

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.C Emergency Service Water System

1. The Emergency Service Water System (ESWS) shall be operable at all times when the reactor coolant temperature is greater than 212 F.
2. If one ESW or ECW pump becomes inoperable, the reactor may remain in operation for a period not to exceed 2 months.
3. If any combination of two ESW or ECW pumps becomes inoperable, the reactor may remain in operation for a period not to exceed 7 days.
4. To consider the Emergency Cooling Water pump operable as an equivalent ESW pump, at least 1 ESW booster pump and 2 Emergency Cooling Tower fans must be operable.
5. To consider the ESW pump operable the associated pump room fans must be available for normal operation except that
 - a) one pump room supply and/or exhaust fan for each compartment may be out of service for 1 month or
 - b) temporary fans may be used in place of permanently installed fans to provide room temperatures at less than 120°F.

4.9.C Emergency Service Water System

1. The ESWS shall be tested once every 3 months as follows:
 - a. Pump operability - the pump shall be manually started and pump capability checked (via discharge pressure ≥ 54.0 psig at shut off head).
 - b. Valve operability - the automatic valves shall be stroked individually from their control switches.
2. The associated pump room fans shall be tested for operability every 3 months.
3.
 - a. The Emergency Cooling Water pump and ESW booster pumps shall be tested every 3 months to verify operability.
 - b. The Emergency Cooling Tower fans shall be tested every 3 months to verify operability.

3.9 BASES (Cont'd.)

The 125-Volt battery system shall have a minimum of 105 Volts at the battery terminals to be considered operable. The 250-Volt portion of the 125/250-Volt battery system shall have a minimum of 210 Volts at the battery terminals to be considered operable.

The ESWS has two 100 percent cooling capacity pumps, each powered from a separate standby power supply. A third pump equivalent to an ESW pump, the Emergency Cooling Water pump, is located at the Emergency Cooling Tower. This latter pump requires the operability of one of the two ESW booster pumps and two of the three Emergency Cooling Tower fans to function adequately. In the event that one ESW or ECW pump is inoperable, the two month allowable out-of-service time is conservative based on the fact that two 100% capacity pumps are available. In the event that two ESW or ECW pumps are inoperable, the significant reduction in redundancy is properly reflected in the seven day allowable out-of-service time.

4.9 BASES

The monthly test of the diesel generator is conducted to check for equipment failures and deterioration. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 75% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for one to two hours. Diesel generator experience at other generating stations indicates that the testing frequency is adequate and provides a high reliability of operation should the system be required.

Each diesel generator has one air compressor and two air receivers for starting. It is expected that the air compressors will run only infrequently. During the monthly check of the diesel generator, one receiver in each set of receivers will be drawn down below the point at which the corresponding compressor automatically starts to check operation and the ability of the compressors to recharge the receivers.

The diesel generator fuel consumption rate at full load is approximately 200 gallons per hour. Thus, the monthly load test of the diesel generators will test the operation and the ability of the fuel oil transfer pumps to refill the day tank and will check the operation of these pumps from the emergency source.

The test of the diesel generator during the refueling outage will be more comprehensive in that it will functionally test the system; i.e., it will check diesel generator starting and closure of diesel generator breaker and sequencing of load on the diesel generator. The diesel generator will be started by simulation of a loss-of-coolant accident. In addition, an undervoltage condition will be imposed to simulate a loss of off-site power. The timing sequence will be checked to assure that the diesel generators can operate the LPCI pumps at rated speed within 18 seconds, and the core spray pumps at rated speed within twenty-four seconds.

4.9 BASES (Cont'd.)

Periodic tests between refueling outages verify the ability of the diesel generator to run at full load and the core and containment cooling pumps to deliver full flow. Periodic testing of the various components, plus a functional test one-a-cycle, is sufficient to maintain adequate reliability.

Although station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure. In addition, the checks described also provide adequate indication that the batteries have the specified ampere hour capability.

The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outages. This testing frequency complies with the testing requirements of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450 (1975), "Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries," and Regulatory Guide 1.129, Revision 1 (February 1978), "Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants."

A performance test determines the ability of the battery to meet a specified discharge rate and duration based on the manufacturer's rating. A service test proves the capability of the battery to deliver the design requirements of the dc systems; i.e., supply and maintain in operable status all of the actual emergency loads for the design basis accident. A performance test is the most severe test because the cycling on the battery at manufacturer's rating shortens the service life of the battery. A service test is performed at design load instead of manufacturer's ratings.

The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel could contribute to excessive damage to the diesel engine.

When it is determined that some auxiliary electrical equipment is out-of-service, the increased surveillance required in Section 4.5.F is deemed adequate to provide assurance that the remaining equipment will be operable.

The test interval for the Emergency Service Water System, the ESW booster pumps, Emergency Cooling Water pump, Emergency Cooling Tower fans, and pump room fans associated with the ESW pumps is deemed adequate to provide assurance that the equipment will be operable. This test interval is based on good engineering judgement and system redundancy, plus the additional testing accomplished when the diesel generators are tested. Pump operability tests during normal operation will be performed by measuring the shut-off head.