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U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Document Control Desk

Subject: Oconee Nuclear Station
Docket Numbers 50-269, 270, and 287
Technical Specification Bases (TSB) Change

Please see attached revisions to Tech Spec Bases 3.4.9, Pressurizer and 3.10.1, Standby Shutdown Facility, which were implemented on January 21, 2004.

Attachment 1 contains the new TSB pages and Attachment 2 contains the markup version of the Bases pages.

If any additional information is needed, please contact Graham Davenport, at (864-885-3044).

Very truly yours,

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Attachment 1

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.9 Pressurizer

BASES

BACKGROUND

The pressurizer provides a point in the RCS where liquid and vapor are maintained in equilibrium under saturated conditions for pressure control purposes to prevent bulk boiling in the remainder of the RCS. Key functions include maintaining required primary system pressure during steady state operation and limiting the pressure changes caused by reactor coolant thermal expansion and contraction during normal load transients.

The pressure control components addressed by this LCO include the pressurizer water level, the required heaters, and their controls and emergency power supplies. Pressurizer safety valves are addressed by LCO 3.4.10, "Pressurizer Safety Valves."

The maximum water level limit has been established to ensure that a liquid to vapor interface exists to permit RCS pressure control during normal operation and proper pressure response for anticipated design basis transients. The water level limit thus serves two purposes:

a. Pressure control during normal operation maintains subcooled reactor coolant in the loops and thus is in the preferred state for heat transport; and

b. By restricting the level to a maximum, expected transient reactor coolant volume increases (pressurizer insurge) will not cause excessive level changes that could result in degraded ability for pressure control.

The maximum water level limit permits pressure control equipment to function as designed. The limit preserves the steam space during normal operation, thus both spray and heaters can operate to maintain the design operating pressure. If the level limits were exceeded prior to a transient that creates a large pressurizer insurge volume, the maximum RCS pressure might exceed the design Safety Limit (SL) of 2750 psig.

The pressurizer heaters are used to maintain a pressure in the RCS so reactor coolant in the loops is subcooled and thus in the preferred state for heat transport to the steam generators (SGs). This function must be

BASES

BACKGROUND (continued)

maintained with a loss of offsite power. Consequently, the emphasis of this LCO is to ensure that the essential power supplies and the associated heaters are adequate to maintain pressure for RCS loop subcooling with an extended loss of offsite power.

A minimum required available capacity of 126 kW ensures that the RCS pressure can be maintained. Unless adequate heater capacity is available, reactor coolant subcooling cannot be maintained indefinitely. Inability to control the system pressure and maintain subcooling under conditions of natural circulation flow in the primary system could lead to loss of single phase natural circulation and decreased capability to remove core decay heat.

APPLICABLE SAFETY ANALYSES

In MODES 1 and 2, the LCO requirement for a steam bubble is reflected implicitly in the accident analyses. No associated safety analyses are performed in lower MODES. All analyses performed from a critical reactor condition assume the existence of a steam bubble and saturated conditions in the pressurizer. In making this assumption, the analyses neglect the small fraction of noncondensible gases normally present.

Safety analyses presented in the UFSAR do not take credit for pressurizer heater operation; however, an implicit initial condition assumption of the safety analyses is that the RCS is operating at normal pressure.

The maximum level limit is of prime interest for the startup accident and Loss of Main Feedwater (LOMFW) event. Conservative safety analyses assumptions for the startup accident indicate that it produces the largest increase of pressurizer level caused by an analyzed event. Thus this event has been selected to establish the pressurizer water level limit. For pressurizer levels > than 285 inches, the LOMFW event may be more limiting.

Evaluations performed for the design basis large break loss of coolant accident (LOCA), which assumed a higher maximum level than assumed for the startup accident, have been made. The higher pressurizer level assumed for the LOCA is the basis for the volume of reactor coolant released to the containment. The containment analysis performed using the mass and energy release demonstrated that the maximum resulting containment pressure was within design limits.

The requirement for emergency power supplies is based on NUREG-0737 (Ref. 2). The intent is to allow maintaining the reactor coolant in a subcooled condition with natural circulation at hot, high pressure conditions

BASES

APPLICABLE SAFETY ANALYSES (continued)

for an undefined, but extended, time period after a loss of offsite power. While loss of offsite power is an initial condition or coincident event assumed in many accident analyses, maintaining hot, high pressure conditions over an extended time period is not evaluated as part of UFSAR accident analyses.

The maximum pressurizer water level limit satisfies Criterion 2 of 10 CFR 50.36 (Ref. 1). Although the heaters are not specifically used in accident analysis, the need to maintain subcooling in the long term during loss of offsite power, as indicated in NUREG-0737 (Ref. 2), is the reason for providing an LCO.

LCO

The LCO requirement for the pressurizer to be OPERABLE with a water level ≤ 285 inches ensures that a steam bubble exists. Limiting the maximum operating water level preserves the steam space for pressure control. The LCO has been established to ensure the capability to establish and maintain pressure control for steady state operation and to minimize the consequences of potential overpressure transients. Requiring the presence of a steam bubble is also consistent with analytical assumptions.

The LCO requires a minimum of 126 kW of pressurizer heaters OPERABLE and capable of being powered from an emergency power supply. Bank 2, Group C heaters are not available for meeting this requirement. As such, the LCO addresses both the heaters and the power supplies. The minimum heater capacity required is sufficient to maintain the system near normal operating pressure when accounting for heat losses through the pressurizer insulation. By maintaining the pressure near the operating conditions, a wide margin to subcooling can be obtained in the loops. The design value of 126 kW is derived from the use of nine heaters rated at 14 kW each. The amount needed to maintain pressure is dependent on the insulation losses, which can vary due to tightness of fit and condition.

APPLICABILITY

The need for pressure control is most pertinent when core heat can cause the greatest effect on RCS temperature, resulting in the greatest effect on pressurizer level and RCS pressure control. Thus Applicability has been designated for MODES 1 and 2. The Applicability is also provided for MODE 3 with RCS temperature > 325°F. The purpose is to prevent solid water RCS operation during heatup and cooldown to avoid rapid pressure rises caused by normal operational perturbations, such as reactor coolant

BASES

APPLICABILITY (continued)

pump startup. The temperature of 325°F has been designated as the cutoff for applicability because LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," provides a requirement for pressurizer level ≤ 325°F. The LCO does not apply in MODE 4, 5 or 6 since either pressurizer level is under the control of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," or the RCS is open to the containment atmosphere.

In MODES 1, 2, and 3, there is the need to maintain the availability of pressurizer heaters capable of being powered from an emergency power supply. In the event of a loss of offsite power, the initial conditions of these MODES give the greatest demand for maintaining the RCS in a hot pressurized condition with loop subcooling for an extended period. For MODE 4, 5, or 6, it is not necessary to control pressure (by heaters) to ensure loop subcooling for heat transfer when the Decay Heat Removal loops are in service, and therefore the LCO is not applicable.

ACTIONS

A.1

With pressurizer water level in excess of the maximum limit, action must be taken to restore pressurizer operation to within the bounds assumed in the analysis. This is done by restoring the pressurizer water level to within the limit.

The 1 hour Completion Time is considered to be a reasonable time for draining excess liquid.

B.1 and B.2

If the water level cannot be restored, reducing core power constrains heat input effects that drive pressurizer insurge that could result from an anticipated transient. By shutting down the reactor and reducing reactor coolant temperature to at least MODE 3 with RCS temperature ≤ 325°F, the potential thermal energy of the reactor coolant mass for LOCA mass and energy releases is reduced.

Twelve hours is a reasonable time based upon operating experience to reach MODE 3 from full power without challenging unit systems and operators. Further pressure and temperature reduction to MODE 3 with RCS temperature ≤ 325°F places the unit into a MODE where the LCO is not applicable. The 18 hour Completion Time to reach the nonapplicable MODE is reasonable based upon operating experience.

BASES

ACTIONS (continued)

C.1

If the power supplies to the heaters are not capable of providing 126 kW, or the pressurizer heaters are inoperable, restoration is required in 72 hours. The Completion Time of 72 hours is reasonable considering the anticipation that a demand will not occur in this period.

D.1 and D.2

If pressurizer heater capability cannot be restored within the allowed Completion Time of Required Action C.1, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3 within 12 hours and to MODE 3 with RCS temperature ≤ 325°F within the following 6 hours. The Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. Similarly, the Completion Time of 18 hours to be in MODE 3 with RCS temperature ≤ 325°F is reasonable based on operating experience to achieve power reduction from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

This SR requires that during steady state operation, pressurizer water level is maintained below the nominal upper limit to provide a minimum space for a steam bubble. The Surveillance is performed by observing the indicated level. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess the level for any deviation and verify that operation is within safety analyses assumptions. Alarms are also available for early detection of abnormal level indications.

SR 3.4.9.2

The SR verifies the power supplies are capable of producing the minimum power and the associated pressurizer heaters are at their design rating. (This may be done by testing the power supply output and heater current, or by performing an electrical check on heater element continuity and resistance.) The Frequency of 18 months is considered adequate to detect heater degradation and has been shown by operating experience to be acceptable.

BASES (continued)

REFERENCES

1. 10 CFR 50.36.

2. NUREG-0737, November 1980.

B 3.10 STANDBY SHUTDOWN FACILITY

B 3.10.1 Standby Shutdown Facility (SSF)

BASES

BACKGROUND

The Standby Shutdown Facility (SSF) is designed as a standby system for use under certain emergency conditions. The system provides additional "defense in-depth" protection for the health and safety of the public by serving as a backup to existing safety systems. The SSF is provided as an alternate means to achieve and maintain the unit in MODE 3 with average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature) following 10 CFR 50 Appendix R fire, sabotage, turbine building flood, station blackout (SBO) and tornado missile events, and is designed in accordance with criteria associated with these events. In that the SSF is a backup to existing safety systems, the single failure criterion is not required. Failures in the SSF systems will not cause failures or inadvertent operations in other plant systems. The SSF requires manual activation and can be activated if emergency systems are not available.

The SSF is designed to maintain the reactor in a safe shutdown condition for a period of 72 hours following 10 CFR 50 Appendix R fire, turbine building flood, sabotage, SBO, or tornado missile events. This is accomplished by re-establishing and maintaining Reactor Coolant Pump Seal cooling; assuring natural circulation and core cooling by maintaining the primary coolant system filled to a sufficient level in the pressurizer while maintaining sufficient secondary side cooling water; and maintaining the reactor subcritical by isolating all sources of Reactor Coolant System (RCS) addition except for the Reactor Coolant Makeup System which supplies makeup of a sufficient boron concentration.

The main components of the SSF are the SSF Auxiliary Service Water (ASW) System, SSF Portable Pumping System, SSF Reactor Coolant (RC) Makeup System, SSF Power System, and SSF Instrumentation.

The SSF ASW System is a high head, high volume system designed to provide sufficient steam generator (SG) inventory for adequate decay heat removal for three units during a loss of normal AC power in conjunction with the loss of the normal and emergency feedwater systems. One motor driven SSF ASW pump, located in the SSF, serves all three units. The ASW pump suction supply is lake water from the embedded Unit 2 condenser circulating water (CCW) piping.

BASES

BACKGROUND (continued)

The SSF ASW System is used to provide adequate cooling to maintain single phase RCS natural circulation flow in MODE 3 with an average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature). In order to maintain single phase RCS natural circulation flow, an adequate number of Bank 2, Group B and C pressurizer heaters must be OPERABLE. These heaters are needed to compensate for ambient heat loss from the pressurizer. As long as the temperature in the pressurizer is maintained, RCS pressure will also be maintained. This will preclude hot leg voiding and ensure adequate natural circulation cooling.

The SSF Portable Pumping System, which includes a submersible pump and a flow path capable of taking suction from the intake canal and discharging into the Unit 2 CCW line, is designed to provide a backup supply of water to the SSF in the event of loss of CCW and subsequent loss of CCW siphon flow. The SSF Portable Pumping System is installed manually according to procedures.

The SSF RC Makeup System is designed to supply makeup to the RCS in the event that normal makeup systems are unavailable. An SSF RC Makeup Pump located in the Reactor Building of each unit supplies makeup to the RCS should the normal makeup system flow and seal cooling become unavailable. The system is designed to ensure that sufficient borated water is provided from the spent fuel pools to allow the SSF to maintain all three units in MODE 3 with average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature) for approximately 72 hours. An SSF RC Makeup Pump is capable of delivering borated water from the Spent Fuel Pool to the RC pump seal injection lines. A portion of this seal injection flow is used to makeup for reactor coolant pump seal leakage while the remainder flows into the RCS to makeup for other RCS leakage (non LOCA).

The SSF Power System includes 4160 VAC, 600 VAC, 208 VAC, 120 VAC and 125 VDC power. It consists of switchgear, a load center, motor control centers, panelboards, remote starters, batteries, battery chargers, inverters, a diesel generator (DG), relays, control devices, and interconnecting cable supplying the appropriate loads.

The AC power system consists of 4160 V switchgear OTS1; 600 V load center OXSF; 600 V motor control centers XSF, 1XSF, 2XSF, 3XSF, PXSF; 208 V motor control centers 1XSF, 1XSF-1, 2XSF, 2XSF-1, 3XSF, 3XSF-1; 120 V panelboards KSF, KSFC.

BASES

BACKGROUND (continued)

The DC power system consists of two 125 VDC batteries and associated chargers, two 125 VDC distribution centers (DCSF, DCSF-1), and a DC power panelboard (DCSF). Only one battery and associated charger is required to be operable and connected to the 125 VDC distribution center to supply the 125 VDC loads. In this alignment, which is normal, the battery is floated on the distribution center and is available to assure power without interruption upon loss of its associated battery charger or AC power source. The other 125 VDC battery and its associated charger are in a standby mode and are not normally connected to the 125 VDC distribution center. However, they are available via manual connection to the 125 VDC distribution center to supply SSF loads, if required.

The SSF Power System is provided with standby power from a dedicated DG. The SSF DG and support systems consists of the diesel generator, fuel oil transfer system, air start system, diesel engine service water system, as well as associated controls and instrumentation. This SSF DG is rated for continuous operation at 3500 kW, 0.8 pf, and 4160 VAC. The SSF electrical design load does not exceed the continuous rating of the DG. The auxiliaries required to assure proper operation of the SSF DG are supplied entirely from the SSF Power System. The SSF DG is provided with manual start capability from the SSF only. It uses a compressed air starting system with four air storage tanks. An independent fuel system, complete with a separate underground storage tank, duplex filter arrangement, a fuel oil transfer pump, and a day tank, is supplied for the DG.

BASES

BACKGROUND (continued)

The following information will aid in determination of SSF Operability:

Associated Inoperable Systems

SSF System Removed From Service	SSF ASW System	SSF Portable Pumping System	SSF RCMU System	SSF Power System	SSF Instruments
SSF ASW System	YES	YES	YES	YES	YES
SSF Portable Pumping	YES	YES	YES	YES	YES
SSF RCMU System	NO	NO	YES	NO	NO
SSF Power System	YES	YES	YES	YES	YES
SSF Instr. System	NO	NO	NO	NO	YES
SSF PZR. Heaters**	YES	NO	NO	NO	NO
SSF RCS Isolation Valves	NO	NO	YES	NO	NO
SSF HVAC System	YES	YES	YES	YES	YES

** When SSF pressurizer heaters are inoperable, the resulting inoperability of the SSF ASW System does NOT render other SSF systems inoperable.

SSF ASW System

Provides motive force for SSF ASW suction pipe air ejector. The air ejector is needed to maintain siphon flow to the SSF HVAC service water pump, the SSF DSW pump, and the SSF ASW pump when the water level in the U2 CCW supply pipe becomes too low. If the SSF DSW pump becomes inoperable, the SSF Power System will become inoperable. Since an inoperable SSF Power System causes all other SSF subsystems to be inoperable, an inoperable SSF ASW System will also cause other SSF Subsystems to be inoperable.

Provides adequate SG cooling to reduce & maintain RCS pressure below the pressure where the SSF RC makeup pump discharge relief valve, HP-404, begins to leak flow. Therefore, full SSF RC Makeup System seal injection flow will be provided to the RC pump seals in time to prevent seal degradation or failure.

BASES

BACKGROUND (continued)

SSF ASW pump should be operated when the diesel is operated to provide a load for the diesel. This is not a requirement for operability since the diesel could be operated to provide long term power to one or more units RC makeup pumps without operating the SSF ASW pump as long as a large load (SSF ASW pump) is not added later (diesel desouping concern).

SSF Portable Pumping

Supplies makeup water to the SSF ASW System, the SSF DSW System, and the SSF HVAC Service Water System after siphon flow / gravity flow and forced CCW flow are lost.

SSF Power System

Other SSF Systems cannot operate without receiving power from the diesel for SSF scenarios where power from U2 MFB is not available.

SSF Pressurizer Heaters

Single phase RCS natural circulation flow cannot be maintained without the pressurizer heaters. The number of SSF heaters utilized is based on testing and calculations performed on a unit by unit basis to determine the minimum number of required heaters needed to overcome actual pressurizer ambient losses. Since the heaters do not have their own action statement, the SSF ASW System is declared inoperable when the heaters are inoperable.

SSF RCS Isolation Valves (HP-3, HP-4, HP-20, RC-4, RC-5, RC-6)

These valves do not have their own action statement. When they are inoperable, their corresponding SSF RC makeup system is considered inoperable.

SSF HVAC System

Portions of the SSF HVAC System, consisting of the SSF Air Conditioning (AC) and Ventilation Systems support the SSF Power System OPERABILITY. The SSF AC System, which includes the HVAC service water system and AC equipment (fan motors, compressors, condensers, and coils), must be operable to support SSF Power System operability. Since an inoperable SSF Power System results in all other SSF subsystems being inoperable, an SSF HVAC System operability problem that makes the SSF Power System inoperable also results in other SSF Subsystems being inoperable.

BASES

BACKGROUND (continued)

The SSF AC System is designed to maintain the SSF Control Room, Computer Room, and Battery Rooms within their design temperature range. Elevated temperatures in the SSF Control Room and Computer Room could cause the SSF Power System to fail during an accident which requires operation of the SSF. Since the SSF HVAC service water pumps perform a redundant function, only one of the two are required to be operable for the SSF HVAC service water system to be considered operable. The SSF Ventilation System, which supplies outside air to the Switchgear, Pump, HVAC and Diesel Generator Rooms, is composed of the following four subsystems: Constant Ventilation, Summer Ventilation, On-line Ventilation, and Diesel Generator Engine Ventilation. These ventilation systems work together to provide cooling to the various rooms of the SSF under both standby and on-line modes. The Diesel Generator Engine Ventilation fan is required for operability of the SSF Power System. The six fans associated with the other three ventilation systems may or may not be required for SSF operability dependent upon outside air temperature. If one of these ventilation fans fail, an engineering evaluation must be performed to determine if any of the SSF Systems or instrumentation are inoperable.

SSF Instrumentation System

SSF Instrumentation is provided to monitor RCS pressure, RCS Loop A and B temperature (hot leg and cold leg), pressurizer water level, and SG A and B water level. Indication is displayed on the SSF control panel.

APPLICABLE SAFETY ANALYSES

The SSF serves as a backup for existing safety systems to provide an alternate and independent means to achieve and maintain one, two, or three Oconee units in MODE 3 with average RCS temperature $\geq 525^{\circ}F$ (unless the initiating event causes the unit to be driven to a lower temperature) for up to 72 hours following 10 CFR 50 Appendix R fire, a turbine building flood, sabotage, SBO, or tornado missile events (Refs. 1, 6, 7, and 8).

The OPERABILITY of the SSF is consistent with the assumptions of the Oconee Probabilistic Risk Assessment (Ref. 2). Therefore, the SSF satisfies Criterion 4 of 10 CFR 50.36 (Ref. 3).

BASES

LCO

The SSF Instrumentation in Table B 3.10.1-1 and the following SSF Systems shall be OPERABLE:

a. SSF Auxiliary Service Water System;

b. SSF Portable Pumping System;

c. SSF Reactor Coolant Makeup System; and

d. SSF Power System.

An OPERABLE SSF ASW System includes pressurizer heaters capable of being powered from the SSF, and an SSF ASW pump, piping, instruments, and controls to ensure a flow path capable of taking suction from the Unit 2 condenser circulating water (CCW) line and discharging into the secondary side of each SG. The minimum number of pressurizer heaters capable of being powered from the SSF is based on maintaining RCS natural circulation flow. The number of pressurizer heaters necessary to meet this requirement is dependent upon steam leakage rate from the pressurizer. The following table shows the number of pressurizer heaters required at various steam leakage rates:

<u>Unit 1</u>

Number of Bank 2, Group B & C Pressurizer Heaters Available	Maximum Allowed Pressurizer Steam Space Leakage
15	0.50 GPM
14	0.25 GPM
13	0.10 GPM
12	0.00 GPM

<u>Unit 2</u>

Number of Bank 2, Group B & C Pressurizer Heaters Available	Maximum Allowed Pressurizer Steam Space Leakage
18	0.50 GPM
17	0.25 GPM
16	0.10 GPM
15	0.00 GPM

BASES

LCO (continued)

Unit 3

Number of Bank 2, Group B & C Pressurizer Heaters Available	Maximum Allowed Pressurizer Steam Space Leakage
19	0.50 GPM
18	0.25 GPM
17	0.10 GPM
16	0.00 GPM

An OPERABLE SSF Portable Pumping System includes an SSF submersible pump and a flow path capable of taking suction from the intake canal and discharging into the Unit 2 CCW line. An OPERABLE Reactor Coolant Makeup System includes an SSF RC Makeup pump, piping, instruments, and controls to ensure a flow path capable of taking suction from the spent fuel pool and discharging into the RCS. The following leakage limits are applicable for the SSF RC Makeup System to be considered OPERABLE:

Maximum Allowed Total Combined RCS Leakage for SSF RC Makeup System Operability

The "maximum allowed total combined RCS leakage" is 24.7 GPM. A Unit's "total combined RCS leakage" shall be ≤ 24.7 GPM for its corresponding SSF RC Makeup System to be considered OPERABLE.

Total Combined RCS leakage is based on "Total RCS Leakage Rate + Quench Tank Level Increase + Total RC Pump Seal Return Flow." Total RC Pump Seal Return Flow is determined by summing the seal return flow rate for all four RC Pumps. If the seal return flow rate for a RC Pump is not available, 3.35 GPM may be used as the seal return flow rate for the affected pump. This worst case seal leakage occurs when two seal stages are failed with the third seal stage leaking maximum outflow to the leakage system.

An OPERABLE SSF Power System includes the SSF DG, diesel support systems, 4160 VAC, 600 VAC, 208 VAC, 120 VAC, and 125 VDC systems. Only one 125 VDC SSF battery and its associated charger are required to be OPERABLE to support OPERABILITY of the 125 VDC system.

BASES

APPLICABILITY

The SSF System is required in MODES 1, 2, and 3 to provide an alternate means to achieve and maintain the unit in MODE 3 with average RCS temperature ≥525°F (unless the initiating event causes the unit to be driven to a lower temperature) following 10 CFR 50 Appendix R fire, turbine building flood, sabotage, SBO and tornado missile events. The safety function of the SSF is to achieve and maintain the unit in MODE 3 with average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature); therefore, this LCO is not applicable in MODES 4, 5, or 6.

ACTIONS

The exception for LCO 3.0.4, provided in the Note of the Actions, permits entry into MODES 1, 2, and 3 with the SSF not OPERABLE. This is acceptable because the SSF is not required to support normal operation of the facility or to mitigate a design basis accident.

A.1, B.1, C.1, D.1, and E.1

With one or more of the SSF Systems inoperable or the required SSF instrumentation of Table B 3.10.1-1 inoperable, the SSF is in a degraded condition and the system(s) or instrumentation must be restored to OPERABLE status within 7 days. The 7 day Completion Time is based on the low probability of an event occurring which would require the SSF to be utilized.

F.1

If the Required Action and associated Completion Time of Condition A, B, C, D, or E are not met when SSF Systems or Instrumentation are inoperable due to maintenance, the unit may continue to operate provided that the SSF is restored to OPERABLE status within 45 days from discovery of initial inoperability.

This Completion Time is modified by a Note that indicates that the SSF shall not be in Condition F for more than a total of 45 days in a calendar

ACTIONS

F.1 (continued)

year. This includes the 7 day Completion Time that leads to entry into Condition F. For example, if the SSF ASW System is inoperable for 10 days, the 45 day special inoperability period is reduced to 35 days. If the SSF ASW System is inoperable for 6 days, Condition A applies and there is no reduction in the 45 day allowance. The limit of 45 days per calendar year minimizes the number and duration of extended outages associated with exceeding the 7 day Completion Time of a Condition.

G.1 and G.2

If the Required Action and associated Completion Time of Condition F are not met or if the Required Action and associated Completion Time of Condition A, B, C, D, or E are not met for reasons other than Condition F, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and MODE 4 within 84 hours. The allowed Completion Times are appropriate, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems, considering a three unit shutdown may be required.

SURVEILLANCE REQUIREMENTS

SR 3.10.1.1

Performance of the CHANNEL CHECK once every 7 days for each required instrumentation channel ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel with a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. This SR is modified by a Note to indicate that it is not applicable to the SSF RCS temperature instrument channels, which are common to the RPS RCS temperature instrument channels and are normally aligned through a transfer isolation device to each Unit control room. The instrument string to the SSF control room is checked and calibrated every 18 months

Agreement criteria are determined based on a combination of the channel instrument uncertainties, including indication and readability. If a

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.1.1 (continued)

channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

The Frequency is based on unit operating experience that demonstrates channel failure is rare.

SR 3.10.1.2

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 4).

SR 3.10.1.3 and 3.10.1.4

SR 3.10.1.3 provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is automatically added. The level is expressed as an equivalent volume in gallons. The day tank is sized based on the amount of fuel oil required to successfully start the DG and to allow for orderly shutdown of the DG upon loss of fuel oil from the main storage tank.

SR 3.10.1.4 provides verification that there is an adequate inventory of fuel oil in the storage tanks to support SSF DG operation for 72 hours at full load. The 72 hour period is sufficient time to place the unit in a safe shutdown condition

The 31 day Frequency for these SRs is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.5

The SR requires the DG to start (normal or emergency) from standby conditions and achieve required voltage and frequency. Standby conditions for a DG means that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations. This SR is modified by a Note to indicate that all DG starts for this Surveillance may be preceded by an engine prelube period and followed by a warmup period prior to loading. This minimizes wear on moving parts that do not get lubricated when the engine is running.

The 31 day Frequency is consistent with Regulatory Guide 1.9 (Ref. 5). This Frequency provides adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.

SR 3.10.1.6

This Surveillance ensures that sufficient air start capacity for the SSF DG is available, without the aid of the refill compressor. The SSF DG air start system is equipped with four air storage tanks. Each set of two tanks will provide sufficient air to start the SSF DG a minimum of three successive times without recharging. The pressure specified in this SR is intended to reflect the lowest value at which the three starts can be accomplished.

The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources.

SR 3.10.1.7

This Surveillance demonstrates that the fuel oil transfer pump automatically starts and transfers fuel oil from the underground fuel oil storage tank to the day tank. This is required to support continuous operation of SSF DG. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

The 92 day Frequency is considered acceptable based on operating experience.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.8

A sample of fuel oil is required to be obtained from the SSF day tank and underground fuel oil storage tank in accordance with the Diesel Fuel Oil Testing Program in order to ensure that fuel oil viscosity, water, and sediment are within the limits of the Diesel Fuel Oil Testing Program.

The 92 day Frequency is considered acceptable based on operating experience related to diesel fuel oil quality.

SR 3.10.1.9

This Surveillance verifies that the SSF DG is capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize electrical loads, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The normal 92 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 3).

This SR is modified by three Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that all DG starts for this Surveillance may be preceded by an engine prelube period and followed by a warmup period prior to loading. This minimizes wear on moving parts that do not get lubricated.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.10

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function). .

The 12 month Frequency for this SR is consistent with IEEE-450 (Ref. 4), which recommends detailed visual inspection of cell condition and rack integrity on a yearly basis.

SR 3.10.1.11

Visual inspection of battery cell to cell and terminal connections provides an indication of physical damage that could potentially degrade battery performance. The anti-corrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection.

The limits established for this SR must be no more than 20% above the resistance as measured during installation or not above the ceiling value established by the manufacturer.

The Surveillance Frequency for these inspections is 12 months. This Frequency is considered acceptable based on operating experience related to detecting corrosion trends.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.12

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length correspond to the design duty cycle requirements. The design basis discharge time for the SSF battery is one hour.

The Surveillance Frequency for this test is 12 months. This Frequency is considered acceptable based on operating experience.

SR 3.10.1.13

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis. This Frequency is justified by the assumption of an 18 month calibration interval to determine the magnitude of equipment drift in the setpoint analysis.

SR 3.10.1.14

Inservice Testing of the SSF valves demonstrates that the valves are mechanically OPERABLE and will operate when required. These valves are required to operate to ensure the required flow path.

The specified Frequency is in accordance with the IST Program requirements. Operating experience has shown that these components usually pass the SR when performed at the IST Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.15

This SR requires the SSF pumps to be tested in accordance with the IST Program. The IST verifies the required flow rate at a discharge pressure to verify OPERABILITY. The SR is modified by a note indicating that it is not applicable to the SSF submersible pump.

The specified Frequency is in accordance with the IST Program requirements. Operating experience has shown that these components usually pass the SR when performed at the IST Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.10.1.16

This SR requires the SSF submersible pump to be tested on a 2 year Frequency and verifies the required flow rate at a discharge pressure to verify OPERABILITY.

The specified Frequency is based on the pump being not QA grade and on operating experience that has shown it usually passes the SR when performed at the 2 year Frequency.

REFERENCES

1. UFSAR, Section 9.6.
2. Oconee Probabilistic Risk Assessment.
3. 10 CFR 50.36.
4. IEEE-450-1987.
5. Regulatory Guide 1.9, Rev. 0, December 1974.
6. NRC Letter from L. A. Wiens to H. B. Tucker, "Safety Evaluation Report on Effect of Tornado Missiles on Oconee Emergency Feedwater System," dated July 28, 1989.
7. NRC Letter from L. A. Wiens to J. W. Hampton, "Safety Evaluation for Station Blackout (10 CFR 50.63) - Oconee Nuclear Station, Units 1, 2, and 3," dated March 10, 1992.

BASES

REFERENCES (continued)	8.	NRC Letter from L. A. Wiens to J. W. Hampton, "Supplemental Safety Evaluation for Station Blackout (10 CFR 50.63) - Oconee Nuclear Station, Units 1, 2, and 3," dated December 10, 1992.

Table B 3.10.1-1 (page 1 of 1)
SSF Instrumentation

FUNCTION	REQUIRED CHANNELS PER UNIT
1. Reactor Coolant System Pressure	1
2. Reactor Coolant System Temperature (Tc)	1/Loop
3. Reactor Coolant System Temperature (Th)	1/Loop
4. Pressurizer Water Level	1
5. Steam Generator A & B Water Level	1/SG

Attachment 2

BASES

APPLICABLE SAFETY ANALYSES (continued)

for an undefined, but extended, time period after a loss of offsite power. While loss of offsite power is an initial condition or coincident event assumed in many accident analyses, maintaining hot, high pressure conditions over an extended time period is not evaluated as part of UFSAR accident analyses.

The maximum pressurizer water level limit satisfies Criterion 2 of 10 CFR 50.36 (Ref. 1). Although the heaters are not specifically used in accident analysis, the need to maintain subcooling in the long term during loss of offsite power, as indicated in NUREG-0737 (Ref. 2), is the reason for providing an LCO.

LCO

The LCO requirement for the pressurizer to be OPERABLE with a water level ≤ 285 inches ensures that a steam bubble exists. Limiting the maximum operating water level preserves the steam space for pressure control. The LCO has been established to ensure the capability to establish and maintain pressure control for steady state operation and to minimize the consequences of potential overpressure transients. Requiring the presence of a steam bubble is also consistent with analytical assumptions.

Bank 2, Group C heaters are not available for meeting this requirement

The LCO requires a minimum of 126 kW of pressurizer heaters OPERABLE and capable of being powered from an emergency power supply. As such, the LCO addresses both the heaters and the power supplies. The minimum heater capacity required is sufficient to maintain the system near normal operating pressure when accounting for heat losses through the pressurizer insulation. By maintaining the pressure near the operating conditions, a wide margin to subcooling can be obtained in the loops. The design value of 126 kW is derived from the use of nine heaters rated at 14 kW each. The amount needed to maintain pressure is dependent on the insulation losses, which can vary due to tightness of fit and condition.

APPLICABILITY

The need for pressure control is most pertinent when core heat can cause the greatest effect on RCS temperature, resulting in the greatest effect on pressurizer level and RCS pressure control. Thus Applicability has been designated for MODES 1 and 2. The Applicability is also provided for MODE 3 with RCS temperature > 325°F. The purpose is to prevent solid water RCS operation during heatup and cooldown to avoid rapid pressure rises caused by normal operational perturbations, such as reactor coolant

BASES

BACKGROUND (continued)

The SSF ASW System is used to provide adequate cooling to maintain single phase RCS natural circulation flow in MODE 3 with an average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature). In order to maintain single phase RCS natural circulation flow, an adequate number of Bank 2, Group B pressurizer heaters must be OPERABLE. These heaters are needed to compensate for ambient heat loss from the pressurizer. As long as the temperature in the pressurizer is maintained, RCS pressure will also be maintained. This will preclude hot leg voiding and ensure adequate natural circulation cooling.

and C

The SSF Portable Pumping System, which includes a submersible pump and a flow path capable of taking suction from the intake canal and discharging into the Unit 2 CCW line, is designed to provide a backup supply of water to the SSF in the event of loss of CCW and subsequent loss of CCW siphon flow. The SSF Portable Pumping System is installed manually according to procedures.

The SSF RC Makeup System is designed to supply makeup to the RCS in the event that normal makeup systems are unavailable. An SSF RC Makeup Pump located in the Reactor Building of each unit supplies makeup to the RCS should the normal makeup system flow and seal cooling become unavailable. The system is designed to ensure that sufficient borated water is provided from the spent fuel pools to allow the SSF to maintain all three units in MODE 3 with average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature) for approximately 72 hours. An SSF RC Makeup Pump is capable of delivering borated water from the Spent Fuel Pool to the RC pump seal injection lines. A portion of this seal injection flow is used to makeup for reactor coolant pump seal leakage while the remainder flows into the RCS to makeup for other RCS leakage (non LOCA).

The SSF Power System includes 4160 VAC, 600 VAC, 208 VAC, 120 VAC and 125 VDC power. It consists of switchgear, a load center, motor control centers, panelboards, remote starters, batteries, battery chargers, inverters, a diesel generator (DG), relays, control devices, and interconnecting cable supplying the appropriate loads.

The AC power system consists of 4160 V switchgear OTS1; 600 V load center OXSF; 600 V motor control centers XSF, 1XSF, 2XSF, 3XSF; PXSF 208 V motor control centers 1XSF, 1XSF-1, 2XSF, 2XSF-1, 3XSF, 3XSF-1; 120 V panelboards KSF, KSFC.

BASES

SSF ASW pump should be operated when the diesel is operated to provide a load for the diesel. This is not a requirement for operability since the diesel could be operated to provide long term power to one or more units RC makeup pumps without operating the SSF ASW pump as long as a large load (SSF ASW pump) is not added later (diesel desouping concern).

SSF Portable Pumping

Supplies makeup water to the SSF ASW System, the SSF DSW System, and the SSF HVAC Service Water System after siphon flow / gravity flow and forced CCW flow are lost.

SSF Power System

Other SSF Systems cannot operate without receiving power from the diesel for SSF scenarios where power from U2 MFB is not available.

SSF Pressurizer Heaters

Replace with attached

Single phase RCS natural circulation flow cannot be maintained without the pressurizer heaters. Since the heaters do not have their own action statement, the SSF ASW System is declared inoperable when the heaters are inoperable.

SSF RCS Isolation Valves (HP-3, HP-4, HP-20, RC-4, RC-5, RC-6)

These valves do not have their own action statement. When they are inoperable, their corresponding SSF RC makeup system is considered inoperable.

SSF HVAC System

Portions of the SSF HVAC System, consisting of the SSF Air Conditioning (AC) and Ventilation Systems support the SSF Power System OPERABILITY. The SSF AC System, which includes the HVAC service water system and AC equipment (fan motors, compressors, condensers, and coils), must be operable to support SSF Power System operability. Since an inoperable SSF Power System results in all other SSF subsystems being inoperable, an SSF HVAC System operability problem that makes the SSF Power System inoperable also results in other SSF Subsystems being inoperable.

The SSF AC System is designed to maintain the SSF Control Room, Computer Room, and Battery Rooms within their design temperature

Stephen C Newman
10/09/2003 08:02 AM

To: Webster K Grayson/Gen/DukePower@DukePower
cc: Reene' V Gambrell/Gen/DukePower@DukePower
Subject: SSF TS BASES Change??

Ken,

As an action item from yesterday's NSRB meeting on the PZR TS change, I propose moving the second sentence from the SSF clarification (that we want to add to the TS 3.4.9 Bases) to the SSF TS 3.10.1 Bases (background section). Let me know what you think or if this is inappropriate. We have a bases change going now so its fairly simple to include this with the ongoing change. The new words will read:

SSF Pressurizer Heaters

Single phase RCS natural circulation flow cannot be maintained without the pressurizer heaters. The number of SSF heaters utilized is based on testing and calculations performed on a unit by unit basis to determine the minimum ~~required~~ number of heaters needed to overcome actual pressurizer ambient losses. Since the heaters do not have their own action statement, the SSF ASW System is declared inoperable when the heaters are inoperable.

Add to Background

BASES

LCO (continued)

An OPERABLE SSF ASW System includes pressurizer heaters capable of being powered from the SSF, and an SSF ASW pump, piping, instruments, and controls to ensure a flow path capable of taking suction from the Unit 2 condenser circulating water (CCW) line and discharging into the secondary side of each SG. The minimum number of pressurizer heaters capable of being powered from the SSF is based on maintaining RCS natural circulation flow. The number of pressurizer heaters necessary to meet this requirement is dependent upon steam leakage rate from the pressurizer. The following table shows the number of pressurizer heaters required at various steam leakage rates: *

Number of Bank 2, Group B Pressurizer Heaters Available	Maximum Allowed Pressurizer Steam Space Leakage
9	0.50 GPM
8	0.25 GPM
7	0.10 GPM
6	0.00 GPM

See attached

An OPERABLE SSF Portable Pumping System includes an SSF submersible pump and a flow path capable of taking suction from the intake canal and discharging into the Unit 2 CCW line. An OPERABLE Reactor Coolant Makeup System includes an SSF RC makeup pump, piping, instruments, and controls to ensure a flow path capable of taking suction from the spent fuel pool and discharging into the RCS. An OPERABLE SSF Power System includes the SSF DG, diesel support systems, 4160 VAC, 600 VAC, 208 VAC, 120 VAC, and 125 VDC systems. Only one 125 VDC SSF battery and its associated charger are required to be OPERABLE to support OPERABILITY of the 125 VDC system.

APPLICABILITY

The SSF System is required in MODES 1, 2, and 3 to provide an alternate means to achieve and maintain the unit in MODE 3 with average RCS temperature ≥525°F (unless the initiating event causes the unit to be driven to a lower temperature) following 10 CFR 50 Appendix R fire, turbine building flood, sabotage, SBO and tornado missile events. The safety function of the SSF is to achieve and maintain the unit in MODE 3 with average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature); therefore, this LCO is not applicable in MODES 4, 5, or 6.

Add to LCO Table

Unit 1

Number of Bank 2, Group B&C Pressurizer Heaters Available	Maximum Allowed Pressurizer Steam Space ~~Available~~ Leakage
15	0.50 gpm
14	0.25 gpm
13	0.10 gpm
12	0.00 gpm

Unit 2

Number of Bank 2, Group B&C Pressurizer Heaters Available	Maximum Allowed Pressurizer Steam Space ~~Available~~ Leakage
18	0.50 gpm
17	0.25 gpm
16	0.10 gpm
15	0.00 gpm

Unit 3

Number of Bank 2, Group B&C Pressurizer Heaters Available	Maximum Allowed Pressurizer Steam Space ~~Available~~ Leakage
19	0.50 gpm
18	0.25 gpm
17	0.10 gpm
16	0.00 gpm