

Enclosure 1 to Document Control Desk Letter  
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PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 900002-0  
MARKED-UP PAGES  
VIRGIL S. SUMMER NUCLEAR STATION

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## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- 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 4.8-2 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 10 of the connected cells is  $\geq 66^{\circ}\text{F}$ . **60**
- 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, and
  - 4. The battery charger will supply at least 300 amperes at 132 volts for at least 8 hours.
- 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, **80** 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 may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1.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.

## ELECTRIC POWER SYSTEMS

### BASES

#### A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

The Surveillance Requirement 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." 1987

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage onfloat charge, connection resistance values and the performance of battery service and discharge tests ensures 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 4.8-2 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 the manufacturer's full charge specific gravity or a battery charger current that had 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 the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than .010 below the manufacturer's 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 4.8-2 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 the manufacturer's recommended 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 the manufacturer's 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.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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- 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 4.8-2 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 10 of the connected cells is  $\geq 60^{\circ}\text{F}$ .
- 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, and
  - 4. The battery charger will supply at least 300 amperes at 132 volts for at least 8 hours.
- 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. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1.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.

## ELECTRIC POWER SYSTEMS

### BASES

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#### A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

The Surveillance Requirement 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 450-1987, "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 onfloat charge, connection resistance values and the performance of battery service and discharge tests ensures 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 4.8-2 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 the manufacturer's full charge specific gravity or a battery charger current that had 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 the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than .010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

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PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 900002-0  
REVISED PAGES  
VIRGIL S. SUMMER NUCLEAR STATION

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PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 900002-0  
VIRGIL C. SUMMER NUCLEAR STATION

DESCRIPTION AND SAFETY EVALUATION

DESCRIPTION OF CHANGE

SCE&G proposes to modify the Virgil C. Summer Nuclear Station Technical Specifications to revise TS 4.8.2.1 and associated basis 3/4 8-2. The proposed amendment changes the battery bank average electrolyte temperature to  $\geq 60^{\circ}\text{F}$  and the minimum battery bank capacity to 80%. The associated basis is changed to reflect that the replacement batteries, installed during refueling outage 5, meet IEEE Std. 450-1987, IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

By letter of August 24, 1988, SCE&G submitted to the NRC an amendment request to change the average electrolyte temperature from 60 to 65 degrees Fahrenheit and the battery capacity from 80% to 90%. This amendment request was based on our review of the calculation for sizing the ESF batteries 1A and 1B which used a derating factor for aging and temperature more conservative than those identified in the TS. The calculations used an aging derating factor of 90% and a temperature derating factor of 94% (65 degrees Fahrenheit) as opposed to a 90% aging derating factor and 90% (60 degrees Fahrenheit) temperature derating factor, as it was stated in the TS.

The NRC granted the request on their letter of August 7, 1989, issued as Amendment 80.

SAFETY EVALUATION

Two full capacity, separate, and independent Class 1E 125 volt direct current systems provide uninterrupted direct current power for control and instrumentation of equipment related to safety. Each Class 1E direct current system consists of a full capacity, 125 volt direct current, lead calcium, 60 cell battery, a 125 volt direct current main distribution panel, and a solid state battery charger. The battery, battery charger and main distribution panel of each system are located in protected areas of the intermediate building. Each new battery has a rated capacity of 2175 amperes-hour (with an eight hour discharge cycle to 1.75 volts per cell) and is capable of powering required loads for a four hour duty cycle based on ampacity requirements experienced during a station blackout. This new requirement envelops the previous two hour duty cycle originally evaluated as acceptable in NUREG-0717, Safety Evaluation Report Related to the Operation of Virgil C. Summer Nuclear Station Unit No. 1. The upgraded battery system has sufficient capacity, capability, and reliability to meet its functional requirement during all operating and accident conditions, and during a postulated four-hour station blackout incident. Station blackout loads

served during the four-hour period are non-accident loads necessary to ensure integrity of fuel clad, reactor coolant system pressure boundary, and primary containment integrity in the event of a loss of all alternating current power for a period of four hours. The replacement batteries were sized to meet a more restrictive load demand down to the most limiting battery conditions: a minimum electrolyte temperature of 60°F, a minimum capacity derating factor for aging and temperature of 80%, and 58 cells connected. The replacement batteries also provide the means for meeting the RG-1.155, Station Blackout, requirements for coping with a station blackout. Acceptance criteria and performance of battery service test for the replacement batteries were in accordance with IEEE 450-1987, Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.



PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 900002-0  
VIRGIL C. SUMMER NUCLEAR STATION

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS

DESCRIPTION OF CHANGE

SCE&G proposes to modify the Virgil C. Summer Nuclear Station Technical Specifications to revise TS 4.8.2.1 and associated basis 3/4 8-2. The proposed amendment changes the battery bank average electrolyte temperature to  $\geq 60^{\circ}\text{F}$  and the minimum battery bank capacity to 80%. The associated basis is changed to reflect that the replacement batteries, installed during refueling outage 5, meet IEEE Std. 450-1987, Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

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The NRC granted the request on their letter of August 7, 1989, issued as Amendment 80.

BASIS FOR PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATIONS

The Commission has provided certain examples (51FR7744) of actions likely to involve no significant hazards considerations. The proposed amendment to TS 4.8.2.1 is consistent with example [vii] which states, "...A change to conform a license to changes in the regulations, where the license change results in very minor changes to facility operations clearly in keeping with the regulations."

SCE&G has evaluated the proposed technical specification change and has determined that it does not represent a significant hazards consideration based on the criteria established in 10CFR50.92 and the above cited example. Operation of VCSNS in accordance with the proposed amendment will not:

- (1) involve a significant increase in the probability or consequences of an accident previously evaluated. The class 1E direct current power system for control and instrumentation neither contributes to the probability nor increases the consequence of a design basis accident. The replacement batteries maintain independence,

redundancy, and capability of the original installation with additional enhanced capacity.

- (2) create the possibility of a new or different kind of accident from any previously evaluated.

The proposed change will not make physical alterations to the class 1E direct current power system configuration, nor will it change its method of operation. The increased capacity of the replacement batteries enhance the system performance. The failure modes and effects of the batteries remain unchanged.

- (3) involve a significant reduction in a margin of safety.

The class 1E direct current power system with the new batteries will provide sufficient capacity, including adequate operational margin, to satisfy the load demands of a design basis event or a station blackout period of four hours. The original system design basis as evaluated by NUREG-0717, Safety Evaluation Report Related to the Operation of Virgil C. Summer Nuclear Station Unit No. 1, remains unchanged. The proposed change does not decrease the margin of safety.