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

SOUTHERN CALIFORNIA EDISON COMPANY AND

SAN DIEGO GAS AND ELECTRIC COMPANY

DOCKET NO. 50-206

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO PROVISIONAL OPERATING LICENSE

Amendment No. 84
License No. DPR-13

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

   A. The application for amendment by Southern California Edison Company and San Diego Gas and Electric Company (the licensees) dated October 20, 1978, as modified or supplemented by letters dated August 26, 1983, November 30, 1983, July 27, 1984, and October 15, 1984, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public; and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

By letter dated December 22, 1983, the staff advised the licensee that insufficient justification had been provided to support deletion of the technical specification governing testing of the AFW pumps. By letters dated December 30, 1983 and January 13, 1984 the licensee provided further information concerning this subject and concluded by requesting that no further consideration be given in this action to the request to delete surveillance of the AFW pumps. Accordingly, the request to delete AFW pump testing was not addressed in this evaluation. However, this request was handled along with other changes to the AFW TS (Proposed Change No. 127) submitted on May 17, 1984), which were issued by Amendment No. 82 on October 24, 1984.

In the course of our review of the remaining issues, additional information was requested from the licensee. This information was furnished by letter dated July 27, 1984. This letter also included some revisions to the licensee's earlier requests. By letter dated October 15, 1984, the licensee requested withdrawal of one of the proposed TS changes. This is further discussed below.

1.3 Scope of Review

This review has considered only the changes in the facility TS proposed by the licensee. It has not considered areas for which changes were not requested. In performing this review the staff has considered whether the changes would reduce any of the operational or administrative requirements implemented at the facility. Whether or not such a reduction was proposed, the staff has also evaluated whether the change would (1) increase the probability or consequences of accidents considered in the FSAR, (2) create the possibility of an accident not considered in the FSAR, or (3) reduce the margin of safety as defined in the basis for any TS.

Although the TS issued by the NRC for San Onofre Unit 1 do not follow the format and provisions of the current STS, the staff has evaluated proposed changes against the generic STS for Westinghouse facilities and the STS issued for San Onofre Unit 2.

This evaluation has also considered, where applicable, the guidance contained in 10 CFR Part 50, Appendices A and B; the NRC Standard Review Plan; industry codes and standards and NRC Regulatory Guides.

2.0 EVALUATION

2.1 Technical Specifications, Section 3.7 - Operability Requirements

2.1.1 Specification 3.7.I. - In this specification which deals with operability requirements for the auxiliary electrical supply, the licensee proposes to change the statement:

"The reactor shall not be made critical or maintained critical unless the following conditions are met:"

to:

"In Modes 1, 2, 3 and 4, the following specifications apply."

Since Modes 1 and 2, per the facility TS, are the modes in which the reactor is critical, the proposed change extends the present requirement to include shutdown modes 3 and 4, when the reactor coolant system (RCS) temperature is greater than 200°F. This is an appropriate improvement since dependable power sources are needed for plant cooldown, regardless of the condition of criticality, whenever the RCS is at elevated temperatures and pressures and there is a significant fission product inventory. The staff also notes the provision is similar to that in the Westinghouse STS and the San Onofre Unit 2 TS. Accordingly, the staff finds the change acceptable.

2.1.2. Specification 3.7.I.A.1 - The licensee proposes to change this specification by adding the underlined portion:

"A. As a minimum the following shall be operable:

1. One Southern California Edison Company and one San Diego Gas and 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. This configuration constitutes the two required offsite circuits."

This change makes this section consistent with Section 3.7.II(1) of the present TS which was revised by Amendment 68 to the license (May 3, 1983) in response to a request from the staff. The effect of the change is to include in operability requirements, circuits between the offsite transmission lines where they enter the switchyard and the onsite electric distribution system. Because this is a more functionally correct and inclusive requirement, the staff finds the change acceptable.

2.1.3 Specification 3.7.I.A.3.c. - The licensee proposes to add Vital Buses 3A, 5 and 6 to those listed in the present specification (Buses 1 through 4) and require that all buses, rather than 3 of 4, be operable in Modes 1, 2, 3 and 4. The licensee states, and our review of the assigned loads confirms, the additional buses are needed as a result of implementation of "TMI modifications". Since these changes reflect plant modifications required by the Commission, the staff finds this revision appropriate and acceptable.

2.1.4 Specification 3.7.I.A.5. - The licensee proposes to add the Safety Injection Load Sequencers to the list of equipment required to be operable during Operational Modes 1 to 4. Because these sequencers are needed to supply emergency power to vital loads in the proper sequence and with proper timing during these modes, the staff concludes this addition is appropriate and acceptable.

2.1.5 Specification 3.7.I.B. - Several changes have been requested for this section which deals with ACTION statements. These changes are primarily administrative (e.g. removal of unnecessary references to sections of TS), or technical improvements (e.g. changing "offsite lines" to the more inclusive term "offsite circuits", and adding an ACTION statement for the Safety Injection Load Sequencers).

The staff concludes the proposed changes provide technical and administrative improvements in the wording of the TS. The staff also concludes it is appropriate to add an ACTION statement for the Safety Injection Load Sequencers and that the time limits of proposed ACTION statements are consistent with the time limits presently specified for an inoperable diesel generator. Accordingly, the staff finds the proposed changes to this section acceptable.

2.1.6 Specification 3.7.II. - This proposed new specification is inserted at this location and the previous specification 3.7.II is renumbered to 3.7.III. The proposed new specification would be additionally applicable to Modes 1, 2 and 3 and would add the Uninterruptible Power Supply (UPS) for the third Safety Injection Valve, MOV-850C to those systems required by Specification 3.7.I.A to be operable in these modes. The proposed specification would also include an ACTION statement defining the allowable time limits for implementing corrective action in the event of inoperability of the UPS.

The period requested for effecting corrective action for the UPS is 72 hours. Although the other two vital D.C. buses are only allowed a 2-hour period of inoperability, the staff finds the 72-hour period acceptable for the UPS because:

(a) The only load served by the UPS is safety injection valve MOV 850C.

(b) The other two vital D.C. buses serve various vital safety loads in addition to a safety injection valve (either MOV 850A or 850B).

(c) A 72-hour period for corrective action is typically permitted in the STS for one train of a two train Emergency Core Cooling System. Thus, a similar period for a one-out-of-three parallel valve configuration is even more conservative.

Based on the foregoing, the proposed specification is acceptable.

2.1.7 Specification 3.7.III. - This proposed specification is substantially the same as the present Specification 3.7.II. The only significant change is an increase in the number of 120-volt A.C. vital buses required to be operable in Modes 5 and 6 and the identification of the required buses. The staff has reviewed the licensee's proposed changes and finds them appropriate based on the electrical loads required to be operable in these two modes. Accordingly, the staff finds this change acceptable.

2.2 Technical Specifications, Section 4.4 - Surveillance Testing

2.2.1. Specifications 4.4.A and 4.4.B.1 and 2. - There are no significant changes to these sections except that Section 4.4.B.1.g would be slightly revised, relocated and renumbered 4.4.E. Changes in wording have been proposed for the new Section 4.4.E; staff review indicates the changes are minor and do not affect technical requirements. Therefore, these proposed changes are acceptable.

2.2.2. Specification 4.4.B.3. - This section would be slightly revised, relocated and renumbered 4.4.F. Although changes in wording are proposed for this section, staff review indicates these changes are minor and do not affect the technical requirements; therefore this proposed change is acceptable.

2.2.3. Specification 4.4.C. - Minor editorial changes are proposed for this section, which the staff finds acceptable.

2.2.4. Specification 4.4.D.2. - The licensee has proposed total replacement of this section with the corresponding provisions of the STS as applicable to San Onofre Unit 1. This replacement includes the addition of Table 4.4-1, Battery Surveillance Requirements, which corresponds to STS Table 4.8-2.

Instances where the proposed changes do not strictly conform to the STS or represent a relaxation of present requirements are addressed below:

2.2.4.1 Section 4.4.D.2.a.(1). - The present TS require a "pilot cell voltage" equal to or greater than 2.17 volts. The STS, however, make no mention of a "pilot cell voltage" but refer instead to a minimum "float voltage" of 2.13 volts.

Staff review indicates there is no reference to a minimum pilot cell voltage of 2.17 volts in IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Load Storage Batteries for Generating Station and Substations," (IEEE-450), but there is reference to a "float voltage" of 2.13. Appendix C.1, of IEEE-450 states, "Cell voltage is not, by itself, an indication of the state of charge

of the battery. Prolonged operation of cells below 2.13 volts can reduce the life expectancy of cells." Inasmuch as IEEE-450 finds 2.13 volts an acceptable operating value and this value has also been endorsed by the staff in development of STS, Table 4.8-2, the staff finds this element of the proposed change acceptable.

2.2.4.2 Section 4.4.D.2.b(1) and (2) - As in the preceding paragraph the cell voltage criterion would be changed from 2.17 volts to 2.13 volts. For the reasons previously stated, this change is acceptable. In addition, the proposed change revises the basis for comparative evaluation of voltage and specific gravity. Specifically, the present TS require comparison of these parameters for each individual cell with values obtained during some earlier test. The STS, on the other hand, require comparison of parameters of each individual cell against the average of all connected cells. In the STS, the assessment of overall battery aging is measured by the periodic Service or Performance Discharge tests.

In support of this change the licensee notes the present TS require comparison of voltage values obtained under significantly different conditions, i.e., "float charge" (nominal charging voltage) conditions versus conditions following an "equalizing charge" (high charging voltage). The licensee states comparisons of voltage obtained under such significantly different conditions are not meaningful. Similarly, the licensee states comparison of individual cell specific gravity values with earlier values is not meaningful because of the several variables which can affect the specific gravity value; such as charging history, temperature, electrolyte level and water additions. Instead, the licensee states the important considerations are the actual cell and average-of-connected cells specific gravity relative to the appropriate acceptance criteria.

In evaluating the licensee's proposed change, the staff notes that the change is consistent with the provisions of IEEE-450 and the STS. Specifically, Appendix D.4 of the IEEE-450 refers to changes in the average specific gravity of the entire battery and not to changes in the specific gravity of a single cell. Also, although single cell voltage is addressed in Appendix D.4, the criterion is an absolute voltage (2.13 volts) and not a change from some previous measured value. Further, IEEE-450 provides for verification of acceptable battery performance by requiring periodic Service and Performance Discharge tests. In addition, when a specified level of battery degradation is observed, more frequent testing is required by the standard. The recommendations of the IEEE-450 are incorporated in the STS, and the licensee has proposed to conform to the STS.

Therefore, since the licensee's proposed revisions of these paragraphs conform to the guidance in the STS, the staff finds the proposed revisions acceptable.

2.2.4.3 Section 4.4.D.2.b. - The specifications discussed in the preceding section were previously numbered 4.4.D.2.b(1) and (2) and are now proposed to be addressed in Section 4.4.D.2.b(1). The licensee has added new paragraphs (2) and (3) which are in substantial conformance with the STS.

Regarding specification 4.4.D.2.b(3), the licensee has proposed that the average electrolyte temperature of ten connected cells be greater than 61°F for the battery banks associated with D.C. buses Nos. 1 and 2, on the basis that 61°F was the electrolyte temperature used in sizing the batteries. Accordingly, the staff finds this acceptable.

The licensee has also proposed an electrolyte temperature limit greater than 48°F for the UPS battery. The licensee's basis for this proposal is that the thermal environment for the UPS is controlled by atmospheric temperature and process heat. According to the licensee, this arrangement allows electrolyte temperature to occasionally drop below 61°F, particularly during Modes 5 and 6 when no process heat is produced. The licensee also correctly notes the UPS is not required to be operable in these Modes.

The licensee has supplied information on UPS electrolyte temperature measured between January 1982 and May 1984. These data show that even in winter months with the reactor in extended shutdown, the minimum temperature recorded in this period was 51°F. Further, with the plant in operation (January-February 1982), the electrolyte temperature was several degrees greater than 61°F.

The licensee, therefore, has selected a criterion of 48°F to cover those periods when the reactor is shut down and process heat is not available. As noted above, this is also a condition when the UPS is not required to be operable. The licensee states, however, that even if the UPS were required when the temperature was 48°F, it would be capable of performing its function because calculations indicate that it has the capability to perform this function at temperatures as low as 35°F.

Therefore, because it is unlikely the UPS would be required to perform its safety function when the electolyte temperature was below 61°F, and because there is a substantial margin of conservatism between the minimum permissible temperature (greater than 48°F) and the calculated minimum acceptable temperature (35°F), the staff finds the proposed temperature limit for the UPS acceptable.

2.2.4.4 Specification 4.4.D.2.c. - The licensee proposes to revise this section to provide conformance with the STS. In addition, the licensee proposes the following changes to present requirements:

(1) Increase the required capacity of the battery charger for D.C. Bus Number 1 from 500 amps to 800 amps.

(2) Increase the required charging voltage of the battery charger for D.C. Bus Number 2 from 125 volts to 130 volts.

(3) Increase the duration of the battery charger test for the UPS from 1 hour to 8 hours.

These changes are prompted by:

(1) An increase in the size of the new battery which has been obtained to replace the original battery used in Battery Bank Number 1,

(2) The desire to standardize on a charging voltage of 130 volts, and

(3) The goal of providing a consistent test duration for Battery Banks Number 1 and 2, and the UPS.

The proposed change as submitted on November 30, 1983 would have increased the required charger capacity for D.C. Bus 2 from the present 45 amps to 200 amps. Further review has shown that the 45-amp value is more appropriate for the surveillance test since it is the required service capacity; the 200-amp is the charger rated capacity. Therefore, by letter dated October 15, 1984, the licensee requested that this part of the proposed change be withdrawn, and that the capacity be kept at 45 amps, as in the existing TS. This request does not adversely affect the rest of the proposed TS changes. The staff finds this acceptable.

The staff concludes that the above changes will provide conformance with the STS and provide greater assurance of the capability of these systems to fulfill their safety functions. Accordingly, these changes are acceptable.

2.2.4.5 Specification 4.4.D.2.d. - The licensee proposes to replace the present requirements for battery testing with requirements identical to those set forth in the STS. This will change the test frequency from "once per refueling cycle" to "at least once per 18 months, during shutdown." Because such testing normally occurs at refueling outages, this change will do little to lengthen the interval between tests. On the other hand, specifying an 18-month interval assures testing will continue at a reasonable frequency, even if the facility is out of service for extended periods between refueling outages. Therefore, the staff finds this aspect of the change acceptable.

Substitution of the STS provisions will also clarify the testing requirements. Present specifications require a "battery service test" and additionally prescribe a test duration, or a specified number of operations of MOV-850C. Specification of a test duration, however, is redundant to the prescription of a "battery service test." This is because the test duration is inherent in the definition of a battery service test (per IEEE-450, 1980), i.e., "A special test of the battery's ability to satisfy the design requirements."

The present specifications prescribe an 8-hour test for Battery 1 and a 3-hour test for Battery 2. This is despite the fact the design duty cycle for both these batteries is 90 minutes. As a result, to meet the present specifications, each of these tests is conducted with the design duty cycle for 90 minutes and with zero load for the balance of the prescribed test period. Adoption of the STS provisions will eliminate this required artificiality in the test procedure.

The 90-minute test duration for Batteries 1 and 2 is based on the safety function of these batteries, i.e., provide power to essential loads until other means of standby power can be provided. Based upon an assumed Loss-of-Coolant-Accident (LOCA) combined with a Loss-of-Offsite Power (LOP), the licensee estimates automatic starting of the diesel generators would supply the needed power within 15 seconds. If there is a LOP without a coincident LOCA, the licensee estimates the time required to supply backup diesel power, based on manual operator action, would be 7 minutes.

The design basis utilized by the licensee in the design of the battery assumes the diesel generator associated with the battery under consideration fails to start. In this case it is necessary to disconnect the battery charger supplied by that electrical division and energize the alternate battery charger which can be supplied from the operable division. For a design basis the licensee has allotted 90 minutes to effect this changeover. Discussions with the licensee's representatives [2] indicate the time actually required to effect the change would not exceed about 15 minutes. Based on this changeover time and the time required to manually start a diesel generator, the staff concludes that the 90-minute interval used in the design basis is suitably conservative. Therefore, based on the foregoing consideration, this proposed change to the TS is acceptable.

2.2.4.6 Section 4.4.D.2.e. - The proposed revision to this section would permit substitution of the 60-month battery Performance Discharge test for the 18-month battery Service test which would otherwise be required during the outage. Although this is a relaxation (presently the Service test is required even in those outages when the Performance Discharge test is also to be performed) it is consistent with the requirements of the STS. It would also eliminate the requirement to subject the battery to two major discharge tests during a single outage. Inasmuch as the STS provisions are acceptable for general application, and the staff is not aware of any reason why they would not be applicable to San Onofre Unit 1, the licensee's request to conform to the STS is acceptable.

(2) Telecon, M. Thomas, SCE and G. Zwetzig, NRC, August 15, 1984.

2.2.4.7 Section 4.4.D.2.f. The proposed revision adds a definition of battery degradation which relies on reductions battery capacity leased on previous performance or the manufacturer's rating, and requires annual Performance Discharge tests if the battery shows signs of degradation or has reached 85% of the expected service life. Since there are no requirements of this type presently in the TS and since the proposed requirements provide conformance with the provisions of Section 5.2(3) of IEEE Std 450-1980 and the STS, the staff finds the proposed revision acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined by 10 CFR Part 20 and changes to the surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The Staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ACKNOWLEDGEMENT

G. Zwetzig, Region V, prepared this evaluation.

Dated: November 14, 1984

3.7 AUXILIARY ELECTRICAL SUPPLY

Applicability: Applies to the availability of electrical power for the operation of the plant auxiliaries.

Objective: To define those conditions of electrical power availability necessary (1) to provide for safe reactor operation, (2) to provide for the continuing availability of engineered safeguards, and (3) to ensure that the station can be maintained in the shutdown or refueling condition for extended time periods.

Specification: I. In Modes 1, 2, 3 and 4 the following specifications shall apply:

A. As a minimum the following shall be OPERABLE:

1. 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. This configuration constitutes the two required offsite circuits.

2. Two separate and independent diesel generators each with:

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

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

   c. A separate fuel transfer pump.

3. AC Distribution

   a. 4160 Volt Bus 1C and 2C,

   b. 480 Volt Bus No. 1, Bus No. 2 and Bus No. 3, and

   c. Vital Bus 1, 2, 3, 3A, 4, 5 and 6.

4. DC Bus No. 1 and DC Bus No. 2 (including at least one full capacity charger and battery supply per bus).

5. The two Safety Injection System Load Sequencers.*

*The automatic load function may be blocked in Mode 3 at a pressure ≤ 1900 psig.

B. Action

1. With one of the required offsite circuits inoperable, demonstrate the OPERABILITY of the remaining AC sources by performing periodic testing requirements A and B.1.a of Technical Specification 4.4 within one hour and at least once per eight (8) hours thereafter; restore an additional offsite circuit to OPERABLE status within 72 hours or be in COLD SHUTDOWN within the next 36 hours.

2. If one diesel generator is declared inoperable, demonstrate the OPERABILITY of the two offsite transmission circuits and the remaining diesel generator by performing periodic testing requirements A and B.1.a of Technical Specification 4.4 within one hour and at least once per eight (8) hours thereafter; restore the inoperable diesel generator to service within 72 hours or be in COLD SHUTDOWN within the next 36 hours.

3. 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 Periodic Testing Requirements A and B.1.a of Technical Specification 4.4 within one hour and at least once per eight (8) hours thereafter; restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in COLD SHUTDOWN within the next 36 hours. Have at least two offsite circuits and two diesel generators OPERABLE within 72 hours from the time of initial loss or be in COLD SHUTDOWN within the next 36 hours.

4. With two required offsite circuits inoperable demonstrate the OPERABILITY of two diesel generators by performing Periodic Testing Requirement B.1.a of Technical Specification 4.4 within one hour and at least once per eight (8) hours thereafter, 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. With only one of the required offsite circuits restored, restore the remaining offsite circuit to OPERABLE status within 72 hours from the time of initial loss or be in COLD SHUTDOWN within the next 36 hours.

5. With two of the above required diesel generators inoperable demonstrate the OPERABILITY of two offsite circuits by performing Periodic Testing Requirement A of Technical Specification 4.4 within one hour and at least once per two (2) hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in COLD SHUTDOWN within the next 36 hours. Restore both diesel generators to OPERABLE status within 72 hours from time of initial loss or be in COLD SHUTDOWN within the next 36 hours.

6. With less than the above complement of AC buses OPERABLE restore the inoperable bus within 8 hours or be in COLD SHUTDOWN within the next 36 hours.

7. With one required DC bus inoperable, restore the inoperable bus to OPERABLE status within 2 hours or be in COLD SHUTDOWN within the next 36 hours.

8. With a required DC bus battery and both of its chargers inoperable, restore the inoperable battery and one of its chargers to OPERABLE status within 2 hours or be in COLD SHUTDOWN within the next 36 hours.

9. With one Safety Injection Load Sequencer inoperable, restore the inoperable sequencer to OPERABLE status within 72 hours or be in COLD SHUTDOWN within the next 36 hours.

II. Additionally, in Modes 1, 2 and 3 the following specifications shall apply:

A. As a minimum the following shall be OPERABLE:

1. The MOV850C Uninterruptible Power Supply (UPS).

B. Action

1. With the MOV850C UPS inoperable, restore the UPS to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

III. In Modes 5 and 6 the following specifications shall apply:

A. As a minimum, the following shall be OPERABLE:

1. 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.

2. One diesel generator (capable of automatic start) with:

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

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

c. A fuel transfer pump.

3. The electrical buses associated with the OPERABLE power sources as follows:

a. One 4,160 Volt AC Bus

b. One 480 Volt AC Bus

c. AC Vital Buses 1, 2 and 4, and

d. One DC Bus (including at least one full capacity charger and battery supply per Bus).

B. Action:

1. With less than the minimum required AC and DC electrical sources specified in III.A above, suspend all operations involving core alterations or positive reactivity changes.

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 of a minimum of three 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 three 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. Correct operation of the safety injection system is assured by the operability of the load sequencers and the UPS for MOV 850C. In addition, each 4160 volt bus has an onsite diesel generator as backup.

Two diesel generators are provided primarily to give redundancy for maintenance, to preclude the necessity for reactor shutdown if one diesel requires maintenance, and to provide protection against a failure of one of the diesel generation systems. 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.

The requirement for one source of offsite power and one diesel generator to be OPERABLE during cold shutdown or refueling conditions 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.

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 starts from ambient 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 ≥4422 kW for ≥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 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 anti-corrosion 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% 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 Safety Injection System Load Sequencers 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 Safety Injection Load Sequencers 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 starts from ambient 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, and

   d. Verifying the diesel generator operates for ≥60 minutes while loaded to ≥4422 kW.

3. Verifying the generator capability to reject a load of 2611 kW without tripping.

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

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 value for each connected cell (3)
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 Gravity(a)	≥ 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[1] is normally in continuous operation, and periodically tested.

The tests specified above will be completed without any preliminary preparation or repairs which might influence the results of the test.

The tests will demonstrate that components which are not normally required will respond properly when required.

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 .015 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.

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