ATTACHMENT 1

EXISTING LICENSE CONDITIONS AND TECHNICAL SPECIFICATIONS

3. This license shall be deemed to contain and is subject to the conditions as specified in the following Commission regulations (Title 10, CFR, Chapter 1): Part 20, Sections 50.54 and 50.59 of Part 50, Section 70.32 of Part 70, Section 40.41 of Part 40 and Section 30.34 of Part 30; is subject to all applicable provisions of the Act and rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified below:

A. Maximum Power Level

Edison is authorized to operate the reactor at steady state power levels up to a maximum of 1347 megawatts thermal.

B. Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 131 are hereby incorporated in the license. Southern California Edison Company shall operate the facility in accordance with the Technical Specifications, except where otherwise stated in specific license conditions. 131 11/15/89

C. Spent Fuel Transshipment

The licensee is authorized to transship spent fuel from the Unit 1 spent fuel pool to the Unit 2 and 3 spent fuel pools in accordancewith licensee's application for amendment dated April 28, 1988, as supplemented April 25, June 10, September 23, October 18, November 10, and December 1, 1988.

This authorization is limited to those activities needed for transshipment only. The matter of heavy load handling using the turbine gantry crane for purposes other than transshipment is being reviewed separately. 116 12/2/88

The licensee may make changes to the transshipment method referenced above without prior NRC approval only if the change does not involve an unreviewed safety question as defined in 10 CFR 50.59.

D. The facility may be modified by implementing the "Sphere Enclosure Project" as described in Amendment 52 to the Final Safety Analysis for the San Onofre Nuclear Generating Station, Unit 1, submitted December 3, 1975; Supplement to the Sphere Enclosure Project Report, submitted March 1, 1976; Second Supplement to the Sphere EnclosureReport submitted March 25, 1978; additional information submitted by letter dated March 25, 1976 (withheld from public disclosure pursuant to 10 CFR Part 2, Section 2.790(d)). 20 4/2/77

E. Steam Generator Inspections

During the refueling outage scheduled to begin no later than November 30, 1985, Southern California Edison shall perform an inspection of the steam generators. The inspection program shall be submitted to the Commission at least 45 days prior to the scheduled shutdown. Commission approval shall be obtained before resuming power operation following this inspection. 89 6/5/85

F. Deleted 37 10/31/78

G. Physical Protection

SCE shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain Safeguards Information protected under 10 CFR 73.21, are entitled: "San Onofre Nuclear Generating Station, Units 1, 2, and 3 Physical Security Plan," with revisions submitted through April 22, 1988; "San Onofre Nuclear Generating Station, Units 1, 2, and 3 Security Force Training and Qualification Plan," with revisions submitted through October 22, 1986; and "San Onofre Nuclear Generating Station, Units 1, 2, and 3, Safeguards Contingency Plan," with revisions submitted through December 29, 1987. Changes made in accordance with 10 CFR 73.55 shall be implemented in accordance with the schedule set forth therein. 108 9/6/88 & NRC ERRATA 10/17/88

H. Fire Protection

The licensee may proceed with and is required to complete the modifications identified in Paragraphs 3.1.1 through 3.1.17 of the NRC's Fire Protection Safety Evaluation (SE), dated July 19, 1979 for the facility. These modifications will be completed in accordance with the schedule in Table 3.1 of the SE and supplements thereto. 44 7/19/79

In addition, the licensee shall submit the additional information identified in Table 3.2 of this SE in accordance with the schedule contained therein. In the event these dates for submittal cannot be met, the licensee shall submit a report, explaining the circumstances, together with a revised schedule.

The licensee is required to implement the administrative controls identified in Section 6 of the SE. The administrative controls shall be in effect within 90 days from the date of issuance of this amendment.

I. DELETED 91 11/14/85

J. Integrated Implementation Schedule

Southern California Edison Company shall implement a plan for scheduling all capital modifications based on the Integrated Implementation Schedule Program Plan (the "Plan") issued in License Amendment No. 98 on April 20, 1987. 98 4/20/87

(1) The Plan shall be followed by the licensee from and after the effective date of this amendment.

(2) Changes to completion dates for items identified in Schedules B and C do not require a license amendment. Dates specified in Schedule A shall be changed only in accordance with applicable NRC procedures.

K. Post Accident Sampling System (PASS), NUREG-0737, Item 11.B.3

1) By July 1, 1986 or startup from the Cycle IX refueling outage, whichever is earlier, SCE shall install a PASS and implement a post-accident sampling program at San Onofre Unit 1. 85 11/23/84

2) Prior to the date in (1) above or until the PASS is operable, SCE shall maintain in effect those compensatory measures described in the SCE letter, dated August 14, 1984.

L. Diesel Generators

The following requirements shall apply to the standby diesel generators:

(1) Approval to increase total connected loads on each diesel engine to 6000 kW or less is granted pending completion of NRC review of the crankshaft crack propagation analysis prepared by Failure Analysis Associates. This approval will remain in effect for up to 50 start-stops on each engine since the last inspection or until the end of Cycle 10, whichever comes first.

(2) A diesel engine maintenance and surveillance program as described in the Safety Evaluation related to Amendment No. 123 to Provisional Operating License No. DPR-13 is to be implemented. Changes to this program will be subject to the provisions of 10 CFR 50.59.

(3) The frequency of the major diesel engine overhauls shall be consistent with Section IV.1, "Overhaul Frequency," in Revision 2 of Appendix II of the Design Review/Quality Revalidation Report that was transmitted by letter dated June 20, 1986. from M. O. Medford, (SCE) to G. E. Lear, (NRC).

123
4/14/89

(4) Oil hole locations in the five most heavily loaded main journals, i.e., journals 8 through 12 on each crankshaft shall be inspected at each refueling outage with liquid penetrant. Indications found shall be evaluated with eddy current testing as appropriate.

During each major engine overhaul, the fillets of the most highly loaded main journals (Nos. 4 through 12) should be inspected together with the oil holes, using liquid penetrant. Indications found shall be evaluated with eddy current testing as appropriate. In addition, these inspections should be performed for the oil holes and fillets in at least three of the crankpin journals at each major engine overhaul.

If during the refueling outage inspections or the major engine overhaul inspections referred to above, cracks are found in the oil holes or in other crankshaft surfaces, these findings are to be reported to the NRC within 24 hours. The affected engine is to be considered inoperable and is not to be restored to operable status until the disposition and/or corrective actions have been approved by the NRC staff.

(5) Cylinder blocks shall be inspected for "ligament" cracks, "stud-to-stud" cracks and "stud-to-end" cracks as defined in the report* by Failure Analysis Associates, Inc. (FaAA) entitled "Design Review of TDI R-4 and RV-4 Series Emergency Diesel Generator Cylinder Blocks" (FaAA Report No. FaAA-84-9-11.1) and dated December 1984. (Note that the FaAA report specifies additional inspections to be performed for blocks with "known" or "assumed" ligament cracks.) The inspection intervals (i.e., frequency) shall not exceed the intervals calculated using the cumulative damage index model in the subject FaAA report. In addition, inspection methods shall be consistent with or equivalent to those identified in the subject FaAA report.

Blocks determined in the future to have "ligament" cracks as the result of the above inspections should be inspected at each refueling outage to determine whether or not cracks have initiated on the top surface, which was exposed because of the removal of two or more cylinder heads. This process should be repeated over several refueling outages until the entire block has been inspected. If after this process has been completed new "ligament" cracks are found, this process should again be repeated. Liquid penetrant testing or a similarly sensitive nondestructive testing technique should be used as appropriate to determine the depth of any cracks discovered. 123 4/14/89

Whenever diesel generator No. 1 is operated in excess of 4375 kW for one hour or more, a visual inspection of the right bank cylinder block is to be performed under intense light within 48 hours after engine shutdown to verify the absence of "stud-to-stud" and "stud-to-end" cracks.

If "stud-to-stud" or "stud-to-end" cracks are found, these findings are to be reported to the NRC within 24 hours. The affected engine is to be considered inoperable and is not to be restored to operable status until the disposition and/or corrective actions have been approved by the NRC staff.

(6) All diesel starts for testing and surveillance will be slow starts (greater than 24 seconds duration) except for the fast start required by Technical Specification 4.4.F conducted once per 18 months during shutdown and any other fast start required following specific maintenance involving the fast start capability.

*This report was transmitted to H. R. Denton, (NRC), from C. L. Ray, Jr., (TDI Owners Group), by letter dated December 11, 1984. 123 4/14/89

M. Cycle X Thermal Shield Monitoring Program

The neutron noise/loose-parts detection system shall be used to monitor the condition of the reactor vessel thermal shield throughout Cycle X or until repair. Periodic monitoring of both neutron noise and loose-parts vibrations confirms that no long term unacceptable trend of degradation is occurring. The details of this program are described below.

(1) The unit will be shut down no later than June 30, 1990 to inspect the condition of the thermal shield.

(2) During the first 7 days of $\geq$ 85% power, interim acceptance criteria for neutron noise/loose-parts monitoring will be developed. These interim criteria will be utilized until the final acceptance criteria is developed.

Final acceptance criteria for neutron noise/loose-parts monitoring will be established by performing baseline evaluations for 45 calendar days at $\geq$ 85% power following return to service for Cycle X operation. The base line data will be established by recording a minimum of 16 segments of data information, each of 20 minute duration at $\geq$ 85% power. Adjustments to the acceptance criteria will be made for cycle burnup and boron concentration changes throughout the cycle. 127 5/15/89

(3) The neutron noise/loose-parts monitoring system shall be OPERABLE in MODE 1 with:

a) At least two horizontal loose-parts detectors monitored for at least five (5) minutes 2 times per day; and,

b) at least three (3) neutron noise inputs monitored for at least twenty (20) minutes once a week, and be analyzed for cross power spectral density, including phase and coherence.

(4) The data provided by the loose-parts/neutron noise monitor shall be analyzed once per week and compared with the established criteria. If the data exceeds the acceptance criteria:

a) Within 1 day the NRC will be informed of the exceedance.

b) Within 14 days the conditions will be evaluated and a report provided to the NRC documenting future plans and actions.

c) The plant will be shutdown should the remaining flexure be demonstrated failed.

(5) Each channel of the loose-part detection system shall be demonstrated OPERABLE in MODE 1 by performance of a:

a) CHANNEL CHECK at least once per 24 hours

b) CHANNEL TEST at least once per 31 days

The surveillance requirements for neutron noise monitor are covered by the Appendix A Technical Specification 4.1.1 for the Power Range Neutron Flux.

(6) With the neutron noise/loose-parts detection instrumentation inoperable for more than 7 days, licensee shall submit a Special Report to the Commission pursuant to Appendix A Technical Specification 6.9.2 within the next 3 days outlining the cause of the malfunction and the plans for restoring the system to operable status. 127 5/15/89

(7) In the case of a seismic event of 0.25g or greater as indicated on site sensors, a controlled shut down shall be initiated. Before operations are resumed, it will be demonstrated that no thermal shield damage has occurred due to the seismic event.

(8) The provisions of Appendix A Technical Specification 3.0.4 are not applicable to this license condition.

3.7 AUXILIARY ELECTRICAL SUPPLY

3.7.1 ELECTRICAL SUPPLY: OPERATING

APPLICABILITY: MODES 1, 2, 3, and 4

OBJECTIVE: To define those conditions of electrical power availability necessary to provide for safe reactor operation and to provide for the continuing availability of engineered safeguards.

SPECIFICATION:

a. One Southern California Edison Company and one San Diego Gas & Electric Company high voltage transmission line to the switchyard and two transmission circuits from the switchyard, one immediate and one delayed access, to the onsite safety-related distribution system shall be OPERABLE. This configuration constitutes the two required offsite circuits.

b. Two redundant and independent diesel generators shall be OPERABLE each with:

    1. A separate day tank containing a minimum of 290 gallons of fuel,

    2. A separate fuel storage system containing a minimum of 37,500 gallons of fuel, and

    3. A separate fuel transfer pump.

c. Train A Emergency AC Buses shall be OPERABLE, comprised of:

    1. 4160 volt Bus 1C,
    2. 480 volt Buses 1 and 3, and associated station service transformers with tie breaker open.

d. Train B Emergency AC Buses shall be OPERABLE, comprised of:

    1. 4160 volt Bus 2C,
    2. 480 volt Buses 2 and 4, and associated station service transformers with tie breaker open.

e. 120 volt AC Vital Buses 1, 2, ~~3,~~ 3A, and 4 energized from associated inverters connected to DC Bus 1.

f. 120 volt AC Vital Buses 5 and 6 energized from associated inverters connected to DC Bus 2.

g. 125 volt DC Bus 1 shall be OPERABLE and energized from Battery No. 1, with at least one full capacity charger.

h. 125 volt DC Bus 2 shall be OPERABLE and energized from Battery No. 2, with at least one full capacity charger.

i. Two trains of Safeguards Load Sequencing Systems (SLSS) shall be OPERABLE.*

j. The MOV-850C Uninterruptible Power Supply (UPS) OPERABLE and energized from the battery with its full capacity charger.**

k. Manual Transfer Switch 7 (MTS-7) shall be OPERABLE and energized from MCC-2.

l. Manual Transfer Switch 8 (MTS-8) shall be OPERABLE and energized from MCC-4.

ACTION:

A. With one of the required offsite circuits inoperable, demonstrate the operability of the remaining AC sources by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 24 hours. Restore the circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

B. If one diesel generator is declared inoperable, demonstrate the operability of the two offsite transmission circuits and the remaining diesel generator by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 24 hours. Restore the inoperable diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

C. With one offsite circuit and one diesel generator of the above required AC electrical power sources inoperable, demonstrate the operability of the remaining AC sources by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 8 hours. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Have at least two offsite circuits and two diesel generators OPERABLE within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

D. With one diesel generator inoperable as in B or C above, verify that: (1) all required systems, subsystems, trains,

---

*The automatic load function may be blocked in Mode 3 at a pressurizer pressure $\leq$ 1900 psig.

**Applicable in MODES 1, 2, and 3 above 500 psig.

components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE; and (2) the steam-driven auxiliary feedwater pump is OPERABLE in MODES 1, 2, and 3. If these conditions are not satisfied within 2 hours, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

E. With two required offsite circuits inoperable, demonstrate the operability of two diesel generators by performing Surveillance Requirement B.1.a of Technical Specification 4.4 within 8 hours, unless the diesel generators are already operating. Restore at least one of the inoperable sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 4 hours. Have at least two offsite circuits and two diesel generators OPERABLE within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

F. With two of the above required diesel generators inoperable, demonstrate the operability of two offsite circuits by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 2 hours thereafter. Restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

G. With less than the above trains of Emergency AC buses OPERABLE, restore the inoperable buses within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

H. With one AC Vital Bus either not energized from its associated inverter, or with the inverter not connected to its associated DC Bus: (1) re-energize the AC Vital Bus within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and (2) re-energize the AC Vital Bus from its associated inverter connected to its associated DC bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

I. With one DC bus inoperable or not energized from its associated battery and at least one full capacity charger, re-energize the DC Bus from its associated battery and at least one full capacity charger within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

J. With one Safeguards Load Sequencing System inoperable, restore the inoperable sequencer to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

K. With the MOV-850C UPS inoperable, or not energized from its associated battery and its full capacity charger, restore the UPS to OPERABLE status and re-energize the UPS from its associated battery and its full capacity charger within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

L. With MTS-7 inoperable or not energized from MCC-2, restore MTS-7 to OPERABLE status and re-energize MTS-7 from MCC-2 within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

M. With MTS-8 inoperable or not energized from MCC-4, restore MTS-8 to OPERABLE status and re-energize MTS-8 from MCC-4 within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

BASIS: The station is connected electrically to the Southern California Edison Company and San Diego Gas & Electric Company system via either of two physically independent high voltage transmission routes composed of four Southern California Edison Company high voltage lines and four San Diego Gas & Electric Company high voltage lines.

Of the four Southern California Edison Company lines, any one can serve as a source of power to the station auxiliaries at any time. Similarly, any of the four San Diego Gas & Electric Company lines can serve as a source of power to the station auxiliaries at any time. By specifying one transmission line from each of the two physically independent high voltage transmission routes, redundancy of sources of auxiliary power for an orderly shutdown is provided.

Similarly, either transformer A or B, along with transformer C, provide redundancy of 4160 volt power to the auxiliary equipment, and in particular to the safety injection trains. In addition, each 4160 volt bus has an onsite diesel generator as backup.

In MODES 1, 2, 3 and 4, two diesel generators provide the necessary redundancy to protect against a failure of one of the diesel generator systems or in case one diesel generator system is taken out for maintenance, without requiring a reactor shutdown. This also eliminates the necessity for depending on one diesel generator to operate for extended periods without shutdown if it were required for post-accident conditions.

When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE. In addition, the ACTION STATEMENT requires a verification that the steam-driven auxiliary feedwater pump is OPERABLE in MODES 1, 2, and 3.

These requirements are intended to provide assurance that a loss of offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the operability of the component.

During normal operations, the 480 volt system is considered OPERABLE if the four 480 volt buses and four station service transformers are OPERABLE with respective tie breakers open. This will ensure that the 480V main breakers and transformers remain OPERABLE during the worst loading condition in case of a SIS without LOP.

The primary power source for Vital Buses 1, 2, 3, 3A, and 4 is Train A DC Bus 1. The alternate power source is available from MCC-2 through MTS-7. The 1987 RPS and ESF single failure analyses credited the Train B backup power to these vital buses through MTS-7.

Correct operation of the safety injection system is assured by the operability of the load sequencers and the UPS for MOV-850C and MOV-358 (MOV-850C UPS). Correct operation of the recirculation system is assured by the operability of the MOV-850C UPS which also supplies MOV-358.

Manual Transfer Switch 8 (MTS-8) provides the means to power MOV-883 and the MOV-850C UPS from either Train A or Train B. However, due to single failure considerations and environmental effects, MTS-8 is normally powered from MCC-4 on Train B. MOV-883 is the discharge valve from the RWST and must remain open during the safety injection phase and close with initiation of recirculation.

3.7.2 ELECTRICAL SUPPLY: SHUTDOWN

APPLICABILITY: MODES 5 and 6

OBJECTIVE: To define those conditions of available electrical power to ensure that the station can be maintained in the shutdown or refueling condition for extended periods.

SPECIFICATION:

a. One Southern California Edison Company or San Diego Gas and Electric Company high voltage transmission line to the switchyard and one transmission circuit from the switchyard, immediate or delayed access, to the onsite safety-related distribution system shall be OPERABLE.

b. One diesel generator shall be OPERABLE which is capable of automatic start with:

   1. A day tank containing a minimum 290 gallons of fuel,

   2. A fuel storage system containing a minimum of 37,500 gallons of fuel, and

   3. A fuel transfer pump.

c. One train of AC buses shall be OPERABLE comprised of:

   1. 4160 volt Bus 1C, and 480 volt Buses 1 and 3 with at least one associated station service transformer; OR

   2. 4160 volt Bus 2C, and 480 volt Buses 2 and 4 with at least one associated station service transformer.

d. 120 volt Vital Buses 1, 2, and 4 energized from associated inverters connected to DC Bus 1.

e. One 125 volt DC Bus OPERABLE and energized from the associated battery with at least one full capacity charger.

ACTION: With less than the minimum required AC and DC electrical sources specified above, suspend all operations involving CORE ALTERATIONS or positive reactivity changes. Initiate corrective actions to energize the required electrical buses. Within 8 hours, depressurize and vent the RCS through at least a 1.75 square inch vent.

BASIS: In MODES 5 and 6, the requirement for one source of offsite power and one diesel generator to be OPERABLE will provide diverse and redundant electrical power sources in order that the station can be maintained in the COLD SHUTDOWN or REFUELING condition for extended time periods. Additionally, this requirement will assure that operations involving core alterations or positive reactivity changes can be conducted safely. One SST and 480V main breaker will be capable of supplying the necessary power to the two associated 480V buses without exceeding their maximum loading ratings due to the reduced bus loading. Vital Buses 1, 2, and 4 power redundant source range nuclear instrument channels and Overpressure Mitigation System (OMS) channels and are required to support operations in MODES 5 and 6.

Temporary cross-training between the two emergency AC trains is allowed only during the outages for maintenance purposes by use of power cables provided between 480 volt Bus 4 and Bus 1. The supply 480V bus, when cross-trained, does not become inoperable. Temporary cross-training will require two breakers in series to maintain adequate separation. In addition, the receiving bus cannot be declared OPERABLE. Loads will be added manually and limited by the operator action.

TABLE 4.1.2
MINIMUM EQUIPMENT CHECK AND SAMPLING FREQUENCY

		Check	Frequency
1a. Reactor Coolant Samples	1.	Gross Activity Determination	At least once per 72 hours. Required during MODES 1, 2, 3 and 4.
	2.	Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1 per 14 days. Required only during MODE 1.
	3.	Spectroscopic for E(1) Determination	1 per 6 months(2) Required only during MODE 1.
	4.	Isotopic Analysis for Iodine Including I-131, I-133, and I-135.	a) Once per 4 hours,(3) whenever the specific activity exceeds 1.0 µCi/gram DOSE EQUIVALENT I-131 or 100/ E (1) µCi/gram. b) One sample between 2 and 6 hours following a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period.
	5.	Boron concentration	Twice/Week

(1) E is defined in Section 1.0.

(2) Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer.

(3) Until the specific activity of the reactor coolant system is restored within its limits.

TABLE 4.1.2 (continued)

	Check	Frequency
1.b Secondary Coolant Samples	1. Gross Activity Determination	At least once per 72 hours. Required only during MODES 1, 2, 3 and 4.
	2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	a) 1 per 31 days, whenever the gross activity determination indicates iodine concentrations greater than 10% of the allowable limit. Required only during MODES 1, 2, 3 and 4.
		b) 1 per 6 months, whenever the gross activity determination indicates iodine concentrations below 10% of the allowable limit. Required only during MODES 1, 2, 3, and 4.

<u>TABLE 4.1.2</u> (continued)

		Check	Frequency
2.	Safety Injection Line and RWST Water Samples	a. Boron Concentration	Monthly when the reactor is critical and prior to return of criticality when a period of subcriticality extends the test beyond 1 month
3.	Control Rod Drop	a. Verify that all rods move from full out to full in, in less than 2.44 seconds	At each refueling shutdown
4.	(Deleted)		
5.	Pressurizer Safety Valves	a. Pressure Setpoint	At each refueling shutdown
6.	Main Steam Safety Valves	a. Pressure Setpoint	At each refueling shutdown
7.	Main Steam Power Operated Relief Valves	a. Test for OPERABILITY	At each refueling shutdown
8.	Trisodium Phosphate Additive	a. Check for system availability as delineated in Technical Specification 4.2	At each refueling shutdown
9.	Hydrazine Tank Water Samples	a. Hydrazine concentration	Once every six months when the reactor is critical and prior to return of criticality when a period of subcriticality extends the test interval beyond six months
10.	Not used.		

TABLE 4.1.2 (continued)

	Check	Frequency
11. MOV-LCV-1100 C Transfer Switch	a. Verify that the fuse block for either breaker 8-1198 to MCC 1 or breaker 42-12A76 to MCC 2A is removed.	Same as Item 10 above
12. Emergency Siren Transfer Switch	a. Verify that the fuse block for either breaker 8-1145 to MCC 1 or breaker 8-1293A to MCC 2 is removed	Same as Item 10 above
13. Communication Power Panel Transfer Switch	a. Verify that the fuse block for either breaker 8-1195 to MCC 1 or breaker 8-1293B to MCC 2 is removed	Same as Item 10 above
14a. Spent Fuel Pool Water Level	Verify water level per Technical Specification 3.8	a. Once every seven days when spent fuel is being stored in the pool.
b. Refueling Pool Water Level		b. Within two hours prior to start of and at least once per 24 hours thereafter during movement of fuel assemblies or RCC's.
15. Reactor Coolant Loops/ Residual Heat Removal Loops	a. Per Technical Specifications 3.1.2.C and 3.1.2.D, in MODE 1 and MODE 2 and in MODE 3 with reactor trip breakers closed, verify that all required reactor coolant loops are in operation and circulating reactor coolant.	a. Once per 12 hours
	b. Per Technical Specification 3.1.2.E, in MODE 3 with the reactor trip breakers open, verify	

TABLE 4.1.2 (continued)

Check	Frequency
1. At least two required reactor coolant pumps are operable with correct breaker alignments and indicated power availability.	1. Once per 7 days
2. The steam generators associated with the two required reactor coolant pumps are operable with secondary side water level ≥ 256 inches (wide range).	2. Once per 12 hours
3. At least one reactor coolant loop is in operation and circulating reactor coolant.	3. Once per 12 hours
c. Per Technical Specification 3.1.2.F, in MODE 4 verify	
1. At least two required (RC or RHR) pumps are operable with correct breaker alignments and indicated power availability.	1. Once per 7 days
2. The required steam generators are operable with secondary side water level ≥ 256 inches (wide range).	2. Once per 12 hours
3. At least one reactor coolant loop/RHR TRAIN is in operation and circulating reactor coolant.	3. Once per 12 hours
d. Per Technical Specifications 3.1.2.G and 3.1.2.H, in MODE 5 verify, as applicable:	

		Check		Frequency
		1. At least one RHR TRAIN is in operation and circulating reactor coolant.	1.	Once per 12 hours
		2. When required, one additional RHR TRAIN is operable with correct pump breaker alignments and indicated power availability.	2.	Once per 7 days
		3. When required, the secondary side water level of at least two steam generators is $\geq$ 256 inches (wide range).	3.	Once per 12 hours
	e.	Per Technical Specification 3.8.A.3, in MODE 6, with water level in refueling pool greater than elevation 40 feet 3 inches, verify that at least one method of decay heat removal is in operation and circulating reactor coolant at a flow rate of at least 400 gpm.	e.	Once per 12 hours
	f.	Per Technical Specification 3.8.A.4, in MODE 6, with water level in refueling pool less than elevation 40 feet 3 inches, verify		
		1. At least one decay heat removal method is in operation and circulating reactor coolant.	1.	Once per 12 hours
		2. One additional decay heat removal method is operable with correct pump breaker alignments and indicated power availability.	2.	Once per 7 days
16. RWST Contained Water Volume	a.	Verify volume $\geq$ 50 ft. plant elevation	a	Monthly when the reactor is critical and prior to return of criticality when a period of subcriticality extends the surveillance beyond 1 month

4.4 EMERGENCY POWER SYSTEM PERIODIC TESTING

APPLICABILITY: Applies to testing of the Emergency Power System.

OBJECTIVE: To verify that the Emergency Power System will respond promptly and properly when required.

SPECIFICATION:

A. The required offsite circuits shall be determined OPERABLE at least once per 7 days by verifying correct breaker alignments and power availability.

B. The required diesel generators shall be demonstrated OPERABLE:

1. At least once per 31 days on a STAGGERED TEST BASIS by:

    a. Verifying the diesel performs a DG SLOW START from standby conditions,

    b. Verifying a fuel transfer pump can be started and transfers fuel from the storage system to the day tank,

    c. Verifying the diesel generator is synchronized and running at 6000 kW (+100 kW, -500 kW) for $\geq$ 60 minutes,

    d. Verifying the diesel generator is aligned to provide standby power to the associated emergency buses,

    e. Verifying the day tank contains a minimum of 290 gallons of fuel, and

    f. Verifying the fuel storage tank contains a minimum of 37,500 gallons of fuel.

2. At least once per 3 months by verifying that a sample of diesel fuel from the required fuel storage tanks is within the acceptable limits as specified by the supplier when checked for viscosity, water and sediment.

C. AC Distribution

1. The required buses specified in Technical Specification 3.7, Auxiliary Electrical Supply, shall be determined OPERABLE and energized from AC sources other than the diesel generators with tie breakers without automatic SIS/SISLOP tripping circuitry open between redundant buses at least once per 7 days by verifying correct breaker alignment and power availability.

D. The required DC power sources specified in Technical Specification 3.7 shall meet the following:

1. Each DC Bus train shall be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and power availability.

2. Each 125 volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

(1) The parameters in Table 4.4-1 meet the Category A limits, and

(2) The total battery terminal voltage is greater than or equal to 129 volts on float charge.

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

(1) The parameters in Table 4.4-1 meet the Category B limits,

(2) There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and

(3) The average electrolyte temperature of ten connected cells is above 61°F for battery banks associated with DC Bus No. 1 and DC Bus No. 2 and above 48°F for the UPS battery bank.

c. At least once per 18 months by verifying that:

(1) The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration,

(2) The cell-to-cell and terminal connections are clean, tight and coated with anticorrosion material,

(3) The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms,

(4) The battery charger for 125 volt DC Bus No. 1 will supply at least 800 amps DC at 130 volts DC for at least 8 hours,

(5) The battery charger for 125 volt DC Bus No. 2 will supply at least 45 amps DC at 130 volts DC for at least 8 hours, and

(6) The battery charger for the UPS will supply at least 10 amps AC at 480 volts AC for at least 8 hours as measured at the output of the UPS inverter.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80%, 85% for Battery Bank No. 1, of the manufacturer's rating when subjected to a performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.4.D.2.d.

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

E. The required Safeguards Load Sequencing Systems (SLSS) shall be demonstrated OPERABLE at least once per 31 days on a STAGGERED TEST BASIS, by simulating SISLOP* conditions and verifying that the resulting interval between each load group is within ± 10% of its design interval.

F. The required diesel generators and the Safeguards Load Sequencing Systems (SLSS) shall be demonstrated OPERABLE at least once per 18 months during shutdown by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.

2. Simulating SISLOP*, and:

   a. Verifying operation of circuitry which locks out non-critical equipment,

   b. Verifying the diesel performs a DG FAST START from standby condition on the auto-start signal, energizes the emergency buses with permanently connected loads and the auto connected emergency loads** through the load sequencer (with the exception of the feedwater, safety injection, charging and refueling water pumps whose respective breakers may be racked-out to the test position) and operates for $\geq$ 5 minutes while its generator is loaded with the emergency loads,

   c. Verifying that on the safety injection actuation signal, all diesel generator trips, except engine overspeed and generator differential, are automatically bypassed.

3. Verifying the generator capability to reject a load of 4,000 kW without tripping. The generator voltage shall not exceed 4,800 volts and the generator speed shall not exceed 500 rpm (nominal speed plus 75% of the difference between nominal speed and the overspeed trip setpoint) during and following the load rejection.

G. Manual Transfer Switches

1. Verify once every 31 days that the fuse block for breaker 8-1181 in MCC-1 for MTS-7 is removed.

2. Verify once every 31 days that MTS-8 is energized from breaker 8-1480B from MCC-4 and the cabinet door is locked, and that breaker 8-1122 from MCC-1 is locked open.

*SISLOP is the signal generated by coincident loss of offsite power (loss of voltage on Buses 1C and 2C) and demand for safety injection.

**The sum of all loads on the engine shall not exceed 6,000 kW.

TABLE 4.4-1

BATTERY SURVEILLANCE REQUIREMENTS

	CATEGORY A[1]	CATEGORY B[2]	
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable[3] value for each connected cell
Electrolyte Level	>Minimum level indication mark, and ≤1/4" above maximum level indication mark	>Minimum level indication mark, and ≤1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥2.13 volts	≥2.13 volts[c]	>2.07 volts
Specific[a] Gravity	≥1.200[b]	≥1.195	Not more than .020 below the average of all connected cells
		Average of all connected cells >1.205	Average of all connected cells ≥1.195[b]

(a) Corrected for electrolyte temperature and level.
(b) Or battery charging current is less than 2 amps when on charge.
(c) Corrected for average electrolyte temperature in accordance with IEEE STD 450-1980.
(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameter(s) are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

BASIS: The normal plant Emergency Power System is normally in continuous operation, and periodically tested.[1]

The tests specified above will be completed without any preliminary preparation or repairs which might influence the results of the test except as required to perform the DG SLOW START test set forth in T.S. 4.4.B.1.a. The tests will demonstrate that components which are not normally required will respond properly when required.

DG SLOW STARTS are specified for the monthly surveillances in order to reduce the cumulative fatigue damage to the engine crankshafts to levels below the threshold of detection under a program of augmented inservice inspection. In the event that the DG SLOW START inadvertently achieves steady state voltage and frequency in less than 24 seconds, the surveillance will not be considered a failure and require restart of the diesel generator.

The surveillance requirements for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensure the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.4-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and .020 below normal full charge specific gravity or a battery charger current that has stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than .020 below normal full charge specific gravity with an average specific gravity of all the connected cells not more than .010 below normal full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operating with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.4-1 is permitted for up to 7 days. During this 7 day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than .020 below normal full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than .040 below normal full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

Verifying required positions for manual transfer switches ensure single failure and environmental interaction requirements are satisfied. The normal alignments for MTS-7 and MTS-8 are MCC-2 and MCC-4, respectively.

REFERENCE: (1) Supplement No. 1 to Final Engineering Report and Safety Analysis, Section 3, Questions 6 and 8.

ATTACHMENT 2

PROPOSED LICENSE CONDITIONS AND TECHNICAL SPECIFICATIONS

L. Diesel Generators

(The license conditions have been deleted and their requirements incorporated into the Technical Specifications.)

3.7 AUXILIARY ELECTRICAL SUPPLY

3.7.1 ELECTRICAL SUPPLY: OPERATING

APPLICABILITY: MODES 1, 2, 3, and 4

OBJECTIVE: To define those conditions of electrical power availability necessary to provide for safe reactor operation and to provide for the continuing availability of engineered safeguards.

SPECIFICATION:

a. One Southern California Edison Company and one San Diego Gas & Electric Company high voltage transmission line to the switchyard and two transmission circuits from the switchyard, one immediate and one delayed access, to the onsite safety-related distribution system shall be OPERABLE. This configuration constitutes the two required offsite circuits.

b. Two redundant and independent diesel generators shall be OPERABLE each with total connected design load not to exceed 6,000 kW and with:

   1. A separate day tank containing a minimum of 290 gallons of fuel,

   2. A separate fuel storage system containing a minimum of 37,500 gallons of fuel, and

   3. A separate fuel transfer pump.

c. Train A Emergency AC Buses shall be OPERABLE, comprised of:

   1. 4160 volt Bus 1C,
   2. 480 volt Buses 1 and 3, and associated station service transformers with tie breaker open.

d. Train B Emergency AC Buses shall be OPERABLE, comprised of:

   1. 4160 volt Bus 2C,
   2. 480 volt Buses 2 and 4, and associated station service transformers with tie breaker open.

e. 120 volt AC Vital Buses 1, 2, 3 & 3A, and 4 energized from associated inverters connected to DC Bus 1.

f. 120 volt AC Vital Buses 5 and 6 energized from associated inverters connected to DC Bus 2.

g. 125 volt DC Bus 1 shall be OPERABLE and energized from Battery No. 1, with at least one full capacity charger.

h. 125 volt DC Bus 2 shall be OPERABLE and energized from Battery No. 2, with at least one full capacity charger.

i. Two trains of Safeguards Load Sequencing Systems (SLSS) shall be OPERABLE.*

j. The MOV-850C Uninterruptible Power Supply (UPS) OPERABLE and energized from the battery with its full capacity charger.**

k. Manual Transfer Switch 7 (MTS-7) shall be OPERABLE and energized from MCC-2.

l. Manual Transfer Switch 8 (MTS-8) shall be OPERABLE and energized from MCC-4.

ACTION:

A. With one of the required offsite circuits inoperable, demonstrate the operability of the remaining AC sources by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 24 hours. Restore the circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

B. If one diesel generator is declared inoperable, demonstrate the operability of the two offsite transmission circuits and the remaining diesel generator by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 24 hours. Restore the inoperable diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

C. With one offsite circuit and one diesel generator of the above required AC electrical power sources inoperable, demonstrate the operability of the remaining AC sources by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 8 hours. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Have at least two offsite circuits and two diesel generators OPERABLE within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

D. With one diesel generator inoperable as in B or C above, verify that: (1) all required systems, subsystems, trains,

* The automatic load function may be blocked in Mode 3 at a pressurizer pressure $\leq$ 1900 psig.

** Applicable in MODES 1, 2, and 3 above 500 psig.

components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE; and (2) the steam-driven auxiliary feedwater pump is OPERABLE in MODES 1, 2, and 3. If these conditions are not satisfied within 2 hours, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

E. With two required offsite circuits inoperable, demonstrate the operability of two diesel generators by performing Surveillance Requirement B.1.a of Technical Specification 4.4 within 8 hours, unless the diesel generators are already operating. Restore at least one of the inoperable sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 4 hours. Have at least two offsite circuits and two diesel generators OPERABLE within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

F. With two of the above required diesel generators inoperable, demonstrate the operability of two offsite circuits by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 2 hours thereafter. Restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

G. With less than the above train of Emergency AC buses OPERABLE, restore the inoperable buses within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

H. With one AC Vital Bus either not energized from its associated inverter, or with the inverter not connected to its associated DC Bus: (1) re-energize the AC Vital Bus within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and (2) re-energize the AC Vital Bus from its associated inverter connected to its associated DC Bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

I. With one DC bus inoperable or not energized from its associated battery and at least one full capacity charger, re-energize the DC Bus from its associated battery and at least one full capacity charger within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

J. With one Safeguards Load Sequencing System inoperable, restore the inoperable sequencer to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

K. With the MOV-850C UPS inoperable, or not energized from its associated battery and its full capacity charger, restore the UPS to OPERABLE status and re-energize the UPS from its associated battery and its full capacity charger within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

L. With MTS-7 inoperable or not energized from MCC-2, restore MTS-7 to OPERABLE status and re-energize MTS-7 from MCC-2 within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

M. With MTS-8 inoperable or not energized from MCC-4, restore MTS-8 to OPERABLE status and re-energize MTS-8 from MCC-4 within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

BASIS: The station is connected electrically to the Southern California Edison Company and San Diego Gas & Electric Company system via either of two physically independent high voltage transmission routes composed of four Southern California Edison Company high voltage lines and four San Diego Gas & Electric Company high voltage lines.

Of the four Southern California Edison Company lines, any one can serve as a source of power to the station auxiliaries at any time. Similarly, any of the four San Diego Gas & Electric Company lines can serve as a source of power to the station auxiliaries at any time. By specifying one transmission line from each of the two physically independent high voltage transmission routes, redundancy of sources of auxiliary power for an orderly shutdown is provided.

Similarly, either transformer A or B, along with transformer C, provide redundancy of 4160 volt power to the auxiliary equipment, and in particular to the safety injection trains. In addition, each 4160 volt bus has an onsite diesel generator as backup.

In MODES 1, 2, 3 and 4, two diesel generators provide the necessary redundancy to protect against a failure of one of the diesel generator systems or in case one diesel generator system is taken out for maintenance, without requiring a reactor shutdown. This also eliminates the necessity for depending on one diesel generator to operate for extended periods without shutdown if it were required for post-accident conditions.

When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE. In addition, the ACTION STATEMENT requires a verification that the steam-driven auxiliary feedwater pump is OPERABLE in MODES 1, 2, and 3.

These requirements are intended to provide assurance that a loss of offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the operability of the component.

The total connected design load on each diesel generator is restricted to 6,000 kW or less. This requirement was the result of a crankshaft crack propagation analysis (See Reference 1). The analysis postulated that the crankshaft initially has stress-induced surface cracks. The analysis then considered the effect of four types of diesel load histories on the growth of these cracks. Each load history consisted of repeated start-stop cycles with some steady state operation at full load (6,000 kW) between each start and its stop. The analysis concluded that for a crankshaft with a detectable size crack (10 mils deep), the number of start-stop cycles required to enlarge the crack until it becomes self-propagating (18 mils deep) under the full load steady state stresses represents the effective life of the crankshaft.

During normal operations, the 480 volt system is considered OPERABLE if the four 480 volt buses and four station service transformers are OPERABLE with respective tie breakers open. This will ensure that the 480V main breakers and transformers remain OPERABLE during the worst loading condition in case of a SIS without LOP.

The primary power source for Vital Buses 1, 2, 3, 3A, and 4 is Train A DC Bus 1. The alternate power source is available from MCC-2 through MTS-7. The 1987 RPS and ESF single failure analyses credited the Train B backup power to these vital buses through MTS-7.

Correct operation of the safety injection system is assured by the operability of the load sequencers and the UPS for MOV-850C and MOV-358 (MOV-850C UPS). Correct operation of the recirculation system is assured by the operability of the MOV-850C UPS which also supplies MOV-358.

Manual Transfer Switch 8 (MTS-8) provides the means to power MOV-883 and the MOV-850C UPS from either Train A or Train B. However, due to single failure considerations and environmental effects, MTS-8 is normally powered from MCC-4 on Train B. MOV-883 is the discharge valve from the RWST and must remain open during the safety injection phase and close with initiation of recirculation.

REFERENCES: (1) Report No FaAA-84-12-14 (Revision 1.0), Evaluation of Transient Conditions on Emergency Diesel Generator Crankshafts at San Onofre Nuclear Generating Station, Unit 1.

3.7.2 ELECTRICAL SUPPLY: SHUTDOWN

APPLICABILITY: MODES 5 and 6

OBJECTIVE: To define those conditions of available electrical power to ensure that the station can be maintained in the shutdown or refueling condition for extended periods.

SPECIFICATION:

a. One Southern California Edison Company or San Diego Gas and Electric Company high voltage transmission line to the switchyard and one transmission circuit from the switchyard, immediate or delayed access, to the onsite safety-related distribution system shall be OPERABLE.

b. One diesel generator shall be OPERABLE which is capable of automatic start, with total connected design load not to exceed 6,000 kW and with:

   1. A day tank containing a minimum 290 gallons of fuel,

   2. A fuel storage system containing a minimum of 37,500 gallons of fuel, and

   3. A fuel transfer pump.

c. One train of AC buses shall be OPERABLE comprised of:

   1. 4,160 volt Bus 1C, and 480 volt Buses 1 and 3 with at least one associated station service transformer; OR

   2. 4,160 volt Bus 2C, and 480 volt Buses 2 and 4 with at least one associated station service transformer.

d. 120 volt Vital Buses 1, 2, and 4 energized from associated inverters connected to DC Bus 1.

e. One 125 volt DC Bus OPERABLE and energized from the associated battery with at least one full capacity charger.

ACTION: With less than the minimum required AC and DC electrical sources specified above, suspend all operations involving CORE ALTERATIONS or positive reactivity changes. Initiate corrective actions to energize the required electrical buses. Within 8 hours, depressurize and vent the RCS through at least a 1.75 square inch vent.

BASIS: In MODES 5 and 6, the requirement for one source of offsite power and one diesel generator to be OPERABLE will provide diverse and redundant electrical power sources in order that the station can be maintained in the COLD SHUTDOWN or

REFUELING condition for extended time periods. Additionally, this requirement will assure that operations involving core alterations or positive reactivity changes can be conducted safely. One SST and 480V main breaker will be capable of supplying the necessary power to the two associated 480V buses without exceeding their maximum loading ratings due to the reduced bus loading. Vital Buses 1, 2, and 4 power redundant source range nuclear instrument channels and Overpressure Mitigation System (OMS) channels and are required to support operations in MODES 5 and 6.

The total connected design load on each diesel generator is restricted to 6,000 kW or less. This requirement was the result of a crankshaft crack propagation analysis (See Reference 1). The analysis postulated that the crankshaft initially has stress-induced surface cracks. The analysis then considered the effect of four types of diesel load histories on the growth of these cracks. Each load history consisted of repeated start-stop cycles with some steady state operation at full load (6,000 kW) between each start and its stop. The analysis concluded that for a crankshaft with a detectable size crack (10 mils deep), the number of start-stop cycles required to enlarge the crack until it becomes self-propagating (18 mils deep) under the full load steady state stresses represents the effective life of the crankshaft.

Temporary cross training between the two emergency AC trains is allowed only during the outages for maintenance purposes by use of power cables provided between 480 volt Bus 4 and Bus 1. The supply 480V bus, when cross-trained, does not become inoperable. Temporary cross-training will require two breakers in series to maintain adequate separation. In addition, the receiving bus cannot be declared OPERABLE. Loads will be added manually and limited by the operator action.

REFERENCES: (1) Report No FaAA-84-12-14 (Revision 1.0), Evaluation of Transient Conditions on Emergency Diesel Generator Crankshafts at San Onofre Nuclear Generating Station, Unit 1.

TABLE 4.1.2
MINIMUM EQUIPMENT CHECK AND SAMPLING FREQUENCY

	Check	Frequency
1a. Reactor Coolant Samples	1. Gross Activity Determination	At least once per 72 hours. Required during MODES 1, 2, 3 and 4.
	2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1 per 14 days. Required only during MODE 1.
	3. Spectroscopic for E(1) Determination	1 per 6 months(2) Required only during MODE 1.
	4. Isotopic Analysis for Iodine Including I-131, I-133, and I-135.	a) Once per 4 hours,(3) whenever the specific activity exceeds 1.0 μCi/gram DOSE EQUIVALENT I-131 or 100/ E (1) μCi/gram. b) One sample between 2 and 6 hours following a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period.
	5. Boron concentration	Twice/Week

(1) E is defined in Section 1.0.

(2) Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer.

(3) Until the specific activity of the reactor coolant system is restored within its limits.

TABLE 4.1.2 (continued)

	Check	Frequency
1.b Secondary Coolant Samples	1. Gross Activity Determination	At least once per 72 hours. Required only during MODES 1, 2, 3 and 4.
	2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	a) 1 per 31 days, whenever the gross activity determination indicates iodine concentrations greater than 10% of the allowable limit. Required only during MODES 1, 2, 3 and 4.
		b) 1 per 6 months, whenever the gross activity determination indicates iodine concentrations below 10% of the allowable limit. Required only during MODES 1, 2, 3, and 4.

TABLE 4.1.2 (continued)

			Check	Frequency
2.	Safety Injection Line and RWST Water Samples	a.	Boron Concentration	Monthly when the reactor is critical and prior to return of criticality when a period of subcriticality extends the test beyond 1 month
3.	Control Rod Drop	a.	Verify that all rods move from full out to full in, in less than 2.44 seconds	At each refueling shutdown
4.	(Deleted)			
5.	Pressurizer Safety Valves	a.	Pressure Setpoint	At each refueling shutdown
6.	Main Steam Safety Valves	a.	Pressure Setpoint	At each refueling shutdown
7.	Main Steam Power Operated Relief Valves	a.	Test for OPERABILITY	At each refueling shutdown
8.	Trisodium Phosphate Additive	a.	Check for system availability as delineated in Technical Specification 4.2	At each refueling shutdown
9.	Hydrazine Tank Water Samples	a.	Hydrazine concentration	Once every six months when the reactor is critical and prior to return of criticality when a period of subcriticality extends the test interval beyond six months
10.	Not used			
11.	MOV-LCV-1100 C Transfer Switch	a.	Verify that the fuse block for either breaker 8-1198 to MCC 1 or breaker 42-12A76 to MCC 2A is removed.	Monthly, when the reactor is critical and prior to returning reactor to critical when period of subcriticality extended the test interval beyond one month

TABLE 4.1.2 (continued)

		Check	Frequency
12. Emergency Siren Transfer Switch	a.	Verify that the fuse block for either breaker 8-1145 to MCC 1 or breaker 8-1293A to MCC 2 is removed	Monthly, when the reactor is critical and prior to returning reactor to critical when period of subcriticality extended the test interval beyond one month
13. Communication Power Panel Transfer Switch	a.	Verify that the fuse block for either breaker 8-1195 to MCC 1 or breaker 8-1293B to MCC 2 is removed	Monthly, when the reactor is critical and prior to returning reactor to critical when period of subcriticality extended the test interval beyond one month
14a. Spent Fuel Pool Water Level		Verify water level per Technical Specification 3.8	a. Once every seven days when spent fuel is being stored in the pool.
b. Refueling Pool Water Level			b. Within two hours prior to start of and at least once per 24 hours thereafter during movement of fuel assemblies or RCC's.
15. Reactor Coolant Loops/ Residual Heat Removal Loops	a.	Per Technical Specifications 3.1.2.C and 3.1.2.D, in MODE 1 and MODE 2 and in MODE 3 with reactor trip breakers closed, verify that all required reactor coolant loops are in operation and circulating reactor coolant.	a. Once per 12 hours
	b.	Per Technical Specification 3.1.2.E, in MODE 3 with the reactor trip breakers open, verify	

TABLE 4.1.2 (continued)

Check	Frequency
1. At least two required reactor coolant pumps are operable with correct breaker alignments and indicated power availability.	1. Once per 7 days
2. The steam generators associated with the two required reactor coolant pumps are operable with secondary side water level $\geq$ 256 inches (wide range).	2. Once per 12 hours
3. At least one reactor coolant loop is in operation and circulating reactor coolant.	3. Once per 12 hours
c. Per Technical Specification 3.1.2.F, in MODE 4 verify	
1. At least two required (RC or RHR) pumps are operable with correct breaker alignments and indicated power availability.	1. Once per 7 days
2. The required steam generators are operable with secondary side water level $\geq$ 256 inches (wide range).	2. Once per 12 hours
3. At least one reactor coolant loop/RHR TRAIN is in operation and circulating reactor coolant.	3. Once per 12 hours
d. Per Technical Specifications 3.1.2.G and 3.1.2.H, in MODE 5 verify, as applicable:	
1. At least one RHR TRAIN is in operation and circulating reactor coolant.	1. Once per 12 hours

TABLE 4.1.2 (continued)

	Check	Frequency
	2. When required, one additional RHR TRAIN is operable with correct pump breaker alignments and indicated power availability.	2. Once per 7 days
	3. When required, the secondary side water level of at least two steam generators is $\geq$ 256 inches (wide range).	3. Once per 12 hours
	e. Per Technical Specification 3.8.A.3, in MODE 6, with water level in refueling pool greater than elevation 40 feet 3 inches, verify that at least one method of decay heat removal is in operation and circulating reactor coolant at a flow rate of at least 400 gpm.	e. Once per 12 hours
	f. Per Technical Specification 3.8.A.4, in MODE 6, with water level in refueling pool less than elevation 40 feet 3 inches, verify	
	1. At least one decay heat removal method is in operation and circulating reactor coolant.	1. Once per 12 hours
	2. One additional decay heat removal method is operable with correct pump breaker alignments and indicated power availability.	2. Once per 7 days
16. RWST Contained Water Volume	a. Verify volume $\geq$ 50 ft. plant elevation	a Monthly when the reactor is critical and prior to return of criticality when a period of subcriticality extends the surveillance beyond 1 month

4.4 EMERGENCY POWER SYSTEM PERIODIC TESTING

APPLICABILITY: Applies to testing of the Emergency Power System.

OBJECTIVE: To verify that the Emergency Power System will respond promptly and properly when required.

SPECIFICATION:

A. The required offsite circuits shall be determined OPERABLE at least once per 7 days by verifying correct breaker alignments and power availability.

B. The required diesel generators shall be demonstrated OPERABLE:

1. At least once per 31 days on a STAGGERED TEST BASIS by:

   a. Verifying the diesel performs a DG SLOW START[1] from standby conditions,

   b. Verifying a fuel transfer pump can be started and transfers fuel from the storage system to the day tank,

   c. Verifying the diesel generator is synchronized and running at 6000 kW (+100 kW, -500 kW) for $\geq$ 60 minutes,

   d. Verifying the diesel generator is aligned to provide standby power to the associated emergency buses,

   e. Verifying the day tank contains a minimum of 290 gallons of fuel, and

   f. Verifying the fuel storage tank contains a minimum of 37,500 gallons of fuel.

2. At least once per 3 months by verifying that a sample of diesel fuel from the required fuel storage tanks is within the acceptable limits as specified by the supplier when checked for viscosity, water and sediment.

---

1 All diesel starts for testing and surveillance will be slow starts (greater than 24 seconds duration) except for the fast start required by Technical Specification 4.4.G conducted once per 18 months during shutdown and any other fast start required following specific maintenance involving the fast start capability.

C. AC Distribution

1. The required buses specified in Technical Specification 3.7, Auxiliary Electrical Supply, shall be determined OPERABLE and energized from AC sources other than the diesel generators with tie breakers without automatic SIS/SISLOP tripping circuitry open between redundant buses at least once per 7 days by verifying correct breaker alignment and power availability.

D. The required DC power sources specified in Technical Specification 3.7 shall meet the following:

1. Each DC Bus train shall be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and power availability.

2. Each 125 volt battery bank and charger shall be demonstrated OPERABLE:

   a. At least once per 7 days by verifying that:

      (1) The parameters in Table 4.4-1 meet the Category A limits, and

      (2) The total battery terminal voltage is greater than or equal to 129 volts on float charge.

   b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

      (1) The parameters in Table 4.4-1 meet the Category B limits,

      (2) There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and

      (3) The average electrolyte temperature of ten connected cells is above 61°F for battery banks associated with DC Bus No. 1 and DC Bus No. 2 and above 48°F for the UPS battery bank.

   c. At least once per 18 months by verifying that:

      (1) The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration,

(2) The cell-to-cell and terminal connections are clean, tight and coated with anticorrosion material,

(3) The resistance of each cell-to-cell and terminal connection is less than or equal to 150 x 10^{-6} ohms,

(4) The battery charger for 125 volt DC Bus No. 1 will supply at least 800 amps DC at 130 volts DC for at least 8 hours,

(5) The battery charger for 125 volt DC Bus No. 2 will supply at least 45 amps DC at 130 volts DC for at least 8 hours, and

(6) The battery charger for the UPS will supply at least 10 amps AC at 480 volts AC for at least 8 hours as measured at the output of the UPS invertor.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80%, 85% for Battery Bank No. 1, of the manufacturer's rating when subjected to a performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.4.D.2.d.

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

E. The required Safeguards Load Sequencing Systems (SLSS) shall be demonstrated OPERABLE at least once per 31 days on a STAGGERED TEST BASIS, by simulating SISLOP* conditions and verifying that the resulting interval between each load group is within ± 10% of its design interval.

F. The required diesel generators and the Safeguards Load Sequencing Systems (SLSS) shall be demonstrated OPERABLE at least once per 18 months during shutdown by:

1. Simulating SISLOP*, and:

   a. Verifying operation of circuitry which locks out non-critical equipment,

   b. Verifying the diesel performs a DG FAST START from standby condition on the auto-start signal, energizes the emergency buses with permanently connected loads and the auto connected emergency loads** through the load sequencer (with the exception of the feedwater, safety injection, charging and refueling water pumps whose respective breakers may be racked-out to the test position) and operates for $\geq$ 5 minutes while its generator is loaded with the emergency loads,

   c. Verifying that on the safety injection actuation signal, all diesel generator trips, except engine overspeed and generator differential, are automatically bypassed.

2. Verifying the generator capability to reject a load of 4,000 kW without tripping. The generator voltage shall not exceed 4,800 volts and the generator speed shall not exceed 500 rpm (nominal speed plus 75% of the difference between nominal speed and the overspeed trip setpoint) during and following the load rejection.

G. Manual Transfer Switches

1. Verify once every 31 days that the fuse block for breaker 8-1181 in MCC-1 for MTS-7 is removed.

2. Verify once every 31 days that MTS-8 is energized from breaker 8-1480B from MCC-4 and the cabinet door is locked, and that breaker 8-1122 from MCC-1 is locked open.

---

* SISLOP is the signal generated by coincident loss of offsite power (loss of voltage on Buses 1C and 2C) and demand for safety injection.

** The sum of all loads on the engine shall not exceed 6,000 kW.

H. Periodic maintenance, surveillance, overhaul and inspection of the required diesel generator shall comply with the following:

1. A diesel engine maintenance and surveillance program as described in the Safety Evaluation related to Amendment No. 123 to this Operating License will be implemented. Changes to this program will be subject to the provisions of 10 CFR 50.59.

2. The frequency of major diesel engine overhaul that is a part of the diesel engine maintenance and surveillance program shall be at least once every ten years. For this overhaul, one engine may be inspected during the refueling outage immediately prior to the ten years and the other engine inspected during the refueling outage immediately following the ten years. Alternatively, both inspections may be performed coincident with the 10-year reactor vessel inservice inspection. The 10-year overhaul interval shall be determined on a calendar basis from the date of completion of the last overhaul.

3. Oil hole locations in journals 8 through 12 on each crankshaft shall be inspected with liquid penetrant. This inspection shall be performed at each refueling outage or at the end of fifty[2] start-stop cycles on the engine since the previous inspection, whichever comes first. Indications found shall be evaluated with eddy current testing as appropriate.

   During each major engine overhaul, the fillets of main journal Nos. 4 through 12 should be inspected together with the oil holes, using liquid penetrant. Indications found shall be evaluated with eddy current testing as appropriate. In addition, these inspections should be performed for the oil holes and fillets in at least three of the crankpin journals at each major engine overhaul.

   If during the oil hole and fillet inspections described above, cracks are found in the oil holes or in other crankshaft surfaces, these findings are to be reported to the NRC within 24 hours. The affected engine is to be considered inoperable and is not to be restored to OPERABLE status until the disposition and/or corrective actions have been approved by the NRC staff.

---

2 Start-stop cycles associated with idle (no load) engine operation at 200 rpm or less need not be counted toward the limit of fifty.

4. Cylinder blocks shall be inspected for "ligament" cracks, "stud-to-stud" cracks and "stud-to-end" cracks as defined in the report[3] by Failure Analysis Associates, Inc. (FaAA) entitled "Design Review of TDI R-4 and RV-4 Series Emergency Diesel Generator Cylinder Blocks" (FaAA Report No. FaAA-84-9-11.1) and dated December 1984. (Note that the FaAA report specifies additional inspections to be performed for blocks with "known" or "assumed" ligament cracks.) The inspection intervals (i.e., frequency) shall not exceed the intervals calculated using the cumulative damage index model in the subject FaAA report. In addition, inspection methods shall be consistent with or equivalent to those identified in the subject FaAA report.

Blocks determined in the future to have "ligament" cracks as the result of the above inspections should be inspected at each refueling outage to determine whether or not cracks have initiated on the top surface, which was exposed because of the removal of two or more cylinder heads. This process should be repeated over several refueling outages until the entire block has been inspected. If after this process has been completed new "ligament" cracks are found, this process should again be repeated. Liquid penetrant testing or a similarly sensitive nondestructive testing technique should be used as appropriate to determine the depth of any cracks discovered.

Whenever diesel generator No. 1 is operated in excess of 4,375 kW for one hour or more, a visual inspection of the right bank cylinder block is to be performed under intense light within 48 hours after engine shutdown to verify the absence of "stud-to-stud" and "stud-to-end" cracks.

If "stud-to-stud" or "stud-to-end" cracks are found, these findings are to be reported to the NRC within 24 hours. The affected engine is to be considered inoperable and is not to be restored to OPERABLE status until the disposition and/or corrective actions have been approved by the NRC staff.

---

3 This report was transmitted to H.R. Denton, (NRC), from C.L. Ray, Jr., (TDI Owners Group), by letter dated December 11, 1984.

TABLE 4.4-1

BATTERY SURVEILLANCE REQUIREMENTS

	CATEGORY A[1]	CATEGORY B[2]	
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable [3] value for each connected cell
Electrolyte Level	>Minimum level indication mark, and ≤1/4″ above maximum level indication mark	>Minimum level indication mark, and ≤1/4″ above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥2.13 volts	≥2.13 volts [c]	>2.07 volts
Specific[a] Gravity	≥1.200[b]	≥1.195	Not more than .020 below the average of all connected cells
		Average of all connected cells >1.205	Average of all connected cells ≥1.195[b]

(a) Corrected for electrolyte temperature and level.
(b) Or battery charging current is less than 2 amps when on charge.
(c) Corrected for average electrolyte temperature in accordance with IEEE STD 450-1980.
(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameter(s) are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

BASIS: The normal plant Emergency Power System is normally in continuous operation, and periodically tested.[1]

The tests specified above will be completed without any preliminary preparation or repairs which might influence the results of the test except as required to perform the DG SLOW START test set forth in T.S. 4.4.B.1.a. The tests will demonstrate that components which are not normally required will respond properly when required.

DG maintenance, surveillance, overhaul and inspection requirements are intended to ensure the reliability and operational readiness of the diesels for emergency service. The basis for these requirements is discussed in NUREG-1216.[2] The maintenance and surveillance program is primarily based on the TDI diesel generator owners group recommendations, as modified by NUREG-1216. The frequency of major engine overhaul conforms to the frequency specified in those recommendations.

The DG design basis load restriction of 6,000 kW and the start-stop restriction of fifty between successive crankshaft inspections were the result of assumptions and recommendations found in the owners group crack propagation analysis.[3] The analysis postulated that the crankshaft initially has stress-induced surface cracks. The analysis then considered the effect of four types of diesel load histories on the growth of these cracks. Each load history consisted of repeated start-stop cycles with some steady state operation at full load (6,000 kW) between each start and its stop. The analysis concluded that for a crankshaft with a detectable size crack (10 mils deep), the number of start-stop cycles required to enlarge the crack until it becomes self-propagating (18 mils deep) under the full load steady state stresses represents the effective life of the crankshaft. Based on this conclusion, the analysis recommended that each crankshaft should be inspected at intervals of approximately fifty start-stop cycles.

Crankshaft stresses associated with idle (no load) DG speeds of 200 rpm or less have been found to be less than steady state stresses and so need not be counted toward the limit of fifty start-stop cycles.[4]

DG SLOW STARTS are specified for the monthly surveillances in order to reduce the cumulative fatigue damage to the engine crankshafts to levels below the threshold of detection under a program of augmented inservice inspection. In the event that the DG SLOW START inadvertently achieves steady state voltage and frequency in less than 24 seconds, the surveillance will not be considered a failure and require restart of the diesel generator.

For the monthly surveillances, each DG is loaded to between 5,500 kW and 6,100 kW. The lower of these limits meets or exceeds the total connected design load on either diesel engine. The upper limit is to accommodate load variations above 6,000 kW.

Main journals numbered 8 through 12 of the DG crankshafts are the most highly stressed journals during engine operation and are therefore the most susceptible to fatigue-induced cracking. For this reason, the oil hole locations at these main journals are inspected for cracks at least once at every refueling outage. At each 10-year major engine overhaul, this inspection is expanded to include additional oil hole locations and selected journal fillets.

The purpose of inspecting the four cylinder blocks is to assure that these blocks, particularly the block that has degraded Widmanstaetten microstructure, remain free of cracks in the area surrounding the cylinder head stud holes.

The DG requirements and restrictions were initially imposed by the NRC as license conditions.[5]

The surveillance requirements for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensure the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.4-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and .020 below normal full charge specific gravity or a battery charger current that has stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than .020 below normal full charge specific gravity with an average specific gravity of all the connected cells not more than .010 below normal full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operating with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.4-1 is permitted for up to 7 days. During this 7 day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than .020 below normal full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than .040 below normal full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

Verifying required positions for manual transfer switches ensure single failure and environmental interaction requirements are satisfied. The normal alignments for MTS-7 and MTS-8 are MCC-2 and MCC-4, respectively.

REFERENCE:

(1) Supplement No. 1 to Final Engineering Report and Safety Analysis, Section 3, Questions 6 and 8.

(2) NUREG-1216, Safety Evaluation Report Related to the Operability and Reliability of Emergency Diesel Generators Manufactured by Transamerica Delaval, Inc. (August 1986)

(3) Report No. FaAA-84-12-14 (Revision 1.0), Evaluation of Transient Conditions on Emergency Diesel Generator Crankshafts at San Onofre Nuclear Generating Station, Unit 1.

(4) Letter dated May 2, 1990, from SCE to NRC, Emergency Diesel Generators.

(5) Amendment No. 123 to San Onofre Unit 1 Provisional Operating License, Issued on April 14, 1989.

NRC-SONGS

Box NRC_SONGS_0022

Accession 9010030013

Southern California Edison Company

23 PARKER STREET

IRVINE, CALIFORNIA 92718

HAROLD B. RAY
SENIOR VICE PRESIDENT

TELEPHONE
714-458-4400

September 26, 1990

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: Docket No. 50-206
Administrative Supplement to Amendment Application No. 183
Emergency Diesel Generators
San Onofre Nuclear Generating Station
Unit 1

Enclosed is an administrative supplement to a pending amendment application to the San Onofre Unit 1 operating license. This supplement resolves editorial differences between the pending amendment application and one that was recently issued by the NRC. In addition, this supplement corrects an error in the existing Technical Specifications and makes a format change in the pending amendment application.

On April 19, 1990, we submitted Amendment Application No. 180 on redesign of the 480V emergency power system. This amendment application significantly revised the format of Technical Specification (TS) 3.7 and also revised TS's 3.14, 4.1 and 4.4. This amendment application was approved and issued by the NRC on August 14, 1990.

On June 5, 1990, we submitted Amendment Application No. 183, which deletes all of License Condition 3.L, titled "Diesel Generators", and transfers its requirements to TS's 3.7 and 4.4. This amendment application is expected to be approved by October 1, 1990.

These two amendment applications affect the text of TS's 3.7 and 4.4 in different ways. However, Amendment Application No. 183 does not show the changes that were proposed as part of Amendment Application No. 180. This is consistent with our standard practice in cases where multiple submittals on the same TS sections are being processed. As a result, there are significant editorial differences between the existing TS, as revised by Amendment Application No. 180, and the proposed TS presently being reviewed by the NRC. SCE is submitting this administrative supplement to resolve those differences by proposing a uniform text for TS's 3.7 and 4.4, based on both the approved and the pending changes.

A001
\\

This supplement also corrects an editorial error in Table 4.1.2 of the existing TS. This error consists of the omission of surveillance frequencies in surveillance Items 11, 12 and 13 of Table 4.1.2. This omission is the result of an oversight in preparing Amendment Application No. 180. In addition, this supplement renumbers the subsections of Section 4.4 of the TS differently than what was proposed in Amendment Application No. 183. Thus the previously proposed subsection "C" is now subsection "H". These changes are further explained in the enclosed "Description and Significant Hazards Consideration Analysis."

On July 31, 1990, we discussed the need for this supplement with J. E. Tatum, the NRC project manager and it was agreed by both parties that this supplement would serve a useful purpose and simplify the administrative activities associated with the NRC's approval of Amendment Application No. 183.

We plan to continue the use of administrative supplements in the future as appropriate to resolve editorial differences between pending and recently issued amendment applications.

If you have any questions, please call me.

Very truly yours,

Harold B. Ray

Enclosure

cc: J. B. Martin, Regional Administrator, NRC Region V
C. Caldwell, NRC Senior Resident Inspector, San Onofre Units 1, 2 and 3
J. H. Hickman, California Department of Health Services

NRC-SONGS

Box	NRC_SONGS_0022
Accession	9010040264

DESCRIPTION AND SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS OF PROPOSED CHANGE NO. 233 TO PROVISIONAL OPERATING LICENSE NO. DPR-13

INTRODUCTION

This is a request for NRC approval to change Technical Specification Nos. 3.5.1, 3.7.1, 4.1.1, and 4.4 and to add License Condition 3.N for San Onofre Nuclear Generating Station, Unit 1 (SONGS 1). The Technical Specification changes are necessary to reflect modifications of the Safeguards Load Sequencing System (SLSS) that are being implemented during the current refueling outage in accordance with 10 CFR 50.59. The modifications are being performed to satisfy single failure requirements and consist of changes to the SLSS actuation logic. The modified SLSS will enable each sequencer to start and load its associated diesel generator upon a safety injection signal (SIS) and concurrent loss of its respective 4160 volt electrical bus rather than upon a SIS and loss of both 4160 volt buses.

The proposed license condition is necessary to require implementation of a plant modification to eliminate a single failure susceptibility concerning automatic transfer between the primary and backup power sources for the vital electrical buses. The plant change will be installed during the Cycle 12 refueling outage.

The need for these changes was discovered as a result of the Emergency Core Cooling System (ECCS) Single Failure Analysis. An interim report on the results of that analysis was submitted to the NRC on July 31, 1990. These proposed changes to the Technical Specifications will resolve the topic identified as Issue No. 8, Sequencer Logic Deficiency, in Enclosure 2 of that report. The plant change proposed by the license condition will resolve a single failure susceptibility concerning the power sources for the vital electrical buses. The susceptibility was identified by SCE as an "issue under review" in the ECCS single failure analysis.

The resolution to the sequencer logic deficiency issue that is embodied by this proposed change differs from the preliminary corrective actions discussed in the ECCS Single Failure Analysis Interim Report. Continued evaluation of the subject has identified changing the SLSS actuation logic for automatic loading of the diesel generators and sequencing ECCS loads as the preferred resolution.

EXISTING TECHNICAL SPECIFICATIONS

See Attachment 1.

PROPOSED TECHNICAL SPECIFICATIONS

See Attachment 2.

EXISTING LICENSE CONDITION

None.

PROPOSED LICENSE CONDITION

See Attachment 3.

I. DESCRIPTION OF TECHNICAL SPECIFICATION CHANGES

This proposed change requests NRC approval to revise Technical Specification Nos. 3.5.1, 3.7.1, 4.1.1, and 4.4 to reflect modifications that are being completed on the SLSS prior to restart from the Cycle 11 refueling outage. The modifications are being performed in accordance with 10 CFR 50.59 and are delineated in the Discussion section below.

The proposed change to Technical Specification 3.7.1, Auxiliary Electrical Supply, amplifies on the diesel generators as backup sources of power for the 4160 volt buses by describing in the Basis section of the Technical Specification the design requirements for automatic starting and loading of the diesels. The modifications to the SLSS that accompany this proposed change enable each sequencer to automatically start and load its associated diesel generator and sequence ECCS loads upon receipt of a SIS and a concurrent loss of its respective 4160 volt bus. Previously, the SLSS required a SIS and loss of both 4160 volt buses to automatically load the diesel generators and sequence ECCS loads. It is also proposed that the above design condition for automatic starting and loading of the diesel generators and ECCS load sequencing be specified in Technical Specification 4.4, Emergency Power System Periodic Testing. Changes to Technical Specification Table 3.5.1-1, Reactor Trip Instrumentation, and Table 4.1.1, Reactor Trip System Instrumentation Surveillance Requirements, are also proposed to reflect revised actuation logic for reactor trip upon loss of power. The surveillance requirements for the 4160 volt bus voltage trip that are proposed in Technical Specification Table 4.1.1 are consistent with those specified for Safety Injection instrumentation in the Standard Technical Specifications, NUREG 0452.

II. DISCUSSION OF TECHNICAL SPECIFICATION CHANGES

INTRODUCTION

An interim report on the methodology and results of the ECCS Single Failure Analysis was submitted to the NRC on July 31, 1990. The report identified eight issues related to satisfying single failure requirements that need resolution. SCE committed to implement corrective actions for all eight of these open issues prior to restart from the current outage.

The proposed Technical Specification changes address the issue that concerns a deficiency in sequencer logic. The issue involves three potential plant conditions which could delay ECCS operation. Each of these three plant conditions are discussed below. The 4160 volt electrical distribution system and the SLSS are next described to aid an understanding of the potential for delayed ECCS operation.

4160 VOLT ELECTRICAL DISTRIBUTION WITH EXISTING SLSS LOGIC

There are two independent safety-related 4160 volt electrical distribution trains consisting of Buses 1C and 2C. These buses supply electrical power to systems and components that are required for normal operation, safe plant shutdown, and mitigation of design basis events. These two electrical distribution systems are energized by off-site electrical sources through Auxiliary Transformer C. Attachment 4 illustrates the normal electrical bus alignments (after completion of 480 volt modifications being implemented during the current outage).

In the event electrical power is not available from off-site sources, each of the two 4160 volt distribution systems is powered by an emergency diesel generator. Upon receipt of a SIS with concurrent loss of Buses 1C and 2C, the SLSS trips all loads on the buses, closes the diesel generator output breakers, and sequences the ECCS loads. For a SIS without a loss of power, the loads on the bus are not tripped, and all ECCS loads except the Main Feedwater Pumps are loaded in a single block. (The Main Feedwater Pumps have their own time delay relay controlling their restart.) The diesel generators automatically start but do not load upon a SIS, a loss of a single 4160 volt bus, or a SIS concurrent with a loss of a single 4160 volt bus.

POTENTIAL FOR DELAYED ECCS OPERATION

There are three potential plant conditions which could delay actuation of the ECCS longer than assumed in the safety analysis:

- During emergency diesel generator surveillance testing, the diesel generator is paralleled to its respective 4160 volt bus. Failure of the diesel generator breaker to trip concurrent with a SIS and loss of off-site power could result in neither sequencer being able to detect the loss of both 4160 volt buses. The sequencer on the surveilled train would sense only a SIS because the diesel generator would maintain the bus energized. That sequencer would attempt to block start ECCS loads while maintaining power to the non-essential loads on its bus. This would result in diesel generator overload and a degraded bus voltage condition leading to failure of this train. The other train would initially sense a SIS and loss of its respective electrical bus but would not connect its diesel generator or sequence its ECCS loads until the first train failed. This would delay ECCS initiation beyond the timing assumed in the safety analysis.

- During ground detection activities on Bus 1C or 2C, the bus is isolated from Auxiliary Transformer C and is connected to the main generator via Bus 1A or 1B. If a SIS event were to occur coincident with a loss of off-site power, the sequencer for the bus not being tested would not detect a loss of bus since there would be voltage on the bus connected to the main generator. The bus being tested would detect a SIS only and block start ECCS loads while maintaining non-essential loads on the bus. The SIS would result in a unit trip. The unit trip would cause the main generator voltage to eventually decrease enough to result in a loss of bus signal on the bus under test. Hence, the loss of both buses would then be sensed and the ECCS loads connected and sequenced. This would delay ECCS initiation beyond the timing assumed in the safety analysis. In addition, if the bus not under test were to fail, ECCS initiation would not be achieved.

- Failure of the main feeder breaker to open on Bus 1C or 2C in response to a degraded grid condition concurrent with a SIS could lead to a failure of ECCS loads to properly sequence. The bus with the failed breaker would remain connected to the grid and would have a degraded voltage condition. Since it would still have voltage, loss of the bus would not be sensed by the SLSS and thus a SIS and concurrent loss of both buses would not be detected. As a result, the ECCS loads would be block loaded on the train with the degraded voltage and would not be sequenced on the redundant train. The loads on the train with the degraded voltage would not start in the time required by the safety analysis.

SLSS MODIFICATIONS

ECCS load sequencing potentially could be delayed by the above three plant conditions because of the present actuation requirement to sense a SIS in combination with a loss of voltage on both 4160 volt buses. SCE is now in the process of eliminating these potential ECCS actuation delays. A design change is being installed to modify the logic for each sequencer so that the loads on the respective ECCS train are sequenced upon a SIS in conjunction with the loss of the respective 4160 volt bus. The following modifications are being implemented in accordance with 10 CFR 50.59 and will be completed prior to restart from the current refueling outage:

- Modification of the circuitry for each SLSS sequencer to actuate a loss of power signal upon loss of voltage on their respective 4160 volt buses rather than on the loss of both buses.

- Addition of separate actuation logic for initiation of reactor trip upon loss of both 4160 volt buses (to avoid reactor trip upon loss of single bus that would result from modification of the sequencer circuits).

In addition to implementation of the above plant changes, SCE will limit the duration of ground detection activities in accordance with Technical Specification 3.7.1, Action G. Operation with only one 4 Kv electrical bus (i.e., the bus under test is considered inoperable) during such ground searches is acceptable since the assumption of a single failure (e.g., the loss of the bus not under test) while operating in an action statement is not required.

III. DESCRIPTION OF LICENSE CONDITION

License Condition 3.N is being proposed to schedule installation of a plant modification to resolve a single failure susceptibility affecting the power sources for the vital electrical buses. The plant modification will be completed prior to restart from the Cycle 12 refueling outage. The plant change is necessary to assure that the vital buses are capable of accommodating all safety-related electrical loads so that the plant can reach safe shutdown under all accident conditions.

IV. DISCUSSION OF LICENSE CONDITION

INTRODUCTION

SCE identified in the ECCS Single Failure Analysis Interim Report the potential for the loss of vital bus power due to the lack of retransfer capability as an "issue under review." It is proposed that this single failure susceptibility be eliminated by implementing a plant modification during the Cycle 12 refueling outage. The need for this plant change is described below.

SINGLE FAILURE

Vital buses 1, 2, 3, and 3A are normally powered through inverters connected to DC Bus. No. 1. The vital buses power a portion of the safety-related instrumentation and equipment necessary to assure the plant can reach safe shutdown. These buses also accommodate loads for components that are located inside containment but that are not qualified for operation in a harsh environment.

The harsh environment that would result from a LOCA or MSLB potentially could cause short circuits on some of these non-qualified loads. The occurrence of multiple faults on the Train A vital buses would cause the automatic transfer switches to transfer the vital buses to the backup power source (Train B 480 volt motor control center number 2). This circumstance would not jeopardize the safety-related loads because the backup power source has sufficient capacity for the protection devices to isolate the faulted loads. However, if the Train B 480 volt power should fail after an auto-transfer, all power would be lost to the affected Train A vital buses since the auto-transfer switches are not designed to retransfer back to the primary power source. This may result in a temporary inability for the SLSS to automatically actuate ECCS operation and to reach safe shutdown. Electrical power could eventually be restored to the vital buses by the operator manually initiating transfer back to the inverters.

DESIGN CHANGE/RISK ASSESSMENT

SCE intends to eliminate this single failure susceptibility by implementing a plant modification. However, the modification cannot be performed during the present outage because the static auto-transfer switches and inverters currently deemed necessary for the design change have a procurement lead time of approximately 12 months. Therefore, SCE proposes a license condition to require installation of the plant change during the Cycle 12 refueling outage. As discussed below, completion of the modification at that time is justified because the risk of adverse consequences occurring during Cycle 11 operation is negligible. The proposed schedule also provides adequate time to finalize the engineering design, procure the necessary equipment and materials, install the hardware, and performance test the system.

SCE has performed a probabilistic risk assessment (PRA) of continued plant operation with the present vital bus automatic transfer capability to assure that scheduling the plant modification for the Cycle 12 refueling outage is acceptable. The assumptions, methodology, and results of that assessment are presented in Attachment 5. The results of that analysis show that the risk of core damage due to this single failure susceptibility is less than 6×10^{-7} per year. This contribution to the overall core damage frequency (estimated to be 2×10^{-4} per year) is quite low, accounting for less than 0.3% of the total. Therefore, SCE has concluded that the probability of this single failure scenario occurring during the upcoming fuel cycle is sufficiently low to allow implementation of the plant change during the Cycle 12 refueling outage.

The proposed schedule for implementing the plant change concerning vital bus auto-transfer also allows the final design to benefit from the integrated resolution of SEP Topic VI-7.C.2, Failure Mode Analysis (ECCS), and Regulatory Guide 1.97, Post-Accident Instrumentation. As committed in our letter dated May 2, 1990 (and confirmed in the NRC Order dated January 2, 1990), that integrated evaluation will be submitted to the NRC by June 30, 1991, and will address physical and electrical separation issues among other considerations. One of the open items to be resolved by the integrated evaluation concerns physical and electrical separation of vital buses 1, 2, 3, and 4 and their associated transfer switches and regulated buses. Completion of the vital bus automatic transfer modification prior to resolving this separation issue as part of the integrated SEP VI-7.C.2/Reg. Guide 1.97 evaluation is likely to result in subsequent changes in the design.

V. SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

As required by 10 CFR 50.91(a)(1) this analysis is provided to demonstrate that the proposed license amendment to revise the SLSS actuation logic in the Technical Specifications and add a license condition concerning vital bus automatic transfer capability does not represent a significant hazards consideration. As demonstrated below, in accordance with the three factor test of 10 CFR 50.92(c), implementation of the proposed amendment was analyzed using the following standards and found not to: 1) involve a significant increase in the probability or consequences of an accident previously evaluated; or 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety.

1. Will operation of the facility in accordance with these proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   Sequencer Logic Deficiency

   The only accidents evaluated in the Updated Final Safety Analysis Report (UFSAR) that are related to the proposed Technical Specification changes are a LOCA or MSLB. Safe shutdown from both of these events is assured, in part, by automatic injection of borated water into the Reactor Coolant System (RCS) by the Safety Injection System. A SIS is automatically initiated by either low pressure in the pressurizer or high containment pressure. Reliable operation of the Safety Injection System is assured by i) two separate and independent pumping trains* for delivering borated water to the RCS and ii) two emergency diesel generators for powering Safety Injection System equipment during loss of off-site power conditions.

   The SLSS starts and loads the diesel generators and provides proper sequencing of the ECCS loads onto the ECCS buses. This proposed change reflects plant modifications that are being performed during the current refueling outage. The modification will change the SLSS actuation logic so that each sequencer starts and loads its respective diesel and sequences the ECCS loads upon receipt of a SIS concurrent with the loss of its respective electrical bus rather than upon a SIS and loss of both buses. In addition, separate trip signals indicative of loss of both 4160 volt buses are being created outside of the SLSS to retain the logic for reactor trip upon loss of off-site power (i.e., loss of both 4160 volt buses). These plant modifications do not affect the Safety Injection System logic initiating circuits or the probability of spurious reactor trips.

   Operation of SONGS 1 in accordance with this proposed change will not increase the probability or consequences of an accident previously evaluated. Rather, the plant modifications reflected by

---

* During ground detection activities, one pumping train may be inoperable for a limited period in accordance with Technical Specification 3.7.1, Action G.

this change assure that ECCS operation will be initiated within the time frame assumed by the MSLB and LOCA safety analyses presented in Sections 15.2 and 15.16 of the UFSAR.

Vital Bus Automatic Transfer

Due to the vital bus transfer single failure susceptibility in the SONGS 1 electrical distribution system, the consequences of a LOCA or MSLB could be more serious than previously concluded by the UFSAR accident analyses. The probability of a LOCA or MSLB occurring is unaffected by the single failure susceptibility.

If the vital buses were being powered from their backup power source, failure of that power source would lead to a temporary loss of all vital bus electrical power. Such an occurrence may prevent automatic actuation of the safeguards required to avoid core damage following a LOCA/MSLB. This possibility stems from the lack of automatic retransfer capability from the vital bus backup power source (480 volt motor control center number 2) to the primary source (DC Bus. No. 1). Electrical power could eventually be restored to the buses by the operator manually transferring to the primary source.

SCE plans to implement a design modification during the Cycle 12 refueling outage to eliminate the possibility of the above single failure scenario. In addition, SCE has concluded that operation throughout Cycle 11 with the current plant configuration does not represent a significant increase in the consequences of a LOCA/MSLB because such a series of events is highly unlikely to occur. All of the following circumstances would have to exist to temporarily lose power to one or more of the vital buses:

- Occurrence of a LOCA or MSLB.
- Sufficient short circuiting of unqualified electrical loads on the vital buses to cause automatic transfer to the backup power source.
- Failure of the vital bus backup power source (Train B 480 volt motor control center number 2) after an automatic transfer.

SCE has performed a PRA for this scenario to confirm that operation with the current plant configuration for a limited period does not represent a significant risk of core damage and/or adverse consequences to the public. The results of that analysis show that the risk of core damage due to this single failure susceptibility is less than 6×10^{-7} per year. Therefore, continued plant operation throughout Cycle 11 with the existing vital bus configuration does not represent a significant increase in the consequences of an accident previously evaluated.

2. Will operation of the facility in accordance with these proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

Sequencer Logic Deficiency

The proposed Technical Specification changes do not introduce the possibility for any new accidents. The plant changes that accompany this proposed change do not affect the requirements for generation of a SIS or initiation of a reactor trip. All new circuits, cabling, and terminations are being installed to satisfy seismic category A requirements and physical and electrical separation criteria for safety-related systems.

In addition, SCE has confirmed that operation of one of the two trains of the Safety Injection System in a sequenced mode (SISLOP) concurrent with the other train in a block-loaded mode (SIS only) will not result in any adverse consequences. Once the plant changes are complete, at least one safety injection train would operate upon receipt of a SIS and a concurrent loss of one of the two 4160 volt buses.

Vital Bus Automatic Transfer

The design for the plant modification that will eliminate the vital bus automatic transfer single failure susceptibility is not yet final. SCE will complete the necessary design modification in accordance with all applicable regulatory requirements to assure that the revised electrical distribution system does not introduce the possibility of any new accidents.

3. Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?

Response: No

Sequencer Logic Deficiency

The proposed Technical Specification changes reflect plant changes that are being performed to eliminate three single failure scenarios that potentially could have delayed initiation of safety injection after a LOCA or MSLB and concurrent loss of off-site power. In each case, the resulting delay could have been beyond the timing assumed in the analyses described in UFSAR Sections 15.2 and 15.16 for a MSLB and a LOCA. The plant changes dictate that safety injection operation will be initiated upon receipt of a SIS and concurrent loss of one rather than both 4160 volt electrical buses to assure there is no reduction in a margin of safety.

Vital Bus Automatic Transfer

Interim operation during Cycle 11 with the present vital bus automatic transfer capability involves a slight chance that the plant may not be able to automatically initiate required safeguards following a LOCA/MSLB. However, SCE has concluded that the potential for this event is not significant since the probability of its occurrence is estimated to be less than $6x10^{-7}$ per year. The design for the plant modification that will eliminate this single failure concern will be installed during the Cycle 12 refueling outage to maintain all existing margins of safety.

SAFETY AND SIGNIFICANT HAZARDS DETERMINATION

Based on the preceding analysis, it is concluded that: (1) Proposed Change No. 233 does not constitute a significant hazards consideration as defined by 10 CFR 50.92; (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change; and (3) this action will not result in a condition which significantly alters the impact of the Station on the environment as described in the NRC Final Environmental Statement.

Attachment 1 - Existing Technical Specifications
Attachment 2 - Proposed Technical Specifications
Attachment 3 - Proposed License Condition
Attachment 4 - Schematic Diagram of SONGS 1 Electrical Distribution System
Attachment 5 - Probabilistic Risk Assessment of Continuing Plant Operation with Present Vital Bus Automatic Transfer Capability

ATTACHMENT 1

EXISTING TECHNICAL SPECIFICATIONS

3.5 INSTRUMENTATION AND CONTROL

3.5.1 REACTOR TRIP SYSTEM INSTRUMENTATION

APPLICABILITY: As shown in Table 3.5.1-1.

OBJECTIVE: To delineate the conditions of the Plant instrumentation and safety circuits necessary to ensure reactor safety.

SPECIFICATION: As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.5.1-1 shall be OPERABLE.

ACTION: As shown in Table 3.5.1-1.

BASIS: During plant operations, the complete instrumentation systems will normally be in service.(1) Reactor safety is provided by the Reactor Protection System, which automatically initiates appropriate action to prevent exceeding established limits.(2) Safety is not compromised, however, by continuing operation with certain instrumentation channels out of service since provisions were made for this in the plant design.(1)(3) This Standard outlines limiting conditions for operation necessary to preserve the effectiveness of the reactor control and protection system when any one or more of the channels is out of service.

REFERENCES:

(1) Final Engineering Report and Safety Analysis, Section 6.

(2) Final Engineering Report and Safety Analysis, Section 6.2.

(3) NIS Safety Review Report, April 1988

TABLE 3.5.1-1

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTION UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2	1
	2	1	2	3*, 4*, 5*	7
2. Power Range, Neutron Flux, Overpower Trip	4	2	3	1, 2	2#
3. Power Range, Neutron Flux, Dropped Rod Rod Stop	4	1**	4	1, 2	28#
4. Intermediate Range, Neutron Flux	2	1	2	1###, 2***	3
5. Source Range, Neutron Flux					
A. Startup	2	1**	2	2##	4
B. Shutdown	2	1**	2	3*, 4*, 5*	7
C. Shutdown	2	0	1	3, 4, and 5	5
6. NIS Coincidentor Logic	2	1	2	1, 2	29
				3*, 4*, 5*	7
7. Pressurizer Variable Low Pressure	3	2	2	1####	6#
8. Pressurizer Fixed High Pressure	3	2	2	1, 2	6#
9. Pressurizer High Level	3	2	2	1	6#

TABLE 3.5.1-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTION UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
10. Reactor Coolant Flow					
A. Single Loop (Above 50% of Full Power)	1/loop	1/loop in any operating loop	1/loop in each operating loop	1	6#
B. Two Loops (Below 50% of Full Power)	1/loop	1/loop in two operating loops	1/loop in each operating loop	1####	6#
11. Steam/Feedwater Flow Mismatch	3	2	2	1#####	6#
12. Turbine Trip-Low Fluid Oil Pressure	3	2	2	1####	6#
13. Reactor Coolant Pump Breaker Position					
A. Single Loop (Above 50% of Full Power)	1/loop	1/loop in any operating loop	1/loop in each operating loop	1	6#
B. Two Loops (Below 50% of Full Power)	1/loop	1/loop in two operating loops	1/loop in each operating loop	1####	6#

TABLE 3.5.1-1 (Continued)

TABLE NOTATION

*	With the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal.
**	A "TRIP" will stop all rod withdrawal.
***	Startup rate circuit enabled at $10^{-[illegible]}$% reactor power.
#	The provisions of Specification 3.0.4 are not applicable.
##	Below the Source Range High Voltage Cutoff Setpoint.
###	Below the P-7 (At Power Reactor Trip Defeat) Setpoint.
####	Above the P-7 (At Power Reactor Trip Defeat) Setpoint.
#####	Above the P-8 Setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are met:

a. The inoperable channel is placed in the tripped condition within 1 hour.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be returned to the untripped condition for up to 2 hours for surveillance testing of other channels per Specification 4.1.

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the Source Range High Voltage Cutoff Setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the Source Range High Voltage Cutoff Setpoint.

b. Above the Source Range High Voltage Cutoff Setpoint but below 10 percent of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10 percent of RATED THERMAL POWER.

However, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.1, provided the other channel is OPERABLE.

ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement suspend all operations involving positive reactivity changes.

ACTION 5 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.5.2 as applicable, within 1 hour and at least once per 12 hours thereafter.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed until performance of the next required OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 8 hours.

ACTION 7 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or open the reactor trip breakers within the next hour.

ACTION 28 - With the number of OPERABLE channels less than the Minimum Channels OPERABLE requirements, within one hour reduce THERMAL POWER such that T_{ave} is less than or equal to 551.5°F, and place the rod control system in manual mode.

ACTION 29 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirements, be in at least HOT STANDBY within 6 hours; however, one channel may be removed from service for up to 2 hours for surveillance testing per Specification 4.1, provided the other channel is OPERABLE.

3.7 AUXILIARY ELECTRICAL SUPPLY

3.7.1 ELECTRICAL SUPPLY: OPERATING

APPLICABILITY: MODES 1, 2, 3, and 4

OBJECTIVE: To define those conditions of electrical power availability necessary to provide for safe reactor operation and to provide for the continuing availability of engineered safeguards.

SPECIFICATION:

a. One Southern California Edison Company and one San Diego Gas & Electric Company high voltage transmission line to the switchyard and two transmission circuits from the switchyard, one immediate and one delayed access, to the onsite safety-related distribution system shall be OPERABLE. This configuration constitutes the two required offsite circuits.

b. Two redundant and independent diesel generators shall be OPERABLE each with:

   1. A separate day tank containing a minimum of 290 gallons of fuel,

   2. A separate fuel storage system containing a minimum of 37,500 gallons of fuel, and

   3. A separate fuel transfer pump.

c. Train A Emergency AC Buses shall be OPERABLE, comprised of:

   1. 4160 volt Bus 1C,
   2. 480 volt Buses 1 and 3, and associated station service transformers with tie breaker open.

d. Train B Emergency AC Buses shall be OPERABLE, comprised of:

   1. 4160 volt Bus 2C,
   2. 480 volt Buses 2 and 4, and associated station service transformers with tie breaker open.

e. 120 volt AC Vital Buses 1, 2, 3, 3A, and 4 energized from associated inverters connected to DC Bus 1.

f. 120 volt AC Vital Buses 5 and 6 energized from associated inverters connected to DC Bus 2.

g. 125 volt DC Bus 1 shall be OPERABLE and energized from Battery No. 1, with at least one full capacity charger.

h. 125 volt DC Bus 2 shall be OPERABLE and energized from Battery No. 2, with at least one full capacity charger.

i. Two trains of Safeguards Load Sequencing Systems (SLSS) shall be OPERABLE.*

j. The MOV-850C Uninterruptible Power Supply (UPS) OPERABLE and energized from the battery with its full capacity charger.**

k. Manual Transfer Switch 7 (MTS-7) shall be OPERABLE and energized from MCC-2.

l. Manual Transfer Switch 8 (MTS-8) shall be OPERABLE and energized from MCC-4.

ACTION:

A. With one of the required offsite circuits inoperable, demonstrate the operability of the remaining AC sources by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 24 hours. Restore the circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

B. If one diesel generator is declared inoperable, demonstrate the operability of the two offsite transmission circuits and the remaining diesel generator by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 24 hours. Restore the inoperable diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

C. With one offsite circuit and one diesel generator of the above required AC electrical power sources inoperable, demonstrate the operability of the remaining AC sources by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 8 hours thereafter and Surveillance Requirement B.1.a within 8 hours. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Have at least two offsite circuits and two diesel generators OPERABLE within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

D. With one diesel generator inoperable as in B or C above, verify that: (1) all required systems, subsystems, trains,

---

*The automatic load function may be blocked in Mode 3 at a pressurizer pressure $\leq$ 1900 psig.

**Applicable in MODES 1, 2, and 3 above 500 psig.

components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE; and (2) the steam-driven auxiliary feedwater pump is OPERABLE in MODES 1, 2, and 3. If these conditions are not satisfied within 2 hours, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

E. With two required offsite circuits inoperable, demonstrate the operability of two diesel generators by performing Surveillance Requirement B.1.a of Technical Specification 4.4 within 8 hours, unless the diesel generators are already operating. Restore at least one of the inoperable sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 4 hours. Have at least two offsite circuits and two diesel generators OPERABLE within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

F. With two of the above required diesel generators inoperable, demonstrate the operability of two offsite circuits by performing Surveillance Requirement A of Technical Specification 4.4 within one hour and at least once per 2 hours thereafter. Restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

G. With less than the above trains of Emergency AC buses OPERABLE, restore the inoperable buses within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

H. With one AC Vital Bus either not energized from its associated inverter, or with the inverter not connected to its associated DC Bus: (1) re-energize the AC Vital Bus within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and (2) re-energize the AC Vital Bus from its associated inverter connected to its associated DC bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

I. With one DC bus inoperable or not energized from its associated battery and at least one full capacity charger, re-energize the DC Bus from its associated battery and at least one full capacity charger within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

J. With one Safeguards Load Sequencing System inoperable, restore the inoperable sequencer to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

K. With the MOV-850C UPS inoperable, or not energized from its associated battery and its full capacity charger, restore the UPS to OPERABLE status and re-energize the UPS from its associated battery and its full capacity charger within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

L. With MTS-7 inoperable or not energized from MCC-2, restore MTS-7 to OPERABLE status and re-energize MTS-7 from MCC-2 within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

M. With MTS-8 inoperable or not energized from MCC-4, restore MTS-8 to OPERABLE status and re-energize MTS-8 from MCC-4 within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

BASIS: The station is connected electrically to the Southern California Edison Company and San Diego Gas & Electric Company system via either of two physically independent high voltage transmission routes composed of four Southern California Edison Company high voltage lines and four San Diego Gas & Electric Company high voltage lines.

Of the four Southern California Edison Company lines, any one can serve as a source of power to the station auxiliaries at any time. Similarly, any of the four San Diego Gas & Electric Company lines can serve as a source of power to the station auxiliaries at any time. By specifying one transmission line from each of the two physically independent high voltage transmission routes, redundancy of sources of auxiliary power for an orderly shutdown is provided.

Similarly, either transformer A or B, along with transformer C, provide redundancy of 4160 volt power to the auxiliary equipment, and in particular to the safety injection trains. In addition, each 4160 volt bus has an onsite diesel generator as backup.

In MODES 1, 2, 3 and 4, two diesel generators provide the necessary redundancy to protect against a failure of one of the diesel generator systems or in case one diesel generator system is taken out for maintenance, without requiring a reactor shutdown. This also eliminates the necessity for depending on one diesel generator to operate for extended periods without shutdown if it were required for post-accident conditions.

When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE. In addition, the ACTION STATEMENT requires a verification that the steam-driven auxiliary feedwater pump is OPERABLE in MODES 1, 2, and 3.

These requirements are intended to provide assurance that a loss of offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the operability of the component.

During normal operations, the 480 volt system is considered OPERABLE if the four 480 volt buses and four station service transformers are OPERABLE with respective tie breakers open. This will ensure that the 480V main breakers and transformers remain OPERABLE during the worst loading condition in case of a SIS without LOP.

The primary power source for Vital Buses 1, 2, 3, 3A, and 4 is Train A DC Bus 1. The alternate power source is available from MCC-2 through MTS-7. The 1987 RPS and ESF single failure analyses credited the Train B backup power to these vital buses through MTS-7.

Correct operation of the safety injection system is assured by the operability of the load sequencers and the UPS for MOV-850C and MOV-358 (MOV-850C UPS). Correct operation of the recirculation system is assured by the operability of the MOV-850C UPS which also supplies MOV-358.

Manual Transfer Switch 8 (MTS-8) provides the means to power MOV-883 and the MOV-850C UPS from either Train A or Train B. However, due to single failure considerations and environmental effects, MTS-8 is normally powered from MCC-4 on Train B. MOV-883 is the discharge valve from the RWST and must remain open during the safety injection phase and close with initiation of recirculation.

4.1.1 OPERATIONAL SAFETY ITEMS

APPLICABILITY: Applies to surveillance requirements for items directly related to Safety Standards and Limiting Conditions for Operation.

OBJECTIVE: To specify the minimum frequency and type of surveillance to be applied to plant equipment and conditions.

SPECIFICATION:

A. Reactor Trip System instrumentation shall be checked, tested, and calibrated as indicated in Table 4.1.1.

B. Equipment and sampling tests shall be as specified in Table 4.1.2.

C. The specific activity and boron concentration of the reactor coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.1.2., Item 1a.

D. The specific activity of the secondary coolant system shall be determined to be within the limit by performance of the sampling and analysis program of Table 4.1.2., Item 1b.

E. All control rods shall be determined to be above the rod insertion limits shown in Figure 3.5.2.1 by verifying that each analog detector indicates at least 21 steps above the rod insertion limits, to account for the instrument inaccuracies, at least once per shift during Startup conditions with K_{eff} equal to or greater than one.

F. The position of each rod shall be determined to be within the group demand limit and each rod position indicator shall be determined to be OPERABLE by verifying that the rod position indication system (Analog Detection System) and the step counter indication system (Digital Detection System) agree within 35 steps at least once per shift during Startup and Power Operation except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the rod position indication system (Analog Detection System) and the step counter indication system (Digital Detection System) at least once per 4 hours.

G. During MODE 1 or 2 operation each rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

H. Instrumentation shall be checked, tested, and calibrated as indicated in Table 4.1.3.

TABLE 4.1.1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST
1. Manual Reactor Trip	N.A.	N.A.	N.A.	R	N.A.
2. Power Range, Neutron Flux	S	D (2,3) R (3,4)	M	N.A.	N.A.
3. Power Range, Neutron Flux, Dropped Rod Rod Stop	N.A.	N.A.	M	N.A.	N.A.
4. Intermediate Range, Neutron Flux	S	R (3,4)	S/U (1), M	N.A.	N.A.
5. Source Range, Neutron Flux	S	R (3)	S/U (1), M	N.A.	N.A.
6. NIS Coincidentor Logic	N.A.	N.A.	N.A.	N.A.	M (5)
7. Pressurizer Variable Low Pressure	S	R	M	N.A.	N.A.
8. Pressurizer Pressure	S	R	M	N.A.	N.A.
9. Pressurizer Level	S	R	M	N.A.	N.A.
10. Reactor Coolant Flow	S	R	Q	N.A.	N.A.
11. Steam/Feedwater Flow Mismatch	S	R	M	N.A	N.A.
12. Turbine Trip-Low Fluid Oil Pressure	N.A.	N.A.	N.A.	S/U (1,6)	N.A.
13. Reactor Coolant Pump Breaker Position*	S	R	R	N.A.	N.A.

*Applicable to Item 6 in Table 2.1

TABLE 4.1.1 (Continued)

TABLE NOTATION

(1) - If not performed in previous 31 days.

(2) - Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.

(3) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(4) - The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.

(5) - Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(6) - Setpoint verification is not applicable.

TABLE 4.1.2
MINIMUM EQUIPMENT CHECK AND SAMPLING FREQUENCY

		Check	Frequency
1a. Reactor Coolant Samples	1.	Gross Activity Determination	At least once per 72 hours. Required during MODES 1, 2, 3 and 4.
	2.	Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1 per 14 days. Required only during MODE 1.
	3.	Spectroscopic for E(1) Determination	1 per 6 months(2) Required only during MODE 1.
	4.	Isotopic Analysis for Iodine Including I-131, I-133, and I-135.	a) Once per 4 hours,(3) whenever the specific activity exceeds 1.0 μCi/gram DOSE EQUIVALENT I-131 or 100/ E (1) μCi/gram. b) One sample between 2 and 6 hours following a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period.
	5.	Boron concentration	Twice/Week

(1) E is defined in Section 1.0.

(2) Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer.

(3) Until the specific activity of the reactor coolant system is restored within its limits.

TABLE 4.1.2 (continued)

		Check	Frequency
1.b Secondary Coolant Samples	1.	Gross Activity Determination	At least once per 72 hours. Required only during MODES 1, 2, 3 and 4.
	2.	Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	a) 1 per 31 days, whenever the gross activity determination indicates iodine concentrations greater than 10% of the allowable limit. Required only during MODES 1, 2, 3 and 4. b) 1 per 6 months, whenever the gross activity determination indicates iodine concentrations below 10% of the allowable limit. Required only during MODES 1, 2, 3, and 4.

TABLE 4.1.2 (continued)

		Check	Frequency
2.	Safety Injection Line and RWST Water Samples	a. Boron Concentration	Monthly when the reactor is critical and prior to return of criticality when a period of subcriticality extends the test beyond 1 month
3.	Control Rod Drop	a. Verify that all rods move from full out to full in, in less than 2.44 seconds	At each refueling shutdown
4.	(Deleted)		
5.	Pressurizer Safety Valves	a. Pressure Setpoint	At each refueling shutdown
6.	Main Steam Safety Valves	a. Pressure Setpoint	At each refueling shutdown
7.	Main Steam Power Operated Relief Valves	a. Test for OPERABILITY	At each refueling shutdown
8.	Trisodium Phosphate Additive	a. Check for system availability as delineated in Technical Specification 4.2	At each refueling shutdown
9.	Hydrazine Tank Water Samples	a. Hydrazine concentration	Once every six months when the reactor is critical and prior to return of criticality when a period of subcriticality extends the test interval beyond six months
10.	Not used.		

TABLE 4.1.2 (continued)

		Check		Frequency
11.	MOV-LCV-1100 C Transfer Switch	a.	Verify that the fuse block for either breaker 8-1198 to MCC 1 or breaker 42-12A76 to MCC 2A is removed.	Same as Item 10 above
12.	Emergency Siren Transfer Switch	a.	Verify that the fuse block for either breaker 8-1145 to MCC 1 or breaker 8-1293A to MCC 2 is removed	Same as Item 10 above
13.	Communication Power Panel Transfer Switch	a.	Verify that the fuse block for either breaker 8-1195 to MCC 1 or breaker 8-1293B to MCC 2 is removed	Same as Item 10 above
14a.	Spent Fuel Pool Water Level		Verify water level per Technical Specification 3.8	a. Once every seven days when spent fuel is being stored in the pool.
b.	Refueling Pool Water Level			b. Within two hours prior to start of and at least once per 24 hours thereafter during movement of fuel assemblies or RCC's.
15.	Reactor Coolant Loops/ Residual Heat Removal Loops	a.	Per Technical Specifications 3.1.2.C and 3.1.2.D, in MODE 1 and MODE 2 and in MODE 3 with reactor trip breakers closed, verify that all required reactor coolant loops are in operation and circulating reactor coolant.	a. Once per 12 hours
		b.	Per Technical Specification 3.1.2.E, in MODE 3 with the reactor trip breakers open, verify	

TABLE 4.1.2 (continued)

Check	Frequency
1. At least two required reactor coolant pumps are operable with correct breaker alignments and indicated power availability.	1. Once per 7 days
2. The steam generators associated with the two required reactor coolant pumps are operable with secondary side water level ≥ 256 inches (wide range).	2. Once per 12 hours
3. At least one reactor coolant loop is in operation and circulating reactor coolant.	3. Once per 12 hours
c. Per Technical Specification 3.1.2.F, in MODE 4 verify	
1. At least two required (RC or RHR) pumps are operable with correct breaker alignments and indicated power availability.	1. Once per 7 days
2. The required steam generators are operable with secondary side water level ≥ 256 inches (wide range).	2. Once per 12 hours
3. At least one reactor coolant loop/RHR TRAIN is in operation and circulating reactor coolant.	3. Once per 12 hours
d. Per Technical Specifications 3.1.2.G and 3.1.2.H, in MODE 5 verify, as applicable:	

TABLE 4.1.2 (continued)

	Check	Frequency
	1. At least one RHR TRAIN is in operation and circulating reactor coolant.	1. Once per 12 hours
	2. When required, one additional RHR TRAIN is operable with correct pump breaker alignments and indicated power availability.	2. Once per 7 days
	3. When required, the secondary side water level of at least two steam generators is $\geq$ 256 inches (wide range).	3. Once per 12 hours
	e. Per Technical Specification 3.8.A.3, in MODE 6, with water level in refueling pool greater than elevation 40 feet 3 inches, verify that at least one method of decay heat removal is in operation and circulating reactor coolant at a flow rate of at least 400 gpm.	e. Once per 12 hours
	f. Per Technical Specification 3.8.A.4, in MODE 6, with water level in refueling pool less than elevation 40 feet 3 inches, verify	
	1. At least one decay heat removal method is in operation and circulating reactor coolant.	1. Once per 12 hours
	2. One additional decay heat removal method is operable with correct pump breaker alignments and indicated power availability.	2. Once per 7 days
16. RWST Contained Water Volume	a. Verify volume $\geq$ 50 ft. plant elevation	a Monthly when the reactor is critical and prior to return of criticality when a period of subcriticality extends the surveillance beyond 1 month

TABLE 4.1.3

MINIMUM FREQUENCIES FOR TESTING, CALIBRATING, AND/OR CHECKING OF INSTRUMENT CHANNELS

Channels	Surveillance	Minimum Frequency
1. Axial Offset	Calibration	At each refueling shutdown
	Check	Once per shift
2. Reactor Coolant Temperature	Calibration	At each refueling shutdown
	Test	Once per month
	Check	Once per shift
3. Pressurizer Pressure Input to Safety Injection Actuation	Calibration	At each refueling shutdown
	Test	Once per month
4. Rod Position Recorder	Calibration	At each refueling shutdown
	Check, comparison with digital readouts	Once per shift during operation
5. Charging Flow	Calibration	At each refueling shutdown
6. Boric Acid Tank Level	Calibration	At each refueling shutdown
	Test	Once per month
7. Residual Heat Pump Flow	Calibration	At each refueling shutdown
8. Volume Control Tank Level	Calibration	At each refueling shutdown.
	Test	Once per month during MODES 1 and 2
9. Hydrazine Tank Level	Calibration	At each refueling shutdown
	Test	One per month during operation

BASIS: CALIBRATION

CALIBRATION should be performed at every reasonable opportunity in order to ensure the presentation and acquisition of accurate information.

The nuclear flux (linear level) channels should be calibrated daily against a heat balance standard to account for errors induced by, changing rod patterns and core physics parameters.

Other channels are subject only to the "drift" errors induced within the instrumentation itself and, consequently, can tolerate longer intervals between CALIBRATION. Process system instrumentation errors induced by drift can be expected to remain within acceptable tolerances if recalibration is performed at intervals of approximately one year.

Substantial CALIBRATION shifts within a channel (essentially a channel failure) will be revealed during routine checking and testing procedures.

Thus, minimum CALIBRATION frequencies of once-per-day for the nuclear flux (linear level) channels, and once-per-year (approximately) for the process system channels is considered acceptable.

TESTING

The minimum testing frequency for those instrument channels connected to the safety system is based on an assumed "unsafe failure" rate of one per channel every four years. This assumption is, in turn, based on operating experience at conventional and nuclear plants. An "unsafe failure" is defined as one which negates channel operability and which, due to its nature, is revealed only when the channel is tested or attempts to respond to a bona fide signal.

The failure rate of one per channel every four years and the testing interval of two weeks imply that, on the average, each channel will be inoperable for 1.75 days per year, or 1.75/365 year. Since two channels must fail in order to negate the safety function, the probability of simultaneous failure of two channels (assuming only two to be in service) is 1.75/365 squared, or 2.3×10^{-5}. From this it can be inferred that in a three channel system the probability of simultaneous failure of two channels is approximately 6.9×10^{-5}. This represents the fraction of time in which each three channel system would have one operable and two inoperable channels, and equals $6.9 \times 10^{-5} \times 8760$ hours per year, or (approximately) 36 minutes/year.

It must also be noted that to thoroughly and correctly test a channel, the channel components must be made to respond in the same manner and to the same type of input as they would be expected to respond to during their normal operation. This, of necessity, requires that during the test the channel be made inoperable for a short period of time. This factor must be, and has been, taken into consideration in determining testing frequencies.

Because of their greater degree of redundancy, the 1/3 and 2/4 logic arrays provide an even greater measure of protection and are thereby acceptable for the same testing interval. Those items specified for monthly testing are associated with process components where other means of verification provide additional assurance that the channel is operable, thereby requiring less frequent testing.

During a 2-year testing period, the Reactor Coolant Flow Trips for each loop were tested 40 times. In all the tests the trips operated precisely on set point. Also, during this period, there were no 'unsafe failures' as defined above in the Reactor Coolant Flow Trips or any similar trip circuitry. All of these channels represent more than 30 years of service without a single 'unsafe failure'. Because of the demonstrated reliability of these instrument channels and particularly the Reactor Coolant Flow Trip, the testing interval of the Reactor Coolant Flow Trip has been extended to 3 months.

CHECK

Failures such as blown instrument fuses, defective indicators, faulted amplifiers which result in "upscale" or "downscale" indication, etc. can be easily recognized by simple observation of the functioning of an instrument or system. Furthermore, such failures are, in many cases, revealed by alarm or annunciator action, and a check supplements this type of built-in surveillance.

Based on experience in operation of both conventional and nuclear plant systems, the minimum checking frequency of once per shift is deemed adequate.

4.4 EMERGENCY POWER SYSTEM PERIODIC TESTING

APPLICABILITY: Applies to testing of the Emergency Power System.

OBJECTIVE: To verify that the Emergency Power System will respond promptly and properly when required.

SPECIFICATION:

A. The required offsite circuits shall be determined OPERABLE at least once per 7 days by verifying correct breaker alignments and power availability.

B. The required diesel generators shall be demonstrated OPERABLE:

1. At least once per 31 days on a STAGGERED TEST BASIS by:

   a. Verifying the diesel performs a DG SLOW START from standby conditions,

   b. Verifying a fuel transfer pump can be started and transfers fuel from the storage system to the day tank,

   c. Verifying the diesel generator is synchronized and running at 6000 kW (+100 kW, -500 kW) for $\geq$ 60 minutes,

   d. Verifying the diesel generator is aligned to provide standby power to the associated emergency buses,

   e. Verifying the day tank contains a minimum of 290 gallons of fuel, and

   f. Verifying the fuel storage tank contains a minimum of 37,500 gallons of fuel.

2. At least once per 3 months by verifying that a sample of diesel fuel from the required fuel storage tanks is within the acceptable limits as specified by the supplier when checked for viscosity, water and sediment.

C. AC Distribution

1. The required buses specified in Technical Specification 3.7, Auxiliary Electrical Supply, shall be determined OPERABLE and energized from AC sources other than the diesel generators with tie breakers without automatic SIS/SISLOP tripping circuitry open between redundant buses at least once per 7 days by verifying correct breaker alignment and power availability.

D. The required DC power sources specified in Technical Specification 3.7 shall meet the following:

1. Each DC Bus train shall be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and power availability.

2. Each 125 volt battery bank and charger shall be demonstrated OPERABLE:

   a. At least once per 7 days by verifying that:

      (1) The parameters in Table 4.4-1 meet the Category A limits, and

      (2) The total battery terminal voltage is greater than or equal to 129 volts on float charge.

   b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

      (1) The parameters in Table 4.4-1 meet the Category B limits,

      (2) There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and

      (3) The average electrolyte temperature of ten connected cells is above 61°F for battery banks associated with DC Bus No. 1 and DC Bus No. 2 and above 48°F for the UPS battery bank.

   c. At least once per 18 months by verifying that:

      (1) The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration,

      (2) The cell-to-cell and terminal connections are clean, tight and coated with anticorrosion material,

      (3) The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms,

(4) The battery charger for 125 volt DC Bus No. 1 will supply at least 800 amps DC at 130 volts DC for at least 8 hours,

(5) The battery charger for 125 volt DC Bus No. 2 will supply at least 45 amps DC at 130 volts DC for at least 8 hours, and

(6) The battery charger for the UPS will supply at least 10 amps AC at 480 volts AC for at least 8 hours as measured at the output of the UPS inverter.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80%, 85% for Battery Bank No. 1, of the manufacturer's rating when subjected to a performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.4.D.2.d.

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

E. The required Safeguards Load Sequencing Systems (SLSS) shall be demonstrated OPERABLE at least once per 31 days on a STAGGERED TEST BASIS, by simulating SISLOP* conditions and verifying that the resulting interval between each load group is within ± 10% of its design interval.

F. The required diesel generators and the Safeguards Load Sequencing Systems (SLSS) shall be demonstrated OPERABLE at least once per 18 months during shutdown by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.

2. Simulating SISLOP*, and:

   a. Verifying operation of circuitry which locks out non-critical equipment,

   b. Verifying the diesel performs a DG FAST START from standby condition on the auto-start signal, energizes the emergency buses with permanently connected loads and the auto connected emergency loads** through the load sequencer (with the exception of the feedwater, safety injection, charging and refueling water pumps whose respective breakers may be racked-out to the test position) and operates for $\geq$ 5 minutes while its generator is loaded with the emergency loads,

   c. Verifying that on the safety injection actuation signal, all diesel generator trips, except engine overspeed and generator differential, are automatically bypassed.

3. Verifying the generator capability to reject a load of 4,000 kW without tripping. The generator voltage shall not exceed 4,800 volts and the generator speed shall not exceed 500 rpm (nominal speed plus 75% of the difference between nominal speed and the overspeed trip setpoint) during and following the load rejection.

G. Manual Transfer Switches

1. Verify once every 31 days that the fuse block for breaker 8-1181 in MCC-1 for MTS-7 is removed.

2. Verify once every 31 days that MTS-8 is energized from breaker 8-1480B from MCC-4 and the cabinet door is locked, and that breaker 8-1122 from MCC-1 is locked open.

---

*SISLOP is the signal generated by coincident loss of offsite power (loss of voltage on Buses 1C and 2C) and demand for safety injection.

**The sum of all loads on the engine shall not exceed 6,000 kW.

TABLE 4.4-1

BATTERY SURVEILLANCE REQUIREMENTS

	CATEGORY A[1]	CATEGORY B[2]	
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable [3] value for each connected cell
Electrolyte Level	>Minimum level indication mark, and ≤1/4" above maximum level indication mark	>Minimum level indication mark, and ≤1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥2.13 volts	≥2.13 volts [c]	>2.07 volts
Specific[a] Gravity	≥1.200[b]	≥1.195	Not more than .020 below the average of all connected cells
		Average of all connected cells >1.205	Average of all connected cells ≥1.195[b]

(a) Corrected for electrolyte temperature and level.
(b) Or battery charging current is less than 2 amps when on charge.
(c) Corrected for average electrolyte temperature in accordance with IEEE STD 450-1980.
(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameter(s) are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

BASIS: The normal plant Emergency Power System is normally in continuous operation, and periodically tested.[1]

The tests specified above will be completed without any preliminary preparation or repairs which might influence the results of the test except as required to perform the DG SLOW START test set forth in T.S. 4.4.B.1.a. The tests will demonstrate that components which are not normally required will respond properly when required.

DG SLOW STARTS are specified for the monthly surveillances in order to reduce the cumulative fatigue damage to the engine crankshafts to levels below the threshold of detection under a program of augmented inservice inspection. In the event that the DG SLOW START inadvertently achieves steady state voltage and frequency in less than 24 seconds, the surveillance will not be considered a failure and require restart of the diesel generator.

The surveillance requirements for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensure the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.4-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and .020 below normal full charge specific gravity or a battery charger current that has stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than .020 below normal full charge specific gravity with an average specific gravity of all the connected cells not more than .010 below normal full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operating with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.4-1 is permitted for up to 7 days. During this 7 day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than .020 below normal full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than .040 below normal full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

Verifying required positions for manual transfer switches ensure single failure and environmental interaction requirements are satisfied. The normal alignments for MTS-7 and MTS-8 are MCC-2 and MCC-4, respectively.

REFERENCE: (1) Supplement No. 1 to Final Engineering Report and Safety Analysis, Section 3, Questions 6 and 8.

ATTACHMENT 2

PROPOSED TECHNICAL SPECIFICATIONS

TABLE 3.5.1-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTION UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
10. Reactor Coolant Flow					
A. Single Loop (Above 50% of Full Power)	1/loop	1/loop in any operating loop	1/loop in each operating loop	1	6#
B. Two Loops (Below 50% of Full Power)	1/loop	1/loop in two operating loops	1/loop in each operating loop	1####	6#
11. Steam/Feedwater Flow Mismatch	3	2	2	1#####	6#
12. Turbine Trip-Low Fluid Oil Pressure	3	2	2	1####	6#
13. Reactor Coolant Pump Breaker Position					
A. Single Loop (Above 50% of Full Power)	1/loop	1/loop in any operating loop	1/loop in each operating loop	1	6#
B. Two Loops (Below 50% of Full Power)	1/loop	1/loop in two operating loops	1/loop in each operating loop	1####	6#
14. 4kV Bus 1C and Bus 2C Undervoltage	2/bus	1/bus from both buses	1/bus from both buses	1,2,3*	1#

When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE. In addition, the ACTION STATEMENT requires a verification that the steam-driven auxiliary feedwater pump is OPERABLE in MODES 1, 2, and 3.

These requirements are intended to provide assurance that a loss of offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the operability of the component. The Safeguards Load Sequencing System is designed so that each sequencer starts and loads its associated diesel generator and sequences the ECCS loads upon receipt of a safety injection signal (SIS) and concurrent loss of voltage on its respective 4160 volt bus (i.e., upon a SISLOP).

During normal operations, the 480 volt system is considered OPERABLE if the four 480 volt buses and four station service transformers are OPERABLE with respective tie breakers open. This will ensure that the 480V main breakers and transformers remain OPERABLE during the worst loading condition in case of a SIS without LOP.

The primary power source for Vital Buses 1, 2, 3, 3A, and 4 is Train A DC Bus 1. The alternate power source is available from MCC-2 through MTS-7. The 1987 RPS and ESF single failure analyses credited the Train B backup power to these vital buses through MTS-7.

Correct operation of the safety injection system is assured by the operability of the load sequencers and the UPS for MOV-850C and MOV-358 (MOV-850C UPS). Correct operation of the recirculation system is assured by the operability of the MOV-850C UPS which also supplies MOV-358.

Manual Transfer Switch 8 (MTS-8) provides the means to power MOV-883 and the MOV-850C UPS from either Train A or Train B. However, due to single failure consideration and environmental effects, MTS-8 is normally powered from MCC-4 on Train B. MOV-883 is the discharge valve from the RWST and must remain open during the safety injection phase and close with initiation of recirculation.

TABLE 4.1.1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST
1. Manual Reactor Trip	N.A.	N.A.	N.A.	R	N.A.
2. Power Range, Neutron Flux	S	D (2,3) R (3,4)	M	N.A.	N.A.
3. Power Range, Neutron Flux, Dropped Rod Stop	N.A.	N.A.	M	N.A.	N.A.
4. Intermediate Range, Neutron Flux	S	R (3,4)	S/U (1), M	N.A.	N.A.
5. Source Range, Neutron Flux	S	R (3)	S/U (1), M	N.A.	N.A.
6. NIS Coincidentor Logic	N.A.	N.A.	N.A.	N.A.	M (5)
7. Pressurizer Variable Low Pressure	S	R	M	N.A.	N.A.
8. Pressurizer Pressure	S	R	M	N.A.	N.A.
9. Pressurizer Level	S	R	M	N.A.	N.A.
10. Reactor Coolant Flow	S	R	Q	N.A.	N.A.
11. Steam/Feedwater Flow Mismatch	S	R	M	N.A.	N.A.
12. Turbine Trip-Low Fluid Oil Pressure	N.A.	N.A.	N.A.	S/U (1,6)	N.A.
13. Reactor Coolant Pump Breaker Position*	S	R	R	N.A.	N.A.
14. 4kV Bus 1C and Bus 2C Voltage	N.A.	R	R	N.A.	N.A.

*Applicable to Item 6 in Table 2.1

2. Simulating SISLOP*, and:

   a. Verifying operation of circuitry which locks out non-critical equipment,

   b. Verifying the diesel performs a DG FAST START from standby condition on the auto-start signal, energizes the emergency buses with permanently connected loads and the auto connected emergency loads** through the load sequencer (with the exception of the feedwater, safety injection, charging and refueling water pumps whose respective breakers may be racked-out to the test position) and operates for ≥ 5 minutes while its generator is loaded with the emergency loads,

   c. Verifying that on the safety injection actuation signal, all diesel generator trips, except engine overspeed and generator differential, are automatically bypassed.

3. Verifying the generator capability to reject a load of 4,000 kW without tripping. The generator voltage shall not exceed 4,800 volts and the generator speed shall not exceed 500 rpm (nominal speed plus 75% of the difference between nominal speed and the overspeed trip setpoint) during and following the load rejection.

G. Manual Transfer Switches

1. Verify once every 31 days that the fuse block for breaker 8-1181 in MCC-1 for MTS-7 is removed.

2. Verify once every 31 days that MTS-8 is energized from breaker 8-1480B from MCC-4 and the cabinet door is locked, and that breaker 8-1122 from MCC-1 is locked open.

---

* SISLOP is the signal generated by a sequencer on coincident loss of voltage on its associated 4160 volt bus (Bus 1C or 2C) and demand for safety injection.

** The sum of all loads on the engine shall not exceed 6,000 kW.

<u>ATTACHMENT 3</u>

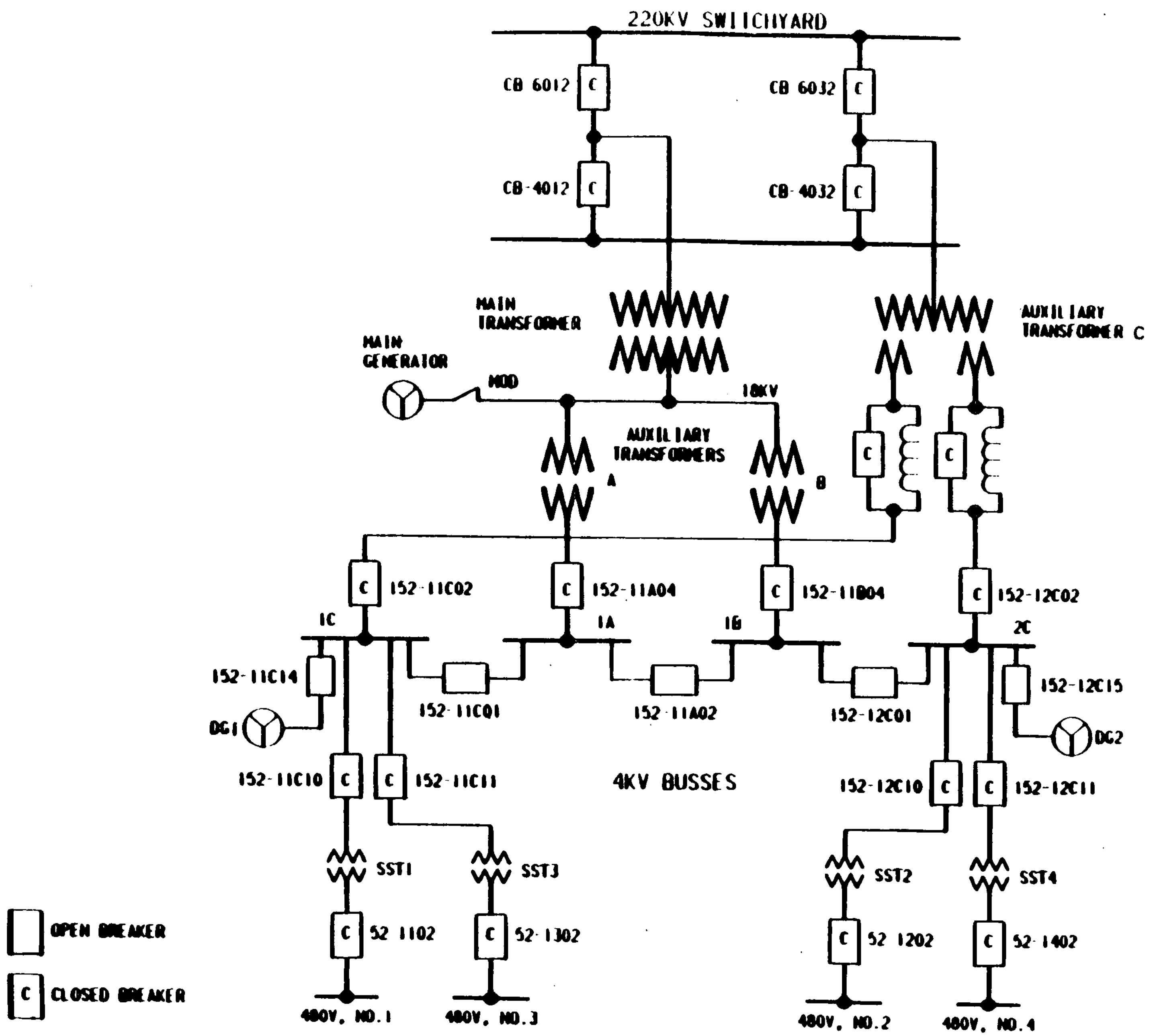
PROPOSED LICENSE CONDITION

N. <u>Plant Modification to Eliminate Single Failure Susceptibility of Vital Bus Automatic Transfer Function</u>

Southern California Edison Company shall modify the electrical distribution system to ensure that the availability of a power source for vital buses 1, 2, 3, and 3A is not subject to a single failure susceptibility. The plant modification shall satisfy the design requirements of the safety-related portions of the existing electrical distribution system and shall be operable prior to restart from the Cycle 12 refueling outage.

ATTACHMENT 4

Electrical Distribution System



ATTACHMENT 5

PROBABILISTIC RISK ASSESSMENT OF
CONTINUING PLANT OPERATION WITH
PRESENT VITAL BUS AUTOMATIC TRANSFER CAPABILITY