

ELECTRICAL POWER SYSTEMS

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

PRIMARY CONTAINMENT PENETRATION CONDUCTOR OVERCURRENT PROTECTIVE DEVICES

LIMITING CONDITION FOR OPERATION

3.8.4.1 All primary containment penetration conductor overcurrent protective devices shown in Table 3.8.4.1-1 and ~~all fuses tested pursuant to Specification 4.8.4.1.a.2~~ shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

a. With one or more of the above required containment penetration conductor overcurrent devices shown in Table 3.8.4.1-1 and ~~or fuses tested pursuant Specification 4.8.4.1.a.2~~ inoperable:

1. Restore the protective device(s) to OPERABLE status or deenergize the circuit(s) by tripping, ^{or} racking out, ~~or removing~~ the alternate device or racking out ~~or removing~~ the inoperable device within 72 hours, and
2. Declare the affected system or component inoperable, and
3. Verify at least once per 7 days thereafter the alternate device is tripped, ^{or} racked out, ~~or removed~~, or the device is racked out, ~~or removed~~.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.8.4.1 Each of the primary containment penetration conductor overcurrent protective devices required above shall be demonstrated OPERABLE:

a. At least once per 18 months:

1. By selecting and functionally testing a representative sample of at least 10% of each type of lower voltage circuit breakers. Circuit breakers selected for functional testing shall be selected on a rotating basis. Testing of these circuit breakers shall consist of injecting a current with a value equal to 300% of the pickup of the thermal (long term time delay) element of Types HFB-TM and KB-TM (thermal magnetic) circuit breakers, and verifying that the circuit breaker operates within the time delay band-width.



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SURVEILLANCE REQUIREMENTS (Continued)

specified by the manufacturer for the test current. The magnetic (instantaneous) element shall be tested by injecting a current in excess of 120% of the pickup value of the magnetic (instantaneous) element and verifying that the circuit breaker trips instantaneously with no intentional time delay. Type MFB-M (magnetic only) circuit breaker testing shall also follow this procedure except that no thermal trip elements will be involved. Circuit breakers found inoperable during functional testing shall be restored to OPERABLE status prior to resuming operation. For each circuit breaker found inoperable during these functional tests, an additional representative sample of at least 10% of all the circuit breakers of the inoperable type shall also be functionally tested until no more failures are found or all circuit breakers of that type have been functionally tested.

2. ~~a. By selecting and functionally testing a representative sample of each type of fuse on a rotating basis. Each representative sample of fuses shall include at least 10% of all fuses of that type. The functional test shall consist of a non-destructive resistance measurement test which demonstrates that the fuse meets its manufacturer's design criteria. Fuses found inoperable during these functional testing shall be replaced with OPERABLE fuses prior to resuming operation. For each fuse found inoperable during these functional tests, an additional representative sample of at least 10% of all fuses of that type shall be functionally tested until no more failures are found or all fuses of that type have been functionally tested, or~~
- ~~b. By replacing 100% of all required fuses.~~

2X. By functionally testing each overcurrent relay listed in Table 3.8.4.1-1. Testing of these relays shall consist of injecting a current in excess of 120% of the nominal relay initiation current and measuring the response time. The measured response time shall be within $\pm 10\%$ of the specified value.

- b. At least once per 60 months by subjecting each circuit breaker to an inspection and preventive maintenance in accordance with procedures prepared in conjunction with its manufacturer's recommendations.



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ELECTRICAL POWER SYSTEMS

BASES

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

Primary containment electrical penetrations and penetration conductors are protected by either de-energizing circuits not required during reactor operation or demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers by periodic surveillance.

The surveillance requirements applicable to lower voltage circuit breakers ~~and fuses~~ provides assurance of breaker ~~and fuse~~ reliability by testing at least one representative sample of each manufacturer's brand of circuit breaker, ~~and/or fuse~~. Each manufacturer's molded case and metal case circuit breakers ~~and/or fuses~~ are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers ~~and/or fuses~~ are tested. If a wide variety exists within any manufacturer's brand of circuit breakers ~~and/or fuses~~, it is necessary to divide that manufacturer's breakers ~~and/or fuses~~ into groups and treat each group as a separate type of breaker ~~or fuses~~ for surveillance purposes.

The bypassing of the motor operated valve thermal overload protection continuously by integral bypass devices ensures that the thermal overload protection will not prevent safety related valves from performing their function. The surveillance requirements for demonstrating the bypassing of the thermal overload protection continuously are in accordance with Regulatory Guide 1.106 "Thermal Overload Protection for Electric Motors on Motor Operated Valves", Revision 1, March 1977.



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ELECTRICAL POWER SYSTEMS

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

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3.8.4.1 All primary containment penetration conductor overcurrent protective devices shown in Table 3.8.4.1-1 and ~~all fuses tested pursuant to Specification 4.8.4.1.a.2~~ shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

a. With one or more of the above required containment penetration conductor overcurrent devices shown in Table 3.8.4.1-1 and ~~or fuses tested pursuant to Specification 4.8.4.1.a.2~~ inoperable:

1. Restore the protective device(s) to OPERABLE status or deenergize the circuit(s) by tripping ^{or} racking out ~~or removing~~ the alternate device or racking out ~~or removing~~ the inoperable device within 72 hours, and
2. Declare the affected system or component inoperable, and
3. Verify at least once per 7 days thereafter the alternate device is tripped, racked out, ~~or removed~~, or the device is racked out, ~~or removed~~.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.8.4.1 Each of the primary containment penetration conductor overcurrent protective devices required above shall be demonstrated OPERABLE:

- a. At least once per 18 months
 1. By selecting and functionally testing a representative sample of at least 10% of each type of lower voltage circuit breakers. Circuit breakers selected for functional testing shall be selected on a rotating basis. Testing of these circuit breakers shall consist of injecting a current with a value equal to 300% of the pickup of the thermal (long time delay) element of Types HFB-TM and KB-TM (thermal magnetic) circuit breakers, and verifying that the circuit breaker operates within the time delay band-width for



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SURVEILLANCE REQUIREMENTS (Continued)

that current specified by the manufacturer for the test current. The magnetic (instantaneous) element shall be tested by injecting a current in excess of 120% of the pickup value of the magnetic (instantaneous) element and verifying that the circuit breaker trips instantaneously with no intentional time delay. Type HFB-M (magnetic only) circuit breaker testing shall also follow this procedure except that no thermal trip elements will be involved. Circuit breakers found inoperable during functional testing shall be restored to OPERABLE status prior to resuming operation. For each circuit breaker found inoperable during these functional tests, an additional representative sample of at least 10% of all the circuit breakers of the inoperable type shall also be functionally tested until no more failures are found or all circuit breakers of that type have been functionally tested.

~~2. a. By selecting and functionally testing a representative sample of each type of fuse on a rotating basis. Each representative sample of fuses shall include at least 10% of all fuses of that type. The functional test shall consist of a non-destructive resistance measurement test which demonstrates that the fuse meets its manufacturer's design criteria. Fuses found inoperable during these functional testing shall be replaced with OPERABLE fuses prior to resuming operation. For each fuse found inoperable during these functional tests, an additional representative sample of at least 10% of all fuses of that type shall be functionally tested until no more failures are found or all fuses of that type have been functionally tested, or~~

~~b. By replacing 100% of all required fuses.~~

2X Functionally testing each overcurrent relay listed in Table 3.8.4.1-1. Testing of these relays shall consist of injecting a current in excess of 120% of the nominal relay initiation current and measuring the response time. The measured response time shall be within $\pm 10\%$ of the specified value.

b. At least once per 60 months by subjecting each circuit breaker to an inspection and preventive maintenance in accordance with procedures prepared in conjunction with its manufacturer's recommendations.

effective upon the unit's following scheduled outages

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BASES

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The bypassing of the motor operated valve thermal overload protection continuously by integral bypass devices ensures that the thermal overload protection will not prevent safety related valves from performing their function. The surveillance requirements for demonstrating the bypassing of the thermal overload protection continuously are in accordance with Regulatory Guide 1.106 "Thermal Overload Protection for Electric Motors on Motor Operated Valves", Revision 1, March 1977.

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