRP. Tornado winds were also screened based on meeting the NUREG-1407 screening criteria. No vulnerabilities to tornado missiles were identified by the licensee.

The IPEEE assessed external floods and concluded that the dominant flood hazard was due to a probable maximum precipitation from a thunderstorm. The licensee analysis concluded that no safety-related equipment would be affected.

Other events including transportation and nearby facility accidents, were screened out in the IPEEE based on hazard frequency. The licensee stated that these risks are re-evaluated on a

tri-annual basis. The most recent study dated October 2005 confirmed that these events can continue to be screened out.

Based on its review, the NRC staff concluded that the proposed TS changes would have only a limited impact on the risk from external events.

Shutdown and Transition Risk (extended battery CT)

The licensee did not provide an assessment of shutdown or transition risk. The NRC staff notes that the additional benefit to transition risk would only occur when unscheduled corrective maintenance could not be completed within the proposed TS CT. For failures occurring during a surveillance, transition risk should be considered, but this should have a limited impact on the analysis based on plant operational history (only one corrective battery maintenance TS entry was noted and it did not exceed the TS CT). For the proposed 14-day 120V DC 1E battery CT, a shutdown and/or transition risk evaluation associated with corrective maintenance is not representative of the configuration most likely to be encountered for the proposed CT. Therefore, with respect to the proposed extended 14-day battery CT, the shutdown risk averted may provide a qualitative risk benefit, but is not credited or quantified in the risk evaluation performed by the licensee.

3.2.3.2 Tier 2 - Avoidance of Risk-Significant Plant Configurations

A licensee should provide reasonable assurance that risk-significant plant equipment outage configurations will not occur when specific plant equipment is taken OOS in accordance with the proposed TS change. However, a specific Tier 2 evaluation was not referenced in the licensee's LAR. In response to RAIs, the licensee stated that because of the very small risk increase when using the battery crosstie configuration with a fully qualified alternate power source, no Tier 2 risk significant configurations were identified. In a subsequent RAI response, the licensee used the SONGS, Units 2 and 3 Safety Monitor software to compare the risk ranking of available components during a same-train DC subsystem battery crosstie configuration against the base case (i.e., no battery crosstie with batteries available). The risk ranking provided the risk for each component assuming that component was unavailable. The risk importance comparison showed that the difference in component risk ranking for each configuration was insignificant. The licensee identified only one potential high-risk configuration associated with the battery cross-tie, which involves the removal of the opposite train battery charger without aligning an equivalent swing battery. However, this configuration is limited by TS to two hours and would not be entered voluntarily using the SONGS, Units 2 and 3 risk management program.

Based on the above, and considering the very small risk increase noted for the battery crosstie configuration, the NRC staff finds the licensee's Tier 2 evaluation of potential risk significant configurations supports the implementation of a battery crosstie at SONGS, Units 2 and 3 and is acceptable to the NRC staff.

3.2.3.3 Tier 3 - Risk-Informed Configuration Risk Management

The licensee stated that its Tier 3 Maintenance Rule Risk Management Program (MRRMP) is implemented per the guidance of RG 1.177, Section 2.3.7.2, "Key Components of the [Configuration Risk Management Program] CRMP," and integrated into the requirements of the

Maintenance Rule, 10 CFR 50.65(a)(4). The MRRMP is controlled and implemented through plant procedure SO123-XX-10. These programs and procedures provide for the assessment and management of the risk of various plant configurations as required by the Maintenance Rule 10 CFR 50.65(a)(4). The licensee's MRRMP includes the following elements.

- Work control initially assesses planned risk configurations using the Safety Monitor during work planning and again a week prior to the work being performed to ensure that no unacceptable risk configurations will occur.

- If a high-risk configuration is identified the licensee attempts to modify the schedule to reduce risk using the action thresholds of the MRRMP. Risk management actions are employed when a high-risk configuration cannot be controlled through schedule modification.

- The licensee also runs the Safety Monitor on a per shift basis to assess the current plant configuration. The Safety Monitor is run for emergent plant configurations as time allows.

Based on the licensee's conformance to the requirements of the Maintenance Rule, 10 CFR 50.65, and the guidelines of RG 1.177, the NRC staff finds the licensee's Tier 3 program satisfies the Tier 3 guidance of RG 1.177 with regards to the proposed extended 14-day battery crosstie CT.

3.2.4 Comparison With Regulatory Guidance

The proposed change to provide an extended battery crosstie CT meets the acceptance guidance of RG 1.174 and 1.177 and the guidance outlined in Chapter 19.0, "Use of Probabilistic Risk Assessment in Plant-Specific, Risk-Informed Decisionmaking: General Guidance," and Chapter 16.1, "Risk-Informed Decisionmaking: Technical Specifications," of the NRC's SRP, NUREG-0800.

3.2.5 Staff Findings and Conditions

The risk impacts for the proposed extended battery crosstie CT are within the RG 1.174 and RG 1.177 acceptance guidelines for ΔCDF, ΔLERF, ICCDP, and ICLERP with credit for the licensee's commitments. The Tier 2 analysis provides reasonable assurance that risk-significant plant equipment outage configurations will not occur when specific plant equipment is taken out of service in accordance with the proposed TS change. The licensee's Tier 3 CRMP is consistent with the RG 1.177 CRMP guidelines. The associated implementation and monitoring program is in accordance with the Maintenance Rule, 10 CFR 50.65. The proposed extended battery crosstie CT of 30 days satisfies the fourth key principle of risk-informed decisionmaking identified in RG 1.174 and RG 1.177 and is therefore acceptable for implementing risk-informed decisionmaking.

3.3 ELECTRICAL AND PRA EVALUATION CONCLUSION

Based on the conclusion in Sections 3.1.3 (Electrical Evaluation) and 3.2.5 (PRA Evaluation), the NRC staff concludes that the proposed amendment meets the appropriate regulatory requirements for the proposed changes to the DC batteries. Based on this, the NRC staff concludes that the proposed amendment is acceptable.

3.4 REGULATORY COMMITMENTS

The licensee provided the following regulatory commitments in Attachment H to its November 14, 2008, supplemental letter:

1. Include minimum established float voltage of ≥129.0 V in proposed TS Bases and LCS.

2. Relocate the requirements of existing SRs 3.8.4.2 (connection resistance, visible corrosion), 3.8.4.3 (physical damage or deterioration), 3.8.4.4 (terminal connections), and 3.8.4.5 (connection resistance) from the TSs to the LCS. Change frequency of existing SR 3.8.4.2 from 92 days to 31 days in LCS.

3. Relocate specific gravity monitoring to the proposed Battery Monitoring and Maintenance Program. This specific gravity monitoring will be performed prior to each battery discharge test.

4. Relocate battery parameters of cell voltage, electrolyte level, electrolyte temperature, and float voltage from TS 3.8.6 to the proposed Battery Monitoring and Maintenance Program.

5. Maintain a capacity margin (presently 2%) to account for the uncertainty in the battery capacity assigned by the manufacturer for allowed float current limit of 1.50 amps for 1800 amp-hour batteries and 0.75 amp for 1260 amp-hour batteries.

6. Appropriate design features will be added to measure float charging current when a swing battery charger is aligned to a Class 1E subsystem battery.

7. Include appropriate battery maintenance practices from industry standard IEEE 450-2002, and Reg. Guide 1.129, Rev. 2, Positions 1,2,3,6,and 8 in the new LCS.

8. Include minimum established float voltage values for the battery charger in the new LCS Bases.

9. Revise Operations procedure to provide ability to power a spare battery charger from a diesel-backed source. This includes having all preparations in place prior to the 72-hour CT.

10. Equipment that will be used to monitor float current will have the necessary accuracy and capability to monitor electrical current in the expected range.

The NRC staff finds that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the regulatory commitments are best provided by the licensee's administrative processes, including its commitment management program. The regulatory commitments do not warrant the creation of regulatory requirements (items requiring prior NRC approval of subsequent changes).

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding published May 6, 2008 (73 FR 25045). 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: M. McConnell, C. Doutt

Date: November 28, 2008

November 28, 2008

R.T. Ridenoure - 2 -

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

Sincerely,
/RA by Jack N. Donohew for/

N. Kalyanam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosures: 1. Amendment No. 218 to NPF-10
2. Amendment No. 211 to NPF-15
3. Safety Evaluation

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