3.18 STANDBY SHUTDOWN FACILITY

Applicability

Applies to the Oconee Standby Shutdown Facility (SSF) consisting of the SSF Auxiliary Service Water (ASW), SSF Reactor Coolant (RC) Makeup Systems, associated instrumentation, electrical generation and distribution, support systems, and the interfaces with normal in-plant systems.

Objective

To specify minimum conditions necessary to assure the operability of the Standby Shutdown Facility when any Oconee unit Reactor Coolant System temperature is at or above 250°F.

Specification

3.18.1 a. The Oconee SSF consisting of the SSF ASW, SSF RC Makeup Systems, associated instrumentation, electrical generation and distribution, support systems, and the interfaces with normal in-plant systems shall be operable at any time an Oconee Unit is at or above 250°F, except as permitted by Specifications 3.18.2, 3.18.3, 3.18.4, 3.18.5, and 3.18.6, and 3.18.7.

b. The Provisions of Specification 3.0 do not apply.

3.18.2 SSF Auxiliary Service Water System

a. The SSF ASW System, consisting of SSF ASW pump and a flow path capable of taking suction from the Unit 2 CCW line and discharging into the secondary side of each steam generator, shall be operable for each Unit at or above 250°F, except as permitted by part (b) or Specification 3.18.5.

b. If the SSF ASW system is inoperable, it shall be restored to operable status within 7 days, or the affected unit(s) shall be in hot shutdown within the next 12 hours. If the SSF ASW System remains inoperable for the next 7 days after hot shutdown is reached by the affected unit(s), the unit(s) shall be below 250°F within the following 48 hours.

3.18.3 SSF Reactor Coolant Makeup System

a. The SSF RC Makeup System, consisting of the SSF RC makeup pump, a flow path from the spent fuel pool and discharging into the Reactor Coolant System shall be operable for each unit at or above 250°F, except as permitted by part (b) or by Specification 3.18.5.

b. If the SSF RC Makeup System is inoperable, it shall be restored to operable status within 7 days or the affected unit(s) shall be in hot shutdown within the next 12 hours. If the SSF RC Makeup System remains inoperable for the next 7 days after hot shutdown is reached by the affected unit(s), the unit(s) shall be below 250°F within the following 48 hours.

3.18.4 SSF Power System

a. The SSF Power System consisting of the SSF Diesel Generator (SSF DG), diesel support systems 4160 VAC, 600 VAC, 208 VAC, 120 VAC, 125 VDC systems, shall be operable for any unit at or above 250°F, except as permitted by part (b) or by Specification 3.18.5.

(1) 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.

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

(3) The DC power system consists of two batteries and associated chargers, 125VDC distribution centers DCSF, DCSF-1, power panelboard DCSF, and power supply 1PSF. Only one battery and associated charger is required to be operable and connected to the 125VDC distribution center.

b. If the SSF Power System is inoperable, it shall be restored to operable status within 7 days or the affected unit(s) shall be in hot shutdown within the next 12 hours. If the SSF Power System remains inoperable for the next 7 days after hot shutdown is reached by the affected unit(s), the unit(s) shall be below 250°F within the following 48 hours.

3.18.5 Special inoperability periods will be allowed for maintenance on the SSF ASW pump and motor, the SSF RC makeup pumps and motors, and the SSF DG (including DG support systems), with the following restrictions:

a. Special inoperability periods are independent of and in addition to the degraded mode periods allowed by Specifications 3.18.2, 3.18.3, and 3.18.4.

b. The combined special inoperability period shall total no more than 45 days per year.

c. The provisions of this specification may be utilized without prior NRC approval.

d. Prior approval from the USNRC Regional Office, Region II, is required to exceed the maximum 45 days per year special inoperability allowance.

3.18.6 SSF Associated Instrumentation

a. The associated instrumentation for the SSF, consisting of the instrumentation specified in Table 3.18.1, shall be operable for each unit at or above 250°F, except as permitted by part (b).

b. With less than the minimum SSF instrumentation in Table 3.18.1 operable, it shall be restored to operable status within 7 days or the affected unit(s) shall be in hot shutdown within the next 12 hours. If less than the minimum SSF instrumentation in Table 3.18.1 remains operable for the next 7 days after hot shutdown is reached by the affected unit(s), the unit(s) shall be below 250°F within the following 48 hours.

3.18.7 While the SSF or any of its major subsystems is in a degraded mode or a special inoperability period allowed by Specifications 3.18.2, 3.18.3, 3.18.4, 3.18.5, and 3.18.6, any Oconee unit may be heated above 250°F if previously shutdown or be permitted to remain critical or be restarted. However, unit(s) status under this specification shall be within the limits of any applicable degraded mode in the Specifications noted above.

Bases

The SSF is designed to mitigate the consequences of postulated fire or flooding incidents or acts of industrial sabotage to one or more of the three units at Oconee. The SSF contains, within seismically designed structures a reactor coolant volume control system for maintenance of primary system coolant during hot shutdown conditions; a steam generator volume control system for secondary system heat removal capabilities; independent emergency sources of AC and DC electrical power and associated electrical distribution systems; and various support systems. The SSF is designed to provide an alternate and independent means to achieve and maintain hot shutdown conditions for one or more of the three Oconee units. The SSF is in addition to and supplements the current shutdown capability described in the Oconee FSAR. It would be operated only in the event installed normal and emergency systems are inoperable. Manual operator action is required to actuate the systems.

The SSF Auxiliary Service Water System is a high head, high volume system designed to provide sufficient steam generator 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.

The SSF RC Makeup System is designed to supply makeup to the Reactor Coolant System (RCS) in the event that normal makeup systems are unavailable. The capacity of this system is sized to account for normal RCS leakage and shrinkage which results from going from a hot power operating condition to hot shutdown.

The SSF power supply is designed to provide normal and independent emergency sources of AC and DC electrical power, their associated electrical distribution systems and various support systems in the SSF. The SSF diesel generator would be operated only in the event installed normal power systems are inoperable. Manual operator action is required to actuate this system.

The SSF power supply includes 4160VAC, 600VAC, 208VAC, 120VAC and 125VDC power. This system supplies power necessary for the hot shutdown of the reactor in the event of loss of power from all other power systems. It consists of switchgear, a load center, motor control centers, panelboards, remote starters, batteries, battery chargers, inverters, a diesel powered electrical generator unit, relays, control devices, and interconnecting cable supplying the appropriate loads.

The 125VDC SSF Power System consists of two 125VDC batteries and associated chargers, two DC distribution centers, and a DC power panelboard. This system is designed to provide an uninterruptible source of power for the SSF equipment controls and instrumentation.

Normally, one 125VDC battery and its associated charger are connected to the 125VDC distribution center to supply the 125VDC loads. In this alignment, the battery is floated on the distribution center and is available to assume load without interruption upon loss of its associated battery charger or AC power source. The other 125VDC battery and its associated charger are in a standby mode and are not normally connected to the 125VDC distribution center. However, they are available via manual connection to the 125VDC distribution center to supply SSF loads, if required.

Although it is desirable to maintain the SSF operable to mitigate design basis events, short periods of inoperability are necessary for testing and maintenance to assure the high degree of reliability placed on the SSF. The 7 day limiting condition for operation (LCO) will be sufficient for routine testing and maintenance; however, inoperability periods of greater than 7 days must be allowed for such equipment as the SSF DG, SSF ASW Pump, and the SSF RC Makeup Pump. For example, to tear down the Diesel Generator for inspection and oil change requires 7 days around the clock work. If bearings or crankshaft need replacement, this maintenance work can exceed 30 days. To minimize the number and duration of extended outages, the following restrictions have been applied. Outages of greater than 7 days are restricted to periods not to exceed 45 days per year without prior NRC approval. Also, scheduled preventative maintenance on the SSF Diesel Generator, SSF Auxiliary Service Water Pump, and the SSF Makeup Pump will be performed concurrent with the unwatering of Unit 2 CCW piping if practical to minimize the frequency of extended outages of the SSF.

TABLE 4.20-1
SSF INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

		Check	Calibrate	Remarks
1.	RCS Pressure (4)	WE	RF	Loop A, B
2.	SSF RC Makeup Pump (4)			
	Suction Pressure	QU(1)	RF	
	Discharge Pressure	QU(1)	RF	
	Suction Temperature	QU(1)	RF	
	Discharge Flow	QU(1)	RF	
3.	RC System Temperature (4)	NA(3)	RF	Loop A, B Hot, Cold
4.	Pressurizer Water Level (4)	WE	RF	
5.	SSF Auxiliary Service Water Pump			
	Suction Pressure	QU(1)	AN	
	Discharge Pressure	QU(1)	AN	
	Unit 1 Discharge Pressure	NA	AN	
	Unit 2 Discharge Pressure	NA	AN	
	Unit 3 Discharge Pressure	NA	AN	
	Discharge Test Flow	QU(1)	AN	
	Suction Temperature	QU(1)	AN	
6.	Steam Generator Levels (4)	WE	RF	A, B
7.	Underground Fuel Oil Storage Tank Inventory	NA	AN	
8.	Incore Thermocouples (4)	WE(2)	RF	
9.	D/G Service Water Pump			
	Discharge Flow	QU(1)	AN	
	Discharge Pressure	QU(1)	AN	
10.	D/G Air Start System Pressure	WE	AN	

(1) Check when pump operated/tested per IST.

(2) Check functioning including functioning of readout recorder.

(3) This instrumentation is normally aligned through a transfer/isolation device to each Unit Control Room and is thus checked in accordance with Specification 4.1, Table 4.1-1, Item 7. Each refueling outage, the instrument string to the SSF Control Room will be checked and calibrated.

(4) Unit 1, 2, 3

Attachment 2

Duke Power Company
Oconee Nuclear Station
Supplemental Technical Specifications for
Oconee Standby Shutdown Facility
In Response to the NRC Letter Dated January 30, 1987

Pursuant to 10 CFR 50, §50.59 on July 26, 1985 Duke Power Company (Duke) submitted a proposed amendment to the Oconee Facility Operating License and revision to the Oconee Technical Specifications. The proposal consisted of several changes to assure the operability of the Oconee Standby Shutdown Facility (SSF). The proposed Technical Specifications were submitted in response to the NRC letter dated April 28, 1983.

Duke's original proposed Technical Specifications were developed from reviews of existing Technical Specifications, and discussions with the NRC Staff. In general these specifications required an inoperable SSF component to be restored to operable status within 7 days or provide compensatory action and return the SSF component to operable status within 60 days or be in hot shutdown within the next 12 hours and cold shutdown within the following 48 hours.

By letter dated January 23, 1987, the NRC concluded, based on seismic consideration of Emergency Feedwater (EFW) System and a review of the Oconee Probabilistic Risk Assessment, that the proposed limiting condition for operation (LCO) of 60 days when an SSF component is declared inoperable to be unacceptable. The NRC requested that Duke adopt an allowable outage time of no longer than seven days rather than the proposed 60 days or propose an alternative LCO if adequate justification can be provided.

By letters dated March 9, 1987 and May 15, 1987 Duke provided initial response by addressing the need for longer inoperability periods based on a practical approach from an operational and maintenance limitation perspective. Furthermore, Duke committed to provide alternative specifications which would provide LCOs based on realistic times needed for various forced outages and preventive maintenance of the SSF systems and components.

The attached proposed technical specifications have been prepared in response to the NRC request dated January 23, 1987. The following paragraphs provide a discussion of the changes and justification for the alternative LCOs.

In regards to adequate post-seismic decay heat removal capability, the SSF Auxiliary Service Water (ASW) as an assured source of water is not the only means for decay heat removal for all three Oconee units. As concluded in the NRC's Safety Evaluation Report (SER) on seismic qualification of the EFW system dated January 14, 1987 the High Pressure Injection (HPI) system and Low Pressure Injection (LPI) system pumps located in Auxiliary Building and protected from flooding will serve as a suitable redundant alternative to the EFW system in the feed-and-bleed mode. In addition, modifications to improve the seismic capability of the EFW system, improved operating procedures, Operator training and the Turbine Building Flood Drain Pipe will further assure the availability of the EFW system following a seismic or flooding event.

The Oconee Probabilistic Risk Assessment (PRA) does postulate an earthquake which ruptures the condenser and its associated piping thereby flooding the turbine building. If the SSF is not successfully initiated or a pressurizer relief valve sticks open, a core melt can occur. Based on seismic fragilities calculated for the Oconee PRA by Structural Mechanics Associates, Inc., the mean annual core-melt frequency for this scenario was estimated to be 2E-05. Because of limited seismic analysis and quantification test information, the capacity of most equipment was evaluated on a generic basis, deriving from previous analyses and tests. Oconee seismic fragilities have since been revised by National Technical Systems using more up-to-date and more plant-specific data. Based on the revised seismic fragility for the condenser, we estimate the frequency of this core-melt scenario to be approximately two orders of magnitude lower than previously calculated. Therefore, seismically-induced flooding of the turbine building is no longer an important contributor to Oconee's mean annual core-melt frequency.

The Oconee SSF was designed to resolve the safe shutdown requirements for fire protection, turbine building flooding, and physical security requirements. The design of the SSF was reviewed and approved by the NRC in a letter dated April 28, 1983. The major systems of the SSF necessary to assure its operability include SSF Auxiliary Service Water (ASW), SSF Reactor Coolant (RC) Makeup, SSF electrical power and SSF associated instrumentation. Accordingly, Specification 3.18 provides the requirements for maintaining these systems operational and the required actions in the event a system becomes inoperable.

Specification 3.18.1, in general, requires that the major systems of the Oconee SSF, support systems and the interfaces with normal in-plant systems to be operable at any time an Oconee unit is at or above 250°F. This requirement covers any plant condition above cold shutdown (250°F) in a broader sense as opposed to the specific conditions such as hot shutdowns, hot standby, or power operation specified in the original submittal.

Specifications 3.18.2, 3.18.3 and 3.18.4 provide limiting condition of operation for SSF ASW System, SSF RC Makeup System and SSF Power System, respectively. These specifications allow an inoperability period of 7 days after which the affected unit(s) must be in hot shutdown within the next 12 hours if the inoperable system is not restored to operable within the allowed 7 days. This is consistent with the NRC recommendation dated January 23, 1987. However, in some cases, based on past experience, more than 7 days will be required to return a system or component to operable status. Examples of such situations are problems associated with the SSF ASW pump or SSF Diesel Generator (i.e., replacement of the Diesel Generator crankshaft may require up to 20 days). For this reason the LCO allows an additional 7 days inoperability while the affected unit(s) are in a hot shutdown condition after which the unit(s) will be brought to below 250°F within the next 48 hours if the system or component remains inoperable. Duke feels that in most cases the situation will be remedied without the need to remain in hot shutdown for 7 days. However, this period of inoperability is needed for the above mentioned situations without the need to bring the affected unit(s) to cold shutdown. This will reduce the risk of challenging the safety systems and the operational burdens.

Technical Specification 3.18.5 allows for special inoperability periods for maintenance on the SSF ASW pump and motor, SSF RC makeup pumps and motors and the

SSF Diesel Generator. The special inoperability periods are independent and in addition to the degraded mode periods allowed by Specifications 3.18.2, 3.18.3 and 3.18.4. The combined special inoperability period for these systems, however, will not exceed a total of 45 days per year without prior approval by the USNRC Regional Office.

Currently, preventive maintenance of Diesel Generator and SSF ASW pump require at least 7 days around the clock work without unanticipated problems. Realistic times for various forced outages of Diesel Generator can range from 5 to 20 days for activities such as oil change or replacing all lower bearings, respectively. Therefore, from a realistic approach, the total of 45 days per year LCO does not appear to be excessive. Furthermore, Duke will attempt to schedule the preventive maintenance of this equipment during outages of sufficient times or refueling outages to minimize the frequency of 45 day outages. For example, the preventive maintenance of the SSF ASW pump can be scheduled to coincides with Unit 2 refueling outages and unwatering of Unit 2 Condenser Cooling Water inlet piping which takes approximately four weeks.

Technical Specification 3.18.6 provides LCO for SSF Associated Instrumentation similar to part (b) of Specifications 3.18.2, 3.18.3 and 3.18.4. However the special inoperability periods in Specification 3.18.5 are not applicable to the SSF Associated Instrumentation.

The previously proposed bases for Specification 3.18 have been revised to reflect changes to this specification. A change was also made in the previously submitted Table 4.20-1 concerning the surveillance requirements for the SSF Instrumentation. Specifically, the original Table 4.20-1 required a quarterly check of the underground fuel oil storage tank inventory. This requirement was inadvertently included and is meaningless since there is only one tank inventory indicator and its acceptable performance can not be verified without comparison to the output from other instruments. Therefore this requirement has been omitted in the proposed specifications. However, it should be noted that this instrument is calibrated on a refueling interval frequency.

Finally, the unaffected parts of the amendment request submitted on July 23, 1985 remain valid and together with this submittal form a complete package for the amendment request.