

3/4.8 ELECTRICAL POWER SYSTEMS

BASES

3/4.8.1, 3/4.8.2 and 3/4.8.3 A.C. SOURCES, D.C. SOURCES and ONSITE POWER DISTRIBUTION SYSTEMS

The OPERABILITY of the A.C. and D.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for the safe shutdown of the facility and the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix "A" to 10 CFR Part 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources is consistent with the initial condition assumptions of the safety analyses and is based upon maintaining OPERABLE at least Division I or II of the onsite A.C. and D.C. power sources and associated distribution systems during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. or D.C. source. Division III supplies the high pressure core spray (HPCS) system and standby service water pump 1SWP*P2C with its auxiliaries.

The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources," December 1974, as modified by plant-specific analysis and diesel generator manufacturer's recommendations. When diesel generator 1A or 1B is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator 1A or 1B as a source of emergency power, are also OPERABLE. This requirement is intended to provide assurance that a loss of offsite power, during the period that diesel generator 1A or 1B is inoperable, will not result in a complete loss of safety function of critical systems. Critical systems are those systems that require emergency power to safely shut down the plant and maintain it in a safe shutdown condition in conjunction with a loss of offsite power. Equipment which "fails safe" upon a loss of power are not included. The following systems/subsystems are required to be verified OPERABLE per this ACTION requirement:

1. one channel of the accident monitoring drywell and containment hydrogen concentration analyzer and monitor
2. two low pressure ECCS subsystems
3. one main steam positive leakage control subsystem
4. one penetration valve leakage control subsystem
5. one safety-related primary containment unit cooler
6. one suppression pool cooling subsystem of RHR
7. one standby gas treatment system
8. one shield building annulus mixing subsystem
9. one fuel building ventilation charcoal filtration subsystem
10. one primary containment hydrogen recombiner

ELECTRICAL POWER SYSTEMS

BASES

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

11. one primary containment/drywell hydrogen mixing subsystem
12. one primary containment/drywell hydrogen ignitor subsystem
13. one standby service water subsystem with both pumps operable
14. the standby cooling tower with two fan cells operable
15. one main control room air conditioning subsystem

The above systems/subsystems are required to be capable of being powered by the OPERABLE diesel generator 1A or 1B. Systems whose ACTION requirements are 72 hours or longer for a complete loss of its safety function are not included on the above list. Continued plant operation is limited to 72 hours with diesel generator 1A or 1B inoperable. The term verify, as used in this context, means to administratively check, by examining logs or other information, to determine if certain components are out of service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the OPERABILITY of the component. When a diesel generator becomes inoperable due to any cause other than preplanned maintenance or testing, there is a requirement in the ACTION to, for each OPERABLE diesel generator separately, either verify that the cause of the diesel generator being inoperable does not impact the OPERABILITY of the OPERABLE diesel generator or perform Surveillance Requirement 4.8.1.1.2.a.4. The term verify in this context means to determine by visual inspection, functional test or other means that the subsystem will perform its function. For diesel generators made by different manufacturers, this verification may consist of a determination that the cause cannot exist if the comparable subsystem is of a different design.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems, during shutdown and refueling, ensures that the facility can be maintained in the shutdown or refueling condition for extended time periods and sufficient instrumentation and control capability is available for monitoring and maintaining the unit status.

The surveillance requirements, for demonstrating the OPERABILITY of the diesel generators, are in accordance with the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, and Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, as modified by plant-specific analysis and diesel generator manufacturer's recommendations.

Generic Letter 84-15 prescribed increasing the surveillance test frequency where previous testing indicated a reliability of less than or equal to 0.95/demand until restored reliability was demonstrated. It also considered a prescriptive testing program which included seven consecutive successful demands without a failure of the DG.