D.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.3 125-volt D. C. bus Train A and 125-volt D. C. bus Train B electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one 125-volt D.C. bus train inoperable, restore the inoperable 125-volt D. C. bus train to OPERABLE status within 2 hours or be in COLD SHUTDOWN within the next 36 hours.

SURVEILLANCE REQUIREMENTS

4.8.2.3.1 Each 125-volt D.C. bus train shall be determined OPERABLE at least once per 7 days by verifying correct breaker alignment and indicated power availability.

4.8.2.3.2 Each 125-volt D. C. battery bank and charger of Train A and Train B shall be demonstrated OPERABLE:

a. By verifying at least once per 7 days that the battery cell parameters meet Table 4.8-1 Category A limits.

b. By verifying at least once per 92 days the battery cell parameters meet Table 4.8-1 Category B limits.

SURVEILLANCE REQUIREMENTS (Continued)

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 deterioration that could degrade battery performance,

   2. The cell-to-cell and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material, and

   3. The battery charger will supply at least 400 amperes at a minimum of 130 volts for at least 12 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 emergency loads for 8 hours 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.

SURVEILLANCE REQUIREMENTS (Continued)

Table 4.8-1
Battery Cell Parameters

Parameter	Category A: Limits For Each Designated Pilot Cell	Category B: Limits For Each Connected Cell
Electrolyte Level	Between the minimum and maximum level indication marks [a]	Not required.
Cell Voltage	≥ 2.08 Volts	≥ 2.08 Volts under float charge
Specific Gravity [b][c]	≥1.200 (Corrected to 77°F)	≥1.200 (Corrected to 77°F)
Battery Voltage	≥ 125 Volts (Overall voltage)	Not required.

(a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum during an equalizing charge provided it is not overflowing. Electrolyte level readings will be verified to meet the Category A limits within 7 days of completing an equalizing charge.

(b) Corrected for electrolyte temperature and level. Level correction is not required, however, when battery charging is < 5 amps when on float charge.

(c) A battery charging current of < 5 amps when on float charge is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of 7 days. When charging current is used to satisfy specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance.

D.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.2.4 One 125-volt D. C. bus train electrical power subsystem shall be OPERABLE:

APPLICABILITY: MODES 5 and 6.

ACTION:

With no 125-volt D. C. bus trains OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes or movement of irradiated fuel assemblies.

SURVEILLANCE REQUIREMENTS

4.8.2.4.1 The above required 125-volt D.C. bus train shall be determined OPERABLE at least once per 7 days by verifying correct breaker alignment and indicated power availability.

4.8.2.4.2 The above required 125-volt D.C. bus train battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2.

D.C. DISTRIBUTION SYSTEMS (TURBINE BATTERY) — OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.5 The Turbine Battery 125-volt D.C. electrical power subsystem shall be OPERABLE.

APPLICABILITY: MODES 1, 2 & 3

ACTION:

With the Turbine Battery 125-volt D.C. electrical power subsystem inoperable, restore the subsystem to OPERABLE status within 7 days or be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.8.2.5.1 Verify 125-volt D.C. bus 201D is OPERABLE at least once per 7 days.

4.8.2.5.2 125-volt D.C. battery bank 201D shall be demonstrated OPERABLE:

a. By verifying at least once per 7 days that the battery cell parameters meet Table 4.8-2 Category A limits.

b. By verifying at least once per 92 days the battery cell parameters meet Table 4.8-2 Category B limits.

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 deterioration that could degrade battery performance, and
2. The cell-to-cell and terminal connections are clean, tight, free of corrosion, and coated with anti-corrosion material.

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 loads for 1 hour 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.

SURVEILLANCE REQUIREMENTS (Continued)

Table 4.8-2
Turbine Battery Cell Parameters

Parameter	Category A: Limits For Each Designated Pilot Cell	Category B: Limits For Each Connected Cell
Electrolyte Level	Between the minimum and maximum level indication marks [a]	Not required.
Cell Voltage	≥ 2.08 Volts	≥ 2.08 Volts under float charge
Specific Gravity [b][c]	≥ 1.200 (Corrected to 77°F)	≥ 1.200 (Corrected to 77°F)
Battery Voltage	≥ 125 Volts (Overall Voltage)	Not required.

(a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum during an equalizing charge provided it is not overflowing. Electrolyte level readings will be verified to meet the Category A limits within 7 days of completing an equalizing charge.

(b) Corrected for electrolyte temperature and level. Level correction is not required, however, when battery charging is < 5 amps when on float charge.

(c) A battery charging current of < 5 amps when on float charge is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of 7 days. When charging current is used to satisfy specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance.

The OPERABILITY of the minimum specified A.C.and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status. If the required power sources or distribution systems are not OPERABLE in MODES 5 and 6, operations involving CORE ALTERATIONS, positive reactivity changes, or movement of irradiated fuel assemblies are required to be suspended. The required action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory provided the boron concentration of the makeup water source is greater than or equal to the boron concentration for the required SHUTDOWN MARGIN. In addition, suspension of these activities does not preclude completion of actions to establish a safe conservative plant condition.

Each 125-volt D.C. bus train consists of its associated 125-volt D.C. bus, a 125-volt D.C. battery bank, and a battery charger with at least 400 ampere charging capacity. To demonstrate OPERABILITY of a 125-volt D.C. bus train, these components must be energized and capable of performing their required safety functions. Additionally, at least one tie breaker between the 125-volt D.C. bus trains must be open for a 125-volt D.C. bus train to be considered OPERABLE.

Footnote (a) to Technical Specification Tables 4.8-1 and 4.8-2 permits the electrolyte level to be above the specified maximum level for the Category A limits during equalizing charge, provided it is not overflowing. Because of the internal gas generation during the performance of an equalizing charge, specific gravity gradients and artificially elevated electrolyte levels are produced which may exist for several days following completion of the equalizing charge. These limits ensure that the plates suffer no physical damage, and that adequate electron transfer capability is maintained in the event of transient conditions. In accordance with the recommendations of IEEE 450-1980, electrolyte level readings should be taken only after the battery has been at float charge for at least 72 hours.

Based on vendor recommendations and past operating experience, seven (7) days has been determined a reasonable timeframe for the 125-volt D.C. batteries electrolyte level to stabilize and to provide sufficient time to verify battery electrolyte levels are within the Category A limits.

Footnote (b) to Technical Specification Tables 4.8-1 and 4.8-2 requires that level correction is not required when battery charging current is < 5 amps on float charge. This current provides, in general, an indication of overall battery condition.

Footnote (c) to Technical Specification Tables 4.8-1 and 4.8-2 states that level correction is not required when battery charging current is < 5 amps on float charge. This current provides, in general, an indication of overall battery condition. Because of specific gravity gradients that are produced during the recharging process, delays of several days may occur while waiting for the specific gravity measurement for determining the state of charge. This footnote allows the float charge current to be used as an alternative to specific gravity to show OPERABILITY of a battery for up to seven (7) days following the completion of a battery equalizing charge. Each connected cells specific gravity must be measured prior to expiration of the 7 day allowance.

Surveillance Requirements 4.8.2.3.2.c.1 and 4.8.2.5.2.c.1 provide for visual inspection of the battery cells, cell plates, and battery racks to detect any indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The non-safety grade 125V D.C. Turbine Battery is required for accident mitigation for a main steam line break within containment with a coincident loss of a vital D.C. bus. The Turbine Battery provides the alternate source of power for Inverters 1 & 2 respectively via non-safety grade Inverters 5 & 6. For the loss of a D.C. event with a coincident steam line break within containment, the feedwater regulating valves are required to close to ensure containment design pressure is not exceeded.

The Turbine Battery D.C. electrical power subsystem consists of 125-volt D.C. bus 201D and 125-volt D.C. battery bank 201D. To demonstrate OPERABILITY of this subsystem, these components must be energized and capable of performing their required safety functions.