

NPF-10/15-253

ATTACHMENT B  
(Proposed Specification)

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## ELECTRICAL POWER SYSTEMS

### 3/4.8.2 D.C. SOURCES

#### OPERATING

#### LIMITING CONDITION FOR OPERATION

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3.8.2.1 As a minimum the following D.C. electrical sources shall be OPERABLE:

- a. 125-volt battery bank A (2B007), and its associated full capacity charger.
- b. 125-volt battery bank B (2B008), and its associated full capacity charger.
- c. 125-volt battery bank C (2B009) and its associated full capacity charger.
- d. 125-volt battery bank D (2B010) and its associated full capacity charger.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

- a. With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1.a.1 within one hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

#### SURVEILLANCE REQUIREMENTS

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4.8.2.1 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 4.8-2 meet the Category A limits, and
  2. The total battery terminal voltage is greater than or equal to 129-volts on float charge.

## 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 ten connected cells is above 60°F.
- c. At least once per refueling interval 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 125-volts for at least 12 hours.
- d. At least once per refueling interval 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 4.8.2.1d.
- 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.

TABLE 4.8-2

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A <sup>(1)</sup>		CATEGORY B <sup>(2)</sup>	
	Limits for each designated pilot cell	Limits for each connected cell	Allowable <sup>(3)</sup> value for each connected cell	
Electrolyte Level	>Minimum level indication mark, and $\leq \frac{1}{8}$ " above maximum level indication mark	>Minimum level indication mark, and $\leq \frac{1}{8}$ " above maximum level indication mark	Above top of plates, and not overflowing	
Float Voltage	$\geq 2.13$ volts	$\geq 2.13$ volts <sup>(c)</sup>	$> 2.07$ volts	
Specific Gravity <sup>(a)</sup>	$\geq 1.200$ <sup>(b)</sup>	$\geq 1.195$	Not more than .020 below the average of all connected cells	
		Average of all connected cells $> 1.205$	Average of all connected cells $\geq 1.195$ <sup>(b)</sup>	

(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 parameters 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.

NPF-10/15-253

ATTACHMENT D  
(Proposed Specifications)

## ELECTRICAL POWER SYSTEMS

### 3/4.8.2 D.C. SOURCES

#### OPERATING

#### LIMITING CONDITION FOR OPERATION

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3.8.2.1 As a minimum the following D.C. electrical sources shall be OPERABLE:

- a. 125-volt battery bank A (3B007) and its associated full capacity charger.
- b. 125-volt battery bank B (3B008) and its associated full capacity charger.
- c. 125-volt battery bank C (3B009) and its associated full capacity charger.
- d. 125-volt battery bank D (3B010) and its associated full capacity charger.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

- a. With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With one of the required full capacity chargers inoperable; demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1.a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

#### SURVEILLANCE REQUIREMENTS

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4.8.2.1 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 4.8-2 meet the Category A limits, and
  2. The total battery terminal voltage is greater than or equal to 129-volts on float charge.

## 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 ten connected cells is above 60°F.
- c. At least once per refueling interval 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 125-volts for at least 12 hours.
- d. At least once per refueling interval 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 4.8.2.1d.
- 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.

TABLE 4.8-2  
BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A <sup>(1)</sup>		CATEGORY B <sup>(2)</sup>
	Limits for each designated pilot cell	Limits for each connected cell	Allowable <sup>(3)</sup> value for each connected cell
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Float Voltage	$\geq 2.13$ volts	$\geq 2.13$ volts <sup>(c)</sup>	> 2.07 volts
		$\geq 1.195$	Not more than .020 below the average of all connected cells
Specific Gravity <sup>(a)</sup>	$\geq 1.200$ <sup>(b)</sup>	Average of all connected cells $> 1.205$	Average of all connected cells $\geq 1.195$ <sup>(b)</sup>

- (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 parameters 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.