ENCLOSURE 1

EXISTING TECHNICAL SPECIFICATION 3.7

"AUXILIARY ELECTRICAL SUPPLY"

AND

EXISTING TECHNICAL SPECIFICATION 4.4

"EMERGENCY POWER SYSTEM PERIODIC TESTING"

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

1. As a minimum the following shall be operable:

A. One Southern California Edison Company and one San Diego Gas & Electric high voltage transmission line.

B. Two separate and independent diesel generators 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. AC Distribution

(1) 4160 Volt Bus 1C and 2C,

(2) 480 volt Bus No. 1, Bus No. 2, and Bus No. 3,

(3) Any 3 of vital buses 1, 2, 3, and 4.

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

2. Action

A. With one of the required incoming transmission lines inoperable, (Section 1.A) demonstrate the operability of the remaining A.C. 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.

*The changes to the Technical Specification Provisions are to be implemented within 30 days from the date of Issuance of Amendment No. 68.

B. If one diesel generator is declared inoperable, demonstrate the operability of the two offsite transmission lines 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.

C. With one offsite line and one diesel generator of the above required A.C. electrical power sources inoperable (Section 1.A and 1.B) demonstrate the operability of the remaining A.C. 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.

D. With two required offsite lines inoperable (Section 1.A) 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 sources restored, restore the remaining offsite source to operable status within 72 hours from the time of initial loss or be in cold shutdown within the next 36 hours.

E. With two of the above required diesel generators inoperable (Section 1.B),

demonstrate the operability of two offsite lines 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 at least two diesel generators to operable status within 72 hours from time of initial loss or be in cold shutdown within the next 36 hours.

F. With less than the above compliment of A.C. buses operable (Section 1.C) restore the inoperable bus within 8 hours or be in cold shutdown within the next 36 hours.

G. With one 125-volt D.C. bus inoperable (Section 1.D), restore the inoperable bus to operable status within 2 hours or be in cold shutdown within the next 36 hours.

H. With a 125-volt D.C. battery and both of its chargers inoperable (Section 1.D), 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.

II. During cold shutdown or refueling conditions the following specifications shall apply:

(1) As a minimum, the following shall be operable:

a. One Southern California Edison Company or one 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, and

b. One diesel generator (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,

3. A fuel transfer pump.

c. The associated 4,160 Volt A.C. Bus, 480 Volt A.C. Bus, two 120 Volt A.C. vital buses, and D.C. Bus.

(2) With less than the minimum required D.C. and A.C. electrical sources specified in II.(1) above, suspend all operations involving core alterations or positive reactivity changes.

*The changes to the Technical Specification provisions are to be implemented within 30 days from the date of issuance of Amendment No. 68.

Basis:

The station is connected electrically to the Southern California Edison Company and San Diego Gas & Electric Company system via either of two phyiscally 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. 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 required maintenance, and to provide protection against a failure of one of the diesel generator 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.

*The changes to the Technical Specification provisions are to be implemented within 30 days from the date of issuance of Amendment No. 68.

4.4 EMERGENCY POWER SYSTEM PERIODIC TESTING

Applicability: Applies to testing of the Emergency Power System and Auxiliary Feedwater Pumps.

Objective: To verify that the Emergency Power System and Auxiliary Feedwater Pumps will respond promptly and properly when required.

Specification:

A. One Southern California Edison Company and one San Diego Gas & Electric Company transmission line shall be determined operable at least once per 7 days by verifying correct breaker alignments and power availability.

B. Each diesel generator shall be demonstrated operable:

1. At least once per 31 days on a staggered test basis by:

a. Verifying the diesel starts from ambient condition,

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 $\geq$4422 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,

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

g. Verifying that the automatic load sequencer is OPERABLE with the interval between each load block within $\pm$ 10% of its design interval.

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

3. At least once per refueling cycle by:

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

b. Simulating a loss of offsite power (loss of voltage on Buses 1C and 2C) in conjunction with a safety injection signal, and:

(1) Verifying operation of circuitry which locks out non-critical equipment,

(2) Verifying the diesel starts from ambient condition on the auto-start signal, energizes the emergency busses 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.

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

(4) Verifying the diesel generator operates for $\geq$60 minutes while loaded to $\geq$4422 kW.

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

C. AC Distribution

1. The buses specified in Technical Specification 3.7, Auxiliary Electrical Supply (Section 1.C) shall be determined operable and energized from A.C. sources other than the diesel generators with tie breakers open between redundant busses at least once per 7 days by verifying correct breaker alignment and power availability.

D. D.C. Bus No. 1, D.C. Bus No. 2 and MOV 850C Uninterruptable Power Supply (UPS) (Including Chargers and Supplies).

1. Each D.C. 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 and battery charger shall be demonstrated operable:

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

(1) The electrolyte level of each pilot cell is between the minimum and maximum level indication marks,

(2) The pilot cell specific gravity, corrected to 77°F, is $\geq$1.20,

(3) The pilot cell voltage is ≥2.17 volts, and

(4) The overall battery voltage is ≥125 volts.

b. At least once per 3 months by verifying that:

(1) The voltage of each connected cell is ≥2.17 volts under float charge and has not decreased more than .08 volts from the value observed during the original acceptance test, and

(2) The specific gravity, corrected to 77°F, of each cell is ≥1.20 and has not decreased more than .02 from the value observed during the previous test, and

c. At least once per refueling shutdown 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, free of corrosion and coated with anticorrosion material,

(3) The battery charger for 125 volt D.C. Bus No. 1 will supply at least 500 amps at 130 volts for at least 8 hours,

(4) The battery charger for 125 volt D.C. Bus No. 2 will supply at least 45 amps at 125 volts for at least 8 hours, and

(5) The battery charger for UPS will supply at least 10 amps, at 480 volts for at least 1 hour.

d. At least once per refueling cycle, during shutdown by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual emergency loads when the battery is subjected to a battery service test. Battery for 125 volt D.C. Bus No. 1 shall be tested for 8 hours. Battery for 125 volt D.C. Bus No. 2 shall be tested for 3 hours. The UPS battery shall be tested for two consecutive complete strokes (open and close) for MOV 850C.

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. This performance discharge test shall be performed subsequent to the satisfactory completion of the required battery service test.

E. At intervals not to exceed every second week when the reactor coolant system pressure is greater than 500 psig, the auxiliary feedwater pumps shall be started to demonstrate satisfactory operation. When the reactor coolant system pressure remains less than 500 psig for a period longer than 2 weeks, the motor driven auxiliary feedwater pump shall be tested prior to increasing reactor coolant system pressure above 500 psig, and the steam driven auxiliary feedwater pump shall be tested as soon as steam becomes available.

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 of 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.

Reference:

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

ENCLOSURE 2

PROPOSED TECHNICAL SPECIFICATION 3.7

"AUXILIARY ELECTRICAL SUPPLY"

AND

PROPOSED TECHNICAL SPECIFICATION 4.4

"EMERGENCY POWER SYSTEM PERIODIC TESTING"

## 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).

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.

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

A. As a minimum the following shall be operable:

1. The two Safety Injection System Load Sequencers,* and

2. The MOV850C Uninterruptable Power Supply (UPS).

B. Action

1. With one Safety Injection System Load Sequencer and/or the MOV850C UPS inoperable, restore the inoperable sequencer and/or 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.

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

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 Bus 4 and two of AC Vital Buses 1, 2 and 3, and
d. One DC Bus (including at least one full capacity charger and battery supply per Bus).

4. In Mode 6 Vital Buses 1 and 4 shall be operable and one of Vital Buses 2 and 3.

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 generator 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 $\geq$4422 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 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 $150 \times 10^{-6}$ 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.

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 $150 \times 10^{-6}$ ohms,

(4) The battery charger for 125 volt DC Bus No. 1 will supply at least 500 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 200 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 $\pm$ 10% of its design interval.

F. The required diesel generators and the Safety Injection System 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 $\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, and

   d. Verifying the diesel generator operates for $\geq$60 minutes while loaded to $\geq$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 (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 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 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.

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 .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.

Operation 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.

RUrnelas:8331

# DESCRIPTION OF PROPOSED CHANGE NO. 126 AND SAFETY ANALYSIS

This is a request to revise Sections 3.7, "Auxiliary Electrical Supply," and 4.4, "Emergency Power System Periodic Testing," of Appendix A Technical Specifications for San Onofre Nuclear Generating Station Unit 1.

## Description

This proposed change is intended as a general revision of the Technical Specifications for the station electrical supplies to update the requirements to cover all operational modes. Many editorial revisions are also made for consistency and clarity. Specific Limiting Conditions for Operation (LCO's) are added or removed where needed to implement the objective of the proposed change. In addition, the surveillance requirements for the station batteries are substantively revised as discussed below.

By application dated October 20, 1978 (Proposed Change No. 76) SCE requested a revision to Technical Specification 4.4, "Emergency Power System Periodic Testing." This application proposed to revise the surveillance requirements for the station battery system and the Uninterruptable Power Supply (UPS) for Motor Operated Valve (MOV) 850C. The Commission granted partial approval of this application by incorporating a revised service test for the UPS in Amendment No. 56 to Provisional Operating License No. DPR-13. The Commission determined that further study was necessary before approval could be granted to the remaining open items in Proposed Change No. 76.

Discussions with the NRC staff have indicated that an acceptable resolution to Proposed Change No. 76 open items would be to revise the battery surveillance requirements consistent with the San Onofre Unit 2 Technical Specifications (The San Onofre Unit 2 Technical Specifications are consistent with the NRC Standard Technical Specifications). Accordingly, Proposed Change No. 126 revises the San Onofre Unit 1 battery surveillance requirements consistent with the San Onofre Unit 2 Technical Specifications and the Standard Technical Specifications to the extent practicable.

## Existing Specifications

The existing Technical Specifications 3.7 and 4.4 of Appendix A to Provisional Operating License No. DPR-13 are as constituted in Enclosure 1.

## Proposed Specifications

Technical Specifications 3.7 and 4.4 would be revised to read as indicated in Enclosure 2.

## Safety Analysis

Due to the large number of changes, each section is reviewed individually in the following paragraphs.

Section 3.7.I

This section is revised to include power supply requirements in Modes 1 through 4, instead of only defining requirements in Modes 1 and 2 as is presently the case. These changes are consistent, to the extent practicable, with the Standard Technical Specifications (STS) and will formalize the existing station practice. By adding specific power supply requirements in Modes 3 and 4, the plant safety is enhanced. The remainder of the revisions in this section are editorial in nature involving no substantive changes and including the use of standard outline format. Specification 3.7.I.A is revised to be consistent with the definition of offsite power supply incorporated into Specification 3.7.II (revised to 3.7.III) by Amendment No. 68 to the license. Specification 3.7.I.A.3.C is revised to include all required Vital Buses including the newly installed Vital Buses which support equipment installed as part of the TMI modifications. Specification 3.7.I.A.4 is revised for clarity to explicitly require the operability of the battery banks associated with the DC buses.

Section 3.7.II

This section replaces the previous 3.7.II (now 3.7.III) to add the explicit LCO's for the Safety Injection System Load Sequencers and the Uninterruptable Power Supply (UPS) for MOV 850C which were implied by the Surveillance Requirements contained in Technical Specifications 4.4.B.1.g (now 4.4.E), 4.4.B.3 (now 4.4.F) and 4.4.D. The requirements imposed on the operability of the system are consistent, to the extent practicable, with the STS and will formalize the existing station practice. The action requirements allow continued operation for 72 hours with either one Load Sequencer inoperable or the UPS inoperable, or both, since this event would still allow one train of safety injection to be operable due to the configuration of the safety injection system at the station. By adding these specific requirements which are omitted from the existing Technical Specifications, the plant safety is enhanced.

Section 3.7.III

This section (previously 3.7.II) is editorially revised into standard outline format. Specification 3.7.III.A.3 is revised for consistency with 3.7.I.A.4 for the DC buses and to require the operability of all Vital Buses associated with equipment required to be operable in Modes 5 and 6. A review of Sections 3.1 and 4.1 of the Technical Specifications determined that the only major instruments, components or systems supplied by the vital buses that are required in Modes 5 and 6 are:

1. RCS temperature indication (Table 4.1.1-5)
2. Pressurizer pressure (Table 4.1.1-7)
3. Pressurizer level (Table 4.1.1-8)
4. Area Radiation Monitoring System (Table 4.1.1-18)
5. Nuclear Flux, 3 NIS Channels (Table 3.5.1)
6. 2 Source Range NIS Channels, Mode 6 only, (T.S. 3.8.A.2).

The following vital bus review includes a description of which vital buses provide power to the instruments indicated above.

1. Vital Buses 1, 2 and 3 each have one train of RCS temperature (T-cold), Pressurizer pressure (narrow range) and Pressurizer level (narrow range). Each vital bus has two NIS channels, one power range and one source or intermediate range. All other loads on Vital Buses 1, 2 and 3 are not required in Modes 5 or 6.

2. Vital Buses 3A, 5 and 6 have predominately post-TMI loads. None of the loads on these buses are required or necessary in Modes 5 or 6.

3. Vital Bus 4 presently has the only wide-range Pressurizer pressure indicator and cold-calibrated Pressurizer level indicator. It also provides power to valves in both flow paths to the core from the charging pumps. In addition, all Area Radiation Monitors and Operational Radiation Monitors are supplied from this bus. Also, Vital Bus 4 is the alternate supply for one source range and one power range NIS channel.

Accordingly Vital Bus 4 is required to be operable at all times and since Vital Buses 1, 2 and 3 each have only one power range NIS channel and two additional channels are required in addition to those associated with Vital Bus 4, two buses of the three are required. This configuration is modified to allow for the two source range channels as required in Mode 6 by specifying that Vital Bus 1 be operable.

Section 4.4

This section has been revised so that the equipment surveillance is applicable as required by the newly established mode related LCO's of Specification 3.7 as discussed above. The format is also revised to be consistent with the new LCO's for the Load Sequencers and the MOV 850C UPS. Specific changes are discussed below.

Section 4.4.B.g (Deleted)

This section is deleted since the Load Sequencer surveillance is transferred to 4.4.E. This revision involves no substantive changes.

Section 4.4.D

The proposed Technical Specifications revise the battery surveillance requirements consistent with the STS. The STS are based on the recommendations of Regulatory Guide 1.129, "Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," and the Institute of Electrical and Electronics Engineers (IEEE) Standard 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations".

Implementation of the STS at San Onofre Unit 1 will assure that standby DC power supplies are maintained in an operable condition as required by the proposed mode dependent LCO's. The proposal involves significant changes to format and content. To assure all considerations are addressed, the following discussion provides background information on the safety function of San Onofre Unit 1 batteries and specific information on the actual surveillances. Item numbers correspond to the proposal.

Background Information

The safety function of Battery Banks 1 and 2 is to provide continuous power to necessary plant loads in response to a loss of offsite power (LOP) event. The time period during which the batteries must supply continuous power is from LOP initiation until a diesel generator provides sufficient output to carry all necessary plant loads. In the event of a safety injection response to a loss of coolant accident (LOCA) coincident with the LOP, this time period is approximately fifteen seconds with a completely automatic plant response. In the event of a LOP without a coincident LOCA, this time period has been estimated to be a maximum of seven minutes with manual operator action required. However, in situations requiring manual operator action, the NRC has established a common practice of requiring that thirty minutes be available to complete the manual action. Therefore, the limiting safety function of Battery Banks 1 and 2 is to provide continuous power to necessary plant loads for thirty minutes following a LOP event. To assure Battery Banks 1 and 2 are adequate to maintain necessary plant loads for thirty minutes, both banks are conservatively sized for a design duty cycle of ninety minutes. (While Section 3.2.6.2 of the San Onofre Unit 1 Final Safety Analysis Report defines the Battery Bank 1 duty cycle as sixty minutes, the duty cycle has been subsequently revised to ninety minutes. The NRC safety evaluation report in support of Amendment No. 25 to Provisional Operating License No. DPR-13 determined that the ninety minute duty cycle of Battery Bank 2 is acceptable.)

The safety function of the UPS is to provide the necessary power for one operation of MOV 850C in the event of a coincident LOP, LOCA in the safety injection leg aligned to diesel generator 1 and loss of diesel generator 2. To assure the UPS has adequate capacity to perform this safety function, the UPS is sized to perform two consecutive operations (opening and closing twice) of MOV 850C. The NRC safety evaluation report in support of Amendment No. 56 to Provisional Operating License No. DPR-13 found the UPS design to be acceptable.

Section 4.4.D.1

This surveillance has been retained from the current Technical Specifications to assure the standby DC power system is available if required.

Section 4.4.D.2

The San Onofre Unit 1 DC battery banks have a nominal voltage of 125 volts.

Section 4.4.D.2.a.1

While the current Technical Specifications require a pilot cell voltage greater than or equal to 2.17 volts, the proposal establishes the minimum acceptable pilot cell voltage as 2.13 volts. As discussed in IEEE Std 450-1980, cell voltage is not, by itself, an indication of the state of charge of the battery. The concern is that prolonged operation of cells below 2.13 volts can reduce the life expectancy of the cells. Since IEEE and NRC have endorsed a minimum acceptable pilot cell voltage of 2.13 volts, the current requirement of 2.17 volts is considered unnecessarily restrictive.

Section 4.4.D.2.a.2

The current Technical Specifications require an overall battery bank voltage greater than or equal to 125 volts while the proposed minimum is 129 volts. The proposed minimum formalizes actual practice at San Onofre Unit 1 for maintaining a battery bank under float charge conditions. As discussed in the comments on 4.4.D.2.a.1 above, a battery cell should be maintained at a minimum of 2.13 volts. By establishing an overall minimum voltage of 129 volts, reasonable assurance is provided on a weekly basis that each connected cell (60 cells maximum) is at a minimum of 2.13 volts.

Section 4.4.D.2.b

The proposal introduces surveillance requirements in response to a battery discharge with terminal voltage below 110 volts or battery overcharge with terminal voltage above 150 volts. The current Technical Specifications lack a corresponding requirement. The proposed responses to abnormal battery conditions assure batteries are returned to the normal state within an acceptable time period.

Section 4.4.D.2.b.1

The current Technical Specifications require the voltage of each connected cell to be greater than or equal to 2.17 volts and not decreased more than .08 volts from the value observed during the original acceptance test. The proposed minimum voltage is 2.13 volts with no comparison to the original acceptance test. The comments on 4.4.D.2.a.1 above concerning a minimum voltage of 2.13 volts also applies to this item. The comparison requirement is deleted from the proposal since the STS lack a corresponding requirement and this comparison provides misleading information when determining battery bank operability. The original acceptance test values currently used were measured following application of an equalizing charge to the battery banks. An equalizing charge consists of applying an abnormally high voltage across the battery bank and is intended to bring all battery cells to an equal, although temporarily high, voltage. In this case, the average individual cell voltage was 2.35 volts. Battery banks are normally maintained on float charge, which involves the application of a voltage slightly higher than the normal battery bank voltage. The San Onofre Unit 1 battery banks are normally maintained on a float charge resulting in an average individual cell voltage of 2.2 volts. Therefore, the currently required comparison of the battery cell voltages under float charge to voltages of battery cells under an equalizing charge is misleading since the comparison is between two entirely unrelated situations.

The current Technical Specifications require the specific gravity of each connected cell to be greater than or equal to 1.20 and not decreased more than .02 from the value observed during the previous test. The proposal requires the specific gravity of each connected cell to be greater than or equal to 1.195 and the average of all connected cells to be greater than 1.205 in accordance with the STS. The proposal eliminates the requirement for a comparison with values observed during the previous test since the STS lack a

corresponding requirement and this comparison yields misleading information for determining battery bank operability. Battery cell specific gravity is influenced by many factors, such as charging, temperature, electrolyte level and water additions. Since these influencing factors may vary significantly over a ninety day period, a comparison between the previous test and the current test does not necessarily provide information relative to the battery condition. This comparison merely acknowledges the fact that a battery is a dynamic system influenced by many internal and external factors. The important considerations are the actual cell and average-of-connected cells specific gravities relative to the appropriate acceptance criteria. These considerations allow a reliable assessment of battery bank conditions.

Section 4.4.D.2.b.2

The proposal introduces a quantitative acceptance parameter for the allowable resistance of cell-to-cell and terminal connections. This criterion is absent from the current Technical Specifications. Therefore, inclusion of this criterion in the proposal provides an additional test of the battery bank condition. The value for the acceptance parameter was derived from the STS.

Section 4.4.D.2.b.3

Ten connected cells are considered to be representative of a battery bank, which is consistent with the San Onofre Unit 2 Technical Specifications. Battery Banks 1 and 2 were sized based on an electrolyte temperature of 61°F. Therefore, a minimum electrolyte temperature above 61°F provides assurance that the batteries operate in their design intended thermal environment. The UPS is excluded from this provision since the UPS thermal environment is controlled by atmospheric temperature and process heat. This arrangement allows electrolyte temperature to occasionally drop below 61°F, particularly during Modes 5 and 6 when no process heat is produced (the UPS is not required to be operable in Modes 4, 5 and 6). However, the UPS battery bank is adequately sized to allow reliable operation in a low temperature environment. A calculation has been performed to show that with an electrolyte temperature of 35°F, the UPS has adequate capacity for two consecutive, complete operations (open and close twice) of MOV 850C. Additionally, the UPS is only required to be operable in Modes 1, 2 and 3, during which time the reactor coolant system is greater than or equal to 350°F and process heat is produced by turbine plant systems.

Section 4.4.D.2.c.5

The proposed charger output of 200 amps DC reflects battery bank requirements based on the 8 hour charging period. The proposed charger output at 130 volts DC formalizes station practice.

Section 4.4.D.2.c.6

The proposed charger test time of 8 hours reflects battery bank requirements and establishes a consistent test duration for the UPS and Battery Banks 1 and 2.

Section 4.4.D.2.d

The current Technical Specifications require a battery service test be conducted on Battery Bank 1 for eight hours, Battery Bank 2 for three hours and the UPS for two consecutive complete strokes of MOV 850C. The proposed Technical Specifications require a battery service test for each respective battery bank's design duty cycle. As discussed above under background information, the duty cycles for Battery Banks 1 and 2 are ninety minutes while the duty cycle for the UPS is two consecutive complete strokes of MOV 850C. The proposed service test demonstrates battery capability to perform as designed. The current eight (Battery Bank 1) and three (Battery Bank 2) hour test durations are eliminated for consistency with the STS and IEEE STD 450-1980. The current service test procedure consists of applying the design battery load for ninety minutes, followed by a zero load period (no load applied to the battery) of six and one-half hours (Battery Bank 1) and one and one-half hours (Battery Bank 2). As approved by the NRC, the zero load period was performed merely to comply with the test duration requirements. Since the zero load period is inconsequential to the service test and to the determination of battery acceptability, the zero load period has been eliminated in the proposal.

Section 4.4.D.2.e

The current Technical Specifications require a performance discharge test every sixty months subsequent to the satisfactory completion of an eighteen month battery service test. The proposed Technical Specifications also require a once per sixty month performance discharge test, but this test can be performed in lieu of the service test, once per sixty month interval in accordance with the STS. While performance of the service test is not a prerequisite for the performance discharge test in the proposal, the performance discharge test is sufficient for determining the acceptability of the battery banks. The batteries were designed to adequately maintain plant loads (as would be demonstrated in a service test) even if the battery capacity drops to 80% of the manufacturer's rating when subjected to a performance discharge test. Since the performance test acceptance criterion is 80% capacity, reasonable assurance exists that the batteries will pass a service test if they pass a performance discharge test.

Section 4.4.D.2.f

The proposal introduces surveillances to be performed in response to battery degradation or aging. The current Technical Specifications lack a corresponding requirement. This proposed requirement assures a battery bank exhibiting signs of degradation or aging is properly monitored and corrective action taken if required.

Section 4.4.E

The existing requirements of 4.4.E relate to surveillance of the auxiliary feedwater pumps. As indicated in our letter dated March 22, 1983, new proposed changes to the auxiliary feedwater system Technical Specifications will be submitted at least 90 days prior to startup from the present seismic upgrade outage. These changes will be consistent, to the extent practicable,

with the STS, and will include all agreements resulting from the NRC review of TMI related items. The existing auxiliary feedwater pump requirements in this section are removed for future incorporation as indicated above. The new requirements of 4.4.E consist of the surveillance requirements for the Load Sequencers previously included in section 4.4.B.g and do not include any substantive changes.

Section 4.4.F

This new section consists of the surveillance requirements for the diesel generators and the Load Sequencers previously included in 4.4.B.3. The only substantive change involves the use of 18 months for the interval between tests rather than refueling cycles. This change is consistent with the STS for testing frequencies of this nature and provides improved assurance of the operability of the required system when operating fuel cycles are extended. This change enhances plant safety.

Significant Hazards Analysis

The proposed changes discussed above shall be deemed to constitute a significant hazards consideration if there is a positive finding in any of the following areas.

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

   Response: No

   As discussed in the Safety Analysis, all changes will result in operation of the facility in accordance with the established design basis and, therefore, will not significantly increase the probability or consequences of an accident previously evaluated.

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

   Response: No

   As discussed in the Safety Analysis, all changes will result in operation of the facility in accordance with the established design basis and, therefore, will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   Response: No

   As discussed in the Safety Analysis, no safety margins will be affected by the changes identified in this proposed amendment.

Safety and Significant Hazards Determination

Based on the Safety and Significant Hazards Analyses, it is concluded that: (1) the proposed change does not constitute a significant hazards consideration as defined by 10 CFR 50.92; and (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 Environmental Statement.

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