BASES

3/4.8.1 and 3/4.8.2 A.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 1) the safe shutdown of the facility, and 2) 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 are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least two independent sets of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of one onsite A.C. source.

When a system or component is determined to be inoperable solely because its emergency power source is inoperable, or solely because its normal power source is inoperable, it may still be considered OPERABLE, provided the appropriate Actions of 3.8.1.1.a.2, b.2 or d.2 are satisfied.

Action 3.8.1.1.a.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required systems. Failure of a single offsite circuit will generally not, by itself, cause any equipment to lose normal AC power. Action 3.8.1.1.b.2 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. Action 3.8.1.1.d.2, which applies when two offsite circuits are inoperable, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions.

These systems are powered from the independent AC electrical power train. However, redundant required systems or components credited by this specification are not necessarily powered from AC electrical sources. For example, the single train turbine-driven auxiliary feedwater pump is redundant to the two motor-driven pumps. Redundant required system or component failures consist of inoperable equipment associated with a train, redundant to the train that has an inoperable DG or offsite power.

LCO 3.0.4.b is not applicable to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG. The provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

BASES (Continued)

The completion time for these actions is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This completion time also allows for an exception to the normal "time zero" for beginning the allowed outage time clock, starting only on discovery that both:

a. One train has no offsite power supplying its loads, one DG is inoperable or two required offsite circuits are inoperable; and
b. A required system or component on the other train is inoperable.

If at any time during these conditions a redundant required system or component subsequently becomes inoperable, this completion time begins to be tracked. Discovering no offsite power to one train of the onsite Class 1E Electrical Power Distribution System, or one required DG inoperable, coincident with one or more inoperable required support or supported systems or components that are associated with the other train that has power, results in starting the completion times for the Action. The specified time is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE AC supplies (one offsite circuit and three DGs for Condition (a), two offsite circuits and two DGs for Condition (b), or three DGs for Condition (d)) are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required system or component's function may have been lost; however, function has not been lost. The completion time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required system or component. Additionally, the completion time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. The completion time for Condition d (loss of both offsite circuits) is reduced to 12 hours from that allowed for one train without offsite power (Action 3.8.1.1.a.2). The rationale is that Regulatory Guide 1.93 allows a completion time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required system or component failure exists, this assumption is not the case, and a shorter completion time of 12 hours is appropriate.

LCO 3.8.1.1, Action b.4.a.2 allows the Allowed Outage Time (AOT) for an inoperable emergency diesel generator (EDG) to extend from 72 hours to 14 days provided the availability of the supplemental power source is verified within the initial 72-hour period and once per 12 hours thereafter. The supplemental power source provides additional defense-in depth during the extended AOT. In the event the supplemental power source cannot be verified available during the AOT, 72 hours is allowed to restore the SPS to available status or the EDG to OPERABLE status. In the event TS Action statement 3.8.1.1.b is entered for an inoperable EDG for greater than or equal to 48 hours, then only 24 hours is allowed to return the SPS to available status or the EDG to OPERABLE status. The 24 hour allowance for an unavailable SPS can be entered more than once to address unanticipated conditions associated with the SPS.

When utilizing the extended EDG AOT (greater than 72 hours and less than or equal to 14 days), the following regulatory commitments shall be implemented:

1. When an EDG is removed from service for an extended 14-day AOT, the Turbine Driven Auxiliary Feedwater Pump and supporting systems and components shall be operable.

2. Component testing or maintenance of safety systems and important non safety equipment in the offsite power systems that can increase the likelihood of a plant transient (unit trip) or LOOP will be avoided. In addition, no discretionary switchyard maintenance will be performed.

3. Voluntary entry into this extended 14 day AOT should not be scheduled if adverse weather conditions are expected.

4. The system load dispatcher will be contacted once per day to ensure no significant grid perturbations (high grid loading unable to withstand a single contingency of line or generation outage) are expected during the extended diesel generator AOT.

5. Licensed Operators and Auxiliary Operators will be appropriately trained on the purpose and use of the Supplemental Power Source (AOT diesels).

6. Operating crews will be briefed on the EDG work plan and procedural actions regarding LOOP and SBO, prior to entering the extended 14 day EDG AOT.

If one or more of the above commitments is not met while in the extended completion time, the corrective action program shall be entered, the risk managed in accordance with the Maintenance Rule, and the commitment(s) restored without delay.

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 unit status.

The Applicability of specifications 3.8.2.2, 3.8.2.4, and 3.8.2.6 includes the movement of irradiated fuel assemblies. This will insure adequate electrical power is available for proper operation of the fuel handling building ventilation system during movement of irradiated fuel in the spent fuel pool.

An offsite circuit would be considered inoperable if it were not available to one required train. Although two trains are required by LCOs 3.8.2.2 and 3.8.2.4, the one train with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and irradiated fuel movement. By the allowance of the option to declare required features inoperable, with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO’s actions.

With the offsite circuit or diesel generator not available to all required trains, the option exists to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With both required diesel generators inoperable, the minimum required diversity of AC power sources is not available. Therefore, it is required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required shutdown margin or boron concentration. Suspending positive reactivity additions that could result in failure to meet the minimum shutdown margin or boron concentration limit is required to assure continued safe operation.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are based upon 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. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. Regulatory Guide 1.108 criteria for determining and reporting valid tests and failures, and accelerated diesel generator testing, have been superseded by implementation of the Maintenance Rule for the diesel generators per 10CFR50.65. In addition to the Surveillance Requirements of 4.8.1.1.2, diesel preventative maintenance is performed in accordance with procedures based on manufacturer's recommendations with consideration given to operating experience.

The minimum voltage and frequency stated in the Surveillance Requirements (SR) are those necessary to ensure the Emergency Diesel Generator (EDG) can accept Design Basis Accident (DBA) loading while maintaining acceptable voltage and frequency levels. Stable operation at the nominal voltage and frequency values is also essential in establishing EDG OPERATILITY, but a time constraint is not imposed. The lack of a time constraint is based on the fact that a typical EDG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not dampened out by load application. In lieu of a time constraint in the SR, controls will be provided to monitor and trend the actual time to reach stable operation within the band as a means of ensuring there is no voltage regulator or governor degradation that could cause an EDG to become inoperable.

"Standby condition" for the purpose of defining the condition of the engine immediately prior to starting for surveillance requirements requires that the lube oil temperature be between 100 °F and 170 °F. The minimum lube oil temperature for an OPERABLE diesel is 100 °F.

The thirteen second time requirement for the Emergency Diesel Generator to reach rated voltage and frequency was originally based on a Westinghouse assumption of fifteen seconds that included the delay time between the occurrence of the incident and the application of electrical power to the first sequenced safeguards pump (BURL-3011, dated November 13, 1974) and included an instrument response time of two seconds (BURL-1531, dated July 27, 1970). The times specified in UFSAR Section 15.4 bound the thirteen seconds specified in the TS.

The narrower band for frequency specified for testing performed in steady state isochronous operation will ensure the EDG will not be run in an overloaded condition (steady state) during accident conditions. Steady state is assumed to be achieved after one minute of operation in the isochronous mode with all required loads sequenced on the bus.

The narrower band for steady state voltage is specified for operation when the EDG is not synchronized to the grid to ensure the voltage regulator will protect driven equipment from over-voltages during accident conditions. Procedural controls will ensure that equipment voltages are maintained within acceptable limits during testing when paralleled to the grid.

The wider band for frequency is appropriate for testing done with the governor in the droop mode. Likewise the wider band for voltage is appropriate when paralleled to the grid.

All voltages and frequencies specified in SR 4.8.1.1.2 are representative of the analytical values and do not account for postulated instrument inaccuracy. Instrument inaccuracies for EDG voltage and frequency are administratively controlled.

Preventive maintenance includes those activities (including pro-test inspections, measurements, adjustments and preparations) performed to maintain an otherwise OPERABLE EDG in an OPERABLE status. Corrective maintenance includes those activities required to correct a condition that would cause the EDG to be inoperable.

Technical Specification Surveillance 4.8.1.1.3.b requires verification of two of the categories of Table 1 of ASTM D975-77, those being 1) Water and Sediment and 2) Viscosity. The required values for these two categories have not changed throughout the history of ASTM D975 and are applicable to S15, S500, and S5000 fuel. Additional requirements for testing exist per Reg Guide 1.137 (Rev. 1) and the Aging Management Program. Necessary fuel oil testing is contained in Salem purchase specification S-C-M255-NDS-0181, and in procedure SC.OP-LB.DF-0001.

Surveillance requirement 4.8.1.2 is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during performance of the surveillance requirement, and to preclude de-energizing a required ESF bus or disconnecting a required offsite circuit during performance of surveillance requirements. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that these surveillance requirements must still be capable of being met, but actual performance is not required during periods when the DG and offsite circuit are required to be OPERABLE. During Startup, prior to entering Mode 4, the surveillance requirements are required to be completed if the surveillance frequency has been exceeded or will be exceeded prior to the next scheduled shutdown.

3/4.8.3 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

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

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. Each manufacturer's molded case circuit breakers and lower voltage circuit breakers are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers are tested. If a wide variety exists within any manufacturer's brand of molded case or lower voltage circuit breakers, it is necessary to further divide that manufacturer's breakers into groups and treat each group as a separate type of breaker for surveillance purposes.

Containment penetration conductor overcurrent protective device information is provided in the UFSAR.