ENCLOSURE 3

ITS Section 3.2

ID 234

Subject: Revised ITS 3.2.3 Required Action A.2 to remove "from Allowable Thermal Power" and retain CTS 3.5.2.4.b.2 wording.

3.2 POWER DISTRIBUTION LIMITS

3.2.3 QUADRANT POWER TILT (QPT)

LCO 3.2.3 QPT shall be maintained less than or equal to the steady state limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. QPT greater than the steady state limit and less than or equal to the transient limit.	A.1	Reduce THERMAL POWER ≥ 2% RTP from the ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit.	2 hours
	<u>AND</u>		
4	A.2	Reduce nuclear overpower trip setpoints, based on flux and flux/flow imbalance, ≥ 2% RTP for each 1% of QPT greater than the steady state limit.	10 hours
	<u>AND</u>		
	A.3	Restore QPT to less than or equal to the steady state limit.	24 hours from discovery of failure to meet the LCO

(continued)

QPT
3.2.~~4~~3

CTS

3.2 POWER DISTRIBUTION LIMITS

3.2.~~4~~3 QUADRANT POWER TILT (QPT)

LCO 3.2.~~4~~3 QPT shall be maintained less than or equal to the steady state limits specified in the COLR. (5) 3.5.2.4.a

APPLICABILITY: MODE 1 with THERMAL POWER > [20]% RTP. (17) 3.5.2.4.a 3.5.2.4.g

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. QPT greater than the steady state limit and less than or equal to the transient limit.	~~A.1.1 Perform SR 3.2.5.1.~~ ~~OR~~	~~Once per 2 hours~~ (7)
	A.1.~~2~~1 Reduce THERMAL POWER ≥ 2% RTP from the ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit. (7)	2 hours 3.5.2.4.b.2 ~~OR~~ ~~2 hours after last performance of SR 3.5.2.1~~ (7)
	AND	
	A.~~1~~2.2 Reduce nuclear overpower trip setpoint~~s and nuclear overpower~~, based on ~~Reactor Coolant System flow and AXIAL POWER IMBALANCE trip setpoint~~ flux and flux/flow imbalance, (4) ≥ 2% RTP ~~from the ALLOWABLE THERMAL POWER~~ for each 1% of QPT greater than the steady state limit.	10 hours 3.5.2.4.b.2
	AND	
		(continued)

Supp 4

ITS Section 3.3

ID 221

Subject: Revised Bases for 3.3.8, Items 11 and 12 to remove mention of computer points (which imply OAC) and only refer to RG 1.97 indicators. Revised Item 14 to take credit for ICCM display as RG 1.97 qualified.

BASES

LCO

8. Containment Isolation Valve Position (continued)

Open-Not Open control switch indication via indicating lights in the control room.

9. Containment Area Radiation (High Range)

Containment Area Radiation (High Range) instrumentation is a Type C, Category 1 variable provided to monitor the potential for significant radiation releases and to provide release assessment for use by operators in determining the need to invoke site emergency plans. The Containment Area Radiation instrumentation consists of two channels (RIA 57 and 58) with readout on two indicators and one channel recorded. The indicated range is 1 to 10^7 R/hr.

10. Containment Hydrogen Concentration

Containment Hydrogen Concentration instrumentation is a Type A, Category 1 variable provided to detect high hydrogen concentration conditions that represent a potential for containment breach. This variable is also important in verifying the adequacy of mitigating actions. The Containment Hydrogen Concentration instrumentation consists of two channels with readout on two indicators and one channel recorded. The indicated range is 0 to 10% hydrogen concentration.

11. Pressurizer Level

Pressurizer Level instrumentation is a Type A, Category 1 variable used in combination with other system parameters to determine whether to terminate safety injection (SI), if still in progress, or to reinitiate SI if it has been stopped. Knowledge of pressurizer water level is also used to verify the unit conditions necessary to establish natural circulation in the RCS and to verify that the unit is maintained in a safe shutdown condition. The Pressurizer Level instrumentation consists of three
4 channels (two for Train A and one for Train B) with
4 two channels indicated and one channel recorded.

(continued)

BASES

LCO

11. Pressurizer Level (continued)

4 (Note: three channels are available only two are
4 required). The indicated range is 0 to 400 inches (11% to 84% level as a percentage of volume).

12. Steam Generator Water Level

Steam Generator Water Level instrumentation is a Type A, Category 1 variable provided to monitor operation of decay heat removal via the SG. The indication of SG level is the extended startup range level instrumentation, covering a span of 0 inches to 388 inches above the lower tubesheet.

The operator relies upon SG level information following an accident (e.g., main steam line break, steam generator tube rupture) to isolate the affected SG to confirm adequate heat sinks for transients and accidents.

The extended startup range Steam Generator Level
4 instrumentation consists of four transmitters (two per
4 SG) that feed four gauges.

13. Steam Generator Pressure

Steam Generator Pressure instrumentation is a Type A, Category 1 variable provided to support operator diagnosis of a main steam line break or SG tube rupture accident to identify and isolate the affected SG. In addition, SG pressure is a key parameter used by the operator to evaluate primary-to-secondary heat transfer.

Steam generator pressure measurement is provided by two pressure transmitters per SG. Each instrument channel inputs to the ICCM cabinet that provide safety inputs to two indicators located on the main control board in the control room. One channel per SG also provides input to a recorder located in the control room.

(continued)

BASES

LCO (continued)

14. Borated Water Storage Tank (BWST) Level

BWST Level instrumentation is a Type A, Category 1 variable provided to support action for long term cooling requirements, i.e., to determine when to initiate the switch over of the core cooling pump suction from the BWST to sump recirculation. BWST level measurement is provided by three channels with readout on two indicators and one recorder. (Note: three channels are available only two are required).
4 Two of the three channels provide inputs to the ICCM
4 cabinet which provides inputs to qualified indicators
4 on the Control Board. The third channel provides a
4 safety input to a dedicated recorder. The channels
provide level indication over a range of 0 to 50 feet (13% to 100% of volume).

15. Upper Surge Tank (UST) Level

Upper Surge Tank Level instrumentation is a Type A, Category 1 variable provided to ensure a water supply for EFW. EFW draws condensate grade suction from the USTs and the Condenser Hotwell.

Two Category 1 instrumentation channels are provided for monitoring UST level. These instrument channels are inputs to corresponding train A and B Inadequate Core Cooling Monitoring (ICCM) system cabinets. The ICCM Train A cabinet provides UST level input to a dedicated qualified recorder and to a qualified indicator, both located in the Control Room. The ICCM Train B cabinet also provides an input to a qualified indicator located in the Control Room. The range of UST level indication is 0 to 12 feet.

UST Level is the primary indication used by the operator to identify loss of UST volume. The operator can then decide to replenish the UST or align suction to the EFW pumps from the hotwell.

(continued)

BASES

LCO (continued)

16. Core Exit Temperature

Core Exit Temperature is a Type A, Category 1 variable provided for verification and long term surveillance of core cooling.

The operator relies on this information following a LOCA to secure HPI and throttle LPI, following a SBLOCA to throttle HPI and begin forced HPI cooling if needed, and following a MSLB and SG Tube Rupture to throttle HPI and isolate the affected SG.

There are a total of 52 Core Exit Thermocouples (CETs) per Oconee Unit. Twenty-four (12 per train) meet seismic and environmental qualification requirements (Category 1). The unit computer is the primary display for all 52 CETs. The CETs are distributed to provide monitoring of four or more in each quadrant for each train. The ICCM plasma displays (1 per train) located in the Control Room serve as safety related backup displays for the twenty-four Category 1 CETs. The range of the readouts is 50°F to 2300°F.

The ICCM CET function uses inputs from twelve incore thermocouples per train to calculate and display temperatures of the reactor coolant as it exits the core and to provide indication of thermal conditions across the core at the core exit. Each of the twelve qualified thermocouples per train is displayed on a spatially oriented core map on the plasma display. Trending of CET temperature is available continuously on the plasma display. The average of the five hottest CETs is trendable for the past forty minutes.

An evaluation was made of the minimum number of valid core exit thermocouples (CETs) necessary for inadequate core cooling detection. The evaluation determined the reduced complement of CETs necessary to detect initial core recovery and to trend the ensuing core heatup. The evaluations account for core nonuniformities and cold leg injection. Based on these evaluations, adequate or inadequate core cooling detection is ensured with two sets of five valid CETs.

Table 3.3.8-1 Note (d) indicates that the subcooling margin monitor takes the average of the five highest

(continued)

BASES

LCO

16. Core Exit Temperature (continued)

CETs for each of the ICCM trains. Two channels ensure that a single failure will not disable the ability to determine the representative core exit temperature.

17. Subcooling Monitor

The Subcooling Monitor is a Type A, Category 1 variable provided for verification and long term surveillance of core cooling. This variable is a computer calculated value using various inputs from the Primary System.

Two channels of indication are provided. One channel monitors RCS Loop A and the Core Saturation margin while another separate channel monitors RCS Loop B and the Core Saturation margin. The indication readouts are located in the control room. This variable also inputs to the unit computer through isolation buffers and is available for trend recording upon operator demand. The range of the readouts is 200°F subcooled to 50°F superheat. The control room display is through the ICCM plasma display unit.

A backup method for determining subcooling margin ensures the capability to accurately monitor RCS subcooling margin (Refer to Specification 5.5.17).

18. HPI System Flow

HPI System Flow instrumentation is a Type A, Category 1 variable provided to support action for short term cooling requirements, to prevent HPI pump runout and inadequate NPSH, and to indicate the need for flow cross connect. HPI flow is throttled based on RCS pressure, subcooled margin, and pressurizer level. Flow measurement is provided by one channel per train with readout on an indicator and recorder. There are two HPI trains. The channels provide flow indication over a range of 0 to 750 gpm.

(continued)

BASES

LCO (continued)

19. LPI System Flow

LPI System Flow instrumentation is a Type A, Category 1 variable provided to support action for long term cooling requirements, to prevent LPI pump runout and for flow balance. The indication is also used to identify an LPI pump operating at system pressures above its shutoff head. Flow measurement is provided by one channel per train with readout on an indicator and recorder. There are two LPI trains. The LPI channels provide flow indication over a range of 0 to 6000 gpm.

20. Reactor Building Spray Flow

Reactor Building Spray Flow instrumentation is a Type A, Category 1 variable provided to support action for long term cooling requirements and iodine removal and to prevent Reactor Building Spray and LPI pump runout. Flow measurement is provided by one channel per train with readout on an indicator and recorder. There are two RBS trains. The channels provide flow indication over a range from 0 to 2000 gpm.

21. Emergency Feedwater Flow

EFW Flow instrumentation is a Type D, Category 1 variable provided to monitor operation of RCS heat removal via the SGs. Two channels provide indication of EFW Flow to each SG over a range of approximately 100 gpm to 1200 gpm. Redundant monitoring capability is provided by the two independent channels of instrumentation for each SG. Each flow transmitter provides an input to a control room indicator. One channel also provides input to a recorder.

EFW Flow is the primary indication used by the operator to verify that the EFW System is delivering the correct flow to each SG. However, the primary indication used by the operator to ensure an adequate inventory is SG level.

(continued)

BASES

LCO (continued)

22. Low Pressure Service Water (LPSW) flow to LPI Coolers

LPSW flow to LPI Coolers is a Type A, Category 1 variable is provided to prevent LPSW pump runout and inadequate NPSH. LPSW flow to LPI Coolers is throttled to maintain proper flow balance in the LPSW System.

Flow measurement is provided by one channel per train with readout on an indicator and recorder. The channels provide flow indication over a range from 0-8000 gpm.

APPLICABILITY

The PAM instrumentation LCO is applicable in MODES 1, 2, and 3. These variables are related to the diagnosis and preplanned actions required to mitigate accidents and transients. The applicable accidents and transients are assumed to occur in MODES 1, 2, and 3. In MODES 4, 5, and 6, unit conditions are such that the likelihood of an event occurring that would require PAM instrumentation is low; therefore, the PAM instrumentation is not required to be OPERABLE in these MODES.

ACTIONS

The ACTIONS are modified by two Notes. Note 1 is added to the ACTIONS to exclude the MODE change restriction of LCO 3.0.4. This exception allows entry into an applicable MODE while relying on the ACTIONS even though the ACTIONS may eventually require a unit shutdown. This exception is acceptable due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments.

Note 2 is added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.8-1. When the Required Channels for a function in Table 3.3.8-1 are specified on a "per" basis (e.g., per loop, per SG, per penetration flow path), then the Condition may be entered separately for each loop, SG, penetration flow path, etc., as appropriate. The Completion Time(s) of the inoperable channels of a Function are tracked

(continued)

BASES

ACTIONS (continued)

separately for each Function starting from the time the Condition is entered for that Function.

A.1

When one or more Functions have one required channel inoperable, the inoperable channel must be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on operating experience. This takes into account the remaining OPERABLE channel, the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring PAM instrumentation during this interval.

Condition A is modified by a Note indicating this Condition is not applicable to PAM Functions 14, 18, 19, 20, and 22.

B.1

Required Action B.1 specifies initiation of action described in Specification 5.6.6 that requires a written report to be submitted to the NRC. This report discusses the results of the root cause evaluation of the inoperability and identifies proposed restorative actions. This action is appropriate in lieu of a shutdown requirement since alternative actions are identified before loss of functional capability and given the likelihood of unit conditions that would require information provided by this instrumentation. The Completion Time of "Immediately" for Required Action B.1 ensures the requirements of Specification 5.6.6 are initiated.

C.1

When one or more Functions have two required channels inoperable (i.e., two channels inoperable in the same Function), one channel in the Function should be restored to OPERABLE status within 7 days. This Condition does not apply to the hydrogen monitor channels. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrumentation action operation and the availability of alternative means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable because the

(continued)

BASES

ACTION

C.1 (continued)

alternate indications may not fully meet all performance of qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur.

Condition C is modified by a Note indicating this Condition is not applicable to PAM Functions 10, 14, 18, 19, 20, and 22.

D.1

When two required hydrogen monitor channels are inoperable, Required Action D.1 requires one channel to be restored to OPERABLE status. This action restores the monitoring capability of the hydrogen monitor. The 72 hour Completion Time is based on the relatively low probability of an event requiring hydrogen monitoring. Continuous operation with two required channels inoperable is not acceptable because alternate indications are not available.

Condition D is modified by a Note indicating this Condition is only applicable to PAM Function 10.

E.1

When one required BWST water level channel is inoperable, Required Action E.1 requires the channel to be restored to OPERABLE status. The 24 hour Completion Time is based on the relatively low probability of an event requiring BWST water and the availability of the remaining BWST water level channel. Continuous operation with one of the two required channels inoperable is not acceptable because alternate indications are not available. This indication is crucial in determining when the water source for ECCS should be swapped from the BWST to the reactor building sump.

Condition E is modified by a Note indicating this Condition is only applicable to PAM Function 14.

(continued)

BASES

ACTIONS (continued)

F.1

When a flow instrument channel is inoperable, Required Action F.1 requires the affected HPI, LPI, or RBS train to be declared inoperable and the requirements of LCO 3.5.2, LCO 3.5.3, or LCO 3.6.5 apply. For Function 22, LPSW flow to LPI coolers, the affected train is the associated LPI train. The required Completion Time for declaring the train(s) inoperable is immediately. Therefore, LCO 3.5.2, LCO 3.5.3, or LCO 3.6.5 is entered immediately, and the Required Actions in the LCOs apply without delay. This action is necessary since there is no alternate flow indication available and these flow indications are key in ensuring each train is capable of performing its function following an accident. HPI, LPI, and RBS train OPERABILITY assumes that the associated PAM flow instrument is OPERABLE because this indication is used to throttle flow during an accident and assure runout limits are not exceeded or to ensure the associated pumps do not exceed NPSH requirements.

Condition F is modified by a Note indicating this Condition is only applicable to PAM Functions 18, 19, 20, and 22.

G.1

Required Action G.1 directs entry into the appropriate Condition referenced in Table 3.3.8-1. The applicable Condition referenced in the Table is Function dependent. Each time an inoperable channel has not met the Required Action and associated Completion Time of Condition C, D, or E, as applicable, Condition G is entered for that channel and provides for transfer to the appropriate subsequent Condition.

H.1 and H.2

If the Required Action and associated Completion Time of Conditions C, D or E are not met and Table 3.3.8-1 directs entry into Condition H, the unit must be brought to a MODE in which the requirements of this LCO do not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and MODE 4 within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full

(continued)

BASES

ACTIONS

H.1 and H.2 (continued)

power conditions in an orderly manner and without challenging unit systems.

I.1

If the Required Action and associated Completion Time of Condition C, D or E are not met and Table 3.3.8-1 directs entry into Condition I, alternate means of monitoring the parameter should be applied and the Required Action is not to shut down the unit, but rather to follow the directions of Specification 5.6.6 in the Administrative Controls section of the Technical Specifications. These alternative means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allowed time. The report provided to the NRC should discuss the alternative means used, describe the degree to which the alternative means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

Both the RCS Hot Leg Level and the Reactor Vessel Level are methods of monitoring for inadequate core cooling capability. The subcooled margin monitors (SMM), and core-exit thermocouples (CET) provide an alternate means of monitoring for this purpose. The function of the ICC instrumentation is to increase the ability of the unit operators to diagnose the approach to and recovery from ICC. Additionally, they aid in tracking reactor coolant inventory.

The alternate means of monitoring the Reactor Building Area Radiation (High Range) consist of a combination of installed area radiation monitors and portable instrumentation.

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs apply to each PAM instrumentation Function in Table 3.3.8-1 except where indicated.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.1

Performance of the CHANNEL CHECK once every 31 days for each required instrumentation channel that is normally energized 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. CHANNEL CHECK will detect gross channel failure; therefore, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared with similar unit instruments located throughout the unit. If the radiation monitor uses keep alive sources or check sources OPERABLE from the control room, the CHANNEL CHECK should also note the detector's response to these sources.

Agreement criteria are based on a combination of the channel instrument uncertainties, including indication and readability. If a 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. Offscale low current loop channels are, where practical, verified to be reading at the bottom of the range and not failed downscale.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal but more frequent checks of channels during normal operational use of the displays associated with this LCO's required channels.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.1 and SR 3.3.8.3

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. This test verifies the channel responds to measured parameters within the necessary range and accuracy.

Note 1 to SR 3.3.8.3 clarifies that the neutron detectors are not required to be tested as part of the CHANNEL CALIBRATION. There is no adjustment that can be made to the detectors. Furthermore, adjustment of the detectors is unnecessary because they are passive devices, with minimal drift. Slow changes in detector sensitivity are compensated for by performing the daily calorimetric calibration and the monthly axial channel calibration.

For the Containment Area Radiation instrumentation, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10 R/hr, and a one point calibration check of the detector below 10 R/hr with a gamma source.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD)sensors or Core Exit thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

SR 3.3.8.2 is modified by a Note indicating that it is applicable only to Functions 7, 10 and 22. SR 3.3.8.3 is modified by Note 2 indicating that it is not applicable to Functions 7, 10 and 22. The Frequency of each SR is based on operating experience and is justified by the assumption of the specified calibration interval in the determination of the magnitude of equipment drift.

REFERENCES

1. Duke Power Company letter from Hal B. Tucker to Harold M. Denton (NRC) dated September 28, 1984.

2. UFSAR, Section 7.5.

(continued)

BASES

REFERENCES (continued)

3. NRC Letter from Helen N. Pastis to H. B. Tucker, "Emergency Response Capability - Conformance to Regulatory Guide 1.97," dated March 15, 1988.

4. Regulatory Guide 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 3, May 1983.

5. NUREG-0737, "Clarification of TMI Action Plan Requirements," 1980.

6. 10 CFR 50.36.

ITS Section 3.3

ID 226

Subject: Revised ITS 3.3.9 Condition C to add the word "required" consistent with Conditions A and B since there are more channels available than requried.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Verify SDM to be within the limit specified in the COLR.	1 hour AND Once per 12 hours thereafter
4 C. One or more required source range neutron flux channel(s) inoperable with THERMAL POWER level > 4E-4% RTP on the wide range neutron flux channels.	C.1 Initiate action to restore affected channel(s) to OPERABLE status.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.9.2	-------------------NOTE-------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	18 months

CTS

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Verify SDM ~~is~~ ~~≥ 1% Δk/k.~~ to be within the limit ~~provided~~ specified in the COLR (2)	1 hour AND Once per 12 hours thereafter
C. One or more required source range neutron flux channel(s) inoperable with THERMAL POWER level > ~~1E-10 amp~~ 4E-4% RTP (22) on the ~~intermediate~~ wide range neutron flux channels. (4)	C.1 Initiate action to restore affected channel(s) to OPERABLE status.	1 hour

DOC M13

TSTF-009, Rev. 1

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T3.5.1-1, Note C

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.9.2	-------------------NOTE------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	[18] months (1)

4.1.1, T4.1-1 Col "Check" Item 6

DOC M14

(continued)

ITS Section 3.3

ID 230

Subject: Revised Section 3.3 to include Spec. 3.3.23, Main Feeder Bus Monitor Panel. Revised Specs 3.3.17, 3.3.18, 3.3.19, 3.3.21 to include note indicating that Completion Times are reduced when in Condition L of LCO 3.8.1.

OCONEE NUCLEAR STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.3 - INSTRUMENTATION

ATTACHMENT 1

TECHNICAL SPECIFICATIONS

3.3 INSTRUMENTATION

3.3.17 Emergency Power Switching Logic (EPSL) Automatic Transfer Function

LCO 3.3.17 Two channels of the EPSL Automatic Transfer Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
4 4 4 4 4 4	A. One channel inoperable.	A.1 ---------NOTE-------- The Completion Time is reduced when in Condition L of LCO 3.8.1. --------------------- Restore channel to OPERABLE status.	 24 hours
	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.17.1 Perform CHANNEL FUNCTIONAL TEST.	18 months

3.3 INSTRUMENTATION

3.3.18 Emergency Power Switching Logic (EPSL) Voltage Sensing Circuits

LCO 3.3.18 Three channels of each of the following EPSL voltage sensing circuits shall be OPERABLE:

a. Startup Transformer;
b. Standby Bus 1;
c. Standby Bus 2; and
d. Auxiliary Transformer.

-------------------------NOTE-------------------------
1. If both N breakers are open, Auxiliary Transformer voltage sensing circuits are not required to be OPERABLE.

2. When not in MODES 1, 2, 3 and 4, only EPSL voltage sensing circuit(s) associated with required AC power source(s) are required to be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

-----------------------------------NOTE-----------------------------------
Separate Condition entry is allowed for each circuit.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required circuits with one channel inoperable.	A.1 ---------NOTE-------- The Completion Time is reduced when in Condition L of LCO 3.8.1. -------------------- Restore channel to OPERABLE status.	 24 hours

(continued)

3.3 INSTRUMENTATION

3.3.19 Emergency Power Switching Logic (EPSL) 230 kV Switchyard Degraded Grid Voltage Protection (DGVP)

LCO 3.3.19 Three DGVP voltage sensing channels and two DGVP actuation logic channels shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

4 ------------------------------------NOTE------------------------------------
4 The Completion Times for Required Actions A and B are reduced when in
4 Condition L of LCO 3.8.1.
4 ---

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One voltage sensing channel inoperable.	A.1 Place channel in trip.	72 hours
B. One actuation logic channel inoperable.	B.1 Restore channel to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	12 hours 84 hours
D. Two or more voltage sensing channels inoperable. <u>OR</u> Two actuation logic channels inoperable.	D.1 Declare the overhead emergency power path inoperable.	Immediately

3.3 INSTRUMENTATION

3.3.21 Emergency Power Switching Logic (EPSL) Keowee Emergency Start Function

LCO 3.3.21 Two channels of the EPSL Keowee Emergency Start Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
4 4 4 4 4 4	A. One channel inoperable.	A.1	---------NOTE-------- The Completion Time is reduced when in Condition L of LCO 3.8.1. --------------------- Restore channel to OPERABLE status.	 72 hours
	B. Required Action and associated Completion Time not met.	B.1 <u>AND</u> B.2	Be in MODE 3. Be in MODE 5.	12 hours 84 hours
	C. Two channels inoperable.	C.1	Declare both Keowee Hydro Units inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.21.1 Perform CHANNEL FUNCTIONAL TEST.	18 months

3.3 INSTRUMENTATION

3.3.22 Emergency Power Switching Logic (EPSL) Manual Keowee Emergency Start Function

LCO 3.3.22 One channel of the EPSL Manual Keowee Emergency Start Function shall be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required channel inoperable.	A.1 Declare both Keowee Hydro Units inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.22.1 Perform CHANNEL FUNCTIONAL TEST.	12 months

3.3 INSTRUMENTATION

3.3.23 Main Feeder Bus Monitor Panel (MFBMP)

LCO 3.3.23 Three MFBMP undervoltage sensing relay channels per bus and two MFBMP undervoltage actuation logic channels shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ---------NOTE--------- Separate Condition entry is allowed. --------------------- One voltage sensing channel inoperable on one or both MFBs.	A.1	Place channel in trip.	7 days
B. One actuation logic channel inoperable.	B.1	Restore channel to OPERABLE status.	7 days
C. ---------NOTE--------- Separate Condition entry is allowed. --------------------- Two or more voltage sensing channels inoperable on one or both MFBs. <u>OR</u> Two actuation logic channels inoperable.	C.1	Restore two of three undervoltage sensing channels to OPERABLE status.	24 hours
		<u>AND</u>	
	C.2	Restore one logic channel to OPERABLE status.	24 hours

(continued)

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ACTIONS (continued)

CONDITION	REQUIRED ACTION 4	COMPLETION TIME
4 4 D. Required Action and 4 associated Completion 4 Time not met.	D.1 Initiate action in accordance with Specification 5.6.6.	Immediately

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4 SURVEILLANCE REQUIREMENTS

4 SURVEILLANCE	FREQUENCY
4 4 SR 3.3.23.1 Perform a CHANNEL FUNCTIONAL TEST.	18 months

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SECTION 3.3 - INSTRUMENTATION

ATTACHMENT 2

BASES

BASES (continued)

ACTIONS

A.1

If one channel is inoperable, it must be restored to OPERABLE status within 24 hours. With one channel inoperable, the remaining channel is capable of providing necessary transfer functions to ensure power is provided to the MFBs. The 24 hour Completion Time is considered appropriate based on engineering judgement, taking into consideration the time required to complete the required action.

4 Required Action A.1 is modified by a Note which indicates
4 that the Completion Time is reduced when in Condition L of
4 LCO 3.8.1. Condition L limits the Completion Time for
4 restoring an inoperable channel to 4 hours when emergency
4 power source(s) or offsite power source(s) are inoperable
4 for extended time periods or for specific reasons.

B.1 and B.2

With the Required Action and associated Completion Time not met, 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 at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.3.17.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the EPSL automatic transfer function. The ES inputs to the Load Shed and Transfer to Standby function and the Retransfer to Startup function are verified to operate properly during an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

(continued)

BASES (continued)

ACTIONS

A Note has been added to the ACTIONS indicating separate Condition entry is allowed for each Voltage Sensing Circuit.

A.1

If one required channel is inoperable in one or more voltage sensing circuits, it must be restored to OPERABLE status within 24 hours. With one channel inoperable, the remaining two channels are capable of providing the voltage sensing function. The 24 hour Completion Time is considered appropriate based on engineering judgement taking into consideration the time required to complete the required action.

4 Required Action A.1 is modified by a Note which indicates
4 that the Completion Time is reduced when in Condition L of
4 LCO 3.8.1. Condition L limits the Completion Time for
4 restoring an inoperable channel to 4 hours when emergency
4 power source(s) or offsite power source(s) are inoperable
4 for extended time periods or for specific reasons.

B.1 and B.2

With the Required Action and associated Completion Time not met in MODES 1, 2, 3 and 4, 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 at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

C.1 and C.2

With two or more channels of a required circuit inoperable when not in MODES 1, 2, 3, and 4 or the Required Action and associated Completion Time not met when not in MODES 1, 2, 3, and 4, the affected AC power sources(s) must be declared inoperable immediately. The appropriate Required Actions will be implemented in accordance with LCO 3.8.2, "AC Sources - Shutdown."

(continued)

BASES

ACTIONS (continued)	D.1 With the Required Action and associated Completion Time not met during movement of irradiated fuel assemblies, movement of fuel assemblies must be suspended immediately. Suspension does not preclude completion of actions to establish a safe conservative condition. This action minimizes the probability or the occurrence of postulated events. The Completion Time of immediately is consistent with the required times for actions requiring prompt attention.
SURVEILLANCE REQUIREMENTS	SR 3.3.18.1 A CHANNEL FUNCTIONAL TEST is performed on each voltage sensing circuit channel to ensure the channel will perform its function. A circuit is defined as three channels, one for each phase. Each channel consists of components from the sensing power transformer through the circuit auxiliary relays which operate contacts in the EPSL logic and breaker trip circuits. Minimum requirements consist of individual channel relay operation causing appropriate contact responses within associated loadshed/breaker circuits, alarm activations, and proper indications for the sensing circuit control power status. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.
REFERENCES	1. UFSAR, Chapters 6 and 15. 2. 10 CFR 50.36.

BASES (continued)

4 ACTIONS
4 The ACTIONS are modified by a Note indicating that the
4 Completion Times for Required Actions A and B are reduced
4 when in Condition L of LCO 3.8.1. Condition L limits the
4 Completion Time for restoring inoperable channels to 4 hours
4 when emergency power source(s) or offsite power source(s)
4 are inoperable for extended time periods or for specific
4 reasons.

A.1

If one DGVP voltage sensing channel is inoperable, the channel must be placed in trip within 72 hours. Tripping the affected channel places the function in a one-out-of-two configuration. Operation in this configuration may continue indefinitely since the DGVP function is capable of performing its DGVP function in the presence of a single failure. With one channel inoperable, the remaining channels are capable of providing the DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation, and the probability of an event requiring ES operation.

B.1

If one DGVP actuation logic channel is inoperable, the actuation logic channel must be restored to OPERABLE status within 72 hours. With one actuation logic channel inoperable, the remaining actuation logic channel is capable of providing the DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation, and the probability of an event requiring ES operation.

C.1 and C.2

With the Required Action and associated Completion Time of Condition A or B not met, 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 at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable based on operating experience and to allow for a controlled shutdown.

(continued)

BASES

ACTIONS (continued)

D.1

With two or more voltage sensing channels or both actuation logic channels inoperable, degraded grid protection is no longer available to the Station during an ES actuation. The condition also prevents switchyard isolation during a LOCA. Since swithyard isolation is inoperable, the overhead power path must be declared inoperable immediately. The appropriate Required Actions will be implemented in accordance with LCO 3.8.1, AC "Sources – Operating."

SURVEILLANCE REQUIREMENTS

SR 3.3.19.1

A CHANNEL FUNCTIONAL TEST is performed on each DGVP voltage sensing channel and DGVP actuation logic channel to ensure the entire channel will perform its intended function. Any setpoint adjustments shall be consistent with the assumptions of the setpoint analysis. The CHANNEL FUNCTIONAL TEST of the DGVP actuation logic channels includes verifying actuation of the switchyard isolation circuitry. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

SR 3.3.19.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the 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.

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

(continued)

BASES (continued)

REFERENCES	1.	UFSAR, Chapter 8.
	2.	10 CFR 50.36.

B 3.3 INSTRUMENTATION

B 3.3.20 Emergency Power Switching Logic (EPSL) CT-5 Degraded Grid Voltage Protection (DGVP)

BASES

BACKGROUND

Two levels of protection are provided for the standby buses to assure that degradation of voltage from the 100 kV transmission system does not adversely impact the function of safety related systems and components. The first level of protection is provided by the EPSL CT-5 Degraded Grid Protection System. The second level of protection is provided by undervoltage relaying on the standby buses (reference LCO 3.3.18, "EPSL Voltage Sensing Circuits") which protects from loss of voltage.

Three undervoltage sensing relays provide common input to two channels of actuating logic. In addition to the three phase undervoltage sensing relays, each channel includes one time-delay relay, one auxiliary relay, and one associated single phase undervoltage sensing relay. Each channel trip signal passes through a selector switch, which either allows or inhibits the trip signal, to actuate one trip coil in each SL breaker. Inoperability of any voltage sensing channel reduces the logic for the voltage sensing function to a two-out-of-two. Loss of two or more voltage sensing relays results in inoperability of both channels of actuation logic.

APPLICABLE SAFETY ANALYSES

The EPSL CT-5 Degraded Grid Voltage Protection function is required to ensure adequate voltage is available during an ES actuation concurrent with a loss of offsite power or degraded voltage from the 230 kV switchyard when ES loads are supplied by the standby buses (Ref.1). Based on calculations, 4.155 kV is the minimum voltage that will ensure proper operation of loads during ES actuation.

This system is only required to be OPERABLE when the unit is in MODES 1, 2, 3, and 4 and the standby buses are energized without being electrically separated from the grid and offsite loads. System design is to provide protection for ES components caused by voltage droop due to inrush as the unit connects to the standby buses. The system is not a substitute for the dedicated line from Lee Gas Turbines.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The Lee Feeder breakers (SL) have no automatic close functions. However, this system does provide additional flexibility for the Station electrical system and operators in available power source options.

The EPSL CT-5 Degraded Grid Voltage Protection satisfies Criterion 3 of 10 CFR 50.36 (Ref. 2).

LCO

Three CT-5 degraded grid voltage sensing relay channels are required to be OPERABLE. Failure of one channel reduces the reliability of the function. The requirement for three channels to be OPERABLE ensures that two channels will remain OPERABLE if a failure has occurred in one channel. The remaining voltage sensing channels can perform the safety function.

Two channels of the CT-5 Degraded Grid Voltage Protection Actuation Logic function are required to be OPERABLE. The requirement for two channels to be OPERABLE ensures that one channel will remain OPERABLE if a failure has occurred in one channel. The remaining channel can perform the safety function.

APPLICABILITY

The CT-5 DGPS functions are required to be OPERABLE in MODES 1, 2, 3, and 4 when standby buses are energized without being electrically separated from grid or loads to ensure adequate voltage protection should a unit be transferred to the standby bus during an event requiring an ES actuation.

The EPSL CT-5 DGVP functions are not required to be OPERABLE in MODES 5 and 6 since more time is available for the operator to respond to a loss of power event.

ACTIONS

A.1

If one CT-5 DGVP voltage sensing relay channel is inoperable, the channel must be placed in trip within 72 hours. Tripping the affected channel places the function in a one-out-of-two configuration. Operation in this configuration may continue indefinitely since the DGVP

(continued)

BASES

ACTIONS

A.1 (continued)

function is capable of performing its DGVP function in the presence of any single random failure. With one channel inoperable, the remaining voltage sensing channels are capable of providing the DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation, and the probability of an event requiring an ES actuation.

B.1

If one CT-5 DGVP actuation logic channel is inoperable, the actuation logic channel must be restored to OPERABLE status within 72 hours. With one actuation logic channel inoperable, the remaining actuation logic channel is capable of providing the CT-5 DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation and the probability of an event requiring an ES actuation.

C.1 and C.2

If two or more voltage sensing relay channels or two actuation logic channels are inoperable, automatic protection from degraded grid voltage for the standby buses powered from the 100 kV transmission system is not available. Continued operation is allowed provided that the SL breakers are opened within one hour.

Additionally, with the Required Action and associated Completion Time of Condition A or B not met, the SL breakers must be opened within one hour. This arrangement provides a high degree of reliability for the emergency power system. The one hour Completion Time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation and the probability of an event requiring an ES actuation.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.20.1

A CHANNEL FUNCTIONAL TEST is performed on each CT-5 DGVP voltage sensing channel and each CT-5 DGVP actuation logic channel to ensure the entire channel will perform its intended function. Any setpoint adjustments shall be consistent with the assumptions of the setpoint analysis. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

SR 3.3.20.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the 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.

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. UFSAR, Chapter 8.
2. 10 CFR 50.36.

B 3.3 INSTRUMENTATION

B 3.3.21 Emergency Power Switching Logic (EPSL) Keowee Emergency Start Function

BASES

BACKGROUND

The Keowee Emergency Start function of EPSL provides a start signal to the two on-site emergency power sources and sets up controls for the emergency mode. There are two channels of the Emergency Start function. Each channel is capable of starting both Keowee units and activating the controls for the emergency mode.

The Emergency Start channels 1 and 2 are actuated from Engineered Safeguards channels 1 and 2 respectively. The Emergency Start channels can also be activated manually from each control room (i.e., two emergency start switches in the Unit 1 and 2 control room and two emergency start switches in the Unit 3 control room) or cable spread rooms. There are two independent channels associated with each Oconee unit.

During a loss-of-coolant accident (LOCA) with a simultaneous loss of offsite power, the Keowee Emergency Start function of EPSL sends a start signal to both Keowee units. Logic is also actuated that ensures separation of both Keowee units from the system grid. Connection of the Keowee Unit aligned to the overhead power path is allowed only after a separate logic sequence (indicating switchyard isolation logic is complete which is not associated with the Keowee Emergency Start function) verifies the yellow bus is separated from the grid.

The Keowee Emergency Start function also disables non critical protective interlocks and trips associated with the Keowee generators. This ensures the generators can remain available as an emergency power source despite minor failures or malfunctions.

The Keowee Emergency Start circuitry is designed such that no single failure can prevent an Emergency Start signal from reaching the Keowee units. Each channel is independent of the other and only one channel is required to perform the entire safety function.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The EPSL Keowee Emergency Start function is required for the engineered safeguards (ES) equipment to function in any accident with a loss of offsite power. The limiting accident for the EPSL voltage sensing circuits is a loss-of-coolant accident (LOCA) with a simultaneous loss of offsite power (Ref. 1).

The EPSL Keowee Emergency Start Function satisfies Criterion 3 of 10 CFR 50.36 (Ref. 2).

LCO

Two channels of the Keowee Emergency Start function are required to be OPERABLE. Failure of one channel reduces the reliability of the function.

The requirement for two channels to be OPERABLE ensures that one channel will remain OPERABLE if a failure has occurred. The remaining channel can perform the safety function.

APPLICABILITY

The EPSL Keowee Emergency Start function is required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that power is provided from AC Sources to the AC Distribution system within the time assumed in the accident analyses.

The EPSL Keowee Emergency Start function is not required to be OPERABLE in MODES 5 and 6 since more time is available for the operator to respond to a loss of power event.

ACTIONS

A.1

If one channel is inoperable, then a failure of the other channel could prevent starting the Keowee units. With one channel inoperable, the remaining channel is capable of providing the Keowee Emergency Start function. The 72 hour Completion Time is considered appropriate based on engineering judgement taking into consideration the time required to complete the required action.

4 Required Action A.1 is modified by a Note which indicates
4 that the Completion Time is reduced when in Condition L of
4 LCO 3.8.1. Condition L limits the Completion Time for

(continued)

BASES

ACTIONS

A.1 (continued)

4 restoring an inoperable channel to 4 hours when emergency
4 power source(s) or offsite power source(s) are inoperable
4 for extended time periods or for specific reasons.

B.1 and B.2

With the Required Action and associated Completion Time not met, 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 at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

C.1

With both channels of the Keowee Emergency Start function inoperable then both Keowee Hydro Units must be declared inoperable immediately. The appropriate Required Actions will be implemented in accordance with LCO 3.8.1, "AC Sources – Operating."

SURVEILLANCE REQUIREMENTS

SR 3.3.21.1

A CHANNEL FUNCTIONAL TEST is performed on each Keowee Emergency Start channel to ensure the channel will perform its function during an automatic transfer of the Main Feeder Buses to the Startup Transfer, Standby Buses, and retransfer to the Startup Transformers. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

REFERENCES

1. UFSAR, Chapters 6 and 15.
2. 10 CFR 50.36.

B 3.3 INSTRUMENTATION

B 3.3.22 Emergency Power Switching Logic (EPSL) Manual Keowee Emergency Start Function

BASES

BACKGROUND

The Keowee Emergency Start function of EPSL provides a start signal to the two on-site emergency power sources and sets up controls for the emergency mode. There are two channels of the Emergency Start function. Each channel is capable of starting both Keowee units and activating the controls for the emergency mode.

The Emergency Start channels 1 and 2 are actuated from Engineered Safeguards channels 1 and 2 respectively. The Emergency Start channels can also be activated manually from each control room (i.e., two emergency start switches in the Unit 1 and 2 control room and two emergency start switches in the Unit 3 control room) or cable spread rooms. There are two independent channels associated with each Oconee unit.

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the Manual Keowee Emergency Start Function during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

The EPSL Manual Keowee Emergency Start Function satisfies Criterion 3 of 10 CFR 50.36 (Ref. 1).

LCO

One channel of the Manual Keowee Emergency Start function, consisting of a manual initiation switch and an Emergency Start channel, is required to be OPERABLE.

(continued)

BASES (continued)

APPLICABILITY

The Manual Keowee Emergency Start function required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provides assurance that:

a. Systems needed to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

ACTIONS

A.1

If the required Manual Keowee Emergency Start channel is inoperable, both Keowee Hydro Units must be declared inoperable immediately. Therefore LCO 3.8.2 is entered immediately, and the required Completion Times for the appropriate Required Actions apply without delay.

SURVEILLANCE REQUIREMENTS

SR 3.3.22.1

A CHANNEL FUNCTIONAL TEST is performed on the required Manual Keowee Emergency Start channel to ensure the channel will perform its function. The Frequency of 12 months is based on engineering judgment and operating experience that determined testing on a 12 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

REFERENCES

1. 10 CFR 50.36.

B 3.3 INSTRUMENTATION

B 3.3.23 Main Feeder Bus Monitor Panel (MFBMP)

BASES

BACKGROUND

The Main Feeder Bus Monitor Panel (MFBMP) uses three undervoltage relays per bus to detect low voltage. The undervoltage relay contacts are arranged to ensure any 2 of 3 phases tripped will de-energize the time-delay relays to start the actuation sequence. There are two time-delay relays and two auxiliary relays per channel. The 20 second time-delay relays de-energize auxiliary relays (TX) to cause load shed, Keowee Emergency start, and through an interposing relay, RX1 or 2, provide permissives to the SK breakers and Retransfer-to-Standby logic. The two logic channels are completely redundant. Channel A provides input to Channel A Load shed/Transfer-to-Standby, Keowee Emergency Start A, and SK1/Retransfer-to-Startup via relay RX1. Channel B provides input to Channel B for the companion logic devices, i.e. Channel B Keowee Emergency Start, RX2 to SK2/Retransfer-to-Startup, and Channel B Load shed/Transfer-to-Standby. The Load shed logic also provides an auto-close permissive to the Startup breakers.

APPLICABLE SAFETY ANALYSES ANALYSES

In the event of a station blackout (SBO), power is required to be available in 4 hours. Operator actions are credited for SBO mitigation. Thus, in the event of a loss of offsite power (LOOP), it is acceptable to credit operator actions to restore power to the main feeder buses (MFBs). The MFBMP provides a convenient and automatic method of establishing safe and reliable power to the MFBs during non-ES events. The system is redundant to ES signals which actuate Load shed/Transfer-to-Standby, and Keowee Emergency Start. The system also arms the Retransfer-to-Startup logic and closure of the Startup and SK breakers indirectly. The MFBMP does not provide the only layer of protection in any DBE, but does provide defense-in-depth for any scenario which results in loss of power to the main feeder buses.

The MFBMP does not satisfy the criteria in 10 CFR 50.36 (Ref. 1).

(continued)

BASES (continued)

LCO

All six of the undervoltage sensing relay channels (three per MFB) are required to be OPERABLE as a common input device to both channels of actuating logic. Inoperability of any undervoltage relay is defined as unable to trip. This condition reduces the logic for the given logic channel and MFB to a two out of two logic. Loss of any two relay channels on a single bus defeats the entire logic of both logic channels. Each logic channel has two time-delay and auxiliary relays, one time delay relay and one auxiliary relay for each MFB. Both time delay relays and auxiliary relays for each logic channel must actuate for the associated channel to operate.

APPLICABILITY

The MFBMP functions are required to be OPERABLE in MODES 1, 2, 3, and 4 to coincide with requirements for ES and other support/protective systems used to ensure adequate power is available for core and containment protection.

The MFBMP functions are not required to be OPERABLE in MODES 5 and 6 since more time is available for the operator to respond to a loss of power event.

ACTIONS

<u>A.1</u>

If one MFBMP voltage sensing channel is inoperable on one or both MFBs, the channel must be placed in trip within 7 days. Tripping the affected channel places the function in a one-out-of-two configuration. Operation in this configuration may continue indefinitely since the MFBMP function is capable of performing its MFBMP function in the presence of a single failure. With one channel inoperable, the remaining channels are capable of providing the Degraded Grid Voltage Protection (DGVP) function. The 7 day completion time is based on engineering judgement and the probability of an event requiring power restoration to the main feeder buses.

The Condition is modified by a Note indicating that this condition may be entered independently for each set of channels associated with a main feeder bus. The Completion Time(s) of the inoperable channels are tracked separately

(continued)

BASES

ACTIONS

A.1 (continued)

from the time the Condition is entered for each main feeder bus.

B.1

If one MFBMP actuation logic channel is inoperable, the actuation logic channel must be restored to OPERABLE status within 7 days. With one actuation logic channel inoperable, the remaining actuation logic channel is capable of providing the MFBMP function. The 7 day completion time is based on engineering judgement and the availability of adequate time for operator response to a LOOP.

C.1 and C.2

With two or more voltage sensing channels or both actuation logic channels inoperable, automatic protection for LOOP events is no longer available. This places additional burden on the operators, even though they are still the credible resource for restoring power in a LOOP event. EPSL response from ES events are not affected. Therefore, allowable time for this condition is limited to 24 hours. The completion time is based on engineering judgement and the availability of adequate time for operator response to a LOOP.

The Condition is modified by a Note indicating that this condition may be entered independently for each set of channels associated with a main feeder bus. The Condition may also be entered independently for inoperable logic channels or inoperable voltage sensing channels. The Completion Time(s) are tracked separately from the time the Condition is entered for each.

D.1

With the Required Action and associated Completion Time not met, Required Action D.1 specifies initiation of action described in Specification 5.6.6 that requires a written report to be submitted to the NRC. This report discusses the results of the root cause evaluation of the

(continued)

BASES

ACTIONS

D.1 (continued)

inoperability and identifies proposed restorative actions. This action is appropriate since the MFBMP does not provide the only layer of protection in any DBE, but does provide defense-in-depth for any scenario which results in loss of power to the Main Feeder Busses. Operator actions are credited for SBO mitigation. The Completion Time of "Immediately" for Required Action D.1 ensures the requirements of Specification 5.6.6 are initiated.

SURVEILLANCE REQUIREMENTS

SR 3.3.23.1

A CHANNEL FUNCTIONAL TEST is performed on each MFBMP voltage sensing channel and MFBMP actuation logic channel to ensure the MFBMP will perform its intended function. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

REFERENCES

1. 10 CFR 50.36.

OCONEE NUCLEAR STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.3 - INSTRUMENTATION

ATTACHMENT 3

CTS MARKUP AND DISCUSSION OF CHANGES

P
4

INSTRUMENTATION

3.3
~~3.7~~ ELECTRICAL POWER SYSTEMS

3.3.17
~~3.7.3~~ Emergency Power Switching Logic (EPSL) Automatic Transfer Functions

LCO 3.3.17
~~TS 3.7.3~~ Two channels of the EPSL Automatic Transfer Function shall be OPERABLE.

Applic
APPLICABILITY: ~~Above COLD SHUTDOWN~~ MODES 1, 2, 3 and 4 (A23)

Actions
ACTIONS

------NOTE------
The Completion Time is reduced when in Condition L of LCO 3.8.1 (A38)

CONDITION	REQUIRED ACTION	COMPLETION TIME	
A. One channel inoperable.	A.1 Restore channel to OPERABLE status.	24 hours	ACT A
B. Required Actions and associated Completion Times not met.	B.1 Be in ~~HOT SHUTDOWN~~ MODE 3 AND B.2 Be in ~~COLD SHUTDOWN~~ MODE 5	12 hours 84 hours	ACT B

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.3.1 Perform ~~SR 3.7.1.14 (EPSL automatic transfer)~~ CHANNEL FUNCTIONAL TEST (M28)	~~As specified in applicable SR.~~ 18 months

(A1) <except as noted>

Specification 3.3.17

4

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.1.11	Verify each Keowee Hydro Unit can: 1) Emergency start from each control room; 2) Attain rated speed and voltage within 23 seconds of an emergency start initiate; 3) Be synchronized to the grid and loaded at the maximum practical rate to a value equivalent to one Unit's safeguard loads plus two Unit's HOT SHUTDOWN loads.	Annually <SEE 3.8 + 3.3.21>
SR 3.7.1.12	-----NOTE----- Not required to be met when the overhead electrical disconnects for the Keowee Hydro Unit associated with the underground emergency power path are open. ------------ Verify the ability of the Keowee Unit ACBs to close automatically to the underground path.	Annually <SEE 3.8>
SR 3.7.1.13	-----NOTE----- Only required to be met when a Lee gas turbine is energizing the standby buses. ------------ Verify that a Lee gas turbine can be started and connected to the isolated 100kV dedicated line and carry the equivalent of a single Unit's maximum safeguard loads within one hour.	18 months
SR 3.7.1.14	Perform an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers.	18 months
SR 3.7.1.15	-----NOTE----- Only required to be met during periods of commercial power generation using the Keowee Hydro Units. ------------ Verify the ability of the Keowee Hydro units to supply emergency power from the initial condition of commercial power generation.	18 months <SEE 3.8>

(continued)

A1 (except as marked)

Supp 4

3.3 ~~3.7~~ INSTRUMENTATION ~~ELECTRICAL POWER SYSTEMS~~

3.3.18 ~~3.7.4~~ Emergency Power Switching Logic (EPSL) Voltage Sensing Circuits

LCO 3.3.18 ~~TS 3.7.4~~ Three channels of each of the following EPSL voltage sensing circuits shall be OPERABLE:

a ~~1.~~ Startup ~~Source;~~ Transformer
b ~~2.~~ Standby Bus 1;
c ~~3.~~ Standby Bus 2;
d ~~4.~~ Normal Source; Auxiliary Transformer

A23

NOTE

1. If both N breakers are open, Normal Source voltage sensing is not required.

Add LCO Note 2 — M34

Applic
APPLICABILITY: ~~Above COLD SHUTDOWN~~ MODES 1, 2, 3 and 4
Add - MODES 5 and 6, During movement of irradiated fuel assemblies

ACTIONS
ACTIONS

NOTE
The Completion Time is reduced when in Condition L of LCO 3.8.1.

A38

NOTE

ACT Note Separate Condition entry is allowed for each inoperable Voltage Sensing Circuit.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel of one or more circuits inoperable.	A.1 Restore channel to OPERABLE status.	24 hours — ACT A
B. Required Action~~s~~ and associated Completion Time~~s~~ not met in MODES 1, 2, 3 + 4	B.1 Be in ~~HOT SHUTDOWN~~ MODE 3	12 hours — ACT B
	AND	
	B.2 Be in ~~COLD SHUTDOWN~~ MODE 5	84 hours
C. Two or more channels of a required circuit inoperable when not in MODES 1, 2, 3 + 4. OR Required Action and associated Completion Time not met when not in MODES 1, 2, 3 + 4.	C.1 Declare the affected AC power source(s) inoperable.	Immediately — M34
D. Required Action and associated Completion Time not met during movement of irradiated fuel assemblies	D.1 Suspend movement of irradiated fuel assemblies	Immediately — M34

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR ~~3.7.4.1~~ 3.3.18.1 Perform a CHANNEL FUNCTIONAL TEST	18 months

A1 (except as marked)

Specification 3.3.19

Supp 4

3.3 ~~3.7~~ INSTRUMENTATION
~~ELECTRICAL POWER SYSTEMS~~

3.3.19 ~~3.7.6~~ Emergency Power Switching Logic (EPSL) 230 KV Switchyard Degraded Grid Voltage Protection (DGVP)

LCO 3.3.19 ~~TS 3.7.6~~ The following ~~EPSL Degraded Grid Voltage Protection functions~~ channels shall be OPERABLE:
1. Three Switchyard Degraded Grid Voltage Sensing ~~Relays;~~ Channels and
2. Two ~~channels of~~ Switchyard Degraded Grid Voltage Protection Actuation Logic.

Applic APPLICABILITY: ~~Above COLD SHUTDOWN~~ MODES 1, 2, 3 and 4 A23

ACTIONS
---NOTE---
The Completion Times for Required Actions A and B are reduced when in Condition L of LCO 3.8.1 A38

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One voltage sensing ~~relay~~ channel inoperable.	A.1 Place voltage sensing ~~relay~~ channel in trip.	72 hours ACT A
B. One channel of actuation logic inoperable.	B.1 Restore channel to OPERABLE status.	72 hours ACT B
C. Required Action(s) and associated Completion Time(s) not met for Conditions A or B.	C.1 Be in ~~HOT SHUTDOWN~~ MODE 3 AND C.2 Be in ~~COLD SHUTDOWN~~ MODE 5	12 hours ACT C 84 hours
D. Two or more voltage sensing ~~relays~~ channels inoperable. OR Two actuation logic channels inoperable.	D.1 Declare overhead emergency power path inoperable.	Immediately ACT D

Specification 3.3.19

(A1) <except as marked>

230 KV Switchyard DGVP

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR ~~3.7.6.1~~ 3.3.19.1	Perform a CHANNEL CALIBRATION of the voltage sensing channel with setpoint Allowable Value as follows: Degraded voltage ≥ 226 kV and ≤ 229 kV with a time delay of 9 seconds ± 1 second.	18 months
SR ~~3.7.6.2~~ 3.3.19.2	Perform a CHANNEL FUNCTIONAL TEST.	18 months

S
4

INSTRUMENTATION

3.3 ~~3.7~~ ELECTRICAL POWER SYSTEMS

3.3.20 ~~3.7.7~~ Emergency Power Switching Logic (EPSL) CT-5 Degraded Grid Voltage Protection

LCO 3.3.20 ~~TS 3.7.7~~ The following EPSL CT-5 Degraded Grid Voltage Protection functions shall be OPERABLE:
1. Three CT-5 Degraded Grid Voltage Sensing ~~Relays;~~ Channels and
2. Two ~~channels of~~ CT-5 Degraded Grid Voltage Protection Actuation Logic. Channels

Applic
APPLICABILITY: MODES 1, 2, 3 and 4 A23 ~~Above COLD SHUTDOWN~~ when the Central switchyard is energizing the standby buses.

Actions
ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One voltage sensing ~~relay~~ Channel inoperable.	A.1 Place voltage sensing ~~relay~~ Channel in trip.	72 hours ACT A
B. One channel of actuation logic inoperable.	B.1 Restore channel to OPERABLE status.	72 hours ACT B
C. Two actuation logic channels inoperable. OR Two or more voltage sensing ~~relays~~ Channel(s) inoperable. OR Required Actions ~~and~~ associated Completion Times ~~cannot be~~ met for Conditions A or B.	C.1 Open SL breakers.	1 hour ACT C

Specification 3.3.20

DGVP

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR ~~3.7.7.1~~ 3.3.20.1 Perform a CHANNEL CALIBRATION of the voltage sensing channel with setpoint Allowable Value as follows: a. Degraded voltage ≥ 4143 V and ≤ 4185 V with a time delay of 9 seconds ± 1 second for the first level undervoltage inputs. b. Degraded voltage ≥ 3871 V and ≤ 3901 V for the second level undervoltage inputs.	18 months
SR ~~3.7.7.2~~ 3.3.20.2 Perform a CHANNEL FUNCTIONAL TEST.	18 months

Specification 3.3.21

(A1) <except as marked>

Supp 4

INSTRUMENTATION

33
~~3.7~~ ELECTRICAL POWER SYSTEMS

3.3.21
~~3.7.5~~ Emergency Power Switching Logic (EPSL) Keowee Emergency Start Function

LCO 3.3.21
~~TS 3.7.5~~ Two channels of the EPSL Keowee Emergency Start Function shall be OPERABLE.

Applic
APPLICABILITY: ~~Above COLD SHUTDOWN~~ MODES 1, 2, 3 and 4 (A23)

Actions
ACTIONS

-----NOTE-----
The Completion Time is reduced when in Condition L of LCO 3.8.1.
---------------- (A38)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 Restore channel to OPERABLE status.	72 hours ACT A
B. Required Actions and associated Completion Times for Condition A not met.	B.1 Be in ~~HOT SHUTDOWN~~ MODE 3 AND B.2 Be in ~~COLD SHUTDOWN~~ MODE 5	12 hours ACT B 84 hours
C. Two channels inoperable.	C.1 Declare both Keowee Hydro Units inoperable ~~for the affected Oconee Unit(s)~~.	Immediately ACT C

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR ~~3.7.5.1~~ 3.3.21.1 Perform ~~SR 3.7.1.11 (Keowee emergency start) and SR 3.7.1.14 (EPSL automatic transfer)~~ CHANNEL FUNCTIONAL TEST (L33) (LA12) (M28)	~~As specified in applicable SR.~~ 18 months

Page 1 of 2

Specification 3.3.21

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.7.1.11 Verify each Keowee Hydro Unit can: 1) Emergency start from each control room; 2) Attain rated speed and voltage within 23 seconds of an emergency start initiate; 3) Be synchronized to the grid and loaded at the maximum practical rate to a value equivalent to one Unit's safeguard loads plus two Unit's HOT SHUTDOWN loads.	Annually
SR 3.7.1.12 ——NOTE—— Not required to be met when the overhead electrical disconnects for the Keowee Hydro Unit associated with the underground emergency power path are open. ———— Verify the ability of the Keowee Unit ACBs to close automatically to the underground path.	Annually
SR 3.7.1.13 ——NOTE—— Only required to be met when a Lee gas turbine is energizing the standby buses. ———— Verify that a Lee gas turbine can be started and connected to the isolated 100kV dedicated line and carry the equivalent of a single Unit's maximum safeguard loads within one hour.	18 months
SR 3.7.1.14 Perform an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers. CHANNEL FUNCTIONAL TEST	18 months
SR 3.7.1.15 ——NOTE—— Only required to be met during periods of commercial power generation using the Keowee Hydro Units. ———— Verify the ability of the Keowee Hydro units to supply emergency power from the initial condition of commercial power generation.	18 months

<SEE 3.8>

LA12

M28

(continued)

<SEE 3.8>

Add LCO, ACTIONS + SR for Spec 3.3.22 (M38)

(A1) <except as marked>

Specification 3.3.22

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR ~~3.7.1.11~~ 3.3.22.1	Verify each Keowee Hydro Unit can: (LA13) 1) Emergency start from each control room; 2) Attain rated speed and voltage within 23 seconds of an emergency start initiate; 3) Be synchronized to the grid and loaded at the maximum practical rate to a value equivalent to one Unit's safeguard loads plus two Unit's HOT SHUTDOWN loads.	~~Annually~~ 12 months (A1)
SR 3.7.1.12	-----NOTE----- Not required to be met when the overhead electrical disconnects for the Keowee Hydro Unit associated with the underground emergency power path are open. ----- Verify the ability of the Keowee Unit ACBs to close automatically to the underground path.	Annually
SR 3.7.1.13	-----NOTE----- Only required to be met when a Lee gas turbine is energizing the standby buses. ----- Verify that a Lee gas turbine can be started and connected to the isolated 100kV dedicated line and carry the equivalent of a single Unit's maximum safeguard loads within one hour.	18 months
SR 3.7.1.14	Perform an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers.	18 months
SR 3.7.1.15	-----NOTE----- Only required to be met during periods of commercial power generation using the Keowee Hydro Units. ----- Verify the ability of the Keowee Hydro units to supply emergency power from the initial condition of commercial power generation.	18 months

<SEE 3.8>

<SEE 3.3.17 + 3.3.21>

<SEE 3.8>

(continued)

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Supp 4

Adel Spec 3.3.23 — M43

Isolation (ES Channels 3 and 4). The ITS LCO statement was expanded to provide a complete list of equipment actuated by the ES channels. The LCO statement does not change the technical specification requirements. Therefore, the change is administrative.

A35 CTS Table 3.5.1-1, Item 14 describes the functional unit as ESF Reactor Building Isolation (Essential Systems) and Reactor Building Cooling System. ITS LCO 3.3.6.c describes this function as Reactor Building (RB) Cooling, Reactor Building Essential Isolation and Penetration Room Ventilation (ES Channels 5 and 6). The ITS LCO statement was expanded to provide a complete list of equipment actuated by the ES channels. The LCO statement does not change the technical specification requirements. Therefore, the change is administrative.

A36 CTS 3.8.1.10 requires the reactor building purge system, including the radiation monitors, to be operable immediately prior to refueling operation. ITS 3.3.16 requires the Reactor Building Isolation-High Radiation function to be OPERABLE during CORE ALTERATION and during movement of irradiated fuel assemblies within the reactor building. CTS defines "refueling operation" as an operation involving a change in core geometry by manipulation of fuel or control rods when the reactor vessel head is removed. Also, movement of irradiated fuel assemblies within the reactor building can only be performed subsequent to the start of refueling. As such, the change is administrative and consistent with the NUREG.

A37 CTS Table 4.1-1 Remarks Note 1 allows a one-time extension of the test frequency to a maximum of 23 months for items 45 and 46 and a maximum of 24 months for items 58, 59, 60, and 61 for Oconee Unit 2 in operating cycle 16. This provision is no longer needed and is deleted since operating cycle 16 has passed. As such, the change is administrative.

4 A38 A Note is added to the ACTIONS Table for ITS LCO 3.3.19 and to Required
4 Action A of LCO 3.3.17, LCO 3.3.18, and LCO 3.3.21 indicating that the
4 Completion Time for Required Actions are reduced when in Condition L of
4 LCO 3.8.1. The addition of this Note does not change any technical
4 requirements, it only prompts the user to recognize that the Completion
4 Times are less than that indicated when in Condition L of LCO 3.8.1.
4 Since the requirements are not changed, only restated, this is an
4 administrative change.

M40 CTS 3.5.1.1 Applicability for the TSV Closure instrumentation channels is while in the startup mode or when the reactor is in a critical state. ITS 3.3.15 Applicability for the TSV Closure instrumentation channels is in MODES 1, 2, and 3 except when all TSVs are closed. The CTS applicability of "in a critical state" is encompassed by ITS MODES 1 and 2, which are defined as MODES where the reactivity condition is ≥ 0.99 k_{eff}. CTS defines the startup mode to be when the shutdown margin is reduced with the intent of going critical. This is considered equivalent to ITS MODE 2 as described in the associated DOCs for Section 1.0. The expanded applicability is appropriate since during MODE 3 conditions there is significant mass and energy in the RCS and steam generators and the TSV Closure function is needed to stop steam flow to the turbine (to prevent overcooling) following a reactor trip. As such, the addition of applicability in MODE 3 is more restrictive. The more restrictive requirement is consistent with comparable NUREG (3.3.11-1, Function 4) requirements.

M41 CTS 3.5.3 specifies an engineered safety features protective actuation setpoint for HPI of $\geq$ 1500 psig RCS pressure. ITS 3.3.5 Table 3.3.5-1 specifies an allowable value of 1590 psig for this function which includes the total loop uncertainty associated with the HPI ES function under normal Reactor Building conditions and additional margin to consider total loop uncertainty associated with the HPI ES function under abnormal reactor building conditions in response to a steam line break. Subsequent review of SBLOCA analyses concluded that 1500 psig was actually an analytical limit. ITS incorporates the allowable value which is a more conservative limit. This is an appropriate restriction on plant operation since it ensures the analytical limit is not exceeded. Administrative controls, which are already in place, are currently used to ensure the analytical limit cannot be exceeded. The new technical specification allowable value establishes more conservative operating limitations on the plant with respect to actuation of ES protective features.

M42 ITS SR 3.3.14.3 is added to provide a requirement for a CHANNEL FUNCTIONAL TEST of each EFW System automatic initiation circuit at a
4 frequency of every 18 months. The addition of the CHANNEL FUNCTIONAL TEST is appropriate to ensure that the automatic initiation circuit can perform its intended function. This is an additional restriction on operation consistent with the NUREG.

4 M43 ITS Specification 3.3.23, "Main Feeder Bus Monitoring Panel (MFBMP)," is
4 added to require three MFBMP undervoltage sensing relays per bus and two
4 MFBMP undervoltage actuation logic channels to be OPERABLE in MODES 1,
4 2, 3, or 4 along with appropriate ACTIONS and Surveillance Requirements.
4 No credit is taken for this system in any accident or transient
4 analyses. Although the MFBMP does not meet any 50.36 criteria, a
4 Specification has been added since the MFBMP provides defense-in-depth
4 for any scenario which results in loss of power to the main feeder
4 buses.

based totally upon the primary system parameters. Above 15% RTP, the secondary system parameters are also considered since they are generally more accurate at higher power levels. By allowing the delay in performance of this calibration until RTP is above 15%, a generally more accurate calorimetric (one including secondary system parameters) is available. The proposed change is consistent with the NUREG.

L15 CTS Table 4.1-1 requires a comparison of the out of core measured AXIAL POWER IMBALANCE to incore measured AXIAL POWER IMBALANCE every 31 days. ITS SR 3.3.1.3, which provides an equivalent requirement, is modified by a Note that allows a delay in performance of this SR until the unit is above 15% RTP. This allowance is appropriate due to the usable range of the incore nuclear instruments which are required for the performance of this SR. Below about 15% the incore nuclear instruments are not capable of providing reliable accurate indication of AXIAL POWER IMBALANCE. Adoption of this Note provides a specific relaxation of requirements where none existed in CTS. This change is consistent with the NUREG.

L16 CTS 3.4.2, which requires the automatic initiation circuitry associated with loss of main feedwater pumps to be OPERABLE prior to criticality, provides no allowed outage time when one of two loss of main feedwater instrumentation channels are inoperable. ITS 3.3.14, ACTION A is added to allow continued reactor operation for an indefinite period when one of two EFW System loss of main feedwater instrumentation channels in an EFW pump automatic initiation circuit is inoperable provided the inoperable channel is placed in a tripped condition for initiation within one hour. ITS 3.3.14 ACTIONS Note is added to allow separate condition entry for each EFW pump initiation circuit. This allows one hour to place the channel in trip for each function when Condition A is entered. This less restrictive provision is acceptable since this leaves the function in a one-out-of-one logic configuration for initiation versus the normal two-out-of-two logic configuration. This maintains at least equivalent reliability for EFW initiation. EFW is maintained single failure proof by the separate initiation circuits for each the three EFW pumps. This less restrictive change is consistent with NUREG Specification 3.3.11, ACTION A.

4 L17 Not used.

OCONEE NUCLEAR STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.3 - INSTRUMENTATION

ATTACHMENT 4

NO SIGNIFICANT HAZARDS CONSIDERATIONS

LESS RESTRICTIVE CHANGE L17

4 Not used.

4 Not used.

OCONEE NUCLEAR STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.3 - INSTRUMENTATION

ATTACHMENT 5

NUREG 1430 MARKUP AND JUSTIFICATIONS

TECHNICAL SPECIFICATIONS

33 <For INSERT 3.3.17-21 except as marked.>

CTS

3.3 INSTRUMENTATION

3.3.17 Emergency Power Switching Logic (EPSL) Automatic Transfer Function

LCO 3.3.17 Two channels of the EPSL Automatic Transfer Function shall be OPERABLE. TS 3.7.3

APPLICABILITY: MODES 1, 2, 3, and 4. Applic

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME	
4 4 4 4 4 4 A. One channel inoperable.	A.1	---------NOTE-------- The Completion Time is reduced when in Condition L of LCO 3.8.1. ---------------------		Doc A38
		Restore channel to OPERABLE status.	24 hours	Act A
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours	Act B
	AND			
	B.2	Be in MODE 5.	84 hours	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY	
SR 3.3.17.1	Perform CHANNEL FUNCTIONAL TEST.	18 months	SR 3.7.3.1 SR 3.7.1.14

3.3 INSTRUMENTATION

3.3.18 Emergency Power Switching Logic (EPSL) Voltage Sensing Circuits

LCO 3.3.18 Three channels of each of the following EPSL voltage sensing circuits shall be OPERABLE: TS 3.7.4

a. Startup Transformer;
b. Standby Bus 1;
c. Standby Bus 2; and
d. Auxiliary Transformer.

---NOTE---

1. If both N breakers are open, Auxiliary Transformer voltage sensing circuits are not required to be OPERABLE. LCO Note

2. When not in MODES 1, 2, 3 and 4, only EPSL voltage sensing circuit(s) associated with required AC power source(s) are required to be OPERABLE. Doc M34

APPLICABILITY: MODES 1, 2, 3, 4 ~~5 and 6,~~
~~During movement of irradiated fuel assemblies.~~ 49 Applic

ACTIONS

---NOTE---
Separate Condition entry is allowed for each circuit. ACT Note

---

CONDITION	REQUIRED ACTION	COMPLETION TIME
4 A. One or more required 4 circuits with one 4 channel inoperable. 4 4 4	A.1 ---NOTE--- The Completion Time is reduced when in Condition L of LCO 3.8.1. --- Restore channel to OPERABLE status.	Doc A38 24 hours ACT A

(continued)

3.3 INSTRUMENTATION

3.3.19 Emergency Power Switching Logic (EPSL) 230 kV Switchyard Degraded Grid Voltage Protection (DGVP)

LCO 3.3.19 Three DGVP voltage sensing channels and two DGVP actuation logic channels shall be OPERABLE. TS 3.7.6

APPLICABILITY: MODES 1, 2, 3, and 4. Applic

ACTIONS

4 ------------------------------------NOTE------------------------------------
4 The Completion Times for Required Actions A and B are reduced when in Condition L of LCO 3.8.1. DOC A38
4 ---

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One voltage sensing channel inoperable.	A.1 Place channel in trip.	72 hours ACT A
B. One actuation logic channel inoperable.	B.1 Restore channel to OPERABLE status.	72 hours ACT B
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. __AND__ C.2 Be in MODE 5.	12 hours ACT C 84 hours
D. Two or more voltage sensing channels inoperable. __OR__ Two actuation logic channels inoperable.	D.1 Declare the overhead emergency power path inoperable.	Immediately ACT D

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.19.1	Perform a CHANNEL FUNCTIONAL TEST.	18 months SR 3.7.6.2
SR 3.3.19.2	Perform a CHANNEL CALIBRATION of the voltage sensing channel with the setpoint allowable value as follows: Degraded voltage ≥ 219 kV and ≤ 222 kV with a time delay of 9 seconds ±1 second.	18 months SR 3.7.6.1

3.3 INSTRUMENTATION

CTS

3.3.21 Emergency Power Switching Logic (EPSL) Keowee Emergency Start Function

LCO 3.3.21 Two channels of the EPSL Keowee Emergency Start Function shall be OPERABLE. TS 3.7.5

APPLICABILITY: MODES 1, 2, 3 and 4.

Applic

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
4 4 4 4 4 4	A. One channel inoperable.	A.1	---------NOTE-------- The Completion Time is reduced when in Condition L of LCO 3.8.1. --------------------- Restore channel to OPERABLE status.	 DOC A38 72 hours	 ACT A
	B. Required Action and associated Completion Time not met.	B.1 AND B.2	Be in MODE 3. Be in MODE 5.	12 hours 84 hours	ACT B
	C. Two channels inoperable.	C.1	Declare both Keowee Hydro Units inoperable.	Immediately	ACT C

CTS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.21.1 Perform CHANNEL FUNCTIONAL TEST.	18 months SR 3.7.5.1 SR 3.7.1.14

3.3 INSTRUMENTATION

3.3.22 Emergency Power Switching Logic (EPSL) Manual Keowee Emergency Start Function

LCO 3.3.22 One channel of the EPSL Manual Keowee Emergency Start Function shall be OPERABLE. DOC M38

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies. DOC M38

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required channel inoperable.	A.1 Declare both Keowee Hydro Units inoperable.	Immediately DOC M38

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.22.1 Perform CHANNEL FUNCTIONAL TEST.	12 months DOC M38

3.3 INSTRUMENTATION

3.3.23 Main Feeder Bus Monitor Panel (MFBMP)

LCO 3.3.23 Three MFBMP undervoltage sensing relay channels per bus and two MFBMP undervoltage actuation logic channels shall be OPERABLE. DOC M43

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE--------- Separate Condition entry is allowed. --------------------- One voltage sensing channel inoperable on one or both MFBs.	A.1 Place channel in trip.	7 days DOC M43
B. One actuation logic channel inoperable.	B.1 Restore channel to OPERABLE status.	7 days DOC M43
C. ---------NOTE--------- Separate Condition entry is allowed. --------------------- Two or more voltage sensing channels inoperable on one or both MFBs. OR Two actuation logic channels inoperable.	C.1 Restore two of three undervoltage sensing channels to OPERABLE status. AND C.2 Restore one logic channel to OPERABLE status.	24 hours DOC M43 24 hours

(continued)

4

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	4	COMPLETION TIME
4 4 4 4	D. Required Action and associated Completion Time not met.	D.1 Initiate action in accordance with Specification 5.6.6.		Immediately Doc M43

4
4
4
4
4 SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
4		
4 4	SR 3.3.23.1 Perform a CHANNEL FUNCTIONAL TEST.	18 months Doc M43

The proposed change results in modifying the testing requirements for three of the Functions listed in Table 3.3.1-1 as follows:

Function 1.a; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with requirements to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS and a CHANNEL CALIBRATION every 18 months. The combination of applicable SRs (CHANNEL CHECK, verification, and adjustment when required, of power range channel output to calorimetric heat balance, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

Function 1.b; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with requirements to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS and a CHANNEL CALIBRATION every 18 months. The combination of applicable SRs (CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

Function 8; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with a requirement to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS. The combination of applicable SRs (CHANNEL CHECK, comparison, and adjustment when required, of out of core measured AXIAL POWER IMBALANCE to incore measured AXIAL POWER IMBALANCE, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

The remainder of the changes to Table 3.3.1-1 are considered to be editorial in nature as they reflect the renumbering of the SRs due to the deletion of the requirements of SR 3.3.1.5.

The change to the SR 3.3.1.3 Note is made for consistency with the Note associated with SR 3.3.1.2.

4 58 ITS Specification 3.3.23, "Main Feeder Bus Monitoring Panel (MFBMP)," is
4 added to require three MFBMP undervoltage sensing relays per bus and two
4 MFBMP undervoltage actuation logic channels to be OPERABLE in MODES 1,
4 2, 3, or 4 along with appropriate ACTIONS and Surveillance Requirements.
4 No credit is taken for this system in any accident or transient
4 analyses. Although the MFBMP does not meet any 50.36 criteria, a
4 Specification has been added since the MFBMP provides defense-in-depth
4 for any scenario which results in loss of power to the main feeder
4 buses.

The proposed change results in modifying the testing requirements for three of the Functions listed in Table 3.3.1-1 as follows:

Function 1.a; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with requirements to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS and a CHANNEL CALIBRATION every 18 months. The combination of applicable SRs (CHANNEL CHECK, verification, and adjustment when required, of power range channel output to calorimetric heat balance, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

Function 1.b; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with requirements to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS and a CHANNEL CALIBRATION every 18 months. The combination of applicable SRs (CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

Function 8; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with a requirement to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS. The combination of applicable SRs (CHANNEL CHECK, comparison, and adjustment when required, of out of core measured AXIAL POWER IMBALANCE to incore measured AXIAL POWER IMBALANCE, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

The remainder of the changes to Table 3.3.1-1 are considered to be editorial in nature as they reflect the renumbering of the SRs due to the deletion of the requirements of SR 3.3.1.5.

The change to the SR 3.3.1.3 Note is made for consistency with the Note associated with SR 3.3.1.2.

3 58 ITS Specification 3.3.23, "Main Feeder Bus Monitoring Panel (MFBMP)," is
3 added to require three MFBMP undervoltage sensing relays per bus and two
3 MFBMP undervoltage actuation logic channels to be OPERABLE in MODES 1,
3 2, 3, or 4 along with appropriate ACTIONS and Surveillance Requirements.
3 No credit is taken for this system in any accident or transient
3 analyses. Although the MFBMP does not meet any 50.36 criteria, a
3 Specification has been added since the MFBMP provides defense-in-depth
3 for any scenario which results in loss of power to the main feeder
3 buses.

OCONEE NUCLEAR STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.3 - INSTRUMENTATION

ATTACHMENT 6

NUREG 1430 MARKUP AND JUSTIFICATIONS

BASES

BASES (continued)

ACTIONS

A.1

If one channel is inoperable, it must be restored to OPERABLE status within 24 hours. With one channel inoperable, the remaining channel is capable of providing necessary transfer functions to ensure power is provided to the MFBs. The 24 hour Completion Time is considered appropriate based on engineering judgement, taking into consideration the time required to complete the required action.

4 Required Action A.1 is modified by a Note which indicates
4 that the Completion Time is reduced when in Condition L of
4 LCO 3.8.1. Condition L limits the Completion Time for
4 restoring an inoperable channel to 4 hours when emergency
4 power source(s) or offsite power source(s) are inoperable
4 for extended time periods or for specific reasons.

B.1 and B.2

With the Required Action and associated Completion Time not met, 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 at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.3.17.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the EPSL automatic transfer function. The ES inputs to the Load Shed and Transfer to Standby function and the Retransfer to Startup function are verified to operate properly during an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

(continued)

BASES (continued)

ACTIONS

A Note has been added to the ACTIONS indicating separate Condition entry is allowed for each Voltage Sensing Circuit.

A.1

If one required channel is inoperable in one or more voltage sensing circuits, it must be restored to OPERABLE status within 24 hours. With one channel inoperable, the remaining two channels are capable of providing the voltage sensing function. The 24 hour Completion Time is considered appropriate based on engineering judgement taking into consideration the time required to complete the required action.

4 Required Action A.1 is modified by a Note which indicates
4 that the Completion Time is reduced when in Condition L of
4 LCO 3.8.1. Condition L limits the Completion Time for
4 restoring an inoperable channel to 4 hours when emergency
4 power source(s) or offsite power source(s) are inoperable
4 for extended time periods or for specific reasons.

B.1 and B.2

With the Required Action and associated Completion Time not met in MODES 1, 2, 3 and 4, 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 at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

C.1 and C.2

With two or more channels of a required circuit inoperable when not in MODES 1, 2, 3, and 4 or the Required Action and associated Completion Time not met when not in MODES 1, 2, 3, and 4, the affected AC power sources(s) must be declared inoperable immediately. The appropriate Required Actions will be implemented in accordance with LCO 3.8.2, "AC Sources – Shutdown."

(continued)

BASES

ACTIONS (continued)

D.1

With the Required Action and associated Completion Time not met during movement of irradiated fuel assemblies, movement of fuel assemblies must be suspended immediately. Suspension does not preclude completion of actions to establish a safe conservative condition. This action minimizes the probability or the occurrence of postulated events. The Completion Time of immediately is consistent with the required times for actions requiring prompt attention.

SURVEILLANCE REQUIREMENTS

SR 3.3.18.1

A CHANNEL FUNCTIONAL TEST is performed on each voltage sensing circuit channel to ensure the channel will perform its function. A circuit is defined as three channels, one for each phase. Each channel consists of components from the sensing power transformer through the circuit auxiliary relays which operate contacts in the EPSL logic and breaker trip circuits. Minimum requirements consist of individual channel relay operation causing appropriate contact responses within associated loadshed/breaker circuits, alarm activations, and proper indications for the sensing circuit control power status. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

REFERENCES

1. UFSAR, Chapters 6 and 15.

2. 10 CFR 50.36.

BASES (continued)

4 ACTIONS The ACTIONS are modified by a Note indicating that the
4 Completion Times for Required Actions A and B are reduced
4 when in Condition L of LCO 3.8.1. Condition L limits the
4 Completion Time for restoring inoperable channels to 4 hours
4 when emergency power source(s) or offsite power source(s)
4 are inoperable for extended time periods or for specific
4 reasons.

A.1

If one DGVP voltage sensing channel is inoperable, the channel must be placed in trip within 72 hours. Tripping the affected channel places the function in a one-out-of-two configuration. Operation in this configuration may continue indefinitely since the DGVP function is capable of performing its DGVP function in the presence of a single failure. With one channel inoperable, the remaining channels are capable of providing the DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation, and the probability of an event requiring ES operation.

B.1

If one DGVP actuation logic channel is inoperable, the actuation logic channel must be restored to OPERABLE status within 72 hours. With one actuation logic channel inoperable, the remaining actuation logic channel is capable of providing the DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation, and the probability of an event requiring ES operation.

C.1 and C.2

With the Required Action and associated Completion Time of Condition A or B not met, 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 at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable based on operating experience and to allow for a controlled shutdown.

(continued)

BASES

ACTIONS (continued)

D.1

With two or more voltage sensing channels or both actuation logic channels inoperable, degraded grid protection is no longer available to the Station during an ES actuation. The condition also prevents switchyard isolation during a LOCA. Since swithyard isolation is inoperable, the overhead power path must be declared inoperable immediately. The appropriate Required Actions will be implemented in accordance with LCO 3.8.1, AC "Sources - Operating."

SURVEILLANCE REQUIREMENTS

SR 3.3.19.1

A CHANNEL FUNCTIONAL TEST is performed on each DGVP voltage sensing channel and DGVP actuation logic channel to ensure the entire channel will perform its intended function. Any setpoint adjustments shall be consistent with the assumptions of the setpoint analysis. The CHANNEL FUNCTIONAL TEST of the DGVP actuation logic channels includes verifying actuation of the switchyard isolation circuitry. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

SR 3.3.19.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the 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.

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

(continued)

BASES (continued)

REFERENCES	1.	UFSAR, Chapter 8.
	2.	10 CFR 50.36.

B 3.3 INSTRUMENTATION

B 3.3.20 Emergency Power Switching Logic (EPSL) CT-5 Degraded Grid Voltage Protection (DGVP)

BASES

BACKGROUND

Two levels of protection are provided for the standby buses to assure that degradation of voltage from the 100 kV transmission system does not adversely impact the function of safety related systems and components. The first level of protection is provided by the EPSL CT-5 Degraded Grid Protection System. The second level of protection is provided by undervoltage relaying on the standby buses (reference LCO 3.3.18, "EPSL Voltage Sensing Circuits") which protects from loss of voltage.

Three undervoltage sensing relays provide common input to two channels of actuating logic. In addition to the three phase undervoltage sensing relays, each channel includes one time-delay relay, one auxiliary relay, and one associated single phase undervoltage sensing relay. Each channel trip signal passes through a selector switch, which either allows or inhibits the trip signal, to actuate one trip coil in each SL breaker. Inoperability of any voltage sensing channel reduces the logic for the voltage sensing function to a two-out-of-two. Loss of two or more voltage sensing relays results in inoperability of both channels of actuation logic.

APPLICABLE SAFETY ANALYSES

The EPSL CT-5 Degraded Grid Voltage Protection function is required to ensure adequate voltage is available during an ES actuation concurrent with a loss of offsite power or degraded voltage from the 230 kV switchyard when ES loads are supplied by the standby buses (Ref.1). Based on calculations, 4.155 kV is the minimum voltage that will ensure proper operation of loads during ES actuation.

This system is only required to be OPERABLE when the unit is in MODES 1, 2, 3, and 4 and the standby buses are energized without being electrically separated from the grid and offsite loads. System design is to provide protection for ES components caused by voltage droop due to inrush as the unit connects to the standby buses. The system is not a substitute for the dedicated line from Lee Gas Turbines.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The Lee Feeder breakers (SL) have no automatic close functions. However, this system does provide additional flexibility for the Station electrical system and operators in available power source options.

The EPSL CT-5 Degraded Grid Voltage Protection satisfies Criterion 3 of 10 CFR 50.36 (Ref. 2).

LCO

Three CT-5 degraded grid voltage sensing relay channels are required to be OPERABLE. Failure of one channel reduces the reliability of the function. The requirement for three channels to be OPERABLE ensures that two channels will remain OPERABLE if a failure has occurred in one channel. The remaining voltage sensing channels can perform the safety function.

Two channels of the CT-5 Degraded Grid Voltage Protection Actuation Logic function are required to be OPERABLE. The requirement for two channels to be OPERABLE ensures that one channel will remain OPERABLE if a failure has occurred in one channel. The remaining channel can perform the safety function.

APPLICABILITY

The CT-5 DGPS functions are required to be OPERABLE in MODES 1, 2, 3, and 4 when standby buses are energized without being electrically separated from grid or loads to ensure adequate voltage protection should a unit be transferred to the standby bus during an event requiring an ES actuation.

The EPSL CT-5 DGVP functions are not required to be OPERABLE in MODES 5 and 6 since more time is available for the operator to respond to a loss of power event.

ACTIONS

A.1

If one CT-5 DGVP voltage sensing relay channel is inoperable, the channel must be placed in trip within 72 hours. Tripping the affected channel places the function in a one-out-of-two configuration. Operation in this configuration may continue indefinitely since the DGVP

(continued)

BASES

ACTIONS

A.1 (continued)

function is capable of performing its DGVP function in the presence of any single random failure. With one channel inoperable, the remaining voltage sensing channels are capable of providing the DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation, and the probability of an event requiring an ES actuation.

B.1

If one CT-5 DGVP actuation logic channel is inoperable, the actuation logic channel must be restored to OPERABLE status within 72 hours. With one actuation logic channel inoperable, the remaining actuation logic channel is capable of providing the CT-5 DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation and the probability of an event requiring an ES actuation.

C.1 and C.2

If two or more voltage sensing relay channels or two actuation logic channels are inoperable, automatic protection from degraded grid voltage for the standby buses powered from the 100 kV transmission system is not available. Continued operation is allowed provided that the SL breakers are opened within one hour.

Additionally, with the Required Action and associated Completion Time of Condition A or B not met, the SL breakers must be opened within one hour. This arrangement provides a high degree of reliability for the emergency power system. The one hour Completion Time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation and the probability of an event requiring an ES actuation.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.20.1

A CHANNEL FUNCTIONAL TEST is performed on each CT-5 DGVP voltage sensing channel and each CT-5 DGVP actuation logic channel to ensure the entire channel will perform its intended function. Any setpoint adjustments shall be consistent with the assumptions of the setpoint analysis. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

SR 3.3.20.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the 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.

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. UFSAR, Chapter 8.
2. 10 CFR 50.36.

B 3.3 INSTRUMENTATION

B 3.3.21 Emergency Power Switching Logic (EPSL) Keowee Emergency Start Function

BASES

BACKGROUND

The Keowee Emergency Start function of EPSL provides a start signal to the two on-site emergency power sources and sets up controls for the emergency mode. There are two channels of the Emergency Start function. Each channel is capable of starting both Keowee units and activating the controls for the emergency mode.

The Emergency Start channels 1 and 2 are actuated from Engineered Safeguards channels 1 and 2 respectively. The Emergency Start channels can also be activated manually from each control room (i.e., two emergency start switches in the Unit 1 and 2 control room and two emergency start switches in the Unit 3 control room) or cable spread rooms. There are two independent channels associated with each Oconee unit.

During a loss-of-coolant accident (LOCA) with a simultaneous loss of offsite power, the Keowee Emergency Start function of EPSL sends a start signal to both Keowee units. Logic is also actuated that ensures separation of both Keowee units from the system grid. Connection of the Keowee Unit aligned to the overhead power path is allowed only after a separate logic sequence (indicating switchyard isolation logic is complete which is not associated with the Keowee Emergency Start function) verifies the yellow bus is separated from the grid.

The Keowee Emergency Start function also disables non critical protective interlocks and trips associated with the Keowee generators. This ensures the generators can remain available as an emergency power source despite minor failures or malfunctions.

The Keowee Emergency Start circuitry is designed such that no single failure can prevent an Emergency Start signal from reaching the Keowee units. Each channel is independent of the other and only one channel is required to perform the entire safety function.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The EPSL Keowee Emergency Start function is required for the engineered safeguards (ES) equipment to function in any accident with a loss of offsite power. The limiting accident for the EPSL voltage sensing circuits is a loss-of-coolant accident (LOCA) with a simultaneous loss of offsite power (Ref. 1).

The EPSL Keowee Emergency Start Function satisfies Criterion 3 of 10 CFR 50.36 (Ref. 2).

LCO

Two channels of the Keowee Emergency Start function are required to be OPERABLE. Failure of one channel reduces the reliability of the function.

The requirement for two channels to be OPERABLE ensures that one channel will remain OPERABLE if a failure has occurred. The remaining channel can perform the safety function.

APPLICABILITY

The EPSL Keowee Emergency Start function is required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that power is provided from AC Sources to the AC Distribution system within the time assumed in the accident analyses.

The EPSL Keowee Emergency Start function is not required to be OPERABLE in MODES 5 and 6 since more time is available for the operator to respond to a loss of power event.

ACTIONS

A.1

If one channel is inoperable, then a failure of the other channel could prevent starting the Keowee units. With one channel inoperable, the remaining channel is capable of providing the Keowee Emergency Start function. The 72 hour Completion Time is considered appropriate based on engineering judgement taking into consideration the time required to complete the required action.

4 Required Action A.1 is modified by a Note which indicates
4 that the Completion Time is reduced when in Condition L of
4 LCO 3.8.1. Condition L limits the Completion Time for

(continued)

BASES

ACTIONS

A.1 (continued)

4 restoring an inoperable channel to 4 hours when emergency
4 power source(s) or offsite power source(s) are inoperable
4 for extended time periods or for specific reasons.

B.1 and B.2

With the Required Action and associated Completion Time not met, 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 at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

C.1

With both channels of the Keowee Emergency Start function inoperable then both Keowee Hydro Units must be declared inoperable immediately. The appropriate Required Actions will be implemented in accordance with LCO 3.8.1, "AC Sources – Operating."

SURVEILLANCE REQUIREMENTS

SR 3.3.21.1

A CHANNEL FUNCTIONAL TEST is performed on each Keowee Emergency Start channel to ensure the channel will perform its function during an automatic transfer of the Main Feeder Buses to the Startup Transfer, Standby Buses, and retransfer to the Startup Transformers. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

REFERENCES

1. UFSAR, Chapters 6 and 15.
2. 10 CFR 50.36.

B 3.3 INSTRUMENTATION

B 3.3.22 Emergency Power Switching Logic (EPSL) Manual Keowee Emergency Start Function

BASES

BACKGROUND

The Keowee Emergency Start function of EPSL provides a start signal to the two on-site emergency power sources and sets up controls for the emergency mode. There are two channels of the Emergency Start function. Each channel is capable of starting both Keowee units and activating the controls for the emergency mode.

The Emergency Start channels 1 and 2 are actuated from Engineered Safeguards channels 1 and 2 respectively. The Emergency Start channels can also be activated manually from each control room (i.e., two emergency start switches in the Unit 1 and 2 control room and two emergency start switches in the Unit 3 control room) or cable spread rooms. There are two independent channels associated with each Oconee unit.

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the Manual Keowee Emergency Start Function during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

The EPSL Manual Keowee Emergency Start Function satisfies Criterion 3 of 10 CFR 50.36 (Ref. 1).

LCO

One channel of the Manual Keowee Emergency Start function, consisting of a manual initiation switch and an Emergency Start channel, is required to be OPERABLE.

(continued)

BASES (continued)

APPLICABILITY

The Manual Keowee Emergency Start function required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provides assurance that:

a. Systems needed to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

ACTIONS

A.1

If the required Manual Keowee Emergency Start channel is inoperable, both Keowee Hydro Units must be declared inoperable immediately. Therefore LCO 3.8.2 is entered immediately, and the required Completion Times for the appropriate Required Actions apply without delay.

SURVEILLANCE REQUIREMENTS

SR 3.3.22.1

A CHANNEL FUNCTIONAL TEST is performed on the required Manual Keowee Emergency Start channel to ensure the channel will perform its function. The Frequency of 12 months is based on engineering judgment and operating experience that determined testing on a 12 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

REFERENCES

1. 10 CFR 50.36.

B 3.3 INSTRUMENTATION

B 3.3.23 Main Feeder Bus Monitor Panel (MFBMP)

BASES

BACKGROUND

The Main Feeder Bus Monitor Panel (MFBMP) uses three undervoltage relays per bus to detect low voltage. The undervoltage relay contacts are arranged to ensure any 2 of 3 phases tripped will de-energize the time-delay relays to start the actuation sequence. There are two time-delay relays and two auxiliary relays per channel. The 20 second time-delay relays de-energize auxiliary relays (TX) to cause load shed, Keowee Emergency start, and through an interposing relay, RX1 or 2, provide permissives to the SK breakers and Retransfer-to-Standby logic. The two logic channels are completely redundant. Channel A provides input to Channel A Load shed/Transfer-to-Standby, Keowee Emergency Start A, and SK1/Retransfer-to-Startup via relay RX1. Channel B provides input to Channel B for the companion logic devices, i.e. Channel B Keowee Emergency Start, RX2 to SK2/Retransfer-to-Startup, and Channel B Load shed/Transfer-to-Standby. The Load shed logic also provides an auto-close permissive to the Startup breakers.

APPLICABLE SAFETY ANALYSES ANALYSES

In the event of a station blackout (SBO), power is required to be available in 4 hours. Operator actions are credited for SBO mitigation. Thus, in the event of a loss of offsite power (LOOP), it is acceptable to credit operator actions to restore power to the main feeder buses (MFBs). The MFBMP provides a convenient and automatic method of establishing safe and reliable power to the MFBs during non-ES events. The system is redundant to ES signals which actuate Load shed/Transfer-to-Standby, and Keowee Emergency Start. The system also arms the Retransfer-to-Startup logic and closure of the Startup and SK breakers indirectly. The MFBMP does not provide the only layer of protection in any DBE, but does provide defense-in-depth for any scenario which results in loss of power to the main feeder buses.

The MFBMP does not satisfy the criteria in 10 CFR 50.36 (Ref. 1).

(continued)

BASES (continued)

LCO

All six of the undervoltage sensing relay channels (three per MFB) are required to be OPERABLE as a common input device to both channels of actuating logic. Inoperability of any undervoltage relay is defined as unable to trip. This condition reduces the logic for the given logic channel and MFB to a two out of two logic. Loss of any two relay channels on a single bus defeats the entire logic of both logic channels. Each logic channel has two time-delay and auxiliary relays, one time delay relay and one auxiliary relay for each MFB. Both time delay relays and auxiliary relays for each logic channel must actuate for the associated channel to operate.

APPLICABILITY

The MFBMP functions are required to be OPERABLE in MODES 1, 2, 3, and 4 to coincide with requirements for ES and other support/protective systems used to ensure adequate power is available for core and containment protection.

The MFBMP functions are not required to be OPERABLE in MODES 5 and 6 since more time is available for the operator to respond to a loss of power event.

ACTIONS

A.1

If one MFBMP voltage sensing channel is inoperable on one or both MFBs, the channel must be placed in trip within 7 days. Tripping the affected channel places the function in a one-out-of-two configuration. Operation in this configuration may continue indefinitely since the MFBMP function is capable of performing its MFBMP function in the presence of a single failure. With one channel inoperable, the remaining channels are capable of providing the Degraded Grid Voltage Protection (DGVP) function. The 7 day completion time is based on engineering judgement and the probability of an event requiring power restoration to the main feeder buses.

The Condition is modified by a Note indicating that this condition may be entered independently for each set of channels associated with a main feeder bus. The Completion Time(s) of the inoperable channels are tracked separately

(continued)

BASES

ACTIONS

A.1 (continued)

from the time the Condition is entered for each main feeder bus.

B.1

If one MFBMP actuation logic channel is inoperable, the actuation logic channel must be restored to OPERABLE status within 7 days. With one actuation logic channel inoperable, the remaining actuation logic channel is capable of providing the MFBMP function. The 7 day completion time is based on engineering judgement and the availability of adequate time for operator response to a LOOP.

C.1 and C.2

With two or more voltage sensing channels or both actuation logic channels inoperable, automatic protection for LOOP events is no longer available. This places additional burden on the operators, even though they are still the credible resource for restoring power in a LOOP event. EPSL response from ES events are not affected. Therefore, allowable time for this condition is limited to 24 hours. The completion time is based on engineering judgement and the availability of adequate time for operator response to a LOOP.

The Condition is modified by a Note indicating that this condition may be entered independently for each set of channels associated with a main feeder bus. The Condition may also be entered independently for inoperable logic channels or inoperable voltage sensing channels. The Completion Time(s) are tracked separately from the time the Condition is entered for each.

D.1

With the Required Action and associated Completion Time not met, Required Action D.1 specifies initiation of action described in Specification 5.6.6 that requires a written report to be submitted to the NRC. This report discusses the results of the root cause evaluation of the

(continued)

BASES

ACTIONS

D.1 (continued)

inoperability and identifies proposed restorative actions. This action is appropriate since the MFBMP does not provide the only layer of protection in any DBE, but does provide defense-in-depth for any scenario which results in loss of power to the Main Feeder Busses. Operator actions are credited for SBO mitigation. The Completion Time of "Immediately" for Required Action D.1 ensures the requirements of Specification 5.6.6 are initiated.

SURVEILLANCE REQUIREMENTS

SR 3.3.23.1

A CHANNEL FUNCTIONAL TEST is performed on each MFBMP voltage sensing channel and MFBMP actuation logic channel to ensure the MFBMP will perform its intended function. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

REFERENCES

1. 10 CFR 50.36.

ITS Section 3.3

ID 238

Subject: Revised ITS 3.3.11 to add 92 day CFT with note indicating only applicable when modifications are implemented that allow online testing consistent with pending MSLB TS change.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
	SR 3.3.11.1	Perform CHANNEL CHECK.	12 hours
4 4 4 4 4 4 4 4	 SR 3.3.11.2	 -------------------NOTE-------------------- Only applicable when modifications are implemented that allow online testing. --- Perform CHANNEL FUNCTIONAL TEST.	92 days
4	SR 3.3.11.3	Perform CHANNEL CALIBRATION.	18 months

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.11.1 (continued)

between each CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION.

Agreement criteria are based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter 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, where practical, to be reading at the bottom of the range and not failed downscale.

The Frequency, about once every shift, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

4 SR 3.3.11.2

4 A CHANNEL FUNCTIONAL TEST is performed on each required
4 instrumentation channel to ensure the channel will perform
4 its intended function.

4 The Frequency of 92 days is based on operating experience,
4 with regard to channel OPERABILITY and drift, which
4 demonstrates that failure of more than one channel in any
4 92 day interval is a rare event.

4 This SR is modified by a Note indicating that it is only
4 applicable when modifications are implemented that allow
4 online testing.

(continued)

BASES

4 SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.11.3

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channels 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.

The Frequency is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. 10 CFR 50.36.

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A1 (except as marked)

~~Table 4.1-1 (CONTINUED)~~

Channel Description	~~Check~~ SR 3.3.8.1	~~Test~~	~~Calibrate~~ SR 3.3.8.3	Remarks (A37)
60. Core Exit Thermocouples	~~MO~~ 31 days (A9)	NA	18 months(1)	~~(1)A one-time extension of the calibration frequency to a maximum of 24 months is allowed for Oconee Unit 2 during operating cycle 16.~~
61. Subcooling Monitor	~~MO~~ 31 days	18 months~~(1)~~ (A37)	18 months(1)	~~(1)A one-time extension of the channel test and calibration frequency to a maximum of 24 months is allowed for Oconee Unit 2 during operating cycle 16.~~
62. Main Steam Header Pressure and MSLB detection (analog) channels	ES	QU(1)	18 months	(1) Testing will be performed every 18 months until modifications are implemented to allow for quarterly testing. (SEE 3.3.11)
63. Feedwater isolation circuitry (digital) channels and manual pushbutton	NA	18 months	NA	(SEE 3.3.12 + 13)

~~ES - Each Shift~~
~~DA - Daily~~
~~WE - Weekly~~
~~MO - Monthly~~
~~QU - Quarterly~~
~~AN - Annually~~
~~PS - Prior to startup, if not performed previous week~~
~~NA - Not Applicable~~
~~STB - STAGGERED TEST BASIS~~
A9

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Specification 3.3.8

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<SEE 3.3.8>

Table 4.1-1 (CONTINUED)

Channel Description	Check	Test	Calibrate	Remarks
60. Core Exit Thermocouples	MO	NA	18 months(1)	(1)A one-time extension of the calibration frequency to a maximum of 24 months is allowed for Oconee Unit 2 during operating cycle 16.
61. Subcooling Monitor	MO	18 months(1)	18 months(1)	(1)A one-time extension of the channel test and calibration frequency to a maximum of 24 months is allowed for Oconee Unit 2 during operating cycle 16.
	SR 3.3.11.1	SR 3.3.11.2	SR 3.3.11.3	
62. Main Steam Header Pressure and MSLB detection (analog) channels	~~ES~~ 12 hrs	~~QU~~(1) 92 days	18 months	(1) Testing will be performed every 18 months until modifications are implemented to allow for quarterly testing.
63. Feedwater isolation circuitry (digital) channels and manual pushbutton	NA	18 months	NA	

<SEE 3.3.12 + 13>

SR Note for SR 3.3.11.2

A15

ES - Each Shift
DA - Daily
WE - Weekly
MO - Monthly

QU - Quarterly
AN - Annually
PS - Prior to startup, if not performed previous week
NA - Not Applicable
STB - STAGGERED TEST BASIS

A9

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Specification 3.3.11

<SEE 3.3.8>

Table 4.1-1 (CONTINUED)

Channel Description	Check	Test	Calibrate	Remarks
60. Core Exit Thermocouples	MO	NA	18 months(1)	(1)A one-time extension of the calibration frequency to a maximum of 24 months is allowed for Oconee Unit 2 during operating cycle 16.
61. Subcooling Monitor	MO	18 months(1)	18 months(1)	(1)A one-time extension of the channel test and calibration frequency to a maximum of 24 months is allowed for Oconee Unit 2 during operating cycle 16.
62. Main Steam Header Pressure and MSLB detection (analog) channels	ES	QU(1)	18 months	(1) Testing will be performed every 18 months until modifications are implemented to allow for quarterly testing.
63. Feedwater isolation circuitry (digital) channels and manual pushbutton	~~NA~~	SR 3.3.12.1 18 months	~~NA~~	

<SEE 3.3.11>

<See 3.3.13>

ES - Each Shift
DA - Daily
WE - Weekly
MO - Monthly
QU - Quarterly
~~AN - Annually~~
~~PS - Prior to startup, if not performed previous week~~
~~NA - Not Applicable~~
STB - STAGGERED TEST BASIS

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Specification 3.3.12

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<SEE 3.3.8>

Table 4.1-1 (CONTINUED)

Channel Description	Check	Test	Calibrate	Remarks
60. Core Exit Thermocouples	MO	NA	18 months(1)	(1)A one-time extension of the calibration frequency to a maximum of 24 months is allowed for Oconee Unit 2 during operating cycle 16.
61. Subcooling Monitor	MO	18 months(1)	18 months(1)	(1)A one-time extension of the channel test and calibration frequency to a maximum of 24 months is allowed for Oconee Unit 2 during operating cycle 16.
62. Main Steam Header Pressure and MSLB detection (analog) channels	ES	QU(1)	18 months	(1) Testing will be performed every 18 months until modifications are implemented to allow for quarterly testing.
63. Feedwater isolation circuitry (digital) channels and manual pushbutton	~~NA~~	SR 3.3.13.1 18 months	~~NA~~	

SEE 3.3.11>

<SEE 3.3.12>

ES - Each Shift
DA - Daily
WE - Weekly
MO - Monthly
QU - Quarterly
AN - Annually
PS - Prior to startup, if not performed previous week
NA - Not Applicable
STB - STAGGERED TEST BASIS

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Specification 3.3.13

Amendment No. (Unit 1)
Amendment No. (Unit 2)
Amendment No. (Unit 3)

This change represents no actual change in requirements, only a change in presentation of requirements. This change is consistent with the NUREG.

A14 CTS 3.3.4 requires the BWST level instrumentation to be OPERABLE when the RCS, with fuel in the core, is in a condition with pressure equal to or greater than 350 psig or temperature equal to or greater than 250°F and subcritical. ITS 3.3.8 requires this instrumentation to be OPERABLE during MODES 1, 2, and 3. MODE 3 is defined as subcritical with the average coolant temperature > 250°F. CTS criteria specified as 250°F is considered more limiting than the 350 psig criteria, since the saturation temperature of water at 350 psig is > 435°F. As such, the proposed change is considered administrative. In addition, the CTS applicability statement "with fuel in the core" is deleted since the ITS definition of MODE is premised on "fuel in the vessel." This is a format change due to ITS conversion and is administrative in nature. The proposed change is consistent with the NUREG.

A15 The CTS Table 4.1-1 Item 62 specifies the testing requirements for the Main Steam Header Pressure and MSLB detection (analog) channels. These testing requirements are retained in ITS SR 3.3.11.2 and 3. CTS Table 4.1-1 requires a CHANNEL CALIBRATION every 18 months and a
4 CHANNEL FUNCTIONAL TEST quarterly. The quarterly test requirement is
4 modified by a note indicating that the functional test will be
4 performed every 18 months until modifications are implemented that will
4 allow for quarterly testing. ITS SR 3.3.11.2 Note indicates that it is
4 only applicable when modifications are implemented that allow online
4 testing. Since both the CTS and ITS definitions specify that the
4 required calibration includes the CHANNEL FUNCTIONAL TEST, the specific
4 requirement to perform the CHANNEL FUNCTIONAL TEST on an 18 month
4 frequency is is already encompassed within the CHANNEL CALIBRATION. ITS
4 includes a 92 day CHANNEL FUNCTIONAL TEST which is only applicable
4 after modifications are complete. This change represents no actual
change in requirements, only a change in presentation of requirements.

A16 CTS 3.5.7 Applicability requires the Main Steam Line Break (MSLB) detection and feedwater isolation circuitry to be OPERABLE when main steam header pressure is greater than 700 psig. ITS 3.3.11, 12, and 13 Applicability for this circuitry of MODES 1, 2, and MODE 3 when main steam header pressure is greater than 700 psig except when all MFCVs and SFCVs are closed. With the exception of "except when all MFCVs and SFCVs are closed," which is addressed in a separate less restrictive DOC, the CTS and ITS Applicabilities are equivalent. Therefore, the change is administrative and is consistent with the NUREG.

A17 CTS 3.5.6, 3.4.1, 3.4.3, and 3.3.4 provide requirements for Post Accident Monitoring (PAM) Functions. ITS 3.3.8 consolidates the CTS PAM Functions into one Specification. In CTS, each Function has separate Actions and is considered separately. However, since ITS addresses the PAM functions using common actions, Note 2 to the ACTIONS

Table is used to indicate separate Condition entry is permitted for each function. This is a change in the presentation of requirements, with no actual change in requirements and is, therefore, administrative. The change is consistent with the NUREG.

A18 CTS 3.5.6.2 in conjunction with Table 3.5.6-1, Column B serves as a pointer to the appropriate action for each function (ITS PAM Functions 1, 3, 5, 6, 7, 9, 10, 16 and 17) when the number of instrument channels falls below the limit provided by Table 3.5.6-1, Column A. In ITS, the addition of ITS Table 3.3.8-1 Column "CONDITIONS REFERENCED FROM REQUIRED ACTION G.1" and Required Action G.1 provides comparable requirements. This is an administrative change only, and is necessary due to the different format used for ITS. This change is consistent with the NUREG.

A19 CTS Table 4.1-1 specifies instrumentation surveillance requirements for each instrument function separately. The ITS 3.3.8 SR Note is used to indicate that all 3.3.8 SRs apply to each PAM function in Table 3.3.8-1 except where indicated. The SR Note to SR 3.3.8.2 and SR Note 2 to SR 3.3.8.3 are provided to specify different calibration frequencies for Functions 7 and 10. The SR Notes are need only due to the change in presentation and format. This is an administrative change only, and is consistent with the NUREG.

A20 CTS 3.3.4 provides appropriate actions for an inoperable BWST level instrumentation channel separate from other PAM functions. ITS ACTION G is added for ITS Function 14 as a pointer to the appropriate action for this function. This is necessary because ITS 3.3.8 addresses the PAM functions using an instrumentation table and common actions, where appropriate. This is an administrative change only, and is necessary due to the different format used for ITS. This change is consistent with the NUREG.

A21 CTS Table 3.5.1-1 specifies the minimum channels required OPERABLE for CRD breakers and SCR (electronic trip assembly) control relays on a per trip system basis. ITS LCO 3.3.4 specifies the total number of channels required OPERABLE. Although presented differently, the two requirements are equivalent. As such, this change represents no actual change in requirements, only a change in presentation of requirements and is consistent with the NUREG.

A22 CTS Table 4.1-1 Items 58, 59, and 61 specifies the testing requirements for the Wide Range Hot Leg Level, Reactor Vessel Head Level, and Subcooling Monitor channels. These testing requirements are retained in ITS SR 3.3.8.3. As applied at ONS, CTS Table 4.1-1 requires a CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST of these functions every refueling outage. Both the CTS and ITS definitions specify that the required calibration includes the CHANNEL FUNCTIONAL TEST. Therefore, the specific requirement to perform the CHANNEL FUNCTIONAL TESTS is not retained in the ITS. This change represents no actual

change in requirements, only a change in presentation of requirements and is consistent with the NUREG.

A23 The CTS 3.7.3 through 3.7.7 Applicability is above COLD SHUTDOWN. ITS 3.3.17 through 3.3.21 Applicability is MODES 1, 2, 3, and 4. CTS defines Cold Shutdown as RCS temperature ≤ 200°F. Since ITS MODE 5 is defined as ≤ 200°F, the Applicabilities are equivalent. As such, this change represents no actual change in requirements, only a change in presentation of requirements and is consistent with the NUREG.

A24 The Remarks column of CTS Table 4.1-1 for Items 54, 55, 56, and 57 refer to TMI Items II.F.1.3, 4, 5, and 6 respectively. This reference to the specific origin of the CTS requirement for these post accident monitoring channels is for informational purposes and is deleted. The Bases for ITS 3.3.8, Post Accident Monitoring Instrumentation, provides appropriate reference to the origin of the requirements without calling out specific TMI Item numbers. This change represents no actual change in requirements, only a change in presentation of requirements and is consistent with the NUREG.

A25 Not used.

A26 Not used.

A27 CTS Table 3.5.1-1 and Note k requirements provide operability and action requirements based on instrument channels per steam generator. ITS 3.3.11 ACTIONS Note is added to allow separate condition entry for the main feedwater isolation function associated with a steam generator. This provision allows four hours to place a channel in trip for each function when Condition A is entered. The change is consistent with the CTS requirement and is only necessary due to the format of the ITS ACTIONS Table. In ITS, only four hours would be allowed from initial entry into the Table. Therefore, without the note, if another channel became inoperable sometime within the four hour period, only the time remaining from initial entry would be allowed. This change represents no actual change in requirements, only a change in presentation of requirements and is consistent with the NUREG.

A28 CTS does not preclude a change in mode while in an action statement. In general, ITS precludes MODE changes while relying on ACTIONS when the ACTIONS may eventually require a unit shutdown. ITS 3.3.8, ACTIONS Note 1 excludes the MODE change restrictions of LCO 3.0.4 for the PAMs. Therefore, the CTS and ITS allowances for mode changes for the PAM instruments are equivalent. This exception allows entry into an applicable MODE while relying on the ACTIONS even though the ACTIONS may eventually require a unit shutdown. This exception is acceptable due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments. This change is consistent with the NUREG.

A29 CTS 3.5.6.1 excludes the provisions of Technical Specification 3.0 for the PAM instruments. ITS 3.3.8 does not provide a similar provision, however, none is needed since appropriate actions are provided for all conditions. Therefore, the change is administrative and consistent with the NUREG.

A30 CTS Table 3.5.6-1 specifies that 2 qualified core exit thermocouple trains must be OPERABLE. The accompanying Note (a) indicates that 5 of 12 qualified core exit thermocouples (CETs) must be operable per train for a train to be considered operable. ITS Table 3.3.8-1 specifies that the core exit temperature function consisting of 2 independent sets of 5 CETS shall be OPERABLE. Note d indicates that the subcooling margin monitor takes the average of the five highest CETs for each of the Inadequate Core Cooling Monitor (ICCM) trains. Although the presentation of these requirements differs, the requirements are equivalent. Therefore, the change is administrative and consistent with the NUREG.

A31 CTS Table 3.5.1-1 Note f.1 requires placing the Reactor Trip Module (RTM) output in the tripped condition within one hour of discovering it inoperable. ITS 3.3.3 Required Action A.1.1 requires tripping the associated CRD trip breaker within one hour. These two actions are considered equivalent since tripping the associated CRD trip breaker effectively places the RTM output in the tripped condition. Therefore, the change is administrative and consistent with the NUREG.

A32 CTS Table 3.5.1-1 Notes j.1 and j.2 require restoration of an inoperable SCR Control Relay (same as ETA relay) or removal of power from the CRD mechanisms supplied by the inoperable SCR Control Relay when one or more SCR control relays are inoperable. ITS 3.3.4 ACTION C requires tripping the corresponding AC CRD trip breaker(s)(Required Action C.2) when one or more ETA relays are inoperable. This action is equivalent since tripping the corresponding AC CRD trip breaker(s) removes power from the CRD mechanisms. Also, restoration is always an option in ITS so there is not need to provide a separate action for this. Therefore, the change is administrative and consistent with the NUREG.

A33 CTS Table 3.5.1-1, Item 12 describes the functional unit as ESF High Pressure Injection Systems and Reactor Building Isolation (Non-essential Systems. ITS LCO 3.3.6.a describes this function as High Pressure Injection, Reactor Building (RB) Non-Essential Isolation, Keowee Start, Load Shed and Standby Breaker Input and Keowee Standby Bus Feeder Breaker Input (ES Channels 1 and 2). The ITS LCO statement was expanded to provide a complete list of equipment actuated by the ES channels. The LCO statement does not change the technical specification requirements. Therefore, the change is administrative.

A34 CTS Table 3.5.1-1, Item 13 describes the functional unit as ESF Low Pressure Injection System. ITS LCO 3.3.6.b describes this function as the Low Pressure Injection System and Reactor Building Essential

Isolation (ES Channels 3 and 4). The ITS LCO statement was expanded to provide a complete list of equipment actuated by the ES channels. The LCO statement does not change the technical specification requirements. Therefore, the change is administrative.

A35 CTS Table 3.5.1-1, Item 14 describes the functional unit as ESF Reactor Building Isolation (Essential Systems) and Reactor Building Cooling System. ITS LCO 3.3.6.c describes this function as Reactor Building (RB) Cooling, Reactor Building Essential Isolation and Penetration Room Ventilation (ES Channels 5 and 6). The ITS LCO statement was expanded to provide a complete list of equipment actuated by the ES channels. The LCO statement does not change the technical specification requirements. Therefore, the change is administrative.

A36 CTS 3.8.1.10 requires the reactor building purge system, including the radiation monitors, to be operable immediately prior to refueling operation. ITS 3.3.16 requires the Reactor Building Isolation-High Radiation function to be OPERABLE during CORE ALTERATION and during movement of irradiated fuel assemblies within the reactor building. CTS defines "refueling operation" as an operation involving a change in core geometry by manipulation of fuel or control rods when the reactor vessel head is removed. Also, movement of irradiated fuel assemblies within the reactor building can only be performed subsequent to the start of refueling. As such, the change is administrative and consistent with the NUREG.

A37 CTS Table 4.1-1 Remarks Note 1 allows a one-time extension of the test frequency to a maximum of 23 months for items 45 and 46 and a maximum of 24 months for items 58, 59, 60, and 61 for Oconee Unit 2 in operating cycle 16. This provision is no longer needed and is deleted since operating cycle 16 has passed. As such, the change is administrative.

4 A38 A Note is added to the ACTIONS Table for ITS LCO 3.3.19 and to Required
4 Action A of LCO 3.3.17, LCO 3.3.18, and LCO 3.3.21 indicating that the
4 Completion Time for Required Actions are reduced when in Condition L of
4 LCO 3.8.1. The addition of this Note does not change any technical
4 requirements, it only prompts the user to recognize that the Completion
4 Times are less than that indicated when in Condition L of LCO 3.8.1.
4 Since the requirements are not changed, only restated, this is an
4 administrative change.

Supp.3 54 28 <Except as marked>

MSLB Detection and MFW Isolation

CTS

One or more MFW Isolation Functions with two or more channels inoperable OR

B.1 Be in MODE 3. AND

12 hours 5

T3.5.1-1 Item 20, Col. D

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B ~~F~~. Required Action and associated Completion Time not met ~~for Functions 1.c, 2, 3 or 4~~.	B.2.1 ~~F.1~~ Reduce ~~once through steam generator~~ main steam header pressure to < ~~750~~ 700 psig. OR	18 ~~12~~ hours 5
	B.2.2 Close all MFCVs and SFCVs.	18 hours

Doc L18

SURVEILLANCE REQUIREMENTS

-----------------------------------NOTE-----------------------------------
Refer to Table 3.3.11-1 to determine which SRs shall be performed for each EFIC Function.

SURVEILLANCE	FREQUENCY	
SR 3.3.11.1 Perform CHANNEL CHECK. INSERT SR Note	12 hours	4.1.1 T 4.1-1 Item 62 Col. "Check"
SR 3.3.11.2 Perform CHANNEL FUNCTIONAL TEST.	92 ~~31~~ days 31	4.1.1 T 4.1-1 Item 62 CFT
SR 3.3.11.3 Perform CHANNEL CALIBRATION.	9 ~~[18]~~ months	4.1.1 T 4.1-1 Item 62 Col "Calibrate"
SR 3.3.11.4 Verify EFIC RESPONSE TIME is within limits.	[18] months on a STAGGERED TEST BASIS	7

Supp 4

INSERT 3.3-29A

4 -------------------NOTE--------------------
4 Only applicable when modifications are
4 implemented that allow online testing.
4 ---

shunt trip function being inoperable. This is consistent with the NUREG Bases discussion and the CTS requirements.

26 Not used.

27 NUREG LCO 3.3.14, "EFIC-EFW-Vector Valve Logic," is not adopted since it is not applicable to ONS. ONS design does not include vector valve logic.

28 NUREG Specification 3.3.11, Emergency Feedwater Initiation and Control (EFIC) System Instrumentation; NUREG Specification 3.3.12, EFIC Manual Initiation; and NUREG Specification 3.3.13, EFIC logic, are modified to address Main Steam Line Break Detection and MFW Isolation Circuitry only. ITS Specifications 3.3.14 and 3.3.15 are added to address Emergency Feedwater System Initiation Circuitry and Main Steam Line Break and Main Feedwater Isolation instrumentation separately. The NUREG Specification combines the EFW System Initiation, MSL Isolation and MFW Isolation functions into one Specification apparently due to common instrumentation and similar initiation circuitry. ONS does not have common instrumentation and similar initiation circuitry for these functions. Consistent with CTS, the ITS addresses these requirements by separate Specifications. The Specification titles, LCOs, ACTIONS, and Surveillance Requirements are appropriately modified to reflect ONS specific terminology and design requirements. Where appropriate, ITS Required Actions are based on similar NUREG Required Actions. For example, the Completion Time of one hour for ITS 3.3.15, Required Action A.1 is consistent with NUREG Specification 3.3.7, Required Action A.2, which allows one hour to declare an affected component inoperable when the actuation logic is inoperable.

29 SR 3.3.8.2 is added to the Post Accident Monitoring (PAM) SR Table to capture the 12 month calibration frequency of the containment pressure and hydrogen concentration functions. ITS SR 3.3.8.2 is modified by a note indicating that the SR is only applicable to these two functions. NUREG SR 3.3.17.2 (ONS SR 3.3.8.3) is modified by a note that indicates that the 18 month calibration is not applicable to these two functions. This change is necessary to accommodate the different frequencies for CHANNEL CALIBRATION.

30 NUREG Table 3.3.17-1 (ONS Table 3.3.8-1) is modified to list the Regulatory Guide 1.97 Type A and the Regulatory Guide 1.97 non-Type A instruments and their associated requirements as documented in the NRC Safety Evaluation Report for Regulatory Guide 1.97 related to Oconee. The "NOTE" at the bottom of the NUREG Table is deleted since it does not apply plant specific.

31 NUREG SR 3.3.11.2, as it relates to the MSLB Detection and MFW Isolation
4 Circuitry, is modified to retain CTS requirements. CTS (Table 4.1-1
4 Item 62) specifies the CHANNEL FUNCTIONAL TEST on a quarterly (92 day)
4 frequency with a note indicating the test is only applicable when

4 modifications are implemented that allow online testing. ITS SR
4 3.3.11.2 and associated note address this requirement in an equivalent
4 manner.

32 The frequency of 92 days for NUREG SR 3.3.15.2 (ITS SR 3.3.16.2) is modified to partially incorporate the CLB. DPC considers the NUREG frequency of 92 days to be inappropriate for ONS. CTS 3.8.10 requires the radiation monitor that initiates purge isolation to be verified operable immediately prior to beginning refueling operations. For consistency with ITS SR 3.9.3.2, which verifies that the reactor building purge supply and exhaust valve actuates to the correct position on an actual or simulated actuation signal once each refueling outage prior to beginning CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, the same SR Frequency is adopted for ITS SR 3.3.16.2. This is appropriate since the safety function of the radiation monitor is to isolate the purge valves. Requiring performance of SR 3.3.16.2 at this Frequency represents a reasonable relaxation of the current requirement of "immediately prior to beginning refueling operations."

33 ITS Specifications 3.3.17 through 3.3.21 are added to capture current technical specification requirements for Emergency Power Switching Logic Functions. The EPSL is designed to assure that power is supplied to the unit main feeder buses and, hence to the unit's essential loads. Appropriate LCOs, ACTIONS, and Surveillance Requirements are added.

34 NUREG LCO 3.3.8, "Emergency Diesel Generator (EDG) Loss of Power Start (LOPS)," is not adopted since it is not applicable to ONS. ONS does not use EDGs for emergency power. Comparable ITS requirements related to the Keowee Hydro Units, which are used at Oconee for emergency power, are included in ITS 3.3.19.

35 NUREG Specification 3.3.16, "Control Room Isolation - High Radiation," is not included in the proposed ONS ITS. ONS does not have an automatic Control Room isolation. At ONS, a high radiation alarm is annunciated in the Control Room at which time the Control Room operator can energize the outside air booster fans and filter systems to minimize unfiltered air entering the control room. Adequate administrative controls are in place to ensure the operability of this function.

36 The NUREG applicability for LCO 3.3.15 (ONS ITS LCO 3.3.16) of MODES 1, 2, 3, and 4 is not adopted in the conversion. The ITS requires the reactor building purge isolation - high radiation monitor to be operable only during CORE ALTERATION and during movement of irradiated fuel assemblies within the containment. At ONS, the reactor building purge valves are required to be verified sealed closed in MODES 1, 2, 3, and 4 and (refer to SR 3.6.3.1). Since the function of the high radiation channel is to initiate closure of these valves on a high radiation signal, the channel need not be OPERABLE during these MODES since the valves are closed.

As a result of the modified applicability, NUREG 3.3.15 ACTIONS A and B are deleted since they no longer apply. These changes maintain the CTS requirements.

37 CTS do not specify an allowable value for the reactor building purge isolation radiation monitor. The UFSAR does not take credit for isolating the purge valves during a refueling accident. The isolation function serves only to minimize radioactive releases but is not required to maintain releases within 10 CFR 100 limits. As such, the specific wording related to the setpoint allowable value in NUREG SR 3.3.15.3 is not included in the ONS ITS.

38 NUREG LCO 3.3.18, "Remote Shutdown System," is not adopted. The ONS CTS does not include any requirements related to shutdown from outside the control room. This function is adequately controlled administratively. In addition, the proposed ONS ITS includes requirements related to the Standby Shutdown Facility, which 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 is in addition to and supplements the current shutdown capability described in the UFSAR.

39 The allowable value for the RCS Variable Low Pressure Function is located in the Core Operating Limits Report for Oconee. Therefore, the equation with bracketed values provided in NUREG Table 3.3.1-1 for Item 5, RCS Variable Low Pressure, is replaced with: "As specified in the COLR."

40 NUREG SR 3.3.1.11 requires a channel check of the EFW initiation function. A comparable channel check requirement is not included for ITS 3.3.14, EFW Pump Initiation Circuitry. The current test requirements, which do not include a channel check, were adopted and are considered adequate based on operating experience to ensure instrument channel operability.

41 Not used.

42 Not used.

43 Not used.

44 CTS Table 4.1-1, Item 1 specifies a monthly functional test for the Reactor Trip Modules. In the conversion to ITS, this Frequency is retained in ITS SR 3.3.3.1. This change is made to provide requirements consistent with CTS for this testing. No new requirements are added by this change and no existing requirements are removed.

45 NUREG Specification 3.3.17 is modified to incorporate plant specific requirements for HPI, LPI and RBS flow instrument channels and BWST water level instrument channels. At ONS there is only one flow

instrument channel per train. If the flow instrument is inoperable, ONS considers the associated train inoperable since without flow indication the operator has no means of precluding pump runout or loss of NPSH. Therefore, the appropriate action for an inoperable flow channel is to declare the affected train inoperable. ACTION F is added to address the condition where one or more of these required flow instrument channels is inoperable. Required Action F.1 requires the affected train be declared inoperable and the appropriate action entered for the affected system. Condition F has a note that indicates that the Condition only applies to the flow instrument channels (Function 18, 19, and 20). The addition of ACTION F made it necessary to modify Conditions A, C, and D to exclude or include Functions for which the conditions are applicable. Table 3.3.17-1 is modified to replace the Condition reference from the Required Action E.1 as being not applicable since the appropriate action only applies to these particular instruments and that action is contained within Required Action F.1.

ACTION E was added to address the condition where one of two BWST water level channels is inoperable. Continuous operation with one of the two required channels is not appropriate because alternate indications are not available. This indication is crucial in determining when the water source for ECCS should be swapped from the BWST to the reactor building sump. Therefore, 24 hours is allowed to restore the indication, consistent with CTS requirements. With both BWST water level channels inoperable, the appropriate action is to shut down.

46 NUREG 3.3.1 Required Action E.1, G.1 and Table 3.3.1-1 provide a bracketed value for the Applicability of the Main Turbine Trip and Loss of Main Feedwater Pumps RPS Functions. The ITS Applicability for each function is based on analyses presented in BAW 1893 that show for operation below certain power levels, the trips are not necessary to minimize challenges to the PORV as required by NUREG-0737. The CTS Applicability for these functions is when the reactor is in a startup mode or in a critical state. Duke Energy has performed a plant specific analysis which concludes that the Oconee RPS System is consistent with the BAW analyses and that the appropriate plant specific applicability for each function is 30% RTP for the Main Turbine Trip function and 2% RTP for the Loss of Main Feedwater Pumps trip function.

47 NUREG Table 3.3.1-1 provides a bracketed value for allowable value for the Main Turbine Trip (Hydraulic Fluid Pressure) function and the Loss of Main Feedwater Pumps (Hydraulic Oil Pressure) function. CTS does not specify allowable values for these functions. Appropriate plant specific values are added.

48 ITS Specification 3.3.22 is added to require the Manual Keowee Emergency Start Function to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies. This addition is necessitated by the addition of requirements for AC Source in MODES 5 and 6 and during movement of irradiated fuel assemblies (refer to Section 3.8). Required

Action A.1 requires both Keowee Hydro Units to be declared inoperable immediately when the required channel is inoperable. ITS SR 3.3.22.1 requires a CHANNEL FUNCTIONAL TEST of the Keowee manual emergency start function every 12 months. The EPSL is designed to assure that power is supplied to the unit main feeder buses and, hence to the unit's essential loads.

49 ONS design requires that the voltage sensing circuit associated with an AC power source be OPERABLE for the AC power source to be considered OPERABLE. Therefore, since requirements for AC Source in MODES 5 and 6 and during movement of irradiated fuel assemblies are added (refer to Section 3.8), requirements for EPSL voltage sensing circuits are included in the ITS. LCO Note 2 is added to specify that only the EPSL voltage sensing circuit(s) associated with required AC power source(s) are required to be OPERABLE. ITS 3.3.18 ACTION C is added to require the affected AC Source to be declared inoperable when the Required Action and associated Completion Time is not met or when two or more channels of a required circuit(s) are inoperable in MODES 5 and 6. ITS 3.3.18 ACTION D is added to require suspending movement of irradiated fuel assemblies when the Required Action and associated Completion Time is not met during movement of irradiated fuel assemblies.

50 NUREG SR 3.3.5.2 Note is deleted since ESPS channels are not removed from service to perform the CHANNEL FUNCTIONAL TEST at Oconee. Since the provisions of the note will not be used at Oconee, the note is removed to preclude implying that the channel is placed in bypass for testing.

51 Specification 3.3.3 Required Action B.2.2 and C.2 and Specification 3.3.4 NUREG 3.3.3 Required Action B.2.2 and C.2 and 3.3.4 Required Action D.2.2 and E.2 are modified to specify, "Remove power from all CRD trip breakers" instead "Remove all power to CRD system." The requirement to remove all power to CRD system could be interpreted to include all control power and logic cabinets since they are a part of this system. It is more appropriate to remove power from all CRD trip breakers. This action places the unit in a condition where the LCO no longer applies.

52 NUREG SR 3.3.3.1 is modified to delete the SR Note. The reactor trip module is not tested by placing it in bypass. It is either in service or in the tripped condition. Therefore, the SR 3.3.3.1 Note is unnecessary and confusing.

53 The Applicability of NUREG LCO 3.3.6 and LCO 3.3.7 is modified to only include the portions of MODE 3 in which the associated ESPS equipment is required to be OPERABLE. This change is made to reflect the fact that some ESPS actuated equipment is not required in either MODE 3 or MODE 4. This change was made to provide Applicabilities for the ESPS requirements which are consistent with the Applicabilities of the actuated equipment.

54 NUREG Specification 3.3.1 Condition C is revised to specify that these Conditions also apply when two or more RPS channels are inoperable. Specification 3.3.3 Conditions B and C are revised to specify that these Conditions also apply when more than one RPS Reactor Trip Module (RTM) is inoperable. Specification 3.3.5 Condition B is revised to specify that this Condition applies when more than one channel is inoperable for each of one or more Parameters. Specification 3.3.11 Condition F is revised to specify that this Condition also applies when more than two channels are inoperable in a Function. These changes provide ACTION requirements which specifically remove the unit from the Applicability for these Specifications. Without this addition, entry into the ACTION requirements of LCO 3.0.3 would be required. Entry into the Required Actions of 3.3.1 Condition C, 3.3.3 Conditions B and C, 3.3.5 Condition B and 3.3.11 Condition F, rather than the Action Requirements of LCO 3.0.3, is more appropriate because specific Required Actions which result in the unit exiting the unique Applicability for each function are provided. This change is consistent with Column D of CTS Table 3.5.1-1 which provides an action within the table rather than requiring a default to CTS 3.0 (equivalent to ITS LCO 3.0.3).

55 In Table 3.3.1-1 the Applicable MODES for Nuclear Overpower High Setpoint function and RCS High Pressure function are expanded to include MODE 3 when not in shutdown bypass operation with any CRD trip breaker in the closed position and the CRD System capable of rod withdrawal. Note (d) is added to ITS Table 3.3.1-1. The Applicable MODES for the RCS High Pressure function is modified to apply only in MODE 2 when not in shutdown bypass operation. This additional Applicability in MODE 3 is appropriate to ensure that the instrumentation required to initiate the insertion of any withdrawn CONTROL RODS is OPERABLE whenever CONTROL RODS are withdrawn or capable of withdrawal. The automatic insertion of any withdrawn CONTROL ROD is consistent with evaluations of accidents initiated from MODE 3. In addition, the applicable MODE for the RCS High Pressure function to apply is MODE 2 when not in shutdown bypass operation. This is appropriate since the Shutdown Bypass RCS High Pressure function is required to be OPERABLE in MODE 2 during shutdown bypass operation with any CRD trip breakers in the closed position and the CRD System capable of rod withdrawal.

56 NUREG SR 3.3.9.3 is moved to Specification 3.3.10 as SR 3.3.10.3. This SR provides verification that at least one decade of overlap exists between the source range and wide range instruments when the wide range instruments come on scale. By associating this SR with the LCO for the source range instruments, the NUREG inappropriately establishes the successful performance of this SR as an OPERABILITY requirement for the source range instruments. By associating this SR with LCO 3.3.10, it more appropriately establishes the successful performance of the SR as an OPERABILITY requirement for the wide range instrument channels. The requirement to verify one decade overlap between the source range and wide range instrument channels ensures a continuous source of power indication is maintained during the approach to criticality. Provided the source range instruments are maintained on scale, a continuous indication of power is maintained, even if the wide range instruments fail to come on scale within the required one decade overlap. By associating this SR with the wide range instrument channels rather than the source range instrument channels, successful performance of this SR will ensure that the wide range instrument channels are OPERABLE prior to relying upon them as the primary indication of core reactor power.

57 NUREG SR 3.3.1.3 has been revised to replace the requirement to "Perform CHANNEL CALIBRATION" with "Adjust the power range channel imbalance output." The Note associated with SR 3.3.1.3 has been revised to correct a typographical omission by inserting a >/= symbol before 15% RTP. NUREG SR 3.3.1.5 has been deleted. NUREG SRs 3.3.1.6 and 3.3.1.7 have been renumbered to account for the deletion of SR 3.3.1.5. NUREG Table 3.3.1-1 is modified to specify additional applicable SRs for Function 1.a and 1.b (CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS and CHANNEL CALIBRATION every 18 months), and Function 8 (CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS) and to correct the SR numbering as a result of the deletion of SR 3.3.1.5. As a result of the deletion of SR 3.3.1.5, the CHANNEL CALIBRATION formerly required by SR 3.3.1.5 for Functions 1.a, 1.b, and 8 has been deleted as an applicable SR.

NUREG SR 3.3.1.5 currently specifies a CHANNEL CALIBRATION. However, the SR is not actually a calibration of the Function, but constitutes only an adjustment of the inputs to the Function. Since the definition of CHANNEL CALIBRATION is intended to encompass the sensor as well as the remainder of the entire channel, the use of this terminology is misleading and confusing, even with the addition of the Note to SR 3.3.1.5. SR 3.3.1.3 (performed every 31 days) measures the imbalance error and requires correction if the error is >/= [2]% RTP. The change to SR 3.3.1.3 still requires correction of the error when it is determined. The required normalization of power range channel output to the calorimetric coincident with the imbalance output being normalized to the incore output is adequately addressed by the combination of SRs 3.3.1.2 and 3.3.1.3.

The proposed change results in modifying the testing requirements for three of the Functions listed in Table 3.3.1-1 as follows:

Function 1.a; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with requirements to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS and a CHANNEL CALIBRATION every 18 months. The combination of applicable SRs (CHANNEL CHECK, verification, and adjustment when required, of power range channel output to calorimetric heat balance, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

Function 1.b; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with requirements to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS and a CHANNEL CALIBRATION every 18 months. The combination of applicable SRs (CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

Function 8; Requirement to perform a CHANNEL CALIBRATION every 92 days has been replaced with a requirement to perform a CHANNEL FUNCTIONAL TEST every 45 days on a STAGGERED TEST BASIS. The combination of applicable SRs (CHANNEL CHECK, comparison, and adjustment when required, of out of core measured AXIAL POWER IMBALANCE to incore measured AXIAL POWER IMBALANCE, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION) is sufficient to ensure that instrument drift error is maintained within acceptable limits for Function OPERABILITY.

The remainder of the changes to Table 3.3.1-1 are considered to be editorial in nature as they reflect the renumbering of the SRs due to the deletion of the requirements of SR 3.3.1.5.

The change to the SR 3.3.1.3 Note is made for consistency with the Note associated with SR 3.3.1.2.

4 58 ITS Specification 3.3.23, "Main Feeder Bus Monitoring Panel (MFBMP)," is
4 added to require three MFBMP undervoltage sensing relays per bus and two
4 MFBMP undervoltage actuation logic channels to be OPERABLE in MODES 1,
4 2, 3, or 4 along with appropriate ACTIONS and Surveillance Requirements.
4 No credit is taken for this system in any accident or transient
4 analyses. Although the MFBMP does not meet any 50.36 criteria, a
4 Specification has been added since the MFBMP provides defense-in-depth
4 for any scenario which results in loss of power to the main feeder
4 buses.

4 <Except as marked>

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.11.1 (continued)

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, where practical, to be reading at the bottom of the range and not failed downscale. 2

The Frequency, about once every shift, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel ~~operability~~ during potentially normal operational use of the displays ~~associated~~ with the LCO required channels. 2

SR 3.3.11.2

Supp 4

INSERT B 3.3-109A

~~A CHANNEL FUNCTIONAL TEST verifies the function of the required trip, interlock, and alarm functions of the channel. Setpoints for both trip and bypass removal functions must be found within the Allowable Value specified in the LCO. (Note that the Allowable Values for the bypass removal functions are specified in the Applicable MODES or Other Specified Condition column of Table 3.3.11-1 as limits on applicability for the trip Functions.) Any setpoint adjustment shall be consistent with the assumptions of the current unit specific setpoint analysis.~~ 4 5

~~The Frequency of 31 days is based on unit operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given function in any 31 day interval is a rare event.~~

SR 3.3.11.3

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The test verifies the channel responds to a measured parameter within the necessary range

(continued)

INSERT B 3.3-109A

4 is performed on each required instrumentation channel to ensure the
4 channel will perform its intended function.

4

4 The Frequency of 92 days is based on operating experience, with regard
4 to channel OPERABILITY and drift, which demonstrates that failure of
4 more than one channel in any 92 day interval is a rare event.

4

4 This SR is modified by a Note indicating that it is only applicable when
4 modifications are implemented that allow online testing.

BASES

Supp 4

SURVEILLANCE REQUIREMENTS

SR 3.3.11.3 (continued)

and accuracy. CHANNEL CALIBRATION leaves the channels 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 ~~unit specific~~ setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the ~~unit specific~~ setpoint analysis. 2

The Frequency is based on the assumption of an [18] month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. 1

SR 3.3.11.4 5

This SR verifies individual channel actuation response times are less than or equal to the maximum value assumed in the accident analysis.

Response time testing acceptance criteria are included in "Unit Specific Response Time Acceptance Criteria" (Ref. 6).

Individual component response times are not modeled in the analysis. The analysis models the overall or total elapsed time, from the point at which the parameter exceeds the actuation setpoint value at the sensor, to the point at which the end device is actuated.

EFIC RESPONSE TIME tests are conducted on an [18] month STAGGERED TEST BASIS. Testing of the final actuation devices, which make up the bulk of the EFIC RESPONSE TIME, is included in the testing of each channel. Therefore, staggered testing results in response time verification of these devices every [18] months. The [18] month test Frequency is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. EFIC RESPONSE TIMES cannot be determined at power since equipment operation is required.

(continued)

ITS Section 3.4

ID 222

Subject: Revised SR 3.4.13.1 to revert back to CTS requirement to evaluate RCS operational leakage.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	-------------------NOTE-------------------- Not required to be performed until 12 hours after establishment of steady state operation. --- 4 Evaluate RCS Operational LEAKAGE.	72 hours
SR 3.4.13.2	Verify steam generator tube integrity is in accordance with the Steam Generator Tube Surveillance Program.	In accordance with the Steam Generator Tube Surveillance Program

BASES

ACTIONS

B.1 and B.2 (continued)

The Completion Times allowed are reasonable, based on operating experience, to reach the required conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 5, the pressure stresses acting on the RCPB are much lower and further deterioration is much less likely.

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1

4 Evaluation of RCS LEAKAGE ensures identified and
4 unidentified leakage is maintained within the associated LCO
4 limits and ensures that the integrity of the RCPB is
4 maintained. Identified and unidentified LEAKAGE is determined by performance of an RCS water inventory balance. Primary to secondary LEAKAGE is measured by effluent monitoring within the secondary systems or comparison of primary and secondary radioisotope concentrations. These methods provide the required leakage detection sensitivity to ensure leakage is within limits..

The RCS water inventory balance must be performed with the reactor at steady state operating conditions and near operating pressure. Therefore, a Note is added allowing that this SR is not required to be performed until 12 hours after establishing steady state operation. This 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

Steady state operation is required to perform a proper water inventory balance since calculations during maneuvering are not useful. For RCS operational LEAKAGE determination by water inventory balance, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP pump seal injection and return flows.

4 An early warning of LEAKAGE is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1 (continued)

These leakage detection systems are specified in LCO 3.4.15, "RCS Leakage Detection Instrumentation."

The 72 hour Frequency is a reasonable interval to trend LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents.

SR 3.4.13.2

This SR provides the means necessary to determine SG OPERABILITY in an operational MODE. The requirement to demonstrate SG tube integrity in accordance with the Steam Generator Tube Surveillance Program emphasizes the importance of SG tube integrity, even though this Surveillance cannot be performed at normal operating conditions.

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

Specification 3.4.13

A1 <except as marked>

Table 4.1-2

MINIMUM EQUIPMENT TEST FREQUENCY

	Item	Test	Frequency	
	1. Control Rod Movement (1)	Movement of Each Rod	Monthly	<SEE 3.1>
Supp 2	2. Pressurizer Safety Valves	Setpoint	18 months(4)	<SEE 3.4.10>
Supp 2	3. Main Steam Safety Valves	Setpoint	18 months(4)	<SEE 3.7>
	4. Refueling System Interlocks(5)	Functional	Prior to Refueling	<SEE 3.3>
	5. Main Steam Stop Valves (1)	Movement of Each Stop Valve	Monthly	<SEE 3.7>
Supp 4 SR 3.4.13.1	6. RCS ~~Reactor Coolant System~~ (2) Leakage	Evaluate	~~Daily~~ 72 hrs	L14
	7. Emergency Condenser (6) Circulating Water System Test	Functional	18 months	<SEE 3.7>
	8. High Pressure Service Water Pumps and Power Supplies	Functional	Monthly	<SEE 3.7>
	9. Spent Fuel Cooling System	Functional	Prior to Refueling	<SEE 3.7>
	10. High Pressure and Low (3) Pressure Injection System	Vent Pump Casings	Monthly and Prior to Testing	<SEE 3.5>
Supp 2	11. Emergency Feedwater Pump Automatic Start and Automatic Valve Actuation Feature	Functional	18 months	<SEE 3.7>
Supp 2	12. MSLB Feedwater Isolation (7) Feature	Functional	18 months	<SEE 3.7>
	13. Essential Siphon Vacuum (8) System Test	Functional	Quarterly	<SEE 3.7>

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3 of 4

the unit be place in MODE 3 within 12 hours and MODE 5 within 36 hours. These changes provide appropriate limits upon the period of time that RCS leakage is permitted to exceed specified limits. The requirements to be in MODE 3 and then MODE 5 is necessary to place the unit in a condition where the driving force (RCS pressure) for RCS leakage is minimized. The requirement to be in MODE 3 within 16 hours (4 hours + 12 hours) is a more restrictive requirement upon unit operation. The requirement to place the unit in MODE 5 is a more restrictive requirement upon unit operation.

If LEAKAGE through the tubes of one steam generator exceeds specified limits, CTS 3.1.6.4 requires a reactor shutdown be initiated within 4 hours and the reactor be in cold shutdown within 36 hours. Initiation of reactor shutdown within 4 hours implies 4 hours to restore LEAKAGE to within limits. With RCS LEAKAGE not within limits, ITS 3.4.13 Action A permits 4 hours to restore LEAKAGE to within limits. With the Required Action and associated Completion Time of Condition A not met, ITS 3.4.13 Action B requires the unit be in MODE 3 within 12 hours and MODE 5 within 36 hours. The requirement to place the unit in MODE 3 within 12 hours is provided to ensure unit cooldown to MODE 5 is begun promptly to place the unit in a condition where the driving force (RCS pressure) for RCS leakage is minimized. The requirement to place the unit in MODE 3 within 16 hours after entry into ITS 3.4.13 Action A is a more restrictive requirement upon unit operation. These changes are consistent with the NUREG.

M34 CTS 3.1.6.5 permitted the rate of unit shutdown and the condition of shutdown to be based on a case specific safety evaluation for reactor shutdowns required by CTS 3.6.1.1, 3.6.1.2 and 3.6.1.3. ITS 3.4.13 Actions A and B provide generic requirements for Conditions involving excessive RCS leakage comparable to CTS 3.6.1.1, 3.6.1.2 and 3.6.1.3.

The requirement to place the unit in MODE 3 within 12 hours and in MODE 5 within 36 hours provides for promptly placing the unit in a condition where the driving force (RCS pressure) for RCS leakage is minimized. The completion times are reasonable, based on operating experience to achieve the require conditions in an orderly manner, without challenging unit systems. The elimination of the flexibility afforded by case specific safety evaluations and its replacement with prescription Conditions and Completion Times is a more restrictive requirement upon unit operation and is consistent with the NUREG.

4 M35 Not used.

 CTS

TSTF 116, RD

Supp. 3

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
SR 3.4.13.1	-------------------NOTE------------------- Not required to be performed ~~in MODE 3 or 4~~ until 12 hours after establishment of steady state operation. -- ~~Perform~~ RCS ~~water inventory balance~~. 55	~~-----NOTE----- Only required to be performed during steady state operation~~ ---------------- 72 hours	Table 4.1-2 footnote (2) Table 4.1-2 Item 6
SR 3.4.13.2	Verify steam generator tube integrity is in accordance with the Steam Generator Tube Surveillance Program.	In accordance with the Steam Generator Tube Surveillance Program	4.17.4.a

Supp 2

~~Verify~~ RCS operational leakage ~~is~~ ~~within limits~~ by ~~performance of~~ TSTF 61

55

Evaluate

Supp. 4

of 75% RTP is the power level assumed in the accident and transient analsyis for three RCP operation.

55 NUREG SR 3.4.13.1, as modified by approved TSTF 116, Revision 1, requires that RCS operational leakage be verified within limits by
4 performance of an RCS water inventory balance. NUREG SR 3.4.13.1 is
4 modified to require evaluation of RCS Operational LEAKAGE in lieu of
4 requiring verification that RCS LEAKAGE is within limits by performance
4 of an RCS water balance inventory. Since pressure boundary leakage is a
4 limit specified in LCO 3.4.13, NUREG SR 3.4.13.1 requires verification
4 that pressure boundary leakage is within limit. At ONS the leakage
4 detection capabilities (RCS water inventory balance, secondary system
4 effluent monitoring instrumentation, and secondary system radioisotope
4 comparisons) cannot be used to identify pressure boundary leakage.
4 NUREG SR 3.4.13.1 is modified to maintain the current licensing basis
4 specified in CTS Table 4.1-2, Item 6 which requires an evaluation of RCS
4 leakage. The ITS does not specify performance of an RCS water inventory balance since this method is only used for determining identified and unidentified leakage. At ONS, to provide the required leakage detection sensitivity, primary to secondary leakage is determined by effluent monitoring within the secondary system or comparison of primary and secondary radioisotope concentrations. This method of performing the surveillance is described in the Bases.

56 NUREG 3.4.14 LCO is modified to retain the current licensing basis regarding the scope of valves subject to this Specification. CTS 3.1.6.10 and CTS 4.5.1.2.2 establish PIV leakage limits for four valves, CF-12, CF-14, LP47 and LP-48. NUREG 3.4.14 LCO is modified to specify these four valves. NUREG 3.4.14 Condition A and SR 3.4.14.1 are modified to insert the term "required." The use of the term "required" is consistent with the ITS writers guide because the scope of the ITS requirement does not include the entire population of PIVs installed in the plant. The capability for leakage testing each individual ONS PIV does not presently exist. Therefore, the scope of ITS 3.4.14 is appropriately limited to those currently encompassed in the scope of CTS 3.1.6.10 and 4.5.1.2.2.

57 NUREG 3.4.5 Condition A is modified to omit the term "required." NUREG 3.4.5 Condition C is revised to read "Two RCS loops inoperable OR Required RCS loop not in operation." NUREG 3.4.5 Condition A is modified to omit the term "required" since the ONS units have only two RCS loops and both must be OPERABLE to comply with the LCO. NUREG 3.4.5 Condition C is revised to consistently identify and correct the entry conditions. The Condition A entry condition is written based on the inoperable equipment (as are entry conditions for almost all ACTIONS). Therefore, the change to the first entry condition of Condition C provides a consistent identification of entry conditions based on inoperable equipment rather than what remains as OPERABLE equipment. The second entry condition for NUREG 3.4.5 Condition C is corrected since the RCS loops are allowed by the LCO Note to be removed from

operation. Therefore, the LCO does not always require the RCS loop to be operating, and "required" is necessary to differentiate between compliance and noncompliance with the LCO when utilizing the Note allowance.

58 NUREG 3.4.6 Conditions A and B are combined and simplified. NUREG 3.4.6 Condition C is revised to read "Two required loops inoperable OR Required loop not in operation." SR 3.4.6.1 is revised to include "required." The revised entry condition for NUREG 3.4.6 Conditions A and B is based only on the inoperable equipment which is required to be OPERABLE by the LCO (not on the status of all available equipment). An entry condition based on the status of equipment which is not required by the LCO is inconsistent with the remainder of the NUREG and with the Writer's Guide (NUMARC 93-03). The revised Required Actions also provide for clearer direction on when a shutdown to MODE 5 is required (the Note clarifies that MODE 5 is only required if a DHR loop is OPERABLE). Also, the connector between Required Actions B.1 and B.2 is revised from OR to AND (as reflected in proposed Required Actions A.1 and A.2.) The Bases clearly indicate that Required Action B.2 is required if restoration (per Required Action B.1) is not accomplished. With an OR connector, a choice is provided of either Required Action B.1 or B.2, but if Required Action B.1 is chosen and fulfilled, i.e., action to restore has been initiated, Required Action B.2 is not required by the NUREG. Since this is inconsistent with the intent (per the Bases) and with similar requirements in NUREG 1431 and NUREG-1432, the connector is revised to require both actions. If restoration is accomplished, i.e., completed, the Condition is exited and the Required Action to be in MODE 5 is not required.

NUREG 3.4.6 Condition C (proposed Condition B) is revised to consistently identify and correct the entry Conditions. The Condition A entry Condition is written based on inoperable equipment (as are entry conditions for almost all ACTIONS.) Therefore, the change to the first entry condition of Condition C provides a consistent identification of entry conditions based on inoperable equipment rather than what remains as OPERABLE equipment. The second entry condition for 3.4.6 Condition C is corrected since the RCS loops are allowed by the LCO Note to be removed from operation. Therefore, the LCO does not always require the RCS loop to be operating, and "required" is necessary to differentiate between compliance and noncompliance with the LCO when utilizing the Note allowance.

"Required" is also added to SR 3.4.6.1 based on the application of the Note, i.e., a loop is not always required to be in operation.

59 NUREG 3.4.7 Condition A is revised to base the entry conditions on inoperable required equipment and to preclude entry into Condition A when also in Condition B since this results in a requirement to initiate action to restore the "second" DHR loop to OPERABLE status at the same time as the action to restore ONE DHR loop to OPERABLE status. NUREG

3.4.7 Condition B is revised to read "Two required loops inoperable OR Required loop not in operation." SR 3.4.7.1 is revised to include "required."

The revised entry conditions for NUREG 3.4.7 Conditions A and B are based only on the status of equipment which is required to be OPERABLE by the LCO (not on the status of all available equipment). An entry condition based on the status of equipment which is not required by the LCO is inconsistent with the remainder of the NUREG and with the Writer's Guide (NUMARC 93-03). Further with insufficient steam generator capability, both DHR loops are required to be OPERABLE. One inoperable loop would then require entry into NUREG 3.4.7 Condition B if one DHR loop is OPERABLE and operating. Therefore, the NUREG 3.4.7 Condition B entry Condition is revised to "No required DHR loop OPERABLE or required DHR loop not in operation." Also, the requirement to initiate action to restore a "second" DHR loop to OPERABLE status at the same time as the action to restore one DHR loop to OPERABLE status is inappropriate.

"Required" is also added to SR 3.4.7.1 based on the application of the Note, i.e., a loop is not always required to be in operation.

60 NUREG 3.4.8 Condition A is modified to include the term "required." NUREG 3.4.8 Condition B is revised to read "Two required DHR loops inoperable OR required DHR loops not in operation." SR 3.4.8.1 is revised to include "required."

NUREG 3.4.8 Condition A is modified to include "required" based on the application of Note 2, i.e., both loops are not always required to be OPERABLE.

NUREG 3.4.8 Condition B is modified to clarify and correct the entry conditions. The change to the first entry condition provides a clarification such that when only one loop is required to be OPERABLE (i.e., during application of Note 2) and that loop is inoperable, this is the appropriate Condition.

The second entry condition for NUREG 3.4.8 Condition B is corrected since the DHR loops are allowed by the LCO Note to be removed from operation. Therefore the LCO does not always require a DHR loop to be operating and "required" is necessary to differentiate between compliance and noncompliance with the LCO when utilizing the Note allowance.

"Required" is also added to SR 3.4.8.1 based on application of the Note, i.e., a loop is not always required to be in operation.

61 A Note is added to LCO 3.4.6, 3.4.7 and 3.4.8 which permits a DHR loop which is not aligned for DHR operation to be considered OPERABLE if capable of being realigned for DHR operation. This note is necessary

due to the multiple alignment requirements for DHR on Unit 1 and 2 when operating at elevated RCS pressure and because of the dual function of the components (Unit 1, 2 and 3) that comprise the decay heat removal mode of the Low Pressure Injection System. Manual alignment for DHR operation is acceptable since the operation of DHR loops is not an automatic function.

RCS pressure must be maintained significantly greater than 125 psig for operation of the reactor coolant pumps. During operation of a DHR loop when RCS pressure is greater than approximately 125 psig, the ONS Unit 1 and Unit 2 design requires unique alignments of the operating DHR loop due to pressure limits of the DHR cooler. These two DHR loop alignments are referred to a high pressure DHR mode and switchover DHR mode. Operation in high pressure mode requires using either the A or C LPI pump and the A DHR Cooler. Operation in switchover mode requires using either the A or C LPI pump and the B DHR cooler. The B LPI pump cannot be used in either high pressure or switchover mode. Consequently, the B LPI pump cannot be used as an OPERABLE DHR pump when RCS pressure is greater than approximately 125 psig. When either the A or C LPI pump is in operation in high pressure mode using the A DHR cooler, the redundant LPI pump and B DHR cooler remain OPERABLE since they are capable of being realigned to the switchover mode of DHR operation.

For Unit 1 and 2 during operation of a DHR loop when RCS pressure is less than approximately 125 psig, and during any operation of a DHR loop on unit 3, any one of the LPI pumps may be in operation through either DHR cooler. One of the LPI pumps is usually maintained in LPI injection alignment to maintain RCS makeup capability.

The addition of the Note to 3.4.6, 3.4.7 and 3.4.8 maintains current allowances regarding operation of the DHR loops in MODE 4 and 5 while ensuring one DHR loop is OPERABLE and in operation and a second loop is OPERABLE.

Supp. 3

INSERT B 3.4-72A

13

5

BASES (continued)

ensures identified + unidentified leakage is maintained

Evaluation of

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1

associated

and

~~Verifying~~ RCS LEAKAGE within the LCO limits ensures that the integrity of the RCPB is maintained. ~~Pressure boundary LEAKAGE would at first appear as unidentified LEAKAGE and can only be positively identified by inspection.~~ Unidentified LEAKAGE ~~and identified LEAKAGE are~~ determined by performance of an RCS water inventory balance. Primary to secondary LEAKAGE is ~~also~~ measured by ~~performance of an RCS water inventory balance in conjunction with~~ effluent monitoring within the secondary ~~steam and feedwater~~ systems.

identified +

is

Tray

2

TSTF 116, RO

A Note is added allowing that

The 12 hour allowance provides sufficient time to collect + process all necessary data after stable plant conditions are established

Supp. 4

Supp. 3

The RCS water inventory balance must be performed with the reactor at steady state operating conditions and near operating pressure. Therefore this SR is not required to be performed ~~in MODES 3 and 4~~ until 12 hours of steady state operation ~~near operating pressures have been established~~.

after establishing

Since

Steady state operation is required to perform a proper water inventory balance; calculations during maneuvering are not useful ~~and a Note requires the Surveillance to be met when steady state is established~~. For RCS operational LEAKAGE determination by water inventory balance, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP pump seal injection and return flows.

TSTF 116, RO

An early warning of ~~pressure boundary LEAKAGE or unidentified~~ LEAKAGE is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level. These leakage detection systems are specified in LCO 3.4.15, "RCS Leakage Detection Instrumentation."

supp. 4

The 72 hour Frequency is a reasonable interval to trend LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents. ~~The Note states that the SR is required to be performed in steady state operation.~~

TSTF 116, RO

supp. 3

SR 3.4.13.2

This SR provides the means necessary to determine SG OPERABILITY in an operational MODE. The requirement to demonstrate SG tube integrity in accordance with the Steam

(continued)

ITS Section 3.5

ID 237

Subject: Revised NUREG Insert 3.5-7C to letter Required Action consistent with the ITS.

INSERT 3.5-7A

CTS

------------------------NOTES------------------------------

1. Only one LPI train is required to be OPERABLE in MODE 4. DOC M8

INSERT 3.5-7B

------------------------NOTES------------------------------

3. In MODES 1, 2, and 3, the LPI discharge header crossover valves shall be manually OPERABLE to open. DOC M10

INSERT 3.5-7C

AND ------------NOTE------------ Only required if DHR loop is OPERABLE. ----------------------------- D.2 Be in MODE 5.	24 hours DOC M8

4

INSERT 3.5-7D

B. One or more LPI discharge header crossover valve(s) manually inoperable to open in MODE 1, 2, or 3.	B.1 Restore LPI discharge header crossover valve(s) to OPERABLE status.	72 hours DOC M10

ITS Section 3.6

ID 233

Subject: Revised DOC L2 for Section 3.6 to reflect CTS 4.4.1.2 La values (.25 weight percent/day).

TECHNICAL CHANGE - LESS RESTRICTIVE

L1 CTS 3.6.6 provides corrective actions when the combined leakage rate
4 exceeds the requirements of CTS 4.4.1.2 (0.125 weight percent/day or 0.5 L_a). If the affected penetration flow paths are not isolated per CTS 3.6.3.c or the combined leakage is not brought to within limits in 48 hours then the reactor must be placed in Cold Shutdown within an additional 36 hours. ITS 3.6.1, Required Action A.1 allows 1 hour to
4 restore containment integrity to within 1.0 L_a (0.25 weight percent/day) prior to requiring a shutdown while CTS 3.6.6.2 allows 48 hours to restore the containment to within the 0.5 L_a limit. The proposed ITS is less restrictive since the ITS does not require action until the L_a limit is exceeded instead of 50% of the L_a limit. In addition, CTS requires the repairs to be initiated immediately, while ITS allows 1 hour for the action to be completed. The ITS requirement is considered adequate to provide assurance that appropriate and timely actions are taken when the containment is in a degraded condition. The short time period for restoration ensures the probability of an accident (requiring containment OPERABILITY) occurring during periods when containment is inoperable is minimal. This provision is consistent with the NUREG.

L2 The CTS 3.6.3.a.1 requires the outer air lock door gasket to be leak tested within 24 hours after opening when the inner door seal is inoperable. This is more frequent than the 10 CFR 50 Appendix J requirement which requires the air lock to be leak tested within 3 days or once every 3 days if the air lock is opened more frequently than once per 3 days. This requirement is currently captured by CTS 4.4.1.5.2.c. The Appendix J test interval is considered adequate and appropriate to provide assurance of air lock integrity. Therefore the 24 hour test requirement is not retained in ITS 3.6.2. As such, this change is a less restrictive requirement. The proposed change is consistent with the NUREG.

L3 CTS 3.6.3.a.2 requires an inoperable hatch to be restored to OPERABLE status within 7 days or the reactor be in cold shutdown within the next 36 hours. ITS 3.6.2 Required Action A.1 and A.2 allow one door to be inoperable indefinitely provided the remaining OPERABLE door is closed and locked. ITS 3.6.2 Required Action A.3 is added to require periodic (once per 31 days) verification the OPERABLE air lock door is locked closed when the other door is inoperable. The deletion of the requirement to restore the door to OPERABLE status or be in Cold Shutdown in the next 36 hours is considered acceptable since the ITS action ensures the leakage boundary is maintained. The 31 day frequency is based on engineering judgement and is considered adequate in view of the low likelihood of a locked door being mispositioned and other administrative controls. The proposed change is consistent with the NUREG.

L4 CTS 3.6.4 requires reactor building internal pressure ≤ 1.2 psig and ≥ -2.45 psig when the reactor is critical. If this requirement is not met, the unit is in a condition prohibited by Technical Specifications

LESS RESTRICTIVE CHANGE L1

The Oconee Nuclear Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1430, "Standard Technical Specifications, Babcock and Wilcox Plants." The proposed changes involve making the current Technical Specifications (CTS) less restrictive. Below is the description of this less restrictive change and the No Significant Hazards Consideration for conversion to NUREG-1430.

CTS 3.6.6 provides corrective actions when the combined leakage
4 rate exceeds the requirements of CTS 4.4.1.2 (0.125 weight
percent/day or 0.5 L_a). If the affected penetration flow paths
are not isolated per CTS 3.6.3.c or the combined leakage is not
brought to within limits in 48 hours then the reactor must be
placed in Cold Shutdown within an additional 36 hours. ITS 3.6.1,
Required Action A.1 allows 1 hour to restore containment integrity
4 to within 1.0 L_a (0.25 weight percent/day) prior to requiring a
shutdown while CTS 3.6.6.2 allows 48 hours to restore the containment to within the 0.5 L_a limit. The proposed ITS is less restrictive since the ITS does not require action until the L_a limit is exceeded instead of 50% of the L_a limit. In addition, CTS requires the repairs to be initiated immediately, while ITS allows 1 hour for the action to be completed. The ITS requirement is considered adequate to provide assurance that appropriate and timely actions are taken when the containment is in a degraded condition. The short time period for restoration ensures the probability of an accident (requiring containment OPERABILITY) occurring during periods when containment is inoperable is minimal. This provision is consistent with the NUREG.

In accordance with the criteria set forth in 10 CFR 50.92, Duke Energy has evaluated this proposed Technical Specification change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change does not involve any physical alteration of plant systems, structures or components, or methods of operation. The containment is not assumed to be an initiator of any analyzed event. The probability of an accident occurring is independent of the status of the containment. The proposed change eliminates the need for immediate action when the 0.5 L_a combined leakage rate limit is exceeded for penetrations and valves. The increase from 0.5 La to 1.0 La does not significantly increase the consequences of an accident since the accident analysis already assumes the containment leakage is 1.0 La. ITS 3.6.1 Required Action A.1

ITS Section 3.7

ID 225

Subject: Revised Bases for 3.7.8 to clarify ECCW siphon headers useable by each unit.

BASES

LCO (continued)

The ESV pump must be capable of restarting, after an appropriate time delay following restoration of emergency power after a loss of off-site power. This ensures air introduced by inleakage or degassing does not prevent siphon header function. Operation of an ESV pump requires a continuous seal water supply from the SSW System. The cross connection between ESV System headers on a Unit must be closed. Instrumentation necessary to provide indication of SSW flow to ESV is required to be OPERABLE to ensure continued availability following a design basis event.

Sharing of siphon headers between units is acceptable with certain restrictions. Net positive suction head requirements for Unit 1 and 2 LPSW pumps cannot be met with suction supplied from a Unit 3 siphon header. Therefore, the two ECCW siphon headers for Units 1 and 2 must be two of the four ECCW siphon headers associated with the Units 1 and 2 CCW piping. Units 1 and 2 may simultaneously share two of the four suction headers. Similarly, NPSH requirements for the Unit 3 LPSW pumps cannot be met with suction supplied from a Unit 1 ECCW siphon header. Therefore, the two ECCW siphon headers for Unit 3 must be two of the four siphon
4 headers associated with Units 2 and 3 CCW piping. The Unit
4 2 ECCW siphon headers may be credited with supplying either
4 the Unit 1 and 2 LPSW System or the Unit 3 LPSW System but
4 not both LPSW Systems simultaneously. Both Unit 2 ECCW
4 siphon headers must be credited to the same LPSW System
4 (i.e., the two Unit 2 headers may not be split with one
4 siphon header credited to the Unit 1 and 2 LPSW System and
4 the other siphon header credited to the Unit 3 LPSW System).
4 The two Unit 3 siphon headers may only be credited to Unit 3
4 (i.e., they cannot be credited to another unit).

The LCO is modified by a Note which indicates the requirements are not applicable to a Unit until after completion of the Service Water upgrade modifications on the respective Unit. This is necessary since the specification is based on the Unit's design after implementation of the modifications.

APPLICABILITY

In MODES 1, 2, 3, and 4, the ECCW siphon headers are normally operating to support the OPERABILITY of the equipment serviced by the ECCW siphon headers and are required to be OPERABLE in these MODES.

(continued)

Insert B3.7-47A

The ECCW siphon headers supply water from Lake Keowee to the LPSW system suction piping and supports the safety function of the LPSW system. Additional information regarding the LPSW System can be found in the Bases of 3.7.7, "LPSW System."

Maintaining the ECCW siphon headers OPERABLE during accident and transient events is an assumption in the accident and transient analysis. The ESV System and SSW System are required to ensure ECCW siphon header piping remains sufficiently primed to supply siphon flow to the LPSW suction piping.

Insert B3.7-47B

Two ECCW siphon headers are required to be OPERABLE during normal unit operation. An ECCW siphon header consists of a flow path from the intake canal through an open CCW pump discharge valve to the LPSW suction piping connection on the CCW crossover header. For an ECCW siphon header to be OPERABLE, an ESV pump must be OPERABLE, in operation, and aligned to the ECCW siphon header. Additionally, the ESV float valve must be OPERABLE. Heat tracing on the ESV float valve must be OPERABLE when the potential for freezing exists. The ESV pump must be capable of restarting after an appropriate time delay following restoration of emergency power after a loss of off-site power. This ensures air introduced by inleakage or degassing does not prevent siphon header function. Operation of an ESV pump requires a continuous seal water supply from the SSW System. The cross connection between ESV System headers on a Unit must be closed. Instrumentation necessary to provide indication of SSW flow to ESV is required to be OPERABLE to ensure continued availability following a design basis event.

Sharing of siphon headers between units is acceptable with certain restrictions. Net positive suction head requirements for Unit 1 and 2 LPSW pumps cannot be met with suction supplied from a Unit 3 siphon header. Therefore, the two ECCW siphon headers for Units 1 and 2 must be two of the four ECCW siphon headers associated with the Units 1 and 2 CCW piping. Units 1 and 2 may simultaneously share two of the four suction headers. Similarly, NPSH requirements for the Unit 3 LPSW pumps cannot be met with suction supplied from a Unit 1 ECCW siphon header. Therefore, the two ECCW siphon headers for Unit 3 must be two of the four siphon headers associated with
4 Units 2 and 3 CCW piping. The Unit 2 ECCW siphon headers may be credited with
4 supplying either the Unit 1 and 2 LPSW System or the Unit 3 LPSW System but
4 not both LPSW Systems simultaneously. Both Unit 2 ECCW siphon headers must be
4 credited to the same LPSW System (i.e., the two Unit 2 headers may not be
4 split with one siphon header credited to the Unit 1 and 2 LPSW System and the
4 other siphon header credited to the Unit 3 LPSW System). The two Unit 3
4 siphon headers may only be credited to Unit 3 (i.e., they cannot be credited
4 to another unit).

The LCO is modified by a Note which indicates the requirements are not applicable to a Unit until after completion of the Service Water upgrade modifications on the respective Unit. This is necessary since the specification is based on the Unit's design after implementation of the modifications.

ITS Section 3.8

ID 231

Subject: Revised Section 3.8 to resolve NRC comments.

OCONEE NUCLEAR STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.8 - ELECTRICAL POWER SYSTEMS

ATTACHMENT 1

TECHNICAL SPECIFICATIONS

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources – Operating

LCO 3.8.1

a. The following AC electrical power sources shall be OPERABLE:

1. Two offsite sources on separate towers connected to the 230 kV switchyard to a unit startup transformer and capable of automatically supplying power to one main feeder bus; and

2. Two Keowee Hydro Units (KHUs) with one capable of automatically providing power through the underground emergency power path to both main feeder buses and the other capable of automatically providing power through the overhead emergency power path to both main feeder buses.

b. The Keowee Reservoir level shall be ≥ 775 feet above sea level.

c. The zone overlap protection circuitry shall be OPERABLE when the overhead electrical disconnects for the KHU associated with the underground power path are closed.

--------------------------NOTES--------------------------

1. A unit startup transformer may be shared with a unit in MODES 5 or 6.

2. The requirements of Specification 5.5.18, "KHU Commercial Power Generation Testing Program," shall be met for commercial KHU power generation.

3. The requirements of Specification 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a Lee Combustion Turbine (LCT) is used to comply with Required Actions.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

------------------------------------NOTE------------------------------------

LCO 3.0.4 is not applicable when both standby buses are energized to comply with Required Actions.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Both required offsite sources and the overhead emergency power path inoperable due to inoperable unit startup transformer.	A.1	Perform SR 3.8.1.3.	1 hour if not performed in previous 12 hours
	AND		
	A.2	Align the emergency startup bus to share another unit's startup transformer.	12 hours
	AND		
	A.3.1	Restore unit startup transformer to OPERABLE status and normal startup bus alignment.	36 hours
	OR		
	A.3.2	Designate one unit, sharing the startup transformer, to be shutdown.	36 hours
B. Unit designated to be shutdown due to sharing a unit startup transformer.	B.1	Be in MODE 3.	12 hours
	AND		
	B.2	Be in MODE 5.	36 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. KHU or its required overhead emergency power path inoperable due to reasons other than Condition A.	C.1	Perform SR 3.8.1.3 for OPERABLE KHU.	1 hour if not performed in previous 12 hours AND Once per 7 days thereafter
	AND		
	C.2.1	Restore the KHU and its required overhead emergency power path to OPERABLE status.	72 hours AND 72 hours from discovery of inoperable KHU
	OR		
	C.2.2.1	Energize both standby buses from LCT via isolated power path.	72 hours AND 1 hour from subsequent discovery of deenergized standby bus
		AND	
	C.2.2.2	Suspend KHU generation to grid except for testing. AND	72 hours
			(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.2.3 Verify by administrative means that the remaining KHU and its required underground emergency power path and both required offsite sources are OPERABLE and the requirements of LCO 3.8.3, "DC Sources-Operating," LCO 3.8.6, "Vital Inverters-Operating," LCO 3.8.8, "Distribution Systems-Operating," LCO 3.3.17, "EPSL Automatic Transfer Function," LCO 3.3.18, "EPSL Voltage Sensing Circuits," LCO 3.3.19, "EPSL 230 kV Switchyard DGVP," and LCO 3.3.21, "EPSL Keowee Emergency Start Function" are met. <u>AND</u>	72 hours
	C.2.2.4 Verify alternate power source capability by performing SR 3.8.1.16. <u>AND</u>	72 hours <u>AND</u> Every 31 days thereafter (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.2.5 Restore KHU and its required overhead emergency power path to OPERABLE status.	28 days when Condition due to an inoperable Keowee main step-up transformer <u>AND</u> 45 days from discovery of initial inoperability when Condition due to an inoperable KHU if not used for that KHU in the previous 3 years

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. KHU or its required underground power path inoperable.	D.1	Perform SR 3.8.1.4 for OPERABLE KHU.	1 hour if not performed in previous 12 hours
	<u>AND</u>		
	D.2	Energize either standby bus from LCT via isolated power path.	24 hours <u>AND</u> 1 hour from subsequent discovery of deenergized required standby bus
	<u>AND</u>		
	D.3	Restore KHU and its required underground emergency power path to OPERABLE status.	72 hours <u>AND</u> 72 hours from discovery of inoperable KHU
E. Required Action and associated Completion Time not met for Required Action D.2.	E.1	Be in MODE 3.	12 hours for one unit <u>AND</u> 24 hours for other unit(s)
	<u>AND</u>		
	E.2	Be in MODE 5.	84 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. Zone overlap protection circuitry inoperable when overhead electrical disconnects for KHU associated with the underground power path are closed.	F.1	Restore zone overlap protection circuitry to OPERABLE status.	72 hours
	OR		
	F.2	Open overhead electrical disconnects for KHU associated with the underground power path.	72 hours
G. Both emergency power paths inoperable due to one inoperable E breaker and one inoperable S breaker on the same main feeder bus.	G.1	Restore one breaker to OPERABLE status.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. ---------NOTE--------- Condition may be entered only when both required offsite sources are verified by administrative means to be OPERABLE and the requirements of LCO 3.8.3, "DC Sources-Operating;" LCO 3.8.6, "Vital Inverters-Operating;" LCO 3.8.8, "Distribution Systems-Operating;" LCO 3.3.17, "EPSL Automatic Transfer Function;" LCO 3.3.18, "EPSL Voltage Sensing Circuits;" LCO 3.3.19, "EPSL 230 kV Switchyard DGVP," are verified by administrative means to be met. -------------------- Both KHUs or their required emergency power paths inoperable for planned maintenance or test with both standby buses energized from LCT via isolated power path.	H.1 Energize both standby buses from LCT via isolated power path. AND H.2 Restore one KHU and its required emergency power path to OPERABLE status.	1 hour from discovery of deenergized standby bus 60 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
I. Both KHUs or their required emergency power paths inoperable for reasons other than Condition G and H.	I.1	Energize both standby buses from LCT via isolated power path.	1 hour AND 1 hour from subsequent discovery of deenergized standby bus
	AND		
	I.2	Determine by administrative means the OPERABILITY status of both required offsite sources, and of equipment required by LCO 3.8.3, "DC Sources-Operating," LCO 3.8.6, "Vital Inverters-Operating," LCO 3.8.8, "Distribution Systems-Operating," LCO 3.3.17, "EPSL Automatic Transfer Function," LCO 3.3.18, "EPSL Voltage Sensing Circuits," LCO 3.3.19, "EPSL 230 kV Switchyard DGVP."	1 hour
	AND		
	I.3	Restore one KHU and its required emergency power path to OPERABLE status.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
J. One or both required offsite sources inoperable due to reasons other than Condition A.	J.1	Energize both standby buses from LCT via isolated power path.	1 hour <u>AND</u> 1 hour from subsequent discovery of deenergized standby bus
	<u>AND</u>		
	J.2	Determine by administrative means the OPERABILITY status of both KHUs and their required emergency power paths and of equipment required by LCO 3.8.3, "DC Sources-Operating," LCO 3.8.6, "Vital Inverters-Operating," LCO 3.8.8, "Distribution Systems-Operating," LCO 3.3.17, "EPSL Automatic Transfer Function," LCO 3.3.18, "EPSL Voltage Sensing Circuits," LCO 3.3.19, "EPSL 230 kV Switchyard DGVP," and LCO 3.3.21, "EPSL Keowee Emergency Start Function."	1 hour
	<u>AND</u>		
	J.3	Restore both offsite sources to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
K. --------NOTE------- Separate Condition entry is allowed for each breaker. ------------------- One trip circuit in one or both closed N breakers inoperable. OR One trip circuit in one or both closed SL breakers inoperable.	K.1	Restore each trip circuit to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
L. -------NOTE-------- Separate Condition entry is permitted for each inoperable AC Source, and LCO or SR not met. -------------------	------------NOTE--------- Not required when a KHU or its required emergency power path are made inoperable for ≤ 12 hours for the purpose of restoring the other KHU to OPERABLE status. -------------------------	
AC Source inoperable or LCO not met, as stated in Note for Condition H entry. <u>OR</u> AC Source inoperable or LCO not met, as stated in Required Action C.2.2.3 when in Condition C for > 72 hours. <u>OR</u> AC Source inoperable or LCO not met, as stated in Required Actions I.2 or J.2 when in Conditions I or J for > 1 hour. <u>OR</u> SR 3.8.1.16 not met.	L.1 Restore inoperable AC Source to OPERABLE status. <u>AND</u> L.2 Restore compliance with LCO. <u>AND</u> L.3 Restore compliance with SR 3.8.1.16.	4 hours 4 hours 4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
M. Required Action and associated Completion Time for Condition C, F, G, H, I, J, K or L not met. OR Required Action and associated Completion Time not met for Required Action D.1 or D.3.	M.1 Be in MODE 3. AND M.2 Be in MODE 5.	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite source.	7 days
SR 3.8.1.2	Verify battery terminal voltage is $\geq$ 125 V on float charge for each KHU's battery.	7 days
SR 3.8.1.3	Verify the KHU associated with the underground emergency power path starts automatically and energizes the underground emergency power path. Manually close the SK breaker to each de-energized standby bus.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.4	-----------------NOTE-------------------- The requirement to energize the underground emergency power path is not applicable 1) when the overhead disconnects are open for the KHU associated with the underground emergency power path or 2) when complying with Required Action D.1. --- Verify the KHU associated with the overhead emergency power path starts automatically and automatically or manually synchronize it to the Yellow bus in 230 kV switchyard. Energize the underground emergency power path after removing the KHU from the overhead emergency power path.	31 days
SR 3.8.1.5	-----------------NOTE-------------------- Not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. --- Verify each closed SL and each closed N breaker opens manually or on an actual or simulated actuation signal.	31 days
SR 3.8.1.6	-----------------NOTE-------------------- Not required to be performed for an S breaker when its standby bus is energized from a LCT via an isolated power path. --- Operate each S and each E breaker through a full cycle.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	Verify both KHU's underground tie breakers cannot be closed simultaneously.	12 months
SR 3.8.1.8	Verify each KHU's overhead emergency power path tie breaker cannot be closed when tie breaker to underground emergency power path is closed.	12 months
SR 3.8.1.9	Verify on an actual or simulated emergency actuation signal each KHU auto starts and: a. Achieves frequency ≥ 57 Hz and ≤ 63 Hz and voltage ≥ 13.5 kV and ≤ 14.49 kV in ≤ 23 seconds; and b. Supplies the equivalent of one Unit's maximum safeguard loads plus two Unit's hot shutdown loads when synchronized to system grid and loaded at maximum practical rate.	12 months
SR 3.8.1.10	Verify each KHU's battery capacity is adequate to supply, and maintain in OPERABLE status, required emergency loads for design duty cycle when subjected to a battery service test.	12 months
SR 3.8.1.11	Verify each KHU's battery cells, cell end plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	12 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	Verify each KHU's battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	12 months
SR 3.8.1.13	-----------------NOTE----------------- Only applicable when the overhead electrical disconnects for the KHU associated with the underground emergency power path are closed. -------------------------------------- Verify on an actual or simulated zone overlap fault signal each KHU's overhead tie breaker and underground tie breaker actuate to the correct position.	12 months
SR 3.8.1.14	-----------------NOTES----------------- Not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. -------------------------------------- Verify each closed SL and closed N breaker opens on an actuation of each redundant trip coil.	18 months
SR 3.8.1.15	-----------------NOTE----------------- Redundant breaker trip coils shall be verified on a STAGGERED TEST BASIS. -------------------------------------- Verify each 230 kV switchyard circuit breaker actuates to the correct position on a switchyard isolation actuation signal.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.16	------------------NOTE------------------ Only applicable when complying with Required Action C.2.2.4. -- Verify one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path.	As specified by Required Action C.2.2.4

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One source from the offsite transmission network to the onsite AC electrical power distribution system(s) required by LCO 3.8.9, "Distribution Systems – Shutdown". The offsite power source shall be an offsite circuit connected to one of the following:

1. 230 kV switchyard to a unit startup transformer to one main feeder bus,

2. 230 kV switchyard, or 525 kV switchyard for Unit 3, to the main step-up and unit auxiliary transformers to one main feeder bus, or

3. Central switchyard to one main feeder bus.

b. One emergency power source capable of supplying the onsite AC electrical power distribution system(s) required by LCO 3.8.9. The emergency power source shall include one of the following:

1. One Keowee Hydro Unit (KHU) capable of providing power through the underground emergency power path to one main feeder bus,

2. One KHU capable of providing power through the overhead emergency power path to one main feeder bus, or

3. One LCT energizing one standby bus via an isolated power path to one main feeder bus.

-------------------------NOTE---------------------------

1. A unit startup transformer may be shared with a Unit in MODES 1 through 6.

2. The requirements of ITS 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a LCT is used for the emergency power requirements.

3. The required emergency power source and required offsite power source shall not be susceptible to a failure disabling both sources.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite source inoperable.	------------NOTE------------ Enter applicable Conditions and Required Actions of LCO 3.8.9, with required equipment de-energized as a result of Condition A. ----------------------------	
	A.1 Declare affected required feature(s) with no offsite power available inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	AND	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND	
	A.2.4 Initiate action to restore required offsite power source to OPERABLE status.	Immediately

(continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One required emergency power source inoperable.	B.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	B.2	Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>		
	B.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>		
	B.4	Initiate action to restore required emergency power source to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.2.1	-------------------NOTE------------------- 1. SR requirements for both standby buses or both main feeder buses are reduced to one standby bus and one main feeder bus. 2. SR 3.8.1.4 requirement to energize the underground emergency power path is not applicable. ---	
	For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, "AC Sources – Operating," except SR 3.8.1.7, SR 3.8.1.13, SR 3.8.1.14, SR 3.8.1.15 and SR 3.8.1.16, are applicable.	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.3 DC Sources – Operating

LCO 3.8.3 DC Sources shall be OPERABLE as follows:

a. Three of four 125 VDC Vital I&C power sources for each unit as follows,

Unit 1 - 1CA, 1CB, 2CA, 2CB

Unit 2 - 2CA, 2CB, 3CA, 3CB

Unit 3 - 3CA, 3CB, 1CA, 1CB;

and aligned such that no power source shall be the only source for two or more of the Unit's panelboards.

b. Two additional 125 VDC Vital I&C power sources when any other Unit is in MODES 1, 2, 3, or 4;

c. One additional 125 VDC Vital I&C power source when no other Unit is in MODES 1, 2, 3, or 4;

d. Two 230 kV Switchyard 125 VDC power sources.

-------------------------NOTE-------------------------

1. For Units 2 and 3, a 125 VDC Vital I&C power source shall not be the only source for panelboards 1DIC and 1DID required by LCO 3.8.8.

2. The additional 125 VDC Vital I&C sources required by LCO 3.8.3 part b, or part c are not required to be connected to the Unit's Distribution System.

3. The additional 125 VDC Vital I&C power source required when LCO 3.8.3 part c applies shall not be a 125 VDC Vital I&C power source that is available to meet the three of four requirement of LCO 3.8.3.a.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

---------------------------------------NOTE---------------------------------------
The Completion Times for Required Actions A through ~~F~~ D are reduced when in Condition L of LCO 3.8.1.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required 125 VDC Vital I&C power source inoperable.	A.1 ---------NOTE-------- Not applicable for up to 72 hours during equalization charge after completion of a performance or service test. -------------------- Restore required power source to OPERABLE status.	24 hours
B. One required 125 VDC Vital I&C power source the only source for two or more of the Unit's panelboards.	B.1 Align sources such that one power source is not the only source for two or more of the Unit's panelboards.	24 hours
C. --------NOTE--------- Only applicable to Units 2 and 3. -------------------- One 125 VDC Vital I&C power source the only source for panelboards 1DIC and 1DID.	C.1 Align sources such that one power source is not the only source to panelboards 1DIC and 1DID.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One 230 kV switchyard 125 VDC power source inoperable.	D.1	---------NOTE-------- Not applicable for up to 72 hours during equalization charge after completion of a performance or service test. --------------------- Restore power source to OPERABLE status.	24 hours
E. Required Action and Associated Completion Time not met.	E.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	E.2	Be in MODE 5.	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify correct breaker alignments and voltage availability from required distribution centers to isolating transfer diodes.	7 days
SR 3.8.3.2	Verify battery terminal voltage is ≥ 125V on float charge.	7 days
SR 3.8.3.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	12 months
SR 3.8.3.4	Verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	12 months
SR 3.8.3.5	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	12 months
SR 3.8.3.6	Verify battery capacity is in accordance with the Battery Discharge Testing Program.	In accordance with the Battery Discharge Testing Program

3.8 ELECTRICAL POWER SYSTEMS

3.8.3 DC Sources – Operating

LCO 3.8.3 DC Sources shall be OPERABLE as follows:

a. Three of four 125 VDC Vital I&C power sources for each unit as follows,

Unit 1 - 1CA, 1CB, 2CA, 2CB

Unit 2 - 2CA, 2CB, 3CA, 3CB

Unit 3 - 3CA, 3CB, 1CA, 1CB;

and aligned such that no power source shall be the only source for two or more of the Unit's panelboards.

b. Two additional 125 VDC Vital I&C power sources when any other Unit is in MODES 1, 2, 3, or 4;

c. One additional 125 VDC Vital I&C power source when no other Unit is in MODES 1, 2, 3, or 4;

d. Two 230 kV Switchyard 125 VDC power sources.

-------------------------NOTE-----------------------------

1. For Units 2 and 3, a 125 VDC Vital I&C power source shall not be the only source for panelboards 1DIC and 1DID required by LCO 3.8.8.

2. The additional 125 VDC Vital I&C sources required by LCO 3.8.3 part b, or part c are not required to be connected to the Unit's Distribution System.

3. The additional 125 VDC Vital I&C power source required when LCO 3.8.3 part c applies shall not be a 125 VDC Vital I&C power source that is available to meet the three of four requirement of LCO 3.8.3.a.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

-----------------------------------NOTE-----------------------------------

The Completion Times for Required Actions A through D are reduced when in Condition L of LCO 3.8.1.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required 125 VDC Vital I&C power source inoperable.	A.1	---------NOTE-------- Not applicable for up to 72 hours to perform equalization charge after completion of a performance or service test. -------------------- Restore required power source to OPERABLE status.	24 hours
B. One required 125 VDC Vital I&C power source the only source for two or more of the Unit's panelboards.	B.1	Align sources such that one power source is not the only source for two or more of the Unit's panelboards.	24 hours
C. --------NOTE--------- Only applicable to Units 2 and 3. -------------------- One 125 VDC Vital I&C power source the only source for panelboards 1DIC and 1DID.	C.1	Align sources such that one power source is not the only source to panelboards 1DIC and 1DID.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One 230 kV switchyard 125 VDC power source inoperable.	D.1	---------NOTE-------- Not applicable for up to 72 hours to perform equalization charge after completion of a performance or service test. --------------------- Restore power source to OPERABLE status.	 24 hours
E. Required Action and Associated Completion Time not met.	E.1	Be in MODE 3.	12 hours
	AND		
	E.2	Be in MODE 5.	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify correct breaker alignments and voltage availability from required distribution centers to isolating transfer diodes.	7 days
SR 3.8.3.2	Verify battery terminal voltage is ≥ 125V on float charge.	7 days
SR 3.8.3.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	12 months
SR 3.8.3.4	Verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	12 months
SR 3.8.3.5	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	12 months
SR 3.8.3.6	Verify battery capacity is in accordance with the Battery Discharge Testing Program.	In accordance with the Battery Discharge Testing Program

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources – Shutdown

LCO 3.8.4 125 VDC Vital I&C power source(s) shall be OPERABLE to support the 125 VDC Vital I&C power panelboards(s) required by LCO 3.8.9, "Distribution Systems – Shutdown" and shall include at least one of the unit's 125 VDC Vital I&C power sources.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required 125 VDC Vital I&C power sources inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate action to restore required power sources to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	-------------------NOTE------------------- The following SRs are not required to be performed: SR 3.8.3.5 and SR 3.8.3.6. -- For 125 VDC Vital I&C power sources required to be OPERABLE, the following SRs are applicable: SR 3.8.3.1 SR 3.8.3.2 SR 3.8.3.3 SR 3.8.3.4 SR 3.8.3.5 SR 3.8.3.6	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 Battery Cell Parameters

LCO 3.8.5 Battery cell parameters for the Keowee Hydro Unit (KHU), 125 VDC Vital I&C, and 230 kV 125 VDC switchyard batteries shall be within the limits of Table 3.8.5-1.

APPLICABILITY: When associated DC power sources are required to be OPERABLE.

ACTIONS

------------------------------------NOTES------------------------------------

1. Separate Condition entry is allowed for each battery.

2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more batteries with one or more battery cell parameters not within Category A or B limits.	A.1 Verify pilot cell electrolyte level and float voltage meet Table 3.8.5-1 Category C values.	1 hour
	<u>AND</u>	
	A.2 Verify battery cell parameters meet Table 3.8.5-1 Category C values.	24 hours <u>AND</u> Once per 7 days thereafter
	<u>AND</u>	
	A.3 Restore battery cell parameters to Category A and B limits of Table 3.8.5-1.	90 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR One or more batteries with average electrolyte temperature of the representative cells < 60°F. OR One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	Verify battery cell parameters meet Table 3.8.5-1 Category A limits.	7 days
SR 3.8.5.2	Verify battery cell parameters meet Table 3.8.5-1 Category B limits.	92 days
SR 3.8.5.3	Verify average electrolyte temperature of representative cells is $\geq$ 60°F.	92 days

Table 3.8.5-1 (page 1 of 1)
Battery Cell Surveillance Requirements

PARAMETER	CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL	CATEGORY B: LIMITS FOR EACH CONNECTED CELL	CATEGORY C: ALLOWABLE LIMITS FOR EACH CONNECTED CELL
Electrolyte Level	≥ Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[(a)]	≥ Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[(a)]	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 V	≥ 2.13 V	> 2.07 V
Specific Gravity[(b)(c)]	≥ 1.200	≥ 1.200 AND Not more than 0.010 below average of all connected cells	≥ 1.200

(a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum during equalizing charges provided it is not overflowing.

(b) Corrected for electrolyte temperature and level. Level correction is not required, however, when battery float current is < 2 amps when on float charge.

(c) A battery float current of < 2 amps when on float charge is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of 7 days. When float current is used in lieu of specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance.

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Vital Inverters – Operating

LCO 3.8.6 Four vital inverters shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One vital inverter inoperable.	A.1 ---------NOTES-------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.8, "Distribution Systems - Operating," with any 120 VAC Vital Instrumentation power panelboard de-energized. 2. The Completion Time is reduced when in Condition L of LCO 3.8.1. --------------------- Restore inverter to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify correct inverter voltage, frequency, and alignment to required 120 VAC Vital Instrumentation power panelboards.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Vital Inverters – Shutdown

LCO 3.8.7 Vital Inverters shall be OPERABLE to support the onsite 120 VAC Vital Instrumentation power panelboard(s) required by LCO 3.8.9, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required vital inverters inoperable.	A.1 Declare affected required equipment inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
	A.2.4 Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, frequency, and alignments to required 120 VAC Vital Instrumentation power panelboards.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Distribution Systems – Operating

LCO 3.8.8 AC, DC, and AC vital electrical power distribution systems shall be OPERABLE as follows:

a. Two main feeder buses each connected to two or more ES power strings;

b. Three ES power strings;

c. 125 VDC Vital I&C power panelboards DIA, DIB, DIC, and DID;

d. For Units 2 or 3, 125 VDC Vital I&C power panelboards 1DIC and 1DID;

e. 230 kV switchyard 125 VDC power panelboards DYA, DYB, DYC, DYE, DYF, and DYG; and

f. 120 VAC Vital Instrumentation power panelboards KVIA, KVIB, KVIC, and KVID.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

-------------------------------------NOTE-------------------------------------

The Completion Times for Required Actions A through F are reduced when in Condition L of LCO 3.8.1.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One main feeder bus inoperable or not connected to two ES power strings.	A.1	Restore main feeder bus to OPERABLE status and connect to at least two ES power strings.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One ES power string inoperable.	B.1	Restore ES power string to OPERABLE status.	24 hours
C. One of the unit's 125 VDC Vital I&C power panelboard inoperable.	C.1	Restore panelboard to OPERABLE status.	24 hours
D. ---------NOTES------- 1. Separate Condition entry is allowed for each 230 kV switchyard 125 VDC power panelboard. 2. Not applicable to the following loss of function combinations: DYA and DYE, DYB and DYF, and DYC and DYG. --------------------- One or more required 230 kV switchyard 125 VDC power panelboards inoperable.	D.1	Restore required panelboards to OPERABLE status.	24 hours
E. ---------NOTE--------- Only applicable to Units 2 and 3. --------------------- One required 125 VDC Unit 1 Vital I&C power panelboard inoperable.	E.1	Restore panelboard to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. One 120 VAC Vital Instrumentation power panelboard inoperable.	F.1	Restore panelboard to OPERABLE status.	4 hours when Condition due to KVIA or KVIB being inoperable <u>AND</u> 24 hours when Condition due to KVIC or KVID being inoperable
G. Required Action and associated Completion Time not met.	G.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	G.2	Be in MODE 5.	84 hours
H. Entry into two or more Conditions that result in a loss of function.	H.1	Enter LCO 3.0.3	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
3.8.8.1	Verify correct breaker alignments and voltage to required main feeder buses.	7 days
3.8.8.2	Verify correct breaker alignments and voltage availability to required ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards and 120 VAC Vital Instrumentation power panelboards.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems – Shutdown

LCO 3.8.9 The necessary portion of main feeder buses, ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards and 120 VAC Vital Instrumentation power panelboards shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required main feeder buses, ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards or 120 VAC Vital Instrumentation power panelboards inoperable.	A.1 Declare associated supported required equipment inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required main feeder buses, ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards or 120 VAC Vital Instrumentation power panelboards to OPERABLE status. <u>AND</u> A.2.5 Declare associated required decay heat removal loop(s) inoperable and not in operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required main feeder buses.	7 days
SR 3.8.9.2	Verify correct breaker alignments and voltage availability to required ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards and 120 VAC Vital Instrumentation power panelboards.	7 days

OCONEE NUCLEAR STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.8 - ELECTRICAL POWER SYSTEMS

ATTACHMENT 2

BASES

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources – Operating

BASES

BACKGROUND

The AC Power System consists of the offsite power sources (preferred power) and the onsite standby power sources, Keowee Hydro Units (KHU). This system is designed to supply the required Engineered Safeguards (ES) loads of one unit and safe shutdown loads of the other two units and is so arranged that no single failure can disable enough loads to jeopardize plant safety. The design of the AC Power System provides independence and redundancy to ensure an available source of power to the ES systems (Ref. 1). The KHU turbine generators are powered through a common penstock by water taken from Lake Keowee. The use of a common penstock is justified on the basis of past hydro plant experience of the licensee (since 1919) which indicates that the cumulative need to dewater the penstock can be expected to be limited to about one day a year, principally for inspection, plus perhaps four days every tenth year.

The preferred power source is provided from offsite power to the red or yellow bus in the 230 kV switchyard to the units startup transformer and the E breakers. The 230 kV switchyard is electrically connected to the 525 kV switchyard via the autobank transformer. Emergency power is provided using two emergency power paths, an overhead path and an underground path. The underground emergency power path is from one KHU through the underground feeder circuit, transformer CT-4, the CT-4 incoming breakers (SK breakers), standby bus and the standby breakers (S breakers). The standby buses may also receive offsite power from the 100 kV transmission system through transformer CT-5 and the CT-5 incoming breakers (SL breakers). The overhead emergency power path is from the other KHU through the startup transformer and the startup incoming breakers (E breakers). In addition to supplying emergency power for Oconee, the KHUs provide peaking power to the generation system. During periods of commercial power generation, the KHUs are operated within the acceptable region of the KHU operating restrictions. This ensures that the KHUs are able to perform their emergency power functions from an initial condition of commercial power generation. The KHU operating restrictions for commercial power generation are contained in UFSAR Chapter 16, (Ref. 2). The standby buses can also

(continued)

BASES

BACKGROUND (continued)	receive power from a combustion turbine generator at the Lee Steam Station through a dedicated 100 kV transmission line, transformer CT-5, and both SL breakers. The 100 kV transmission line can be supplied from a Lee combustion turbine (LCT) and electrically separated from the system grid and offsite loads. The minimum capacity available from any of the multiple sources of AC power is 22.4MVA (limited by CT-4 and CT-5 transformer capacities).
APPLICABLE SAFETY ANALYSIS	The initial conditions of design basis transient and accident analyses in the UFSAR Chapter 6 (Ref. 4) and Chapter 15 (Ref. 5) assume ES systems are OPERABLE. The AC power system is designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ES systems so that the fuel, reactor coolant system, and containment design limits are not exceeded. Consistent with the accident analysis assumptions of a loss of offsite power (LOOP) and a single failure of one onsite emergency power path, two onsite emergency power sources are required to be OPERABLE. AC Sources – Operating are part of the primary success path and function to mitigate an accident or transient that presents a challenge to the integrity of a fission product barrier. As such, AC Sources - Operating satisfies the requirements of Criterion 3 of 10 CFR 50.36 (Ref. 3).
LCO	Two sources on separate towers connected to the 230 kV switchyard to a unit startup transformer and one main feeder bus are required to be OPERABLE. Two KHUs with one capable of automatically providing power through the underground emergency power path to both main feeder buses and the other capable of automatically providing power through the overhead emergency power path to both main feeder buses are required to be OPERABLE. The Keowee Reservoir level is required to be ≥ 775 feet above sea level to support OPERABILITY of the KHUs. The zone overlap protection circuitry is required to be OPERABLE when the overhead electrical disconnects for the KHU associated with the

(continued)

BASES

LCO (continued)

underground power path are closed to provide single failure protection for the KHUs.

Operable offsite sources are required to be "physically independent" (separate towers) prior to entering the 230 kV switchyard. Once the 230 kV lines enter the switchyard, an electrical pathway must exist through OPERABLE power circuit breakers (PCBs) and disconnects such that both sources are available to energize the Unit's startup transformer either automatically or with operator action. Once within the boundary of the switchyard, the electrical pathway may be the same for both independent offsite sources. In addition, at least one E breaker must be available to automatically supply power to a main feeder bus from the energized startup transformer. The voltage provided to the startup transformer by the two independent offsite sources must be sufficient to ensure ES equipment will operate. Two of the following offsite sources are required:

1) Jocassee (from Jocassee) Black or White,
2) Dacus (from North Greenville) Black or White,
3) Oconee (from Central) Black or White,
4) Calhoun (from Central) Black or White,
5) Autobank transformer fed from either the Asbury (from Newport), Norcross (from Georgia Power), or Katoma (from McGuire) 525 kV line.

An OPERABLE KHU and its required emergency power path are required to be able to provide sufficient power within specified limits of voltage and frequency within 23 seconds after an emergency start initiate signal and includes its required emergency power path, required instrumentation, controls, auxiliary and DC power, cooling and seal water, lubrication and other auxiliary equipment necessary to perform its safety function. Two emergency power paths are available. One emergency power path consists of an underground circuit while the other emergency power pathway uses an overhead circuit through the 230 kV switchyard.

(continued)

BASES

LCO (continued)

An OPERABLE KHU and its required overhead emergency power path must be capable of automatically supplying power from the KHU through the KHU main step-up transformer, the 230 kV yellow bus, the Unit startup transformer and both E breakers to both main feeder buses. At least one channel of switchyard isolation (by actuation from degraded grid voltage protection) is required to be OPERABLE to isolate the 230 kV switchyard yellow bus. If closed, each N breaker must be capable of opening using either of its associated breaker trip circuits. Either of the following combinations provides an acceptable KHU and required overhead emergency power path:

Keowee Hydro Unit		Keowee Hydro Unit	
1A)	Keowee Unit 1 generator,	1B)	Keowee Unit 2 generator,
2A)	Keowee ACB 1 (enabled by one channel of Switchyard Isolate Complete),	2B)	Keowee ACB 2 (enabled by one channel of Switchyard Isolate Complete),
3A)	Keowee auxiliary transformer 1X, Keowee ACB 5, Keowee Load Center 1X,	3B)	Keowee auxiliary transformer 2X, Keowee ACB 6, Keowee Load Center 2X,
4A)	Keowee MCC 1XA,	4B)	Keowee MCC 2XA,
5A)	Keowee Battery #1, Charger #1 or Standby Charger, and Distribution center 1DA,	5B)	Keowee Battery #2, Charger #2 or Standby Charger, and Distribution Center 2DA,
6A)	ACB-1 to ACB-3 interlock,	6B)	ACB-2 to ACB-4 interlock,

7) Keowee reservoir level $\geq$ 775 feet above sea level,

Overhead Emergency Power Path

8) Keowee main step-up transformer,
9) PCB 9 (enabled by one channel of Switchyard Isolate Complete),
10) The 230kV switchyard yellow bus capable of being isolated by one channel of Switchyard Isolate,
11) A unit startup transformer and associated yellow bus PCB (CT-1 / PCB 18, CT-2 / PCB 27, CT-3 / PCB 30),
12) Both E breakers.

(continued)

BASES

LCO (continued)

An OPERABLE KHU and its required underground emergency power path must be capable of automatically supplying power from the KHU through the underground feeder, transformer CT-4, both standby buses, and both Unit S breakers to both main feeder buses. If closed, each N breaker and each SL breaker must be capable of opening using either of its associated breaker trip circuits. Either of the following combinations provides an acceptable KHU and required underground emergency power path:

Keowee Hydro Unit		Keowee Hydro Unit	
1A)	Keowee Unit 1 generator,	1B)	Keowee Unit 2 generator,
2A)	Keowee ACB 3,	2B)	Keowee ACB 4,
3A.1)	Keowee auxiliary transformer CX, Keowee ACB 7, Keowee Load Center 1X,	3B.1)	Keowee auxiliary transformer CX, Keowee ACB 8, Keowee Load Center 2X,
3A.2)	One Oconee Unit 1 S breaker capable of feeding switchgear 1TC,	3B.2)	One Oconee Unit 1 S breaker capable of feeding switchgear 1TC,
3A.3)	Switchgear 1TC capable of feeding Keowee auxiliary transformer CX,	3B.3)	Switchgear 1TC capable of feeding Keowee auxiliary transformer CX,
4A)	Keowee MCC 1XA,	4B)	Keowee MCC 2XA,
5A)	Keowee Battery #1, Charger #1 or Standby Charger, and Distribution Center 1DA,	5B)	Keowee Battery #2, Charger #2 or Standby Charger, and Distribution Center 2DA,
6A)	ACB-1 to ACB-3 interlock,	6A)	ACB-2 to ACB-4 interlock,

7) Keowee reservoir level ≥ 775 feet above sea level,

<u>Underground Emergency Power Path</u>

8) The underground feeder,
9) Transformer CT-4,
10) Both SK breakers,
11) Both standby buses,
12) Both S breakers, and
13) ACB-3 to ACB-4 interlock.

(continued)

BASES

LCO (continued)	This LCO is modified by three Notes. Note 1 indicates that a unit startup transformer may be shared with a unit in MODES 5 and 6. Note 2 indicates that the requirements of Specification 5.5.18, "KHU Commercial Power Generation Testing Program," shall be met for commercial KHU power generation. Note 3 indicates that the requirements of Specification 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a Lee Combustion Turbine (LCT) is used to comply with Required Actions.

APPLICABILITY

The AC power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of accidents and transients, and

b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated accident.

AC source requirements during MODE 5 and 6 are covered in LCO 3.8.2, AC Sources-Shutdown.

ACTIONS

The ACTIONS are modified by a Note. The Note excludes the MODE change restriction of LCO 3.0.4 when both standby buses are energized from an LCT via an isolated power path to comply with Required Actions. This exception allow entry into an applicable MODE while relying on the ACTIONS even though the ACTIONS may eventually require a unit shutdown. This exception is acceptable due to the additional capabilities afforded when both standby buses are energized from an LCT via an isolated power path.

(continued)

BASES

ACTIONS (continued)

A.1, A.2, A.3.1, and A.3.2

In the event a startup transformer becomes inoperable, it effectively causes the emergency overhead power path and both of the offsite sources to be inoperable. A KHU and its required underground power path remain available to ensure safe shutdown of the unit in the event of a transient or accident without a single failure.

Operation may continue provided the KHU and its required underground emergency power path are tested using SR 3.8.1.3 within one hour if not performed in the previous 12 hours. This Required Action provides assurance that no undetected failures have occurred in the KHU and its required underground emergency power path. Since Required Action A.1 only specifies "perform," a failure of SR 3.8.1.3 acceptance criteria does not result in a Required Action not met. However, if the KHU and its required underground emergency path fails SR 3.8.1.3, both emergency power paths and both required offsite circuits are inoperable, and Condition I for both KHUs and their required emergency power paths inoperable for reasons other than Condition G and H is entered concurrent with Condition A.

If available, another Unit's startup transformer should be aligned to supply power to the affected Unit's auxiliaries so that offsite power sources and the KHU and its required overhead emergency power path will also be available if needed. Although this alignment restores the availability of the offsite sources and the KHU and its required overhead emergency power path, the shared startup transformer's capacity and voltage adequacy could be challenged under certain DBA conditions. The shared alignment is acceptable because the preferred mode of Unit shutdown is with reactor coolant pumps providing forced circulation and due to the low likelihood of an event challenging the capacity of the shared transformer during a 72 hour period to bring a Unit to MODE 5. Required Action A.3.1 requires that the unit startup transformer be restored to OPERABLE status and normal startup bus alignment in 36 hours or Required Action 3.2 requires designating one unit sharing the startup transformer, to be shutdown. For example, if Unit 1 and 2 are operating and CT-2 becomes inoperable, Unit 2 may align CT-1 to be available to the Unit 2 main feeder buses and continue operating for up to 36 hours. At that time, if CT-2 has not been restored to OPERABLE status, one Unit must

(continued)

BASES

ACTIONS

A.1, A.2, A.3.1, and A.3.2 (continued)

be "designated" to be shutdown. The designated Unit must be shut down per ACTION B. Note that with one Unit in MODES 1, 2, 3 or 4 and another Unit in a condition other than MODES 1, 2, 3, or 4, the units may share a startup transformer indefinitely provided that the loads on the unit not in MODES 1, 2, 3 or 4 are maintained within acceptable limits. For example, if Unit 1 is in MODE 5 and CT-2 becomes inoperable, Unit 2 may align CT-1 to the Unit 2 main feeder buses and continue operation indefinitely.

B.1 and B.2

When a unit is designated to be shutdown due to sharing a unit startup transformer per Required Action A.3.2, the unit must be brought to a MODE in which the LCO does not apply, since the shared unit startup transformer's capacity could be challenged under certain DBA conditions. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5

With the KHU or its required overhead emergency power path inoperable due to reasons other than an inoperable startup transformer (Condition A), sufficient AC power sources remain available to ensure safe shutdown of the unit in the event of a transient or accident. Operation may continue if the OPERABILITY of the remaining KHU and its required underground emergency power path is determined by performing SR 3.8.1.3 within 1 hour if not performed in the previous 12 hours and once every 7 days thereafter. This demonstration assures the remaining emergency power path is not inoperable due to a common cause or other failure. Testing on a 7 day Frequency is acceptable since both standby buses must be energized from an LCT via an isolated power path when in Condition C for > 72 hours. When the standby buses are

(continued)

BASES

ACTIONS

C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

energized by an LCT via an isolated power path, the likelihood that the OPERABLE KHU and its required underground emergency power path will be required is decreased. Since Required Action C.1 only specifies "perform," a failure of SR 3.8.1.3 acceptance criteria does not result in a Required Action not met. SR 3.8.1.3 is only required to be performed when the KHU associated with the underground emergency power path is OPERABLE.

If the KHU and its required underground emergency path fails SR 3.8.1.3, both KHUs and their required emergency power paths are inoperable, and Condition I (Both KHUs or their required emergency power paths inoperable for reasons other than Condition G or H) is entered concurrent with Condition C.

If the inoperable KHU or its required overhead emergency power path are not restored to OPERABLE status within 72 hours as required by Required Action C.2.1, a controlled shutdown must be initiated as required by the Required Actions for Condition M unless the extended Completion Times of Required Action C.2.2.5 are applicable. The second Completion Time for Required Action C.2.1 establishes a limit on the maximum time allowed for a KHU to be inoperable during any single contiguous occurrence of having a KHU inoperable. If Condition C is entered as a result of switching an inoperable KHU from the underground to the overhead emergency power path, it may have been inoperable for up to 72 hours. This could lead to a total of 144 hours since the initial failure of the KHU. The second Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time the KHU become inoperable, instead of at the time Condition C was entered.

The extended Completion Times of Required Action C.2.2.5 apply when the KHU or its required overhead emergency power path is inoperable due to an inoperable Keowee main step-up transformer or an inoperable KHU (if not used for that KHU in the previous 3 years). In order to use the extended Completion Times, within 72 hours of entering Condition C both standby buses must be energized from an LCT (Required

(continued)

BASES

ACTIONS

C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

Action C.2.2.1), KHU generation to the grid except for testing must be suspended (Required Action C.2.2.2), the remaining KHU and its required underground emergency power path and both required offsite sources must be verified OPERABLE, the LCOs indicated in Required Action C.2.2.3 must be verified to be met, and alternate power source capability must be verified by performing SR 3.8.1.16.

Required Action C.2.2.5 permits maintenance and repair of a Keowee main step-up transformer which requires longer than 72 hours. Transformer replacement is rare but is time extensive. A 28 day Completion Time is permitted by Required Action C.2.2.5 to restore the KHU and its overhead power path to OPERABLE status when inoperable due to an inoperable Keowee main step-up transformer. This allows a reasonable period of time for transformer replacement.

Required Action C.2.2.5 also permits maintenance and repair of a KHU which requires longer than 72 hours. The primary long term maintenance items are expected to be hydro turbine runner and discharge ring welding repairs which are estimated to be necessary every six to eight years. Also, generator thrust and guide bearing replacements are necessary. Other items which manifest as failures are expected to be rare and may be performed during the permitted maintenance periods. As such, the 45 day restoration time of Required Action C.2.2.5 is allowed only once in a three year period for each KHU. This Completion Time is 45 days from discovery of initial inoperability of the KHU. This effectively limits the time the KHU can be inoperable to 45 days from discovery of initial inoperability rather than 45 days from entry into Condition C and precludes any additional time that may be gained as a result of switching an inoperable KHU from the underground to the overhead emergency power path

Required Actions C.2.2.1, C.2.2.2, C.2.2.3, and C.2.2.4 must be met in order to allow the longer restoration times of Required Action C.2.2.5. Required Action C.2.2.1 requires that both standby buses be energized using an LCT through the 100 kV transmission circuit. With this arrangement (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of

(continued)

BASES

ACTIONS

C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

reliability for the emergency power system is provided. In this configuration, the LCT is serving as a second emergency power source, however, since the 100 kV transmission circuit is vulnerable to severe weather a time limit is imposed. The second Completion Time of Required Action C.2.2.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost. Required Action C.2.2.2 requires suspension of KHU generation to the grid except for testing. The restriction reduces the number of possible failures which could cause loss of the underground emergency power path. Required Action C.2.2.3 requires verifying by administrative means that the remaining KHU and its required underground emergency power path and both required offsite sources are OPERABLE. This provides additional assurance that offsite power will be available. In addition, this assures that the KHU and its required underground emergency power path are available. Required Action C.2.2.3 also requires verifying by administrative means that the requirements of the following LCOs are met:

LCO 3.8.3, "DC Sources—Operating;"

LCO 3.8.6, "Vital Inverters—Operating;"

LCO 3.8.8, "Distribution Systems—Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;"

LCO 3.3.19, "EPSL 230 kV Switchyard DGVP;" and

LCO 3.3.21, "EPSL Keowee Emergency Start Function."

This increases the probability, even in the unlikely event of an additional failure, that the DC power system and the 120 VAC Vital Instrumentation power panelboards will function as required to support EPSL, power will not be lost to ES equipment, and EPSL will function as required.

(continued)

BASES

ACTIONS

C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

Verifying by administrative means allows a check of logs or other information to determine the OPERABILITY status of required equipment in place of requiring unique performance of Surveillance Requirements. If the AC Source is subsequently determined inoperable, or an LCO stated in Required Action C.2.2.3 is subsequently determined not met is subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L.

Required Action C.2.2.4 requires verifying alternate power source capability by performing SR 3.8.1.16. This confirms that entry into Condition C is due only to an inoperable main step-up transformer or an inoperable KHU, as applicable. If SR 3.8.1.16 is subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L.

D.1, D.2 and D.3

With the KHU or its required underground emergency power path inoperable, sufficient AC power sources remain available to ensure safe shutdown of the unit in the event of a transient or accident. Operation may continue for 72 hours if the remaining KHU and its required overhead emergency power path are tested using SR 3.8.1.4 within one hour if not performed in the previous 12 hours. SR 3.8.1.4 is only required to be performed when the KHU associated with the overhead emergency power path is OPERABLE.This Required Action provides assurance that no undetected failures have occurred in the overhead emergency power path. Since Required Action D.1 only specifies "perform," a failure of SR 3.8.1.4 acceptance criteria does not result in a Required Action not met. However, if the KHU and its required overhead emergency path fails SR 3.8.1.4, both KHUs and their required emergency power paths are inoperable, and Condition I for both KHUs and their emergency power paths inoperable for reasons other than Condition G or H is entered concurrent with Condition D. This demonstration is to assure that the remaining emergency power path is not inoperable due to a common cause or due to an undetected failure. For outages of the KHU and its required underground emergency power path in excess of 24 hours, an

(continued)

BASES

ACTIONS

D.1, D.2 and D.3 (continued)

LCT must energize a standby bus prior to the outage exceeding 24 hours. This ensures the availability of a power source on the standby buses when the KHU and its required underground emergency power path are out of service in excess of 24 hours. The second Completion Time of Required Action D.2 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost.

The second Completion Time for Required Action D.3 establishes a limit on the maximum time allowed for a KHU to be inoperable during any single contiguous occurrence of having a KHU inoperable. If Condition D is entered as a result of switching an inoperable KHU from the overhead to the underground emergency power path, it may have been inoperable for up to 72 hours. This could lead to a total of 144 hours since the initial failure of the KHU. The second Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time the KHU become inoperable, instead of at the time Condition D was entered.

E.1 and E.2

If the Required Action and associated Completion Time for Required Action D.2 are not met, 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 at least MODE 3 within 12 hours for one Oconee unit and 24 hours for other Oconee unit(s) and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

F.1 and F.2

With the zone overlap protection circuitry inoperable when the overhead electrical disconnects for the KHU associated with the underground power path are closed, the zone overlap protection circuitry must be restored to OPERABLE status or

(continued)

BASES

ACTIONS

F.1 and F.2 (continued)

the overhead electrical disconnects must be opened within 72 hours. In this Condition, both KHUs and their required emergency power paths are OPERABLE, however a single failure could result in the loss of both KHUs.

G.1

With both emergency power paths inoperable due to an E breaker and S breaker inoperable on the same main feeder bus, one breaker must be restored to OPERABLE status. In this Condition, both emergency power paths can still provide power to the remaining main feeder bus.

H.1 and H.2

With both KHUs or their required emergency power paths inoperable for planned maintenance or test with both standby buses energized from an LCT via an isolated power path, the KHU must be restored to OPERABLE status within 60 hours. Operation with both KHUs and their required power paths inoperable is permitted for 60 hours provided that both standby buses are energized using an LCT through the 100 kV transmission circuit and the requirements of the Note to the Condition are met. The Note to the Condition indicates that it may only be entered when both offsite sources are verified by administrative means to be OPERABLE and the requirements of the following LCOs are verified by administrative means to be met:

LCO 3.8.3, "DC Sources — Operating;"

LCO 3.8.6, "Vital Inverters — Operating;"

LCO 3.8.8, "Distribution Systems — Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;" and

LCO 3.3.19, "EPSL 230 kV Switchyard DGVP."

(continued)

BASES

ACTIONS

H.1 and H.2 (continued)

This increases the probability, even in the unlikely event of an additional failure, that the DC power system and the 120 VAC Vital Instrumentation power panelboards will function as required to support EPSL, power will not be lost to ES equipment, and EPSL will function as required.

Verifying by administrative means allows a check of logs or other information to determine the OPERABILITY status of required equipment in place of requiring unique performance of Surveillance Requirements. If the AC Source is subsequently determined inoperable, or an LCO stated in the Note to Condition H is subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L.

With both standby buses energized from an LCT via an isolated power path (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of reliability for the emergency power system is provided. In this configuration, the LCT is serving as a second emergency power source, however, since the Oconee Units are vulnerable to a single failure of the 100 kV transmission circuit a time limit of 60 days is imposed. Required Action H.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost.

If both emergency power paths are restored, unrestricted operation may continue. If only one power path is restored, operation may continue per ACTIONS C or D.

I.1, I.2, and I.3

With both KHUs or their required emergency power paths inoperable for reasons other than Conditions G and H, insufficient standby AC power sources are available to supply the minimum required ES functions. In this Condition, the offsite power system is the only source of AC power available for this level of degradation. The risk associated with continued operation for one hour without an emergency power source is considered acceptable due to the low likelihood of a LOOP during this time period, and because of the potential for grid instability caused by the

(continued)

BASES

ACTIONS

<u>I.1, I.2, and I.3</u> (continued)

simultaneous shutdown of all three units. This instability would increase the probability of a total loss of AC power. Operation with both KHUs or their required power paths inoperable is permitted for 12 hours provided that Required Actions I.1 and I.2 are met. Required Action I.1 requires that both standby buses be energized using an LCT via an isolated power path. With this arrangement (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of reliability for the emergency power system is provided. In this configuration, the LCT is serving as a second emergency power source, however, since the Oconee Units are vulnerable to a single failure of the 100 kV transmission circuit a time limit of 12 hours is imposed. The second Completion Time of Required Action I.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost. Required Action I.2 requires that the OPERABILITY status of both offsite sources be determined by administrative means and that the OPERABILITY status of equipment required by the following LCOs be determined by administrative means:

LCO 3.8.3, "DC Sources–Operating;"

LCO 3.8.6, "Vital Inverters–Operating;"

LCO 3.8.8, "Distribution Systems–Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;" and

LCO 3.3.19, "EPSL 230 kV Switchyard DGVP."

This increases the probability, even in the unlikely event of an additional failure, that the DC power system and the 120 VAC Vital Instrumentation power panelboards will function as required to support EPSL, power will not be lost to ES equipment, and EPSL will function as required.

Determining by administrative means allows a check of logs or other information to determine the OPERABILITY status of required equipment in place of requiring unique performance of Surveillance Requirements. If the AC Source is initially

(continued)

BASES

ACTIONS

I.1, I.2, and I.3 (continued)

or subsequently determined inoperable, or an LCO stated in Required Action I.2 is initially or subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L.

If both emergency power paths are restored, unrestricted operation may continue. If only one power path is restored, operation may continue per ACTIONS C or D.

J.1, J.2, and J.3

With one or both required offsite sources inoperable for reasons other than Condition A, sufficient AC power sources are available to supply necessary loads in the event of a DBA. However, since the AC power system is degraded below the Technical Specification requirements, a time limit on continued operation is imposed. With only one of the required offsite sources OPERABLE, the likelihood of a LOOP is increased such that the Required Actions for all required offsite circuits inoperable are conservatively followed. The risk associated with continued operation for one hour without a required offsite AC source is considered acceptable due to the low likelihood of a LOOP during this time period, and because of the potential for grid instability caused by the simultaneous shutdown of all three units.

Operation with one or both required offsite sources inoperable is permitted for 24 hours provided that Required Actions J.1 and J.2 are met. Required Action J.1 requires that both standby buses be energized using an LCT via an isolated power path. With this arrangement (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of reliability for the emergency power system is provided. In this configuration, the LCT is serving as an emergency power source, however, since the Oconee units are vulnerable to a single failure of the 100 kV transmission circuit a time limit is imposed. The second Completion Time of Required Action J.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost. Required Action J.2 requires that the OPERABILITY status of both KHUs and their required emergency

(continued)

BASES

ACTIONS

J.1, J.2, and J.3 (continued)

power paths be determined by administrative means and that the OPERABILITY status of equipment required by the following LCOs be determined by administrative means:

LCO 3.8.3, "DC Sources—Operating;"

LCO 3.8.6, "Vital Inverters—Operating;"

LCO 3.8.8, "Distribution Systems—Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;"

LCO 3.3.19, "EPSL 230 kV Switchyard DGVP," and

LCO 3.3.21, "EPSL Keowee Emergency Start Function."

This increases the probability, even in the unlikely event of an additional failure, that the DC power system and the 120 VAC Vital Instrumentation power panelboards will function as required to support EPSL, power will not be lost to ES equipment, and EPSL will function as required.

Determining by administrative means allows a check of logs or other information to determine the OPERABILITY status of required equipment in place of requiring unique performance of Surveillance Requirements. If the AC Source is initially or subsequently determined inoperable, or an LCO stated in Required Action J.2 is initially or subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L.

K.1

The two trip circuits for each closed N and SL breakers are required to ensure both breakers will open. An N breaker trip circuit encompasses those portions of the breaker control circuits necessary to trip the associated N breaker from the output of the 2 out of 3 logic matrix formed by the auxiliary transformer's undervoltage sensing circuits up to and including an individual trip coil for the associated N breaker. The undervoltage sensing channels for the

(continued)

BASES

ACTIONS

K.1 (continued)

auxiliary transformer are addressed in LCO 3.3.18, "Emergency Power Switching Logic (EPSL) Voltage Sensing Circuits." An SL breaker trip circuit encompasses those portions of the breaker control circuits necessary to trip the SL breaker from the output of both 2 out of 3 logic matrices formed by each standby bus's undervoltage sensing circuits up to and including an individual trip coil for the associated SL breaker. The undervoltage sensing channels for the CT-5 transformer are addressed in LCO 3.3.18, "Emergency Power Switching Logic (EPSL) Voltage Sensing Circuits." With one trip circuit inoperable a single failure could cause an N or SL breaker to not open. This could prevent the transfer to other available sources. Therefore, 24 hours is allowed to repair the trip circuit or open the breaker (opening the breaker results in exiting the Condition). The Completion Time is based on engineering judgement taking into consideration the time required to complete the required action and the availability of the remaining trip circuit.

A Note modifies the Condition, indicating that separate Condition Entry is permitted for each breaker. Thus, Completion Times are tracked separately for the N1, N2, SL1, and SL2 breaker.

L.1, L.2, and L.3

With an AC Source inoperable or LCO not met, as stated in Note for Condition H entry; or with an AC Source inoperable or LCO not met, as stated in Required Action C.2.2.3 when in C Condition C for > 72 hours; or with an AC Source inoperable or LCO not met, as stated in Required Action I.2 or J.2 when in Conditions I or J for > 1 hour; or with SR 3.8.1.16 not met, Required Action L.1, L.2 and L.3 requires restoration within four hours. Condition L is modified by a Note indicating that separate Condition entry is permitted for each inoperable AC Source, and LCO or SR not met. The Required Action is modified by a Note that allows the remaining OPERABLE KHU and its required emergency power path to be made inoperable for up to 12 hours if required to restore both KHUs and their required emergency power paths to OPERABLE status. This note is necessary since certain actions such as dewatering the penstock may be necessary to

(continued)

BASES

ACTIONS

L.1, L.2, and L.3 (continued)

restore the inoperable KHU although these actions would also cause both KHUs to be inoperable.

The purpose of this Required Action is to restrict the allowed outage time for an inoperable AC Source or equipment required by an LCO when in Conditions C, H, I or J. For Conditions I and J when the LCOs stated are initially not met, the maximum Completion Time is four hours or the remaining Completion Time allowed by the stated LCO, whichever is shorter.

M.1 and M.2

If a Required Action and associated Completion Time for Condition C, F, G, H, I, J, K or L are not met; or if a Required Action and associated Completion Time are not met for Required Action D.1 or D.3, 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 at least MODE 3 within 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their power source, and that appropriate separation of offsite sources is maintained. The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.2

This SR verifies adequate battery voltage when the KHU batteries are on float charge. This SR is performed to verify KHU battery OPERABILITY. The Frequency of once per 7 days is consistent with manufacturers recommendations and IEEE-450 (Ref. 8).

SR 3.8.1.3

This SR verifies the availability of the KHU associated with the underground emergency power path to start automatically and energize the underground power path. Utilization of either the auto-start or emergency start sequence assures the control function OPERABILITY by verifying proper speed control and voltage. Power path verification is included to demonstrate breaker OPERABILITY from the KHU onto the standby buses. This is accomplished by closing the Keowee Feeder Breakers (SK) to energize each deenergized standby bus. The 31 day Frequency is adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.8.1.4

This surveillance verifies the availability of the KHU associated with the overhead emergency power path. Utilization of either the auto-start or emergency start sequence assures the control function OPERABILITY by verifying proper speed control and voltage. The ability to supply the overhead emergency power path is satisfied by demonstrating the ability to synchronize (automatically or manually) the KHU with the grid system. The SR also requires that the underground power path be energized after removing the KHU from the overhead emergency power path. The SR is modified by a Note indicating that the requirement to energize the underground emergency power path is not applicable when the overhead disconnects are open for the KHU associated with the underground emergency power path or 2) when complying with Required Action D.1. The latter exception is necessary since Required Action D.1 continues to be applicable when both KHUs are inoperable.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.4 (continued)

The 31 day Frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.8.1.5

This surveillance verifies OPERABILITY of the trip functions of each closed SL and each closed N breaker. Neither of these breakers have any automatic close functions; therefore, only the trip coils require verification. Cycling of each breaker demonstrates functional OPERABILITY and the coil monitor circuits verify the integrity of each trip coil. The 31 day frequency is based on operating experience.

This SR modified by a Note that states it is not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and the breakers must remain closed to energized the standby buses from a LCT.

SR 3.8.1.6

Infrequently used source breakers are cycled to ensure OPERABILITY. The Standby breakers are to be cycled one breaker at a time to prevent inadvertent interconnection of two units through the standby bus breakers. Cycling the startup breakers verifies OPERABILITY of the breakers and associated interlock circuitry between the normal and startup breakers. This circuitry provides an automatic, smooth, and safe transfer of auxiliaries in both directions between sources. The 31 day Frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

This SR is modified by a Note which states the SR is not required to be performed for an S breaker when its standby bus is energized from a LCT via an isolated power path. This

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.6 (continued)

is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and cycling the S breakers connects the standby buses with the main feeder buses which are energized from another source.

SR 3.8.1.7

The KHU tie breakers to the underground path, ACB3 and ACB4, are interlocked to prevent cross-connection of the KHU generators. The safety analysis utilizes two independent power paths for accommodating single failures in applicable accidents. Connection of both generators to the underground path compromises the redundancy of the emergency power paths. Installed test logic is used to verify a circuit to the close coil on one underground ACB does not exist with the other underground ACB closed. The 12 month Frequency for this surveillance is adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.8.1.8

Each KHU tie breaker to the underground emergency power path and tie breaker to the overhead emergency path, are interlocked to prevent the unit associated with the underground circuit from automatically connecting to the overhead emergency power path. The safety analysis utilizes two independent power paths for accommodating single failures in applicable accidents. Connection of both generators to the overhead emergency power path compromises the redundancy of the emergency power paths. Temporary test instrumentation is used to verify a circuit to the close coil on the overhead ACB does not exist with the Underground ACB closed. The 12 month Frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.9

This surveillance verifies the KHUs' response time to an Emergency Start signal (normally performed using a pushbutton in the control room) to ensure ES equipment will have adequate power for accident mitigation. UFSAR Section 6.3.3.3 (Ref. 9) establishes the 23 second time requirement for each KHU to achieve rated frequency and voltage. Since the only available loads of adequate magnitude for simulating a accident is the grid, subsequent loading on the grid is required to verify the KHU's ability to assume rapid loading under accident conditions. Sequential block loads are not available to fully test this feature. This is the reason for the requirement to load the KHUs at the maximum practical rate. The 12 month Frequency for this SR is adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.8.1.10

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 should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of 12 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 6) and Regulatory Guide 1.129 (Ref. 7), which state that the battery service test should be performed with intervals between tests not to exceed 18 months.

SR 3.8.1.11

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 12 month Frequency for this SR is consistent with manufacturers recommendations and IEEE-450 (Ref. 8), which recommends detailed visual inspection of cell condition and rack integrity on a yearly basis.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.12

Verification of cell to cell connection cleanliness, tightness, and proper coating with anti-corrosion grease provides an indication of any abnormal condition, and assures continued OPERABILITY of the battery. The 12 month frequency is based on engineering judgement and operational experience and is sufficient to detect cell connection degradation when it is properly coupled with other surveillances more frequently performed to detect abnormalities.

SR 3.8.1.13

The KHU underground ACBs have a control feature which will automatically close the KHU, that is pre-selected to the overhead path, into the underground path upon an electrical fault in the zone overlap region of the protective relaying. This circuitry prevents an electrical fault in the zone overlap region of the protective relaying from locking out both emergency power paths during dual KHU grid generation. In order to ensure this circuitry is OPERABLE, an electrical fault is simulated in the zone overlap region and the associated underground ACBs are verified to operate correctly. This surveillance is required on a 12 month Frequency. The 12 month Frequency is based on engineering judgement and provides reasonable assurance that the zone overlap protection circuitry is operating properly.

This SR is modified by a Note indicating the SR is only applicable when the overhead disconnects to the underground KHU are closed. When the overhead disconnects to the underground KHU are open, the circuitry preventing the zone overlap protective lockout of both KHUs is not needed.

SR 3.8.1.14

This surveillance verifies OPERABILITY of the trip functions of the SL and N breakers. This SR verifies each trip circuit of each breaker independently opens each breaker. Neither of these breakers have any automatic close functions; therefore, only the trip circuits require verification. The 18 month Frequency is based on

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.14 (continued)

engineering judgement and provides reasonable assurance that the SL and N breakers will trip when required.

The SR is modified by a Note indicating that the SR is not required for an SL breaker when its standby bus is energized by a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and the breakers must remain closed to energized the standby buses from a LCT.

SR 3.8.1.15

This surveillance verifies proper operation of the 230 kV switchyard circuit breakers upon an actual or simulated actuation of the Switchyard Isolation circuitry. This test causes an actual switchyard isolation (by actuation of degraded grid voltage protection) and alignment of KHUs to the overhead and underground emergency power paths. An 18 month Frequency minimizes the impact to the Station and the operating Units which are connected to the 230 kV switchyard. The effect of this SR is not significant because the generator red bus tie breakers and feeders from the Oconee 230 kV switchyard red bus to the system grid remain closed. Either Switchyard Isolation Channel causes full system realignment, which involves a complete switchyard realignment. To avoid excessive switchyard circuit breaker cycling, realignment and KHU emergency start functions, this SR need be performed only once each SR interval.

This SR is modified by a Note. This Note states the redundant breaker trip coils shall be verified on a STAGGERED TEST BASIS. Verifying the trip coils on a STAGGERED TEST BASIS precludes unnecessary breaker operation and minimizes the impact to the Station and the operating Units which are connected to the 230 kV switchyard.

SR 3.8.1.16

This SR verifies that one KHU provides an alternate manual AC power source capability by manual or automatic KHU start

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.16 (continued)

with manual synchronize, or breaker closure, to energize its non-required emergency power path. That is, when the KHU to the overhead emergency power path is inoperable, the SR verifies that the overhead emergency power path is OPERABLE. When the overhead emergency power path is inoperable, the SR verifies that the KHU associated with the overhead emergency power path is OPERABLE.

This SR is modified by a Note indicating that the SR is only applicable when complying with Required Action C.2.2.4.

REFERENCES

1. UFSAR, Section 3.1.39
2. UFSAR, Chapter 16
3. 10 CFR 50.36
4. UFSAR, Chapter 6
5. UFSAR, Chapter 15
6. Regulatory Guide 1.32
7. Regulatory Guide 1.129
8. IEEE-450-1980
9. UFSAR, Section 6.3.3.3

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources – Shutdown

BASES

BACKGROUND

A description of the AC sources, except AC sources utilizing transformer CT-5, is provided in the Bases for LCO 3.8.1, "AC Sources – Operating." An additional source of AC power is available either directly from the 100 kV Central Tie Substation or from the combustion turbines at Lee Steam Station via a 100 kV transmission line connected to Transformer CT-5. This single 100 kV circuit is connected to the 100 kV transmission system through the substation at Central, located eight miles from Oconee. The Central Substation is connected to Lee Steam Station twenty-two miles away through a similar 100 kV line. This line can either be isolated from the balance of the transmission system to supply emergency power to Oconee from Lee Steam Station, or offsite power can be supplied directly from the 100 kV system from the Central Tie Substation. When CT-5 is energized from the 100 kV system, this is an acceptable offsite source for Oconee Units in MODES 5 and 6. When CT-5 is energized from an OPERABLE Lee Combustion Turbine (LCT) and isolated from the balance of the transmission system, this source is an acceptable emergency power source.

Located at Lee Steam Station are three 44.1 MVA combustion turbines. One of these three combustion turbines can be started in one hour and connected to the 100 kV line. Transformer CT-5 is sized to carry the engineered safeguards auxiliaries of one unit plus the shutdown loads of the other two units.

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many accidents that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst-case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from accident analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4 various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown MODES based on:

a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration;

b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both;

c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems; and

(continued)

BASES

APPLICABLE SAFETY ANALYSIS (continued)

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite emergency power sources and their associated emergency power paths.

The AC sources satisfy Criterion 3 of the 10 CFR 50.36 (Ref. 1).

LCO

One offsite source capable of supplying the onsite power distribution system(s) of LCO 3.8.9, "Distribution Systems – Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE emergency power source, associated with a distribution system required to be OPERABLE by LCO 3.8.9, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite source. Together, OPERABILITY of the required offsite source and emergency power source ensure the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite source must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the main feeder bus(es). Qualified offsite source are those that are described in the UFSAR and are part of the licensing basis for the unit.

An offsite source can be an offsite circuit connected through the 230 kV switchyard to the startup transformer and to one main feeder bus. Additionally, the offsite source can be an offsite circuit connected through the 230 kV switchyard (525 kV switchyard for Unit 3) to a backcharged unit main step-up transformer and unit auxiliary transformer to one main feeder bus. Another alternative is the energized Central 100 kV switchyard connected through the 100 kV line and transformer CT-5 to one main feeder bus.

(continued)

BASES

LCO (continued)

In MODES 5 or 6 and during movement of irradiated fuel, a Lee Combustion Turbine (LCT) energizing one standby bus via an isolated power path to one main feeder bus can be utilized as an emergency power source. The LCT is required to provide power within limits of voltage and frequency using the 100 kV transmission line electrically separated from the system grid and offsite loads energizing one or more standby buses through transformer CT-5. The required number of energized standby buses is based upon the requirements of LCO 3.8.9, "Distribution System - Shutdown."

An OPERABLE KHU must be capable of starting, accelerating to rated speed and voltage, and connecting to the main feeder bus(es). The sequence must be capable of being accomplished within 23 seconds after a manual emergency start initiation signal. An emergency power source must be capable of accepting required loads and must continue to operate until offsite power can be restored to the main feeder buses.

This LCO is modified by three Notes. Note 1 indicates that a unit startup transformer may be shared with a unit in MODES 5 and 6. Note 2 indicates that the requirements of Specification 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a Lee Combustion Turbine (LCT) is used for the emergency power requirements. Note 3 indicates that the required emergency power source and the required offsite power source shall not be susceptible to a failure disabling both sources.

The required emergency power source and required offsite source cannot be susceptible to a failure disabling both sources. If the required offsite source is the 230 kV switchyard and the startup transformer energizing the required main feeder bus(es), the KHU and its required underground emergency power path are required to be OPERABLE since it is not subject to a failure, such as an inoperable startup transformer, which simultaneously disables the offsite source. If the Central switchyard is serving as the required offsite source through the CT-5 transformer and required standby bus(es) energizing required main feeder bus(es), the KHU and its required overhead emergency power path are required to be OPERABLE to preclude failure of a standby bus from disabling the offsite source and the underground emergency power path. Conversely, if an LCT is

(continued)

BASES

LCO (continued)

being used as an emergency power source, the required offsite source must be an offsite circuit connected through the startup transformer or a backcharged unit main step-up transformer and the unit auxiliary transformer.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

A.1

An offsite source would be considered inoperable if it were not available to one required main feeder bus. Although two main feeder buses may be required by LCO 3.8.9, the one main feeder bus with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By the allowance of the option to declare features inoperable with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

(continued)

BASES

ACTIONS (continued)

A.2.1, A.2.2, A.2.3, A.2.4, B.1, B.2, B.3, and B.4

With the offsite source not available to all required features, the option would still exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required emergency power source inoperable, the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions. The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory provided the required SDM is maintained.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System's ACTIONS are not entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required main feeder bus, the ACTIONS for LCO 3.8.9 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite source, whether or not a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for the situation involving a de-energized required main feeder bus.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.7, SR 3.8.1.13, SR 3.8.1.14, SR 3.8.1.15 and SR 3.8.1.16 are not required to be met. SR 3.8.1.7 verifies both KHUs cannot be tied to the underground emergency power path simultaneously. This SR verifies train independence to prevent a single failure from disabling both KHUs. This SR is not required to be met in MODES 5 and 6 and during movement of irradiated fuel assemblies, because single failure protection is not required in these MODES. SR 3.8.1.13 requires verification that on an actual or simulated zone overlap signal each KHU's overhead tie breaker and underground tie breaker actuate to the correct position. This SR verifies redundancy between the KHU's in the ability to connect to the underground emergency power path. This redundancy is not required in MODES 5 and 6. SR 3.8.1.14 requires verification that each closed SL and closed N breaker opens on an actuation of each redundant trip coil. This SR verifies each trip circuit for each breaker independently opens each breaker. This SR is not required to be met in MODES 5 and 6 and during movement of irradiated fuel assemblies, because there is no requirement for the automatic transfer function to be OPERABLE when the Unit is in these MODES. SR 3.8.1.15 requires verification that each 230 kV switchyard circuit breaker actuates to the correct position on an actual or simulated switchyard isolation actuation signal. This SR is not required to be met in MODES 5 and 6 and during movement of irradiated fuel assemblies, because there is no requirement for the switchyard isolation function to be OPERABLE when the Unit is in these MODES. SR 3.8.1.16 verifies that one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path. This SR is not required to be met in MODES 5 and 6 and during movement of irradiated fuel assemblies, because there is no requirement for providing this capability when the Unit is in these MODES.

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BASES

SURVEILLANCE REQUIREMENTS

3.8.2.1 (continued)

The SR is modified by two Notes. Note 1 indicates that SR requirements to energize both standby buses may be reduced to require energizing only one standby bus and one main feeder bus. Reduced OPERABILITY requirements associated with MODES 5 and 6 and during movement of irradiated fuel may permit a reduction in requirements for energizing portions of the AC distribution system. Note 2 indicates that the SR 3.8.1.4 requirement to energize the underground power path is not applicable since the performance of this portion of the SR is only appropriate when both emergency power paths are required to be OPERABLE.

REFERENCES

1. 10 CFR 50.36.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.3 DC Sources — Operating

BASES

BACKGROUND

The 125 VDC Vital I&C electrical power sources provide the AC emergency power system with control power. It also provides both motive power and control power for selected safety related equipment. Additionally, the 125 VDC Vital I&C electrical power sources provide DC electrical power through DC panelboards to the inverters, which in turn supply the AC Vital instrumentation power panelboards.

The 125 VDC Vital I&C electrical power system is a system consisting of six power sources shared by the three Oconee units. Each unit has its own two power sources with backup sources supplied to the unit's 125 VDC Vital Instrumentation distribution system from another unit using a network of isolating diode assemblies. This provides necessary redundancy and independence for the 125 VDC Vital I&C power sources. Each source consists of one 125 VDC battery, the associated battery charger for each battery, the distribution center, the associated control equipment, isolating transfer diodes and interconnecting cabling. Additionally, there is one standby battery charger shared between each unit's batteries, which provides backup service in the event that the preferred battery charger is out of service.

The 125 VDC I&C batteries of a unit are physically separated in separate enclosures from batteries of another unit to minimize their exposure to any damage. The battery chargers and associated DC distribution centers and switchgear of a unit are located in separate rooms from the battery chargers and associated DC distribution centers of another unit in the auxiliary building and physical separation is maintained between redundant equipment.

During normal operation, the 125 VDC Vital I&C loads are powered from the battery chargers with the batteries floating on the system. In case of loss of power to a battery charger, the associated DC loads are automatically powered from the 125 VDC Vital I&C battery. Each battery has adequate storage capacity to carry the required load continuously for at least 1 hour.

(continued)

BASES

BACKGROUND (continued)

Each 125 VDC Vital I&C power source has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient capacity to restore the battery from the design minimum charge to its fully charged state while supplying normal steady state loads.

The 230 kV switchyard 125 VDC Power System provides power to power circuit breakers, protective and control relays, indicating lights, annunciators, carrier equipment and other switchyard equipment requiring an uninterrupted power source.

The 230 kV switchyard 125 VDC Power System consists of two sources. Each source consists of one 125 VDC battery, the associated battery charger for each battery, distribution panel, and associated control equipment and interconnecting cabling. Redundant batteries are located in separate rooms and redundant chargers, distribution centers and panelboards are located on different walls of the 230 kV switchyard relay house. Additionally, there is one standby battery charger shared between the sources, which provides backup service in the event that the preferred battery charger is out of service.

During normal operation, the 230 kV 125 VDC loads are powered from the battery chargers with the batteries floating on the system. In case of loss of power to a battery charger, the associated DC load is automatically powered from the 230 kV 125 VDC battery. Each battery has adequate storage capacity to carry the required load continuously for at least 1 hour.

Each 230 kV 125 VDC power source has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient capacity to restore the battery from the design minimum charge to its fully charged state while supplying normal steady state loads.

(continued)

BASES

BACKGROUND (continued)

The 125 VDC Vital I&C power and 230 kV 125 VDC power distribution systems are described in more detail in the Bases for LCO 3.8.8, "Distribution System – Operating," and for LCO 3.8.9, "Distribution Systems – Shutdown."

APPLICABLE SAFETY ANALYSES

The initial conditions of accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume that Engineered Safeguards (ES) systems are OPERABLE. The 125 VDC Vital I&C electrical power system provides normal and emergency DC electrical power for the emergency auxiliaries, and control and switching during all MODES of operation.

The 230 kV switchyard 125 VDC Power System provides control power for circuit breaker operation in the 230 kV switchyard as well as DC power for degraded grid voltage protection circuits during all MODES of operation.

The OPERABILITY of the DC sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining the DC sources OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite AC power or all onsite AC power; and

b. A worst-case single failure.

The DC sources satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

LCO

Three 125 VDC Vital I&C electrical power sources and two 230 kV switchyard 125 VDC electrical power sources, each source consisting of one battery, associated battery charger, distribution center and the corresponding control equipment and interconnecting cabling supplying power to the associated panelboards are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated transient or an accident.

(continued)

BASES

LCO (continued)

For operation of any Oconee unit, three of four 125 VDC Vital I&C Sources capable of supplying the unit's DC distribution system shall be OPERABLE as follows:

Unit 1: 1CA, 1CB, 2CA, 2CB
Unit 2: 2CA, 2CB, 3CA, 3CB
Unit 3: 3CA, 3CB, 1CA, 1CB

and aligned such that no power source shall be the only source for two or more of the Unit's panelboards. The three of four requirement ensures that a single failure will not result in a loss of power to more than one 125 VDC Vital I&C panelboard. This requirement ensures supported safety functions are not vulnerable to a single failure.

When any other unit is in MODES 1, 2, 3, or 4, two additional 125 VDC Vital I&C Sources are required to be OPERABLE. In addition to ensuring that each Oconee unit in MODES 1, 2, 3, or 4 has three of the four 125 VDC Vital I&C Sources capable of supplying the units' DC distribution system OPERABLE, the additional requirement ensures sufficient capacity and voltage for supported DC loads assuming a single failure. When no other Unit is in MODES 1, 2, 3, or 4, one additional 125 VDC Vital I&C power source is required to be OPERABLE. This ensures sufficient capacity and voltage for supported DC loads assuming a single failure.

The requirement that two 230 kV 125 VDC sources be OPERABLE ensures that supported safety functions are not vulnerable to a single failure.

An OPERABLE DC electrical power source requires all required batteries, respective chargers, and distribution centers to be operating and connected to required DC panelboard(s). The DC electrical power source from the unit not in the MODES 1, 2, 3, or 4 must be connected to any of that unit's energized panelboards to be considered OPERABLE for a unit in MODES 1, 2, 3, or 4.

The LCO is modified by three Notes. Note 1, which applies to Units 2 and 3 only, indicates that no single 125 VDC Vital I&C source shall be the only source for panelboards 1DIC and 1DID. This is necessary since vital I&C

(continued)

BASES

LCO (continued)

panelboards 1DIC and 1DID supply power for SK and SL breaker control, protective relaying for both standby buses, breaker control for both standby breakers for the three Oconee units, and retransfer to startup source logic circuits for the three Oconee units. The requirement that no single 125 VDC source be the only source of power for panelboards 1DIC and 1DID ensures than a single failure will not result in a loss of power to both panelboards. This requirement ensures supported safety functions are not vulnerable to a single failure.

Note 2 indicates that the additional 125 VDC Vital I&C sources required by part b or part c of the LCO are not required to be connected to the Unit distribution system. The additional power sources are necessary to assure assumptions in the DC capacity and voltage drop analyses for the operating unit are valid. Note 3 specifies that the additional 125 VDC Vital I&C power source required by LCO 3.8.3 part c shall not be a power source that is available to meet the three of four requirment of LCO 3.8.3.a. This requirement is necessary to assure assumptions in the DC capacity and voltage drop analyses for the operating unit are valid.

APPLICABILITY

The DC electrical power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of transients and accidents; and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated accident.

The DC electrical power requirements for MODES 5 and 6 are addressed in the Bases for LCO 3.8.4, "DC Sources – Shutdown."

(continued)

BASES (continued)

ACTIONS

The ACTIONS are modified by a Note indicating that the Completion Times for Required Actions A through D are reduced when in Condition L of LCO 3.8.1. Condition L limits the Completion Time for restoring inoperable power sources to 4 hours when emergency power source(s) or offsite power source(s) are inoperable for extended time periods or for specific reasons.

A.1

With one of the required 125 VDC Vital I&C sources inoperable, the remaining sources are fully capable of providing adequate voltage to the four unit DC panelboards and will assure alignment of power to at least three panelboards. Three panelboards are necessary to shut down the operating unit and maintain it in a safe shutdown condition. However, overall reliability is reduced because an additional failure could result in the minimum required ES functions not being supported. Therefore, the inoperable source must be restored to OPERABLE status within 24 hours. Required Action A.1 is modified by a Note indicating that it is not applicable for up to 72 hours to perform an equalization charge after completion of a performance test or service test. This note allows a maximum Completion Time of 96 hours (24 hours for an inoperable battery due to performing a service test plus 72 hours to perform equalization charge).

The Completion Time for this Required Action is based on engineering judgment, taking into consideration the extent of degradation involved, the likelihood of events or failures which could challenge the system, and the time required to complete the equalization charge.

B.1

In this condition, a single failure of a battery (or its associated equipment) could cause loss of more than one unit panelboard during an accident, so that required safety functions might not be supported. Specifically, if a single source were providing the only power source for panelboards DIA and DIB, single failure of the source would result in failure of both ES digital channels. Vulnerability of the ES digital channels to single failure for 24 hours is

(continued)

BASES

ACTIONS

B.1 (continued)

considered acceptable due to the limited scope of potential failures. Similarly, if the panelboards are isolated from their backup Unit (e.g., the Unit's DC system is isolated from the other Units), a single failure could result in loss of two or more panelboards so that required safety functions may not be supported. If the panelboards are isolated from their backup Unit when one of that Unit's batteries are inoperable (and the DC buses are cross tied), the remaining battery has the capacity to support all required loads, however, a single failure could result in loss of all four panelboards so that required safety functions may not be supported. Therefore, within 24 hours after such a condition arises, affected equipment shall be restored and aligned such that no single source is the only battery power supply for more than one 125 VDC Vital I&C panelboard for the unit under consideration. The 24 hour Completion Time is based on engineering judgement taking into consideration the time to complete the Required Action and the redundancy available in the 125 VDC Vital I&C System.

C.1

With a single source providing the only power supply for 125 VDC Vital I&C panelboards 1DIC and 1DID, a single failure of a battery (or its associated equipment) could cause loss of both panelboards, so that required automatic EPSL functions for all three units may not be supported. These panelboards provide primary and backup control power for the SK and SL breaker control power, standby bus protective relaying, standby breaker control power and retransfer to startup logic. Therefore, within 24 hours after such a condition arises, affected equipment shall be restored and aligned such that no single source is the only battery power supply for both DC panelboards 1DIC and 1DID.

The Completion Time is based on engineering judgement, provides a reasonable time to complete repairs and considers the redundancy available in the 125 VDC Vital I&C DC System.

This Condition is modified by a Note indicating that this ACTION is only applicable to Units 2 and 3. For Unit 1 the appropriate action is specified in ACTION B.

(continued)

BASES

ACTIONS (continued)

D.1

With one of the required 230 kV switchyard DC power sources inoperable, the remaining source is fully capable of providing adequate voltage to the associated panelboards and is fully capable of powering the necessary panelboards. However, another failure of a DC source or panelboard could result in failure of the overhead emergency power path. In addition, in the event of grid voltage degradation the station and onsite emergency power sources could fail to separate from the grid. Therefore, the inoperable source must be restored to OPERABLE status within 24 hours. Required Action D.1 is modified by a Note indicating that it is not applicable for up to 72 hours to perform an equalization charge after completion of a performance test or service test. This note allows a maximum Completion Time of 96 hours (24 hours for an inoperable battery due to performing a service test plus 72 hours to perform equalization charge).

The Completion Time for this Required Action is based on engineering judgment, taking into consideration the extent of degradation involved, the likelihood of events or failures which could challenge the system, and the time required to complete the required actions.

E.1 and E.2

If the inoperable DC electrical power source cannot be restored to OPERABLE status within the required Completion Time, 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 at least MODE 3 within 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This Surveillance verifies that the distribution centers are functioning properly, with the correct circuit breaker alignment to the isolating transfer diodes. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each required isolating transfer diode. The verification of proper voltage availability on the distribution centers ensures that the required voltage is readily available for isolating transfer diodes connected to these distribution centers. The 7 day Frequency takes into account the redundant capability of the DC electrical power distribution systems, and other indications available in the control room that alert the operator to system malfunctions.

SR 3.8.3.2

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. 5).

SR 3.8.3.3

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. 5), which recommends detailed visual

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.3 (continued)

inspection of cell condition and rack integrity on a yearly basis.

SR 3.8.3.4

Visual inspection of inter-cell, inter-rack, inter-tier, and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate graded battery condition. The anticorrosion 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 Surveillance Frequencies of 12 months are consistent with IEEE-450 (Ref. 5), which recommends cell to cell and terminal connection visual inspection on a yearly basis.

SR 3.8.3.5

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 should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of 12 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 6) and Regulatory Guide 1.129 (Ref. 7), which state that the battery service test should be performed during refueling operations, or at some other outage, with intervals between tests not to exceed 18 months.

SR 3.8.3.6

This SR requires battery capacity be verified in accordance with the Battery Discharge Testing Program. A battery performance discharge test is a test of constant current capacity of a battery, normally done in the as found condition, after having been in service, to detect any change in the capacity determined by the acceptance test.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.4 (continued)

The test is intended to determine overall battery degradation due to age and usage.

The Surveillance Frequencies for this test are in accordance with the Battery Discharge Testing Program and are consistent with the recommendations in IEEE-450 (Ref. 5). These periodic frequencies are based on the outcome of the previous battery capacity test.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.
4. UFSAR, Chapter 8.
5. IEEE-450-1987.
6. Regulatory Guide 1.32, February 1977.
7. Regulatory Guide 1.129, December 1974.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources – Shutdown

BASES

BACKGROUND	A description of the 125 VDC Vital I&C sources is provided in the Bases for LCO 3.8.3, "DC Sources – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Accidents and transients analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume that Engineered Safeguard (ES) systems are OPERABLE. The 125 VDC Vital I&C electrical power system provides normal and emergency DC electrical power for the emergency auxiliaries, and control and switching during all MODES of operation.

Although the 230 kV Switchyard 125 VDC Power System provides control power for circuit breaker operation in the 230 kV switchyard as well as DC power for degraded grid voltage protection circuits during all MODES of operation, no credit is taken for these functions in MODES 5 and 6.

The OPERABILITY of the 125 VDC Vital I&C sources is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum 125 VDC Vital I&C electrical power sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

The 125 VDC Vital I&C sources satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

(continued)

BASES (continued)

LCO

The 125 VDC Vital I&C electrical power sources, each source consisting of one battery, one battery charger, and the corresponding control equipment and interconnecting cabling within the source, are required to be OPERABLE to support required distribution systems required OPERABLE by LCO 3.8.9, "Distribution Systems – Shutdown" and shall include at least one of the unit's 125 VDC Vital I&C power sources. This ensures the availability of sufficient 125 VDC Vital I&C electrical power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The 125 VDC Vital I&C electrical power sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies, provide assurance that:

a. Required features to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Required features needed to mitigate a fuel handling accident are available;

c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The 125 VDC Vital I&C electrical power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.3.

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

If two or more 125 VDC Vital I&C panelboards are required by LCO 3.8.9, the remaining 125 VDC Vital I&C panelboards with 125 VDC Vital I&C power available may be capable of supporting sufficient systems to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to

(continued)

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

declare required features inoperable with the associated 125 VDC Vital I&C power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO ACTIONS. In many instances this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required 125 VDC Vital I&C electrical power sources and to continue this action until restoration is accomplished in order to provide the necessary 125 VDC Vital I&C electrical power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required 125 VDC Vital I&C electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

SR 3.8.4.1 requires performance of all Surveillances required by SR 3.8.3.1 through SR 3.8.3.6. Therefore, see the corresponding Bases for LCO 3.8.3 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE 125 VDC Vital I&C sources from being discharged below their capability to provide the

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.8.4.1 (continued) required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.
REFERENCES	1. UFSAR, Chapter 6. 2. UFSAR, Chapter 15. 3. 10 CFR 50.36.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 Battery Cell Parameters

BASES

BACKGROUND

This LCO delineates the limits on electrolyte temperature, level, float voltage, and specific gravity for the KHU, 125 VDC Vital I&C, and 230 kV 125 VDC power source batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.8.1, "AC Sources Operating," LCO 3.8.2, "AC Sources - Shutdown, LCO 3.8.3, "DC Sources – Operating," and LCO 3.8.4, "DC Sources – Shutdown."

APPLICABLE SAFETY ANALYSES

The initial conditions of Accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safeguards (ES) systems are OPERABLE. The 125 VDC Vital I&C electrical power system provides normal and emergency DC electrical power for the emergency auxiliaries, and control and switching during all MODES of operation.

Although the 230 kV Switchyard 125 VDC Power System provides control power for circuit breaker operation in the 230 kV switchyard as well as DC power for degraded grid voltage protection circuits during all MODES of operation, no credit is taken for these functions in MODES 5 and 6.

Each Keowee Hydro Unit (KHU) includes a 125 VDC power source to supply power to DC auxiliary loads and the Keowee Emergency Start circuits.

The OPERABILITY of the DC sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining required DC sources OPERABLE during accident conditions, in the event of:

a. An assumed loss of all offsite AC power or all onsite AC power; and

b. A worst-case single failure.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	Battery cell parameters satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).
LCO	Battery cell parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after a transient or a postulated accident. Electrolyte limits are conservatively established, allowing continued DC electrical system function even with Category A and B limits not met.
APPLICABILITY	The battery cell parameters are required solely for the support of the associated DC electrical power sources. Therefore, battery cell parameters are only required to be met when the DC power source is required to be OPERABLE. Refer to the Applicability discussion in Bases for LCO 3.8.1, LCO 3.8.2, LCO 3.8.3 and LCO 3.8.4.
ACTIONS	The ACTIONS Table is modified by a Note which indicates that separate Condition Entry is allowed for each battery. This is acceptable, since the Required Actions for each Condition provides appropriate compensatory actions for each inoperable DC source. Complying with the Required Actions for one inoperable DC source may allow for continued operation, and subsequent inoperable DC sources(s) are governed by separate Condition entry and application of associated Required Actions. A second Note states that LCO 3.0.4 is not applicable. This is acceptable since a battery remains OPERABLE when one or more cells does not meet Category A or B limits but continues to meet Category C limits. Failure to meet Category C limits requires declaring the associated battery inoperable. LCO 3.0.4 requirements are applicable to the requirements of LCO 3.8.3, "DC Sources - Operating" for an inoperable battery.

(continued)

BASES

ACTIONS (continued)

A.1, A.2, and A.3

With one or more cells in one or more batteries not within limits (i.e., Category A limits not met or Category B limits not met or Category A and B limits not met) but within the Category C limits specified in Table 3.8.5-1 in the accompanying LCO, the battery is degraded but there is still sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of Category A or B limits not met, and continued operation is permitted for a limited period.

The pilot cell electrolyte level and float voltage are required to be verified to meet the Category C limits within 1 hour (Required Action A.1). This check will provide a quick indication of the status of the remainder of the battery cells. One hour provides time to inspect the electrolyte level and to confirm the float voltage of the pilot cells. One hour is considered a reasonable amount of time to perform the required verification.

Verification that the Category C limits are met (Required Action A.2) provides assurance that during the time needed to restore the parameters to the Category A and B limits, the battery will still be capable of performing its intended function. A period of 24 hours is allowed to complete the initial verification because specific gravity measurements must be obtained for each connected cell. Taking into consideration both the time required to perform the required verification and the assurance that the battery cell parameters are not severely degraded, this time is considered reasonable. The verification is repeated at 7 day intervals until the parameters are restored to Category A and B limits. This periodic verification is consistent with the normal Frequency of pilot cell Surveillances.

Continued operation is only permitted for 90 days before battery cell parameters must be restored to within Category A and B limits. With the consideration that, while battery capacity is degraded, sufficient capacity exists to perform the intended function and to allow time to fully restore the battery cell parameters to normal limits, this time is acceptable prior to declaring the battery inoperable.

(continued)

BASES

ACTIONS (continued)

B.1

With the Required Action and associated Completion Time not met, or with one or more batteries with one or more battery cell parameters outside the Category C limit for any connected cell, or with the average electrolyte temperature of representative cells falling below 60°F, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding DC electrical power source must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 4), which recommends regular battery inspections including voltage, specific gravity, and electrolyte temperature of pilot cells.

SR 3.8.5.2

The quarterly inspection of specific gravity and voltage is consistent with IEEE-450 (Ref. 4).

SR 3.8.5.3

This Surveillance verification that the average temperature of representative cells is ≥ 60°F is consistent with a recommendation of IEEE-450 (Ref. 4), which states that the temperature of electrolytes in representative cells should be determined on a quarterly basis.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.5.3 (continued)

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on plant specific calculations.

Table 3.8.5-1

This table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage and electrolyte specific gravity are considered to approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450 (Ref. 4), with the extra ¼ inch allowance above the high water level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote a to Table 3.8.5-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided it is not overflowing. These limits ensure that the plates suffer no physical damage and that adequate electron transfer capability is maintained in the event of transient conditions. IEEE-450 (Ref. 4) recommends that electrolyte level readings should be made only after the battery has been at float charge for at least 72 hours.

The Category A limit specified for float voltage is ≥ 2.13 V per cell. This value is based on a recommendation of IEEE-450 (Ref. 4), which states that prolonged operation of cells < 2.13 V can reduce the life expectancy of cells.

The Category A limit specified for specific gravity for each pilot cell is ≥ 1.200 (0.015 below the manufacturer fully charged nominal specific gravity or a battery charging current that had stabilized at a low value). This value is

(continued)

BASES

SURVEILLANCE REQUIREMENTS

TABLE 3.8.5-1 (continued)

characteristic of a charged cell with adequate capacity. According to IEEE-450 (Ref. 4), the specific gravity readings are based on a temperature of 77°F (25°C).

The specific gravity readings are corrected for actual electrolyte temperature and level. For each 3°F (1.67°C) above 77°F (25°C), 1 point (0.001) is added to the reading; 1 point is subtracted for each 3°F below 77°F. The specific gravity of the electrolyte in a cell increases with a loss of water due to electrolysis or evaporation.

Category B defines the normal parameter limits for each connected cell. The term "connected cell" excludes any battery cell that may be jumpered out.

The Category B limits specified for electrolyte level, float voltage and specific gravity are the same as those specified for Category A and have been discussed above. In addition to that limit, it is required that the specific gravity for each connected cell must be no less than 0.010 below the average of all connected cells. This limit ensures that the effect of a highly charged or new cell does not mask overall degradation of the battery.

Category C defines the limits for each connected cell. These values, although reduced, provide assurance that sufficient capacity exists to perform the intended function and maintain a margin of safety. When any battery parameter is outside the Category C limits, the assurance of sufficient capacity described above no longer exists and the battery must be declared inoperable.

The Category C limits specified for electrolyte level (above the top of the plates and not overflowing) ensure that the plates suffer no physical damage and maintain adequate electron transfer capability. The Category C limits for float voltage is based on IEEE-450 (Ref. 4), which states that a cell voltage of 2.07 V or below, under float conditions and not caused by elevated temperature of the cell, indicates internal cell problems and may require cell replacement.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

Table 3.8.5-1 (continued)

The Category C limits of for specific gravity is the same as the limits specified for Category A and has been discussed above.

The footnotes to Table 3.8.5-1 are applicable to Category A, B, and C specific gravity. Footnote (b) to Table 3.8.5-1 requires the above mentioned correction for electrolyte level and temperature, with the exception that level correction is not required when battery float current is < 2 amps on float charge. This current provides, in general, an indication of overall battery condition.

Because of specific gravity gradients that are produced during the recharging process, delays of several days may occur while waiting for the specific gravity to stabilize. A stabilized charger current is an acceptable alternative to specific gravity measurement for determining the state of charge. This phenomenon is discussed in IEEE-450 (Ref. 4). Footnote (c) to Table 3.8.5-1 allows the float (charger) current to be used as an alternate to specific gravity for up to 7 days following a battery recharge. When battery float current is verified in lieu of specific gravity, the specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance. Within 7 days each connected cell's specific gravity must be measured to confirm the state of charge. Following a minor battery recharge (such as equalizing charge that does not follow a deep discharge) specific gravity gradients are not significant, and confirming measurements may be made in less that 7 days.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.
4. IEEE-450-1995.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Vital Inverters – Operating

BASES

BACKGROUND	The inverters are the preferred source of power for the 120 VAC Vital Instrumentation panelboards because of the stability and reliability they achieve. The function of the inverter is to provide AC electrical power to the 120 VAC Vital Instrumentation panelboard. The panelboards can be powered from an alternate AC source or from the 125 VDC Vital I&C batteries through a 125 VDC Vital I&C Power Panelboard and the inverters. The inverters provide an uninterrupted power source for the instrumentation and controls for the Reactor Protective System (RPS) and the Engineered Safeguards (ES) System .

APPLICABLE SAFETY ANALYSES

The initial conditions of Accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1), and Chapter 15 (Ref. 2), assume Engineered Safeguards (ES) systems are OPERABLE. The inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the RPS and ES instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and is based on meeting the design basis of the unit. This includes maintaining required 120 VAC Vital Instrumentation panelboards OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite AC electrical power or all onsite AC electrical power; and

b. A worst-case single failure.

Inverters are a part of the distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

(continued)

BASES (continued)

LCO

The inverters ensure the availability of AC electrical power for the systems instrumentation required to shut down the reactor and maintain it in a safe condition after a transient or a postulated accident.

Maintaining the required inverters OPERABLE ensures that the redundancy incorporated into the design of the RPS and ES instrumentation and controls is maintained. The four inverters ensure an uninterrupted supply of AC electrical power to the 120 VAC Vital Instrumentation panelboards even if the 4.16 kV buses are de-energized.

OPERABLE inverters require the associated Vital Instrumentation panelboards to be powered by the inverter with output voltage and frequency within tolerances, and power input to the inverter from a 125 VDC Vital I&C source.

APPLICABILITY

The inverters are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of transients and accidents; and

b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated accident.

Inverter requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.7, "Inverters – Shutdown."

ACTIONS

A.1

With a required inverter inoperable, its associated 120 VAC Vital Instrumentation panelboard becomes inoperable until it is manually re-energized from its alternate regulated voltage source.

(continued)

ACTIONS

A.1 (continued)

For this reason, Note 1 has been included for Required Action A.1 requiring entry into the Conditions and Required Actions of LCO 3.8.8, "Distribution Systems – Operating." This ensures the vital bus is re-energized within either 4 or 24 hours. Required Action A.1 allows 7 days to fix the inoperable inverter and return it to service. The 7 day limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the 120 VAC Vital Instrumentation panelboard is powered from its regulated voltage source, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the 120 VAC Vital Instrumentation panelboards is the preferred source for powering instrumentation trip setpoint devices.

Required Action A.1 is also modified by Note 2 which indicates that the Completion Time is reduced when in Condition L of LCO 3.8.1. Condition L limits the Completion Time for restoring an inoperable vital inverter to 4 hours when emergency power source(s) or offsite power source(s) are inoperable for extended time periods or for specific reasons.

B.1 and B.2

If the Required Action and associated Completion Time are not met, 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 at least MODE 3 within 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1 (continued)

closed and 120 VAC Vital Instrumentation panelboards energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation of the RPS and ES connected to the 120 VAC Vital Instrumentation panelboards. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.7 Vital Inverters – Shutdown

BASES

BACKGROUND	A description of the inverters is provided in the Bases for LCO 3.8.6, "Inverters – Operating."
APPLICABLE SAFETY ANALYSES	The initial conditions of Accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safeguards systems are OPERABLE. The DC to AC inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protection System and Engineered Safeguards (ES) System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY. The OPERABILITY of the minimum inverters to each 120 VAC Vital Instrumentation panelboards during MODES 5 and 6 ensures that: a. The unit can be maintained in the shutdown or refueling condition for extended periods; b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and c. Adequate power is available to mitigate events postulated during shutdown, such as a fuel handling accident.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSIS (continued)	The inverters were previously identified as part of the distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

LCO

The inverters ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after a transient or accident. The battery powered inverters provide uninterruptible supply of AC electrical power to the 120 VAC Vital Instrumentation panelboards even if the 4.16 kV buses are de-energized. OPERABILITY of the inverters requires that the 120 VAC Vital Instrumentation panelboard be powered by the inverter. This ensures the availability of sufficient inverter power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The inverters required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.6.

(continued)

BASES (continued)

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

If two or more 120 VAC Vital Instrumentation panelboards are required by LCO 3.8.9, "Distribution Systems – Shutdown," the remaining OPERABLE inverters may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for positive reactivity additions. The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained. By the allowance of the option to declare required features inoperable with the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions).

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required inverters and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from an alternate regulated voltage source.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and 120 VAC Vital Instrumentation panelboards

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1 (continued)

energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation connected to the 120 VAC Vital Instrumentation panelboards. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Distribution Systems – Operating

BASES

BACKGROUND

The onsite AC, DC, and AC vital electrical power distribution systems are divided into redundant and independent AC, DC, and AC vital electrical power distribution buses and panelboards.

The electrical power distribution system consists of two 4.16 kV main feeder buses each connected to three 4.16 kV Engineered Safeguards (ES) power strings, and secondary 600 V load centers; and 600 V and 208 V motor control centers. Both main feeder buses can be connected to the offsite sources or the emergency power sources. Upon a loss of power to the normal unit auxiliary transformer, the main feeder buses are transferred to the startup transformer powered from either the offsite sources through the 230 kV switchyard or the overhead emergency power path. If power is not available from the startup transformer, the main feeder buses are transferred to the standby buses powered from either the underground emergency power path or a Lee combustion turbine using a 100 kV transmission line separated from the system grid and offsite loads. Control power for the 4.16 kV breakers is supplied from the 125 VDC Vital I&C batteries. Control power for the circuit breakers in the 230 kV switchyard is provided from the 230 kV Switchyard 125 VDC batteries. Additionally, power to grid voltage protection circuits are also provided from the 230 kV switchyard 125 VDC batteries. Additional description of this system may be found in the Bases for LCO 3.8.1, "AC Sources – Operating," and the Bases for LCO 3.8.3, "DC Sources – Operating."

The 120 VAC Vital Instrumentation panelboards are normally powered from the inverters. The alternate power supply for the vital panelboards is a regulated voltage source and its use is governed by LCO 3.8.6, "Inverters – Operating." Each regulated voltage source is powered from a non-safety related non-load shed source.

(continued)

BASES

BACKGROUND (continued)	There are four 125 VDC Vital I&C panelboards supplying power to DC loads. Each 125 VDC I&C panelboard is connected to two 125 VDC Vital I&C sources through isolating transfer diodes. Upon a loss of power from either source, power is supplied to the panelboard through the redundant source. There are two 230 kV switchyard 125 VDC sources each supplying power to three required DC panelboards.

APPLICABLE SAFETY ANALYSES

The initial conditions of accidents and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume ES systems are OPERABLE. The AC, DC, and AC vital electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ES systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the AC, DC, and AC vital electrical power distribution systems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining power distribution systems OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite power or all onsite AC electrical power; and

b. A worst-case single failure.

The distribution systems satisfy Criterion 3 of the 10 CFR 50.36 (Ref. 4).

(continued)

BASES (continued)

LCO

The AC, DC, and AC vital electrical power distribution systems are required to be OPERABLE. To be considered OPERABLE the AC Distribution System must include two energized main feeder buses capable of being automatically powered by a Keowee Hydro Unit. Each main feeder bus is considered OPERABLE if it is energized and connected to at least two ES power strings. Each of the three ES power strings is required to be energized. The three ES power Strings consist of the following:

1A) Switchgear TC	1B) Switchgear TD	1C) Switchgear TE
2A) Load Center X8	2B) Load Center X9	2C) Load Center X10
3A) 600V MCC XS1 and 1, 2, 3XSF	3B) 600V MCC XS2	3C) 600V MCC XS3
4A) 208V MCC XS1 and 1, 2, 3XSF	4B) 208V MCC XS2	4C) 208V MCC XS3

Each string is considered OPERABLE if it is energized by at least one main feeder bus except when MCC 1, 2, or 3XSF is powered from load center OXSF. These MCCs would not be available during a DBA when powered from load center OXSF and are therefore are considered inoperable.

An OPERABLE 125 VDC Vital I&C Distribution System must include energized 125 VDC Vital I&C panelboards DIA, DIB, DIC, and DIB. Additionally, for Units 2 and 3 only, Vital I&C panelboards 1DIC and 1DID shall be energized.

To be considered OPERABLE, 230 kV switchyard 125 VDC panelboards DYA, DYB, DYC, DYE, DYF, and DYG must be energized.

An OPERABLE 120 VAC Vital Instrumentation Distribution System must include energized 120 VAC Vital Instrumentation panelboards KVIA, KVIB, KVIC, and KVID.

These distribution systems ensure the availability of AC, DC, and AC vital electrical power for the systems required to shut down the reactor and maintain it in a safe condition after a transient or accident.

(continued)

BASES

LCO (continued)

Maintaining the AC, DC, and AC vital electrical power distribution systems OPERABLE ensures that the redundancy incorporated into the design of ES is not defeated. Therefore, a single failure within any system or within the electrical power distribution systems will not prevent safe shutdown of the reactor.

An OPERABLE AC electrical power distribution system requires the associated buses, ES power strings, load centers, and motor control centers to be energized to their proper voltages. OPERABLE 125 VDC Vital I&C panelboards require the panelboards to be energized to their proper voltage from either a battery or charger. OPERABLE 120 VAC Vital Instrumentation panelboards require the panelboards to be energized to their proper voltage from the associated inverter via inverted DC voltage or alternate regulated voltage source.

APPLICABILITY

The electrical power distribution systems are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of accident or transients; and

b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

Electrical power distribution system requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.9, "Distribution Systems – Shutdown."

ACTIONS

The ACTIONS are modified by a Note indicating that the Completion Times for Required Actions A through F are reduced when in Condition L of LCO 3.8.1. Condition L limits the Completion Time for restoring inoperable power sources to 4 hours when emergency power source(s) or offsite power source(s) are inoperable for extended time periods or for specific reasons.

(continued)

BASES

ACTIONS (continued)

A.1 and B.1

With one Main Feeder bus inoperable or not connected to two ES power strings or one ES power string inoperable, the remaining portion of the AC electrical power distribution system is capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining portion of the power distribution systems could result in the minimum required ES functions not being supported. Therefore, the required AC buses, ES power strings, load centers, and motor control centers must be restored to OPERABLE status within 24 hours.

Condition A and B's worst scenario is one main feeder bus and one ES power string without AC power. In this Condition, the unit is more vulnerable to a complete loss of AC power. It is, therefore, imperative that the unit operator's attention be focused on minimizing the potential for loss of power to the remaining bus or ES power strings by stabilizing the unit, and on restoring power to the affected bus or ES power string. The 24 hour time limit before requiring a unit shutdown in this Condition is acceptable because of:

a. The potential for decreased safety if the unit operator's attention is diverted from the evaluations and actions necessary to restore power to the affected train to the actions associated with taking the unit to shutdown within this time limit; and

b. The potential for an event in conjunction with a single failure of a redundant component.

C.1

With one of the unit's 125 VDC Vital I&C panelboard inoperable, the remaining 125 VDC Vital I&C panelboards are capable of supporting the minimum safety functions necessary to shutdown the reactor and maintain it in a safe shutdown condition, assuming no additional failure. The overall reliability is reduced, however, because an additional failure in the remaining 125 VDC Vital I&C panelboards could

(continued)

BASES

ACTIONS

C.1 (continued)

result in the minimum required ES functions not being supported. Therefore, the 125 VDC Vital I&C panelboard must be restored to OPERABLE status within 24 hours by powering the bus from a battery or charger.

Condition C represents one of the unit's 125 VDC Vital I&C panelboard without adequate 125 VDC Vital I&C power; potentially with both the batteries significantly degraded and the associated chargers nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all 125 VDC Vital I&C power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining panelboard(s) and restoring power to the affected panelboard(s).

This 24 hour limit is longer than Completion Times allowed for some of the components that are without power. Utilizing the LCO 3.0.6 exception to LCO 3.0.2 for components without adequate 125 VDC Vital I&C power, which would have Required Action Completion Times shorter than 24 hours, is acceptable because of:

a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) while allowing stable operations to continue;

b. The potential for decreased safety by requiring entry into numerous applicable Conditions and Required Actions for components without DC power and not providing sufficient time for the operators to perform the necessary evaluations and actions to restore power to the affected panelboard(s); and

c. The potential for an event in conjunction with a single failure of a redundant component.

D.1

If a required 230 kV switchyard 125 VDC panelboard or combination of required panelboards which are not redundant to each other are inoperable, the required panelboard(s) shall be restored to OPERABLE status within 24 hours. Loss

(continued)

BASES

ACTIONS

D.1 (continued)

of the remaining distribution center or a redundant panelboard could result in failure of the overhead emergency power path. In addition, in the event of grid degradation, the station and onsite emergency power sources could fail to separate from the grid.

Condition D is modified by two Notes. Note 1 indicates that Separate Condition entry is allowed for each 230 kV switchyard 125 VDC power panelboard. Note 2 indicates that Condition D is not applicable to the following loss of function combinations: DYA and DYE, DYB and DYF, and DYC and DYG.

The 24 hour Completion Time is based on engineering judgement taking into consideration the time to complete the required action, the redundancy available in the 230 kV switchyard 125 VDC system, the redundancy available in the emergency power paths, and the infrequency of an actual grid system degradation.

E.1

With either panelboard 1DIC inoperable or panelboard 1DID inoperable, a single failure of the remaining panelboard would result in failure of control power for the S, SK, and SL breakers, standby bus protective relaying, and retransfer to startup logic. Within 24 hours after such a condition arises, the inoperable panelboard shall be restored. The Completion Time is based on engineering judgement taking into consideration the time to complete the required action and the redundancy available in the Vital I&C DC System and AC electrical power system.

This Condition is modified by a Note indicating that it is only applicable to Units 2 and 3. For Unit 1 the appropriate action is specified in ACTION C.

F.1 and F.2

With one 120 VAC Vital Instrumentation power panelboard inoperable, the remaining three OPERABLE 120 VAC Vital Instrumentation power panelboards are capable of supporting

(continued)

BASES

ACTIONS

F.1 and F.2 (continued)

the minimum safety functions necessary to shut down the unit and maintain it in the safe shutdown condition. Overall reliability is reduced, however, since an additional single failure could result in the minimum required functions not being supported. Therefore, the inoperable 120 VAC Vital Instrumentation power panelboard must be restored to OPERABLE status within 4 or 24 hours dependent upon which panelboard is inoperable. The Completion Time for restoring panelboard KVIA or KVIB is limited to 4 hours since these panelboards power the digital Engineered Safeguards Protective System (ESPS) channels and they cannot actuate without power. The Completion Time for restoring KVIC or KVID is 24 hours.

Condition F represents one 120 VAC Vital Instrumentation panelboard without power; potentially both the 125 VDC Vital I&C source and the alternate AC source are nonfunctioning. In this situation the unit is significantly more vulnerable to a complete loss of all 120 VAC Vital Instrumentation panelboards. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining 120 VAC Vital Instrumentation panelboards and restoring power to the affected 120 VAC Vital Instrumentation panelboard.

The 4 hour and 24 hour limits are longer than Completion Times allowed for some of the components that are without adequate vital AC power. Utilizing the LCO 3.0.6 exception to LCO 3.0.2 for components without adequate vital AC power, that would have the Required Action Completion Times shorter than 4 hours or 24 hours if declared inoperable, is acceptable because of:

a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) and not allowing stable operations to continue;

b. The potential for decreased safety by requiring entry into numerous applicable Conditions and Required Actions for components without adequate vital AC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train; and

(continued)

BASES

ACTIONS

F.1 and F.2 (continued)

c. The potential for an event in conjunction with a single failure of a redundant component.

The digital ESPS channels are powered from KVIA and KVIB, and cannot actuate without power. The 4 hour Completion Time takes into account the importance to safety of restoring the 120 VAC Vital Instrumentation panelboards to OPERABLE status, the redundant capability afforded by the other OPERABLE 120 VAC Vital Instrumentation panelboards, and the low probability of an accident occurring during this period.

Panelboards KVIC and KVID supply some loads which trip upon loss of power. For example, RPS channels and ES analog channels go to a tripped state upon loss of power. The 24 hour Completion Time takes into account the importance to safety of restoring the 120 VAC Vital Instrumentation panelboards to OPERABLE status, the redundant capability afforded by the other OPERABLE 120 VAC Vital Instrumentation panelboards, and the low probability of an accident occurring during this period.

G.1 and G.2

If the Required Action and associated Completion Time are not met, 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 at least MODE 3 within 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

H.1

Condition H corresponds to a level of degradation in the electrical distribution system that causes a required safety function to be lost. When more than one Condition is entered, and this results in the loss of a required safety function, the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation.

(continued)

BASES

ACTIONS

H.1 (continued)

LCO 3.0.3 must be entered immediately to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the main feeder buses are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital electrical power distribution systems, and other indications available in the control room that alert the operator to system malfunctions.

SR 3.8.8.2

This Surveillance verifies that the required AC, DC, and AC vital electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each ES power string and panelboard. The verification of voltage availability on the ES power strings, and panelboards ensures that voltage is readily available for motive as well as control functions for critical system loads connected to the ES power strings, and panelboards. Verification of voltage availability may be accomplished by observing alarm conditions, status lights or by confirming proper operation of a component supplied from each ES power string or panelboard. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital electrical power distribution systems, and other indications available in the control room that alert the operator to system malfunctions.

(continued)

BASES (continued)

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. Regulatory Guide 1.93, December 1974.
4. 10 CFR 50.36.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.9 Distribution Systems – Shutdown

BASES

BACKGROUND

A description of the AC, DC and AC vital electrical power distribution systems is provided in the Bases for LCO 3.8.8, "Distribution Systems – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safeguards (ES) systems are OPERABLE. The AC, DC, and AC vital electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ES systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the AC, DC, and AC vital electrical power distribution systems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC, DC, and AC vital electrical power distribution systems during MODES 5 and 6, and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

The AC and DC electrical power distribution systems satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

(continued)

BASES (continued)

LCO

Various combinations of portions of systems, equipment, and components are required OPERABLE by other LCOs, depending on the specific plant condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the electrical distribution system necessary to support OPERABILITY of required systems, equipment, and components – all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY.

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The AC and DC electrical power distribution buses, ES power strings and panelboards required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies, provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC, DC, and AC vital electrical power distribution buses, ES power strings and panelboards requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.8.

(continued)

BASES (continued)

ACTIONS

<u>A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5</u>

Although redundant required equipment may require redundant buses, ES power strings and panelboards of electrical power distribution systems to be OPERABLE, a reduced set of OPERABLE distribution buses, ES power strings and panelboards may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to declare required equipment associated with an inoperable distribution buses, ES power strings and panelboards inoperable, appropriate restrictions are implemented in accordance with the affected distribution buses, ES power strings and panelboards LCO's Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions).

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC and DC electrical power distribution buses, ES power strings and panelboards and to continue this action until restoration is accomplished in order to provide the necessary power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, a required decay heat removal (DHR) subsystem may be inoperable. In this case, Required Actions A.2.1 through A.2.4 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the DHR ACTIONS would not be entered. Therefore, Required Action A.2.5 is provided to direct declaring DHR inoperable, which results in taking the appropriate DHR actions.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution buses, ES power strings and panelboards should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the required main feeder buses are functioning properly, with all the required main feeder buses energized. The verification of proper voltage availability on the buses, ES power strings and panelboards ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the capability of the electrical power distribution buses, ES power strings and panelboards, and other indications available in the control room that alert the operator to system malfunctions.

SR 3.8.9.2

This Surveillance verifies that the required AC, DC, and AC vital electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each ES power strings and panelboards. The verification of voltage availability on the ES power strings, and panelboards ensures that voltage is readily available for motive as well as control functions for critical system loads connected to the ES power strings, and panelboards. Verification of voltage availability may be accomplished by observing alarm conditions, status lights or by confirming proper operation of a component supplied from each ES power string or panelboard. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital electrical power distribution systems, and other indications available in the control room that alert the operator to system malfunctions.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 14.
3. 10 CFR 50.36.

OCONEE NUCLEAR STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.8 - ELECTRICAL POWER SYSTEMS

ATTACHMENT 3

CTS MARKUP AND DISCUSSION OF CHANGES

A1 <except as marked>

Supp4

3.8 ~~3.7~~ ELECTRICAL POWER SYSTEMS

3.8.1 ~~3.7.1~~ AC Sources - Operating

LCO 3.8.1 ~~TS 3.7.1~~ The following AC electrical power sources shall be OPERABLE: A44

LCO a.2 ~~1.~~ One underground emergency power path from one Keowee Hydro Unit through the S breakers,

~~2.~~ One overhead emergency power path from a second Keowee Hydro Unit through the E breakers,

M13 3. ~~One underground emergency power path from a second Keowee Hydro Unit through the S breakers,~~ A33

LCO a.1 ~~4.~~ Two offsite sources on separate towers connected to the 230kV switchyard, and

Add LCO b. 5. ~~One Lee gas turbine.~~ A25

The zone overlap protection circuitry shall be

NOTES

LCO c. ~~1.~~ The underground emergency power path ~~specified in LCO 3.7.1.3~~ is not required to be OPERABLE when overhead electrical disconnects for the underground emergency power path ~~specified in LCO 3.7.1.1~~ are ~~open~~. closed — A33

LCO Note 3 2. One Lee gas turbine is only required to be OPERABLE when: A25

a) underground emergency power path is inoperable ≥ 24 hours,
b) overhead Keowee Hydro Unit is inoperable ≥ 72 hours,
c) Keowee Main Step-up transformer is inoperable ≥ 72 hours,
d) both emergency power paths are inoperable for planned reasons,
e) both emergency power paths are inoperable ≥ 1 hour for unplanned reasons,
f) one or more required offsite sources are inoperable ≥ 1 hour.

3. ~~During periods of commercial power generation, the operability of the Keowee Hydro units shall be based on lake levels and the power level of the Keowee Hydro units. The Keowee Hydro operating restrictions for commercial power generation shall be contained in the ONS Selected Licensee Commitment manual.~~ LA1

APPLICABILITY: ~~Above COLD SHUTDOWN~~ MODES 1, 2, 3 and 4

Add LCO Note 1 — A47

Add LCO Note 2 — A48

A1 <except as marked>

Specification 3.8.1

Add ACTIONS Note — A3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
Both ACT A A. ~~One or more~~ required offsite sources and overhead emergency power path inoperable due to inoperable startup transformer.	A.1 Perform ~~SR 3.7.1.4~~ SR 3.8.1.3	1 hour if not performed in previous 12 hours. ~~AND~~ ~~Once per 12 hours thereafter.~~ — L3
A35	AND A.2 ~~Share another Unit's startup transformer.~~ Align the emergency startup bus to A.3.1 Restore unit startup transformer to OPERABLE status and normal startup bus alignment | 36 hours	12 hours
Unit designated to be shutdown due to sharing a unit startup transformer.	AND A.~~3~~ 3.2 ~~Designate shared startup transformer to one Unit.~~ 3B	36 hours — A35 one unit, sharing the startup transformer, to be shutdown.
ACT B B. ~~Shared startup transformer designated to one Unit.~~ ~~OR~~ ~~Required Actions and associated Completion Times not met for Condition A.~~ — M8	B.1 Be in ~~HOT SHUTDOWN~~ MODE 3 AND B.2 Be in ~~COLD SHUTDOWN~~ MODE 5	12 hours 36 hours
ACT C C. ~~Overhead emergency power path inoperable due to reasons other than Condition A or B~~ KHU or its required ~~AND~~ ~~Underground emergency power path operable.~~	C.1 Perform ~~SR 3.7.1.4~~ SR 3.8.1.3 for OPERABLE KHU — A28 INSERT RA J.4 CT + RA K.4 CT — A27	1 hour if not performed in ~~preceding~~ previous 12 hours. AND ~~Once per 12 hours thereafter unless two standby buses are energized by an OPERABLE Lee gas turbine.~~ — L3 (continued)

(A1) <except as marked> Specification 3.8.1

Supp 4

C.2.1 Restore KHU and its required overhead emergency power path to OPERABLE status. (A27)

(A26) (A27)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTC C. (continued) C.2.2.1 (see CTS M/u for RA J.1+K.1) AND C.2.2.2 (see CTS M/u for RA J Note 1) AND C.2.2.3 (see CTS M/u for RA K.2) AND C.2.2.4 (see CTS M/u for RA J.2+K.2) AND C.2.2.5 (see CTS M/u for RA J.5+K.5)	AND C.2 ~~Enter applicable Conditions and Required Actions for overhead emergency power path inoperable for > 72 hours.~~ ~~NOTE~~ ~~Required Actions must be completed prior to entering applicable Conditions.~~	72 hours AND 72 hours from discovery of inoperable KHU (M9)
D. ~~Underground emergency power path inoperable.~~ KHU or its required ~~AND~~ ~~Overhead emergency power path operable.~~ (A28)	D.1 Perform ~~SR 3.7.1.5~~. SR 3.8.1.4 for OPERABLE KHU AND D.2 Energize either ~~a~~ standby bus by ~~an~~ OPERABLE Lee gas turbine. ~~The 100kV transmission circuit shall be electrically separated from the system grid and all offsite loads.~~ (LA2) AND D.3 Restore KHU and its required underground emergency power path to OPERABLE status.	1 hour if not performed in ~~preceding~~ previous 12 hours. AND ~~Once per 12 hours thereafter unless two standby buses are energized by an OPERABLE Lee gas turbine.~~ (L3) LCT via isolated power path (A36) 24 hours AND 1 hour from subsequent discovery of deenergized standby bus~~es~~ 72 hours AND 72 hours from discovery of inoperable KHU (M9)

(continued)

4

A1 <except as marked>

Add Action F — A33

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. ACT E Required Action and associated Completion Time for Required Action D.2 not met.	E.1 Be in ~~HOT SHUTDOWN~~ MODE 3 AND E.2 Be in COLD SHUTDOWN	12 hours for ~~the first~~ one Oconee unit. AND 24 hours for ~~subsequent~~ other Oconee unit(s). 84 hours
~~F.~~ ACT G Both emergency power paths inoperable due to One inoperable E breaker and one inoperable S breaker on the same main feeder bus.	F.1 ~~Declare associated main feeder bus inoperable.~~ Restore one breaker to OPERABLE status.	~~Immediately~~ 24 hrs A37
~~G.~~ ACT H Both emergency power paths inoperable for planned ~~reason other than Condition F.~~ KHUs or their required maintenance or test with both standby buses energized from an LCT via an isolated power path A30	LCO 3.0.4 NOTE ~~TS 3.0.~~ is not applicable when both standby buses are energized ~~by an OPERABLE Lee gas turbine.~~ by LCT via isolated power path ~~G.1~~ H.1 ~~Energize two standby buses by an OPERABLE Lee gas turbine. The 100kV transmission circuit shall be electrically separated from the system grid and all offsite loads.~~ LA2 ~~AND~~ CONDITION H Note G.2 Verify by administrative means the ~~operability status of:~~ that Both required ~~Two~~ offsite sources ~~(TS 3.7.1)~~, Distribution Systems ~~(TS 3.7.2)~~, EPSL ~~(TSs 3.7.3, 3.7.4, 3.7.6)~~, DC Sources ~~(TS 3.7.8)~~ and Vital Inverters ~~(TS 3.7.9)~~. are OPERABLE A30 LCOs 3.3.17, 3.3.18 + 3.3.19 are met LCO 3.8.8 LCO 3.8.3 A30	A3 ACTIONS Table Note to comply with Req. Actions A36 ~~Prerequisite~~ A30 ~~AND~~ 1 hour from subsequent discovery of deenergized standby buses. ~~Prerequisite~~ A30 (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~G.~~ (continued) ACT H	AND	
ACT L →	G.3 Restore inoperable components listed in G.2 to OPERABLE status.	4 hours from discovery of inoperable component. A29
	AND H.2 ~~G.4~~ Restore one KHU and its required emergency power path to OPERABLE status.	60 hours
~~H.~~ ACT I Both KHUs and their required emergency power paths inoperable for unplanned reason other than Condition F.	LCO 3.0.3 NOTE ~~TS 3.7.0~~ is not applicable when both standby buses are energized ~~by an OPERABLE Lee gas turbine.~~	Action Table Note A3
to comply with Req. Actions	~~H.1~~ I Energize ~~two~~ both standby buses ~~by an OPERABLE Lee gas turbine. The 100kV transmission circuit shall be electrically separated from the system grid and all offsite loads.~~	from LCT via isolated power path A36 1 hour LA2 AND 1 hour from subsequent discovery of deenergized standby buses.
both required	AND I ~~H.2~~ Verify by administrative means the operability status of ~~Two~~ offsite sources ~~(TS 3.7.1)~~ LCO 3.8.8, and of equipment required by Distribution Systems ~~(TS 3.7.2)~~ LCOs 3.3.17, 3.3.18, 3.3.19, EPSL ~~(TSs 3.7.3, 3.7.4, 3.7.6)~~, DC Sources ~~(TS 3.7.8)~~ LCO 3.8.3 and Vital Inverters ~~(TS 3.7.9)~~ LCO 3.8.6.	1 hour
ACT L →	AND H.3 Restore inoperable components listed in H.2 to OPERABLE status.	4 hours from discovery of inoperable component. A29
	AND I.3 ~~H.4~~ Restore one emergency power path to OPERABLE status.	12 hours

(continued)

P
4

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~I.~~ J One or more required offsite sources inoperable due to reasons other than Condition A or B.	LCO 3.0.4 ——NOTE—— ~~TS 3.7.0~~ is not applicable when both standby buses are energized ~~by an OPERABLE Lee gas turbine~~. from LCT via isolated power path A36	ACTIONS Table Note A3
to comply with Req. Actions	~~I.1~~ J.1 Energize ~~two~~ both standby buses ~~by an OPERABLE Lee gas turbine. The 100kV transmission circuit shall be electrically separated from the system grid and all offsite loads.~~ LA2	1 hour AND 1 hour from subsequent discovery of deenergized standby buses.
LCO 3.8.8	AND ~~I.2~~ J.2 Verify by administrative means the operability status of: Two emergency power paths ~~(TS 3.7.1)~~, Distribution Systems ~~(TS 3.7.2)~~, EPSL ~~(TSs 3.7.3-3.7.6)~~, DC Sources ~~(TS 3.7.8)~~, and Vital Inverters ~~(TS 3.7.9)~~. LCO 3.8.6	1 hour and of equipment required by LCOs 3.3.17, 3.3.18, 3.3.19, 3.3.21 LCO 3.8.3
Act L →	~~AND~~ ~~I.3 Restore inoperable components listed in I.2 to OPERABLE status.~~	~~4 hours from discovery of inoperable component.~~ A29
	AND I.~~4~~ 3 Restore required offsite sources to OPERABLE status.	24 hours

(continued)

A1 <except as marked>

Add Action L — A29

A27 A26

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
NOTE: Only applicable once in a three year period for each Keowee Hydro Unit. (A27)	NOTES: 1. Keowee Hydro Unit generation to the system grid prohibited except for test. (A26)	RA C.2.2.2
J. ~~Overhead emergency power path inoperable > 72 hours due to~~ inoperable Keowee Hydro Unit. (COND. C + 2nd CT for RA C.2.2.5)	2. The OPERABLE Keowee Hydro Unit may be made inoperable for 12 hours if required to restore both Keowee Hydro Units to OPERABLE status.	RA L Note
RA C.2.2.5 2nd CT	3. ~~TS 3.7.0~~ LCO 3.0.4 is not applicable when both standby buses are energized ~~by an OPERABLE Lee gas turbine~~.	to comply with Req. Actions; ACTIONS Table Note — A3
both; C.2.2.1; A36 — from LCT via isolated power path	~~J.1~~ Energize ~~two~~ standby buses by ~~an~~ OPERABLE Lee gas turbine. The 100kV transmission circuit shall be electrically separated from the system grid and all offsite loads.	~~Prerequisite~~ 72 hrs — A30 AND — LA2 1 hour from subsequent discovery of deenergized standby buses.
	AND	
RA C.2.2.3; A42 — RA C.2.2.4; LCO 3.8.8	J.2 Verify by (A30) administrative means the ~~operability status of~~ Two (Both required) offsite sources and underground emergency power path ~~(TS 3.7.1)~~ overhead emergency power path excluding Keowee Hydro Unit ~~(TS 3.7.1)~~, Distribution Systems ~~(TS 3.7.2)~~, EPSL ~~(TS 3.7.3-3.7.6)~~, DC Sources ~~(TS 3.7.8)~~, and Vital Inverters ~~(TS 3.7.9)~~.	~~Prerequisite~~ 72 hrs — A30 are OPERABLE and LCOs 3.3.17, 3.3.18, 3.3.19, 3.3.21, 3.8.3, 3.8.6
	AND	
ACT L →	J.3 Restore inoperable components listed in J.2 to OPERABLE status.	4 hours from discovery of inoperable component (A29)

(continued)

A1 <except as marked>

4

from discovery of initial inoperability when Condition due to an inoperable KHU if not used for that KHU in the previous 3 years

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~J.~~ (continued) ACT C (cont.)	AND	RA C.1, 2nd CT A27
C.1	~~J.4~~ Perform ~~SR 3.7.1.4~~ SR 3.8.1.3	Once per 7 days thereafter 45
C.2.2.5	AND ~~J.5~~ Restore Keowee Hydro Unit to OPERABLE status.	42 days once in a 3 year period for each Keowee Hydro Unit.
~~K.~~ ACT C Overhead emergency power path inoperable > 72 hours due to inoperable Keowee Main Step-up transformer. COND. C + 2nd CT for C.2.2.5 to comply with Required Actions	LCO 3.0.4 ——NOTE—— ~~TS 3.7.0~~ is not applicable when both standby buses are energized ~~by an OPERABLE Lee gas turbine~~.	ACTIONS Table Note A3; from LCT via isolated power path A36
C.2.2.1	~~K.~~1 Energize ~~two~~ both standby buses ~~by an OPERABLE Lee gas turbine. The 100kV transmission circuit shall be electrically separated from the system grid and all offsite loads.~~	~~Prerequisite~~ 72 hrs A30 AND LA2 1 hour from subsequent discovery of deenergized standby buses.
RA C.2.2.3; A42 RA C.2.2.4	AND A30 both required ~~K.2~~ Verify by administrative means the ~~operability status of two~~ offsite sources and underground emergency power path ~~(TS 3.7.1)~~ overhead Keowee Hydro Unit ~~Distribution Systems~~ ~~(TS 3.7.2)~~, EPSL ~~(TSs 3.73-3.7.6)~~, DC Sources ~~(TS 3.7.8)~~, and Vital Inverters ~~(TS 3.7.9)~~. are met	~~Prerequisite~~ 72 hrs A30 are OPERABLE and LCOs 3.8.8, 3.3.17, 3.3.18, 3.3.19, 3.3.21, 3.8.3, 3.8.6 A30
ACT L	AND K.3 Restore inoperable components listed in K.2 to OPERABLE status.	4 hours from discovery of inoperable component. A29

(continued)

A1 (except as marked)

Supp 4

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~K.~~ ACT C (continued) RA C.1 RA C.2.2.5	AND ~~K.4~~ Perform SR 3.7.1.4. AND ~~K.5~~ Restore Keowee Main Step-up transformer to OPERABLE status.	RA C.1, 2nd CT Once per 7 days thereafter A27 25 ~~days~~
~~L.~~ K. ——NOTE—— Separate Condition entry is allowed for each breaker. One trip circuit in one or both closed N breakers inoperable. OR One trip circuit in one or both closed SL breakers inoperable.	~~L~~K.1 Restore each trip circuit to OPERABLE status.	24 hours 28 days when Condition due to an inoperable Keowee main step-up transformer
M. Required Actions and associated Completion Times for Conditions C, F, G, H, I, J, K, or L not met. OR Required Actions and associated Completion Times for Required Actions D.1 or D.3 not met.	M.1 Be in ~~HOT SHUTDOWN~~ MODE 3 AND M.2 Be in ~~COLD SHUTDOWN~~ MODE 5	12 hours 84 hours

A1 (except as marked) Specification 3.8.1

A8 — 12 months for SR 3.8.1.10, SR 3.8.1.11, + SR 3.8.1.12

SR 3.8.1.11

7 days for SR 3.8.1.2

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
~~SR 3.7.1.1~~	Perform SRs ~~3.7.8.1 (Float Voltage)~~ SR 3.8.1.2, ~~3.7.8.3 (Service Test)~~ SR 3.8.1.10, ~~3.7.8.4 (Structural Surveillance)~~ SR 3.8.1.11, and ~~3.7.8.5 (Connection Surveillance)~~ SR 3.8.1.12 for the Keowee batteries.	~~As specified in the applicable SRs.~~ A8
~~SR 3.7.1.2~~ SR 3.8.1.3	~~NOTES~~ ~~1. Energizing standby buses is not required to be performed when standby buses are energized by an OPERABLE Lee gas turbine.~~ ~~2. Not required to be met for the Keowee Hydro Unit associated with the overhead emergency power path when the overhead electrical disconnects for the Keowee Hydro Unit associated with the underground emergency power path are open.~~ Verify ~~each~~ Keowee Hydro Unit associated with the underground emergency power path starts automatically and energizes the underground emergency power path. A31 — Energize the underground emer. power path after removing the KHU from the overhead emergency power path.	~~Monthly~~ 31 days Manually close the SK breaker to each deenergized standby bus — A38 A31
~~SR 3.7.1.3~~ SR 3.8.1.4	~~NOTE~~ ~~Only required to be met for the Keowee Hydro Unit associated with the overhead emergency power path.~~ Verify ~~each~~ Keowee Hydro Unit associated with the overhead emer. power path starts automatically and synchronizes with Yellow bus in 230 kV switchyard.	~~Monthly~~ 31 days The reqmt. to energize the underground emer. power path is not applicable when 1) the overhead disconnects are open for the KHU associated with the und. path or when complying with RA D.1 — A31
~~SR 3.7.1.4~~	~~NOTES~~ ~~1. SR 3.7.1.2 may be performed in lieu of SR 3.7.1.4~~ ~~2. Energizing standby buses is not required to be performed when standby buses are energized by an OPERABLE Lee gas turbine.~~ ~~Verify Keowee Hydro Unit associated with underground emergency power path starts automatically and energizes the underground emergency power path.~~	~~Monthly~~ A31

(continued)

Add SR 3.8.1.1 — M1

Add SR 3.8.1.16 — A42

A1 <except as marked>

Specification 3.8.1

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.1.5	NOTE SR 3.7.1.3 may be performed in lieu of SR 3.7.1.5. Verify Keowee Hydro Unit associated with overhead emergency power path starts automatically and synchronizes with Yellow bus in 230 kV switchyard.	Monthly A31
SR 3.7.1.6 SR 3.8.1.5 A39	NOTES 1. Only required to be met when the associated breaker is closed. 2. Not required to be performed for SL breakers when overhead emergency power path is inoperable ≥ 72 hours. closed Verify each N and SL breaker opens on an actual or simulated actuation signal.	A40 its standby bus is energized from LCT via isolated power path Monthly 31 days
SR 3.7.1.7 SR 3.8.1.6	NOTE Not required to be performed for S breakers when overhead emergency power path is inoperable ≥ 72 hours. Operate Verify the S and E breakers through a are OPERABLE by full cycling.	A7 Monthly 31 days
SR 3.7.1.8 SR 3.8.1.7 SR 3.8.1.8	Verify OPERABILITY of the Keowee underground feeder breaker interlock and the underground to overhead ACB interlock.	Annually 12 months
SR 3.7.1.9	NOTE Only required to be met when a Lee gas turbine is energizing the standby buses. Verify the dedicated 100kV line is OPERABLE by energizing both standby buses by a Lee gas turbine.	<SEE 5.0> A25 Annually
SR 3.7.1.10	NOTE Only required to be met when a Lee gas turbine is energizing the standby buses. Verify a Lee gas turbine can be started, placed on the system grid, and supply the equivalent of a single Unit's maximum safeguard loads and two Unit's HOT SHUTDOWN loads on the system grid.	Annually

(continued)

Ⓐ <except as marked>

Supp 4

SURVEILLANCE REQUIREMENTS (continued)

M12

SURVEILLANCE		FREQUENCY
M12 3.8.1.9 SR 3.7.1.11	Verify each Keowee Hydro Unit can: 1) ~~Emergency start from each control room;~~ 2) Attain ~~rated speed~~ and voltage [≥ 13.5 kV and ≤ 14.49KV] [Freq. ≥57Hz & ≤ 63 Hz] within 23 seconds of an [actual or simulated] emergency start initiate; 3) Be synchronized to the grid and loaded at the maximum practical rate to a value equivalent to one Unit's safeguard loads plus two Unit's HOT SHUTDOWN loads. A22	~~Annually~~ 12 months <SEE 3.3>
SR 3.7.1.12 SR 3.8.1.13	-----NOTE----- ~~Not required to be met~~ Only applicable when the overhead electrical disconnects for the Keowee Hydro Unit associated with the underground emergency power path are open. Verify ~~the ability of the Keowee Unit ACBs to close automatically to the underground path.~~ on an actual or simulated zone overlap fault signal, each KHUs overhead + underground tie breaker actuates to the correct position M7	~~Annually~~ 12 months
SR 3.7.1.13	-----NOTE----- Only required to be met when a Lee gas turbine is energizing the standby buses. Verify that a Lee gas turbine can be started and connected to the isolated 100kV dedicated line and carry the equivalent of a single Unit's maximum safeguard loads within one hour.	A25 18 months <SEE 5.0>
SR 3.7.1.14	Perform an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers.	18 months <SEE 3.3>
SR 3.7.1.15	-----NOTE----- Only required to be met during periods of commercial power generation using the Keowee Hydro Units. Verify the ability of the Keowee Hydro units to supply emergency power from the initial condition of commercial power generation.	A48 18 months <SEE 5.0>

(continued)

Specification 3.8.1

A1 <except as marked>

Supp 4

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.7.1.16 ——NOTE—— Only required to be met during periods of commercial power generation using the Keowee Hydro Units. —— Verify that the Keowee Hydro units load rejection response is bounded by the design criteria used to develop the Keowee operating restrictions.	A48 18 months <SEE 5.0>
SR 3.7.1.17 SR 3.8.1.14 ——NOTES—— 1. Only required to be met when associated breaker is closed. A39 2. Not required to be performed for SL breakers when overhead emergency power path is inoperable ≥ 72 hours. —— closed Verify each N and SL breaker opens on an actual or simulated actuation signal to each breaker trip circuit.	A40 its standby bus is energized from LCT via isolated power path 18 months
SR 3.7.1.18 SR 3.8.1.15 ——NOTE—— Redundant breaker trip coils will be verified on a STAGGERED TEST BASIS. —— Verify each 230 kV switchyard circuit breaker actuates to the correct position on an actual or simulated switchyard isolation actuation signal.	18 months

A41

14 of 15

A1 <except as marked>

Specification 3.8.1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE (terminal)	FREQUENCY
SR 3.7.8.1 SR 3.8.1.2	Verify battery ~~float~~ voltage ≥ 125VDC on float charge	~~Weekly~~ 7 days
SR 3.7.8.2	Verify peak inverse voltage capability of each 125 VDC Vital I&C auctioneering diode is within limits.	6 Months <SEE 3.8.3>
SR 3.7.8.3 SR 3.8.1.10	Verify battery capacity is adequate to supply and maintain in OPERABLE status the required emergency loads for the design duty cycle when the battery is subjected to a battery service test.	~~Annually~~ 12 months
SR 3.7.8.4 SR 3.8.1.11	Verify cells, end cell plates, and battery racks show no visual indication of structural damage or degradation.	~~Annually~~ 12 months
SR 3.7.8.5 SR 3.8.1.12	Verify cell to cell and terminal connections are clean, tight, and coated with anti-corrosion grease.	~~Annually~~ 12 months

physical damage or abnormal deterioration that could degrade battery performance — A24

M6

Add Specification 3.8.2

(A1) <except as marked> Specification 3.8.3

Supp 4

3.8 ~~3.7~~ ELECTRICAL POWER SYSTEMS

3.8.3 ~~3.7.8~~ DC Sources - Operating

LCO 3.8.3 ~~TS 3.7.8~~ DC Sources shall be OPERABLE ~~as follows~~ for each unit as follows: Unit 1 - 1CA, 1CB, 2CA, 2CB Unit 2 - 2CA, 2CB, 3CA, 3CB Unit 3 - 3CA, 3CB, 1CA, 1CB;

a ~~1~~. Three of four 125 VDC Vital I&C power sources;

b ~~2~~. Two additional ~~Five of six~~ 125 VDC Vital I&C power sources ~~for operation of two or three Units,~~ when any other Unit is in MODES 1, 2, 3, or 4

c ~~3~~. One additional ~~Four of six~~ 125 VDC Vital I&C power sources ~~for operation of one Unit,~~ when no other Unit is in MODES 1, 2, 3 or 4 and aligned such that no

~~4.~~ ~~No single 125 VDC Vital I&C~~ power source shall be the only source ~~supplying power to~~ for two or more ~~125 VDC Vital I&C~~ panelboards, of the Unit's

1 ~~5~~. For Units 2 or 3, a ~~no single~~ 125 VDC Vital I&C power source shall not be the only source ~~supplying power to 125 VDC Vital I&C~~ for panelboards 1DIC and 1DID ~~, and~~ required by LCO 3.8.8

d ~~6~~. Two 230 kV switchyard 125 VDC power sources.

NOTES

2 ~~1~~. The additional 125 VDC Vital I&C power sources required by LCO ~~3.7.8~~ 3.8.3 part ~~2~~ b or part ~~3~~ c are not required to be connected to the Unit's distribution system.

3 ~~2~~. The additional 125 VDC Vital I&C power sources required by LCO ~~3.7.8~~ 3.8.3 part ~~3~~ c shall ~~include one~~ not be a 125 VDC Vital I&C power source ~~belonging to each unit not above COLD SHUTDOWN~~ that is available to meet the three of four requirement of LCO 3.8.3.a.

Applic

APPLICABILITY: ~~Above COLD SHUTDOWN~~ MODES 1, 2, 3, and 4.

ACTIONS

ACTIONS

NOTE

The Completion Times for Required Actions A through D are reduced when in Condition L of LCO 3.8.1 (A43)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One required 125 VDC Vital I&C power source inoperable to perform equalization charge after performance test or service test.~~	~~A.1 Restore required 125 VDC Vital I&C power source to OPERABLE status.~~	~~72 hours~~
~~B~~ A. One required 125 VDC Vital I&C power source inoperable ~~for reasons other than Condition A.~~	~~B~~ A.1 Restore required ~~125 VDC Vital I&C~~ power source to OPERABLE status.	24 hours

Add RA A.1 Note (A49)

(continued)

1 of 3

Supp 4

ACTIONS (continued)

required CONDITION	REQUIRED ACTION	COMPLETION TIME
~~C.~~ B One 125 VDC Vital I&C power source ~~supplying~~ the only source ~~of power to two or more 125 VDC Vital I&C~~ panelboards. for two or more of the Unit's	~~C.1~~ B Align 125 VDC Vital I&C power sources such that ~~no~~ one 125 VDC Vital I&C power source is ~~serving~~ ~~as~~ only ~~power~~ source ~~to~~ for two or more ~~125 VDC Vital I&C~~ of the Units panelboards. not the	24 hours ACT B
~~D.~~ C ——NOTE—— Only Condition ~~D is not~~ applicable to Unit ~~1.~~ 2 and 3 One 125 VDC Vital I&C power source ~~supplying~~ the only source of ~~power to 125 VDC Vital I&C~~ for panelboards 1DIC and 1DID.	~~D.1~~ C Align 125 VDC Vital power sources such that ~~no~~ one 125 VDC Vital I&C power source is ~~serving~~ not the ~~as~~ only ~~power~~ source ~~to~~ for ~~125 VDC Vital I&C~~ panelboards 1DIC and 1DID.	24 hours ACT C
~~E. One 230 kV switchyard 125 VDC power source inoperable to perform equalization charge after performance test or service test.~~	~~E.1 Restore 230 kV switchyard 125 VDC power source to OPERABLE status.~~	~~72 hours~~ A50 Add RA D.1 Note
~~F.~~ D One 230 kV switchyard 125 VDC power source inoperable ~~for reasons other than Condition E~~ A50	~~F.1~~ D Restore ~~230 kV~~ switchyard ~~125 VDC~~ power source to OPERABLE status.	24 hours ACT D
~~G.~~ E Required Actions and associated Completion Times not met.	~~G.1~~ E Be in ~~HOT SHUTDOWN~~ MODE 3 AND ~~G.2~~ E Be in ~~COLD SHUTDOWN~~ MODE 5	12 hours ACT E 84 hours
~~H. Two or more required 125 VDC Vital I&C power sources inoperable. OR Two 230 kV switchyard 125 VDC power sources inoperable.~~	~~H.1 Enter TS 3.0~~	~~Immediately~~ A51

Supp 4

Add SR 3.8.3.1 — M10

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR ~~3.7.8.1~~ 3.8.3.2	Verify battery ~~float~~ terminal voltage ≥ 125VDC on float charge.	~~Weekly~~ 7 days
SR 3.7.8.2	Verify peak inverse voltage capability of each 125 VDC Vital I&C auctioneering diode is within limits.	6 Months — LA3
SR ~~3.7.8.3~~ 3.8.3.5	Verify battery capacity is adequate to supply and maintain in OPERABLE status the required emergency loads for the design duty cycle when ~~the battery is~~ subjected to a battery service test.	~~Annually~~ 12 months
SR ~~3.7.8.4~~ 3.8.3.3	Verify cells, end cell plates, and battery racks show no visual indication of ~~structural damage or degradation~~ physical damage or abnormal deterioration that could degrade battery performance. — A24	~~Annually~~ 12 months
SR ~~3.7.8.5~~ 3.8.3.4	Verify cell to cell and terminal connections are clean, tight, and coated with anti-corrosion ~~grease~~ material.	~~Annually~~ 12 months

Add SR 3.8.3.6 — M11

Specification
3.8.4

Add specification
3.8.4

M6

A1 <except as marked>

Supp 4

3.8 ~~3.7~~ ELECTRICAL POWER SYSTEMS

3.8.5 ~~3.7.10~~ Battery Cell Parameters

LCO 3.8.5 ~~TS 3.7.10~~ Battery cell parameters for the Keowee Hydro Unit, 125 VDC Vital I&C, and 230 kV 125 VDC switchyard batteries shall be within the limits of Table ~~3.7.10-1.~~ 3.8.5-1

Applic

APPLICABILITY: When associated DC power sources are required to be OPERABLE.

ACTIONS

ACTIONS

NOTES

NOTE 1 1. Separate Condition entry is allowed for each battery.

NOTE 1 2. LCO 3.0.4 is not applicable ~~TS 3.7.0 does not apply.~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more batteries with one or more battery cell parameters not within Category A or B limits.	A.1 Verify pilot cell electrolyte level and float voltage meet Table ~~3.7.10-1~~ 3.8.5-1 Category C values.	1 hour ACT A
	AND	
	A.2 Verify battery cell parameters meet Table ~~3.7.10-1~~ 3.8.5-1 Category C values.	24 hours AND Once per 7 days thereafter
	AND	
	A.3 Restore battery cell parameters to Category A and B limits of Table ~~3.7.10-1.~~ 3.8.5-1	90 days
B. Required Action and associated Completion Time of Condition A not met. OR One or more batteries with average electrolyte temperature of the representative cells < 60°F. OR One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately ACT B

A1 <except as marked>

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR ~~3.7.10.1~~ 3.8.5.1	Verify battery cell parameters meet Table ~~3.7.10-1~~ 3.8.5-1 Category A limits.	~~Weekly~~ 7 days
SR ~~3.7.10.2~~ 3.8.5.2	Verify battery cell parameters meet Table ~~3.7.10-1~~ 3.8.5-1 Category B limits.	~~Quarterly~~ 92 days
SR ~~3.7.10.3~~ 3.8.5.3	Verify average electrolyte temperature of representative cells is $\geq$ 60°F.	~~Quarterly~~ 92 days

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Table ~~3.7.10-1~~ 3.8.5-1 (page 1 of 1)
Battery Cell Surveillance Requirements

PARAMETER	CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL	CATEGORY B: LIMITS FOR EACH CONNECTED CELL	CATEGORY C: ALLOWABLE LIMITS FOR EACH CONNECTED CELL
Electrolyte Level	≥ Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[(a)]	≥ Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[(a)]	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 V	≥ 2.13 V	> 2.07 V
Specific Gravity[(b)(c)]	≥ 1.200	≥ 1.200 AND Not more than 0.010 below average of all connected cells	≥ 1.200

(a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum during equalizing charges provided it is not overflowing.

(b) Corrected for electrolyte temperature and level. Level correction is not required, however, when battery float current is < 2 amps when on float charge.

(c) A battery float current of < 2 amps when on float charge is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of 7 days. When float current is used in lieu of specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance.

A1 <except as marked> Specification 3.8.6

3.8 ~~3.7~~ ELECTRICAL POWER SYSTEMS

3.8.6 ~~3.7.9~~ Vital Inverters - Operating

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LCO 3.8.6 ~~TS 3.7.9~~ Four vital inverters shall be OPERABLE.

----------NOTES----------
1. Enter applicable Conditions and Required Actions of LCO 3.8.8, "Distribution Systems - Operating," with any 120 VAC Vital Instrumentation power panelboard de-energized. A17 A18
2. The Completion Time is reduced when in Condition L of LCO 3.8.1 A43

APPLICABILITY: ~~Above COLD SHUTDOWN~~ MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ~~DIA or DIB~~ One Vital inverter inoperable. A15	~~A.1 Connect associated panelboard to regulated panelboard KRA.~~	~~4 hours~~ A17
	~~AND~~	
	~~A.2 Verify associated panelboard is energized.~~	~~Once per 24 hours~~ L1
	AND	
	A.1 ~~A.3~~ Restore vital inverter to OPERABLE status.	7 days ACT A
~~B.~~ A One ~~DIC or DID~~ Vital inverter inoperable.	~~B.1 Connect associated panelboard to regulated panelboard KRA.~~	~~24 hours~~ A18 ACT A
	~~AND~~	
	~~B.2 Verify associated panelboard is energized.~~	~~Once per 24 hours~~ L1
	~~AND~~	
	A.1 ~~B.3~~ Restore vital inverter to OPERABLE status.	7 days A.1 CT

(continued)

Specification 3.8.6

A1 <except as marked>

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B ~~C~~. Required Actions and associated Completion Times not met.	B ~~C~~.1 Be in ~~HOT SHUTDOWN~~ MODE 3 AND B ~~C~~.2 Be in ~~COLD SHUTDOWN~~ MODE 5	12 hours ACT B 84 hours
D. Two or more vital inverters inoperable.	D.1 Enter TS 3.0	Immediately A14

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR ~~3.7.9.1~~ 3.8.6.1	Verify correct vital inverter voltage, frequency, and alignment to required 120 VAC Vital Instrumentation Power panelboards.	~~Weekly~~ 7 days

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Specification 3.8.7

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Add Specification 3.8.7