ATTACHMENT 2

TECHNICAL SPECIFICATION SUPPLEMENT

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
----------NOTE---------- Only applicable once in a three year period for each Keowee Hydro Unit. ----------	----------NOTES---------- 1. Keowee Hydro Unit generation to the system grid prohibited except for test. 2. The OPERABLE Keowee Hydro Unit may be made inoperable for 12 hours if required to restore both Keowee Hydro Units to OPERABLE status. 3. TS 3.7.0 is not applicable when both standby buses are energized by an OPERABLE Lee gas turbine. ----------	
J. Overhead emergency power path inoperable > 72 hours due to inoperable Keowee Hydro Unit.	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. AND	Prerequisite AND 1 hour from subsequent discovery of deenergized standby buses.
	J.2 Verify by administrative means the operability status of: Two 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 (TSs 3.7.3-3.7.6), DC Sources (TS 3.7.8), and Vital Inverters (TS 3.7.9). AND	Prerequisite
	J.3 Restore inoperable components listed in J.2 to OPERABLE status.	4 hours from discovery of inoperable component.

(continued)

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.	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

(continued)

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.	18 months
SR 3.7.1.17 ----------NOTES---------- 1. Only required to be met when associated breaker is closed. 2. Not required to be performed for SL breakers when overhead emergency power path is inoperable $\geq$ 72 hours. ---------- Verify each N and SL breaker opens on an actual or simulated actuation signal to each breaker trip circuit.	18 months
SR 3.7.1.18 ----------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

3.7 ELECTRICAL POWER SYSTEMS

3.7.4 Emergency Power Switching Logic (EPSL) Voltage Sensing Circuits

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

1. Startup Source;
2. Standby Bus 1;
3. Standby Bus 2;
4. Normal Source.

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

APPLICABILITY: Above COLD SHUTDOWN

ACTIONS

---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
B. Required Actions and associated Completion Times not met.	B.1 Be in HOT SHUTDOWN AND B.2 Be in COLD SHUTDOWN	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.4.1 Perform a CHANNEL TEST	18 months

3.7 ELECTRICAL POWER SYSTEMS

3.7.6 Emergency Power Switching Logic (EPSL) Degraded Grid Voltage Protection

TS 3.7.6 The following EPSL Degraded Grid Voltage Protection functions shall be OPERABLE:

1. Three Switchyard Degraded Grid Voltage Sensing Relays;
2. Two channels of Switchyard Degraded Grid Voltage Protection Actuation Logic.

APPLICABILITY: Above COLD SHUTDOWN

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Perform a CHANNEL CALIBRATION of the voltage sensing channel with setpoint Allowable Value as follows: Degraded voltage $\geq$ 226 kV and $\leq$ 229 kV with a time delay of 9 seconds $\pm$ 1 second.	18 months
SR 3.7.6.2	Perform a CHANNEL TEST.	18 months

3.7 ELECTRICAL POWER SYSTEMS

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

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;
2. Two channels of CT-5 Degraded Grid Voltage Protection Actuation Logic.

APPLICABILITY: Above COLD SHUTDOWN when the Central switchyard is energizing the standby buses.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Perform a CHANNEL CALIBRATION of the voltage sensing channel with setpoint Allowable Value as follows: a. Degraded voltage $\geq$ 4143 V and $\leq$ 4185 V with a time delay of 9 seconds $\pm$ 1 second for the first level undervoltage inputs. b. Degraded voltage $\geq$ 3871 V and $\leq$ 3901 V for the second level undervoltage inputs.	18 months
SR 3.7.7.2	Perform a CHANNEL TEST.	18 months

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One 125 VDC Vital I&C power source supplying only source of power to two or more 125 VDC Vital I&C panelboards.	C.1 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 two or more 125 VDC Vital I&C panelboards.	24 hours
D. ----------NOTE---------- Condition D is not applicable to Unit 1. ---------- One 125 VDC Vital I&C power source supplying only source of power to 125 VDC Vital I&C panelboards 1DIC and 1DID.	D.1 Align 125 VDC Vital power sources such that no one 125 VDC Vital I&C power source is serving as only power source to 125 VDC Vital I&C panelboards 1DIC and 1DID.	24 hours
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
F. One 230 kV switchyard 125 VDC power source inoperable for reasons other than Condition E.	F.1 Restore 230 kV switchyard 125 VDC power source to OPERABLE status.	24 hours
G. Required Actions and associated Completion Times not met.	G.1 Be in HOT SHUTDOWN AND G.2 Be in COLD SHUTDOWN	12 hours 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

BASES (continued)

TS

The basic design criteria of the entire emergency electric power system of a nuclear unit, including the generating sources, distribution system and controls, is that a single failure of any component passive or active will not preclude the system from supplying emergency power when required (Ref 5).

Overhead Emergency Power Path

If closed, each N breaker must be capable of opening using either of its associated breaker trip circuits. Either of the following combinations provide an acceptable overhead emergency power path.

1A)	Keowee Unit 1 generator,	1B)	Keowee Unit 2 generator,
2A)	Keowee ACB 1,*	2B)	Keowee ACB 2,*
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)	Keowee Unit 1 interlocks between overhead and underground emergency power path breakers,	6B)	Keowee Unit 2 interlocks between overhead and underground emergency power path breakers,

7) Keowee reservoir level $\geq$ 775 feet above sea level,
8) Keowee main step-up transformer,
9) Zone overlap circuitry,
10) PCB 9,*
11) The 230kV switchyard yellow bus capable of being isolated by one channel of Switchyard Isolate from Degraded Grid Voltage Protection circuitry,
12) A unit startup transformer and associated yellow bus PCB (CT-1 / PCB 18, CT-2 / PCB 27, CT-3 / PCB 30), and
13) Both E breakers.

* Enabled by one channel of Switchyard Isolate Complete.

(continued)

BASES (continued)

TS (continued)

Underground Emergency Power Path

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 provide an acceptable underground emergency power path.

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)	Keowee Unit 1 interlocks between overhead and underground emergency power path breakers,	6B)	Keowee Unit 2 interlocks between overhead and underground emergency power path breakers,

7) Keowee reservoir level $\geq$775 feet above sea level,
8) The underground feeder,
9) Interlocks between underground emergency power path breakers,
10) Transformer CT-4,
11) Both SK breakers,
12) Both standby buses, and
13) Both S breakers.

Offsite Sources

The two offsite sources are required to be "physically independent" (separate towers) prior to entering the 230kV switchyard. Once the 230kV lines enter the switchyard, an electrical pathway must exist through operable 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 the main feeder buses from the

(continued)

BASES (continued)

ACTIONS

I.1 through I.4 (continued)

The term verify as used in these Required Actions allows for an administrative check by examining logs or other information to determine if the required equipment is inoperable for maintenance or other reasons. It does not require unique performance of Surveillance Requirements needed to demonstrate operability of the equipment.

If two offsite sources are restored within 24 hours, unrestricted operation may continue.

The Required Actions have been modified by a NOTE which provides an exception to TS 3.7.0 when an OPERABLE Lee gas turbine is energizing the standby buses as required by TS 3.7.1. This exception allows the Unit to heat up above COLD SHUTDOWN when one or more required offsite sources are inoperable due to reasons other than Condition A or B.

J.1 through J.5

Condition J has been established to allow maintenance and repair of a Keowee Hydro Unit which requires longer than 72 hours. This Condition is modified by a NOTE which indicates the Condition is applicable once in a three year period for each Keowee Hydro Unit. A "Keowee Hydro Unit" is considered to be all components between ACBs 1, 2, 3, and 4, as well as all components between auxiliary transformer CX and the Keowee Main step-up transformer. 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 will be necessary. Other items which manifest as failures are expected to be extremely rare and could possibly be performed during the permitted maintenance periods. A time period of up to 45 days for each Keowee Hydro unit is permitted every three years. The 3 days from Condition C are added to the 42 day Completion Time in Condition J to get the 45 day time period.

The Required Actions for the special inoperability period have been modified by three NOTES. NOTE 1 prohibits generation to the system grid except for testing. This restriction limits the number of possible failures which could cause loss of the underground emergency power path. NOTE 2 allows the OPERABLE Keowee Hydro Unit to be made inoperable for 12 hours if required to restore both Keowee Hydro Units to OPERABLE status. This note is necessary since certain actions such as dewatering the penstock may be necessary to restore the inoperable Keowee Hydro Unit although these actions would also cause both Keowee Hydro Units to be inoperable. NOTE 3 provides an exception to TS 3.7.0 when an OPERABLE Lee gas turbine is energizing the standby buses as required by TS 3.7.1. This exception allows the Unit to heat up above COLD SHUTDOWN when the overhead emergency power path is inoperable for greater than 72 hours due to an inoperable Keowee Hydro Unit. The Required Actions detailed below are prerequisites for use of the special inoperability period. With the exception of Lee energizing the standby buses, in the event these Required Actions are not met during the special inoperability period, 4 hours is allowed by Required Action J.3 to restore

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.13

This surveillance is modified by a NOTE which indicates that the surveillance is only required to be met when a Lee gas turbine is energizing the standby buses. A Lee gas turbine is not required to be OPERABLE when it is not energizing the standby buses.

The Design Bases response for the Lee Gas Turbines is to supply power to the Oconee site. Therefore, the capability of the Lee Gas Turbines to supply the Oconee main feeder buses is demonstrated by loading a Lee Gas Turbine on the isolated 100kV line with the equivalent of a single Unit's maximum safeguards loads (4.8MVA) within one hour. An 18 month frequency for this surveillance is reasonable based on operating experience and the one hour time response required of the source.

SR 3.7.1.14

This surveillance performs functional verification for the source and Main Feeder Bus voltage sensing, Keowee Emergency start, Loadshed and Transfer-to-Standby, and Retransfer-to-Startup logic of the EPSL System. The method is designed to provide actual power failures remote from the Main Feeder Buses so that the logic may be monitored. For SR purposes, a "failed" source is defined as the complete loss of voltage. The ramp/rate/time responses for the voltage relays are verified independently as a prerequisite to this SR. Circuits actuated by the source undervoltage relays are verified per SR 3.7.4.1. To eliminate the human or computer error in timing events, critical time setpoints for Load shed, Transfer-to-Standby, Retransfer-to-Startup, and reactor coolant pump trip relays are verified independently during the refueling outage. This test verifies the integrated response of the circuits. Key circuits for verification include the Engineered Safeguards contacts to the Keowee Emergency Start, Loadshed and Transfer/Retransfer relays, and close permissive for Keowee Feeder Breakers (SK). Excessive cycling of equipment may be prevented by using a single action input, verification of the required end result by alarms or visual inspection, subsequent reset of the initiating logic, and then insertion of an alternate input for verification of the required circuits. An 18 month frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing. This surveillance will be performed during the refueling outage for each Oconee unit.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.15

This surveillance is modified by a NOTE which indicates that the surveillance is only required to be met during periods of commercial power generation using the Keowee Hydro Units. The logic which aligns the Keowee Hydro Units following a load rejection from commercial power generation is not required to be operable when the Keowee Hydro Units are not providing commercial power.

In order to ensure that the Keowee Hydro units are operable during periods of commercial power generation, the protection circuitry will be tested on an 18 month frequency. This surveillance will ensure that the adverse effects of overspeed following a load rejection will be precluded and the appropriate emergency power paths will be aligned. In addition, the speed sensing governor failure logic will be verified during this surveillance. The Keowee Watt/VAR meter, frequency relays, and governor magnetic speed switch will be calibrated prior to the performance of this surveillance. This surveillance can be performed with one or both Keowee units operating at any load below the maximum power level as defined by the Keowee operating restrictions.

SR 3.7.1.16

This surveillance is modified by a NOTE which indicates that the surveillance is only required to be met during periods of commercial power generation using the Keowee Hydro Units. The response of the Keowee Hydro Units following a load rejection from commercial power generation is not required to be bounded by the design criteria, which were used to develop the Keowee operating restrictions, when the Keowee Hydro Units are not providing commercial power.

A maximum power dual unit load rejection will be performed on an 18 month frequency. This surveillance will verify that the Keowee Hydro units response to a load rejection is bounded by the design criteria used to develop the Keowee operating restrictions. The design criteria are defined in the calculation that determines the Keowee operating restrictions. A power level for the dual unit load rejection will be defined based on the operating conditions for the day of the test. In addition, a revision of the operating restrictions for simultaneous operation of both Keowee units will require that a maximum power dual unit load rejection test be performed prior to implementing the revision. A revision of the operating restrictions for a single Keowee unit will require only a maximum power single unit load rejection as defined by the conditions for the day of the test. However, if a load rejection test is performed to support a revision to the operating restrictions, then no additional load rejection test will be required until the next surveillance. The Keowee Watt/VAR meter and frequency relays will be calibrated prior to the performance of this surveillance.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.17

This surveillance is modified by two NOTES. NOTE 1 indicates that the surveillance is only required to be met when the associated breaker is closed. The trip function is not necessary when the breaker is already open. NOTE 2 to this surveillance states that the surveillance is not required to be performed for the SL breakers when the overhead emergency power path is inoperable $\geq$ 72 hours. When the overhead emergency power path is inoperable for $\geq$ 72 hours, the SL breakers must remain closed to energize the standby buses from an OPERABLE Lee gas turbine.

This surveillance verifies operability of the trip functions of the SL and N breakers. This surveillance verifies that 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. An 18 month frequency is based on engineering judgement and provides reasonable assurance that the SL and N breakers will trip when required.

SR 3.7.1.18

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 the Keowee Hydro Units to the overhead and underground emergency power paths. An 18 month frequency minimizes the impact to Keowee and the operating Units which are connected to the 230 kV switchyard. The effect of this surveillance 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 Keowee Hydro Unit emergency start functions, this surveillance need be performed for only one Switchyard Isolation Channel each surveillance interval. This is acceptable since operability of the overhead emergency power path requires only one channel of the Switchyard Isolation circuitry to be capable of isolating the switchyard. Functional verification of the Switchyard Isolation Channel logic is addressed in Technical Specification 3.7.6, "Emergency Power Switching Logic (EPSL) Degraded Grid Voltage Protection."

This surveillance is modified by a NOTE. This NOTE states that the redundant breaker trip coils will be verified on a STAGGERED TEST BASIS. This can be accomplished by alternating the switchyard isolation channels which are actuated during each test. Verifying the trip coils on a STAGGERED TEST BASIS precludes unnecessary breaker operation and minimizes the impact to Keowee and the operating Units which are connected to the 230 kV switchyard.

(continued)

BASES (continued)

ACTIONS

The Required Actions have been established based on the level of degradation of the DGPS.

A.1

If a single voltage sensing relay is inoperable, the relay must be placed in trip within 72 hours. Tripping the affected relay places the function in a 1-out-of-2 configuration. Operation in this configuration may continue indefinitely since the DGPS function is capable of performing its function in the presence of a single failure. With one relay inoperable, the remaining relays are capable of providing the DGPS function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual Grid system voltage degradation, the probability of a simultaneous ES actuation, and the availability of other Unit's sensing relays.

B.1

In the event one channel of actuation logic is inoperable (unable to trip) then a single failure of the other channel to trip when required would remove protection from a Degraded Grid condition concurrent with ES actuation. The 72 hour completion time to restore the inoperable channel is based on engineering judgement taking into consideration the infrequency of actual grid system degradation, the probability of a simultaneous ES actuation, and the availability of the OPERABLE channel.

C.1 and C.2

If the Required Actions and associated Completion Times for Condition A or B cannot be met, the unit must be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in 84 hours. These times allow for a controlled shutdown of one or all three Units without placing undue stress on plant operators or plant systems.

D.1 and D.2

Two or more voltage sensing relays inoperable or two actuation logic channels inoperable removes Degraded Grid Protection from being available to the Station during ES actuation. The loss of protection exposes any Unit to an inadequate power supply during a degraded grid situation concurrent with a LOCA on that Unit. In addition, the inoperability of the Degraded Grid Voltage Protection system prevents switchyard isolation during a LOCA. Since switchyard isolation is inoperable, the overhead emergency power path is declared inoperable in accordance with the requirements in Technical Specification 3.7.1. The Completion Times are based on engineering judgement taking into consideration the infrequency of actual grid system degradation, and the probability of a simultaneous ES actuation.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

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.

SR 3.7.6.2

A CHANNEL TEST is performed on each DGPS voltage sensing channel and DGPS 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 TEST of the DGPS actuation logic channels includes verifying actuation of both channels of the switchyard isolation circuitry. The Frequency 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)

REFERENCES

1. 10 CFR 50.36.

2. 230kV Switchyard Power System DBD, OSS-0254.00-00-2004.

BASES (continued)

TS (continued) 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. Loss of the 27SL1 or 2 relay makes the affected channel inoperable. Loss of two or more voltage sensing relays results in inoperability of both channels of actuation logic.

APPLICABILITY This system is required when the Standby Buses are energized by Central Switchyard and any Unit is above COLD SHUTDOWN. This ensures adequate voltage protection should an ES Unit be transferred to the Standby Bus during an event and coincides with requirements for ES and other support/protective systems used to ensure adequate power is available for core and containment protection.

ACTIONS The Required Actions have been established based on the level of degradation of the Degraded Grid Protection System.

A.1

If a single voltage sensing relay is inoperable, the relay must be placed in trip within 72 hours. Tripping the affected relay places the function in a 1-out-of-2 configuration. Operation in this configuration may continue indefinitely since the DGPS function is capable of performing its function in the presence of a single failure. With one relay inoperable, the remaining relays are capable of providing the DGPS function. The 72 hour completion time is based on engineering judgement taking into consideration the remaining OPERABLE undervoltage relays, the availability of the 230kV switchyard, the infrequency of actual Grid system voltage degradation, and the probability of a simultaneous ES actuation and loss of the 230kV switchyard.

B.1

In the event one channel of actuation logic is inoperable then a single failure of the other channel would remove protection from a degraded grid condition at the Central Switchyard concurrent with ES actuation and loss of the 230kV switchyard. The 72 hour completion time is based on engineering judgement taking into consideration the remaining OPERABLE channel of actuation logic, the availability of the 230kV switchyard, the infrequency of actual Grid system voltage degradation, and the probability of a simultaneous ES actuation and loss of the 230kV switchyard.

C.1

When two or more voltage sensing relays or both actuation logic channels are inoperable, there is no automatic protection from degraded grid voltage for the standby buses powered from the 100kV transmission system through the Central Switchyard. EPSL response from ES events could be inhibited by Standby Bus voltage being allowed low enough to cause equipment damage, but not low enough for the EPSL standby

(continued)

BASES (continued)

ACTIONS

C.1 (continued)

bus undervoltage relays to cause breaker operation. Therefore, the standby buses must be separated from the 100kV transmission system within 1 hour. In addition, if the Required Actions and associated Completion Times cannot be met, the standby buses must be separated from the 100kV transmission system within 1 hour. This is accomplished by either opening both SL breakers, or by energizing both standby buses by an OPERABLE Lee gas turbine. If the standby buses are energized by an OPERABLE Lee gas turbine, the 100kV transmission circuit must be electrically separated from the system grid and all offsite loads. In addition, if the Required Actions and associated Completion Times cannot be met, the standby buses must be separated from the 100kV transmission system within 1 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 availability of the 230kV switchyard, the infrequency of actual grid system voltage degradation, the probability of simultaneous ES actuation and loss of the 230kV switchyard, and the time to complete the Required Action.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

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.

SR 3.7.7.2

A CHANNEL TEST is performed on each CT-5 DGPS voltage sensing channel and each CT-5 DGPS 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 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.

BASES (continued)

ACTIONS

D.1 (continued)

three Units, and retransfer to startup logic for all three Units. In this condition, a single failure of that battery (or its associated equipment) could cause loss of both panelboards, so that required automatic EPSL functions for all three units might 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 both DC panelboards 1DIC and 1DID. 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.

A NOTE has been included to clarify that Condition D is not applicable to Unit 1. Condition C applies to Unit 1. It is acceptable for Units 2 and 3 to be in Conditions C and D simultaneously since the 1DIC and 1DID are not redundant to any Unit 2 or Unit 3 panelboards.

E.1 and F.1

With one of the required 230kV SY DC Sources inoperable, the remaining source is fully capable of providing adequate voltage to all connected panelboards, assuming no single failure. In addition, with one of the required DC sources inoperable, the remaining source is fully capable of powering the necessary panelboards, assuming no single failure. However, overall reliability is reduced because of the potential for a single failure in the remaining DC source or in a redundant panelboard. Loss of the remaining DC source or 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. Therefore, the inoperable source must be restored to OPERABLE status within 24 hours. A required battery may be inoperable for a period of 72 hours to perform equalizer charge following the performance test or service test (SR 3.7.8.3).

The completion times for actions in this TS are 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.

G.1 and G.2

If the Required Actions and associated Completion Times cannot be met, all three Units must be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in the following 72 hours. These times allow for a controlled shutdown of all three units without placing undue stress on plant operators or plant systems.

H.1

The inoperability of two or more required 125 VDC Vital I&C power sources or two 230kV switchyard 125VDC power sources could result in a loss of safety function. Therefore, the provisions of TS 3.0 apply.

(continued)

ATTACHMENT 3

TECHNICAL SPECIFICATION MARKUP

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
----------NOTE---------- Only applicable once in a three year period for each Keowee Hydro Unit. ----------	----------NOTES---------- 1. Keowee Hydro Unit generation to the system grid prohibited except for test.	
J. Overhead emergency power path inoperable > 72 hours due to inoperable Keowee Hydro Unit.	2. The OPERABLE Keowee Hydro Unit may be made inoperable for ~~24~~ 12 hours if required to restore both Keowee Hydro Units to OPERABLE status.	
	3. TS 3.7.0 is not applicable when both standby buses are energized by an OPERABLE Lee gas turbine. ----------	
	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
	AND	AND
		1 hour from subsequent discovery of deenergized standby buses.
	J.2 Verify by administrative means the operability status of: Two 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 (TSs 3.7.3-3.7.6), DC Sources (TS 3.7.8), and Vital Inverters (TS 3.7.9).	Prerequisite
	AND	
	J.3 Restore inoperable components listed in J.2 to OPERABLE status.	4 hours from discovery of inoperable component.

(continued)

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 ~~Refueling~~
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.	~~Refueling~~ 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 ~~Refueling~~

(continued)

Amendment _____ Unit 1
Amendment _____ Unit 2
Amendment _____ Unit 3

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.	18 months ~~Refueling~~
SR 3.7.1.17 ----------NOTES---------- 1. Only required to be met when associated breaker is closed. 2. Not required to be performed for SL breakers when overhead emergency power path is inoperable ≥ 72 hours. ---------- Verify each N and SL breaker opens on an actual or simulated actuation signal to each breaker trip circuit.	18 months ~~Refueling~~
SR 3.7.1.18 ----------NOTE---------- Redundant breaker trip coils ~~may~~ 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 ~~Refueling~~

3.7 ELECTRICAL POWER SYSTEMS

3.7.4 Emergency Power Switching Logic (EPSL) Voltage Sensing Circuits

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

1. Startup Source;
2. Standby Bus 1;
3. Standby Bus 2;
4. Normal Source.

---NOTE---

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

APPLICABILITY: Above COLD SHUTDOWN

ACTIONS

---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
B. Required Actions and associated Completion Times not met.	B.1 Be in HOT SHUTDOWN AND B.2 Be in COLD SHUTDOWN	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.4.1 Perform a CHANNEL TEST	~~Refueling~~ 18 months

Amendment _____ Unit 1
Amendment _____ Unit 2
Amendment _____ Unit 3

3.7 ELECTRICAL POWER SYSTEMS

3.7.6 Emergency Power Switching Logic (EPSL) Degraded Grid Voltage Protection

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

APPLICABILITY: Above COLD SHUTDOWN

ACTIONS

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

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.6.1	Perform a CHANNEL CALIBRATION of the voltage sensing channel with setpoint Allowable Value as follows: Degraded voltage $\geq$ 226 kV and $\leq$ 229 kV with a time delay of 9 seconds $\pm$ 1 second.	~~Refueling~~ 18 months
SR 3.7.6.2	Perform a CHANNEL TEST.	~~Refueling~~ 18 months

Amendment _____ Unit 1
Amendment _____ Unit 2
Amendment _____ Unit 3

3.7 ELECTRICAL POWER SYSTEMS

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

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;
2. Two channels of CT-5 Degraded Grid Voltage Protection Actuation Logic.

APPLICABILITY: Above COLD SHUTDOWN when the Central switchyard is energizing the standby buses.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Perform a CHANNEL CALIBRATION of the voltage sensing channel with setpoint Allowable Value as follows: a. Degraded voltage $\geq$ 4143 V and $\leq$ 4185 V with a time delay of 9 seconds $\pm$ 1 second for the first level undervoltage inputs. b. Degraded voltage $\geq$ 3871 V and $\leq$ 3901 V for the second level undervoltage inputs.	~~Refueling~~ 18 months
SR 3.7.7.2	Perform a CHANNEL TEST.	~~Refueling~~ 18 months

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One 125 VDC Vital I&C power source supplying only source of power to two or more 125 VDC Vital I&C panelboards.	C.1 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 two or more 125 VDC Vital I&C panelboards.	24 hours
D. ----------NOTE---------- Condition D is not applicable to Unit 1. ---------- One 125 VDC Vital I&C power source supplying only source of power to 125 VDC Vital I&C panelboards 1DIC and 1DID.	D.1 Align 125 VDC Vital power sources such that no one 125 VDC Vital I&C power source is serving as only power source to 125 VDC Vital I&C panelboards 1DIC and 1DID.	24 hours
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
F. One 230 kV switchyard 125 VDC power source inoperable for reasons other than Condition E.	F.1 Restore 230 kV switchyard 125 VDC power source to OPERABLE status.	24 hours
G. Required Actions and associated Completion Times not met. ~~OR~~	G.1 Be in HOT SHUTDOWN AND	12 hours
	G.2 Be in COLD SHUTDOWN	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

BASES (continued)

TS

The basic design criteria of the entire emergency electric power system of a nuclear unit, including the generating sources, distribution system and controls, is that a single failure of any component passive or active will not preclude the system from supplying emergency power when required (Ref 5).

If closed, each N breaker must be capable of opening using either of its associated breaker trip circuits.

Overhead Emergency Power Path

Either of the following combinations provide an acceptable overhead emergency power path.

1A)	Keowee Unit 1 generator,	1B)	Keowee Unit 2 generator,
2A)	Keowee ACB 1,*	2B)	Keowee ACB 2,*
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)	Keowee Unit 1 interlocks between overhead and underground emergency power path breakers,	6B)	Keowee Unit 2 interlocks between overhead and underground emergency power path breakers,

7) Keowee reservoir level $\geq$ 775 feet above sea level,
8) Keowee main step-up transformer,
9) Zone overlap circuitry,
10) PCB 9,*
11) The 230kV switchyard yellow bus capable of being isolated by one channel of Switchyard Isolate from Degraded Grid Voltage Protection circuitry,
12) A unit startup transformer and associated yellow bus PCB (CT-1 / PCB 18, CT-2 / PCB 27, CT-3 / PCB 30), and
13) Both E breakers.

* Enabled by one channel of Switchyard Isolate Complete.

(continued)

BASES (continued)

TS (continued)

If closed, each N breaker and each SL breaker must be capable of opening using either of its associated breaker trip circuits.

Underground Emergency Power Path

Either of the following combinations provide an acceptable underground emergency power path.

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)	Keowee Unit 1 interlocks between overhead and underground emergency power path breakers,	6B)	Keowee Unit 2 interlocks between overhead and underground emergency power path breakers,

7) Keowee reservoir level $\geq$775 feet above sea level,
8) The underground feeder,
9) Interlocks between underground emergency power path breakers,
10) Transformer CT-4,
11) Both SK breakers,
12) Both standby buses, and
13) Both S breakers.

Offsite Sources

The two offsite sources are required to be "physically independent" (separate towers) prior to entering the 230kV switchyard. Once the 230kV lines enter the switchyard, an electrical pathway must exist through operable 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 the main feeder buses from the

(continued)

BASES (continued)

ACTIONS

I.1 through I.4 (continued)

The term verify as used in these Required Actions allows for an administrative check by examining logs or other information to determine if the required equipment is inoperable for maintenance or other reasons. It does not require unique performance of Surveillance Requirements needed to demonstrate operability of the equipment.

If two offsite sources are restored within 24 hours, unrestricted operation may continue.

The Required Actions have been modified by a NOTE which provides an exception to TS 3.7.0 when an OPERABLE Lee gas turbine is energizing the standby buses as required by TS 3.7.1. This exception allows the Unit to heat up above COLD SHUTDOWN when one or more required offsite sources are inoperable due to reasons other than Condition A or B.

J.1 through J.5

Condition J has been established to allow maintenance and repair of a Keowee Hydro Unit which requires longer than 72 hours. This Condition is modified by a NOTE which indicates the Condition is applicable once in a three year period for each Keowee Hydro Unit. A "Keowee Hydro Unit" is considered to be all components between ACBs 1, 2, 3, and 4, as well as all components between auxiliary transformer CX and the Keowee Main step-up transformer. 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 will be necessary. Other items which manifest as failures are expected to be extremely rare and could possibly be performed during the permitted maintenance periods. A time period of up to 45 days for each Keowee Hydro unit is permitted every three years. The 3 days from Condition C are added to the 42 day Completion Time in Condition J to get the 45 day time period.

The Required Actions for the special inoperability period have been modified by three NOTES. NOTE 1 prohibits generation to the system grid except for testing. This restriction limits the number of possible failures which could cause loss of the underground emergency power path. NOTE 2 allows the OPERABLE Keowee Hydro Unit to be made inoperable for ~~24~~ 72 hours if required to restore both Keowee Hydro Units to OPERABLE status. This note is necessary since certain actions such as dewatering the penstock may be necessary to restore the inoperable Keowee Hydro Unit although these actions would also cause both Keowee Hydro Units to be inoperable. NOTE 3 provides an exception to TS 3.7.0 when an OPERABLE Lee gas turbine is energizing the standby buses as required by TS 3.7.1. This exception allows the Unit to heat up above COLD SHUTDOWN when the overhead emergency power path is inoperable for greater than 72 hours due to an inoperable Keowee Hydro Unit. The Required Actions detailed below are prerequisites for use of the special inoperability period. With the exception of Lee energizing the standby buses, in the event these Required Actions are not met during the special inoperability period, 4 hours is allowed by Required Action J.3 to restore

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.13

This surveillance is modified by a NOTE which indicates that the surveillance is only required to be met when a Lee gas turbine is energizing the standby buses. A Lee gas turbine is not required to be OPERABLE when it is not energizing the standby buses.

The Design Bases response for the Lee Gas Turbines is to supply power to the Oconee site. Therefore, the capability of the Lee Gas Turbines to supply the Oconee main feeder buses is demonstrated by loading a Lee Gas Turbine on the isolated 100kV line with the equivalent of a single Unit's maximum safeguards loads (4.8MVA) within one hour. ~~The Refueling~~ frequency for this surveillance is reasonable based on operating experience and the one hour time response required of the source.

An 18 month

SR 3.7.1.14

This surveillance performs functional verification for the source and Main Feeder Bus voltage sensing, Keowee Emergency start, Loadshed and Transfer-to-Standby, and Retransfer-to-Startup logic of the EPSL System. The method is designed to provide actual power failures remote from the Main Feeder Buses so that the logic may be monitored. For SR purposes, a "failed" source is defined as the complete loss of voltage. The ramp/rate/time responses for the voltage relays are verified independently as a prerequisite to this SR. Circuits actuated by the source undervoltage relays are verified per SR 3.7.4.1. To eliminate the human or computer error in timing events, critical time setpoints for Load shed, Transfer-to-Standby, Retransfer-to-Startup, and reactor coolant pump trip relays are verified independently during the refueling outage. This test verifies the integrated response of the circuits. Key circuits for verification include the Engineered Safeguards contacts to the Keowee Emergency Start, Loadshed and Transfer/Retransfer relays, and close permissive for Keowee Feeder Breakers (SK). Excessive cycling of equipment may be prevented by using a single action input, verification of the required end result by alarms or visual inspection, subsequent reset of the initiating logic, and then insertion of an alternate input for verification of the required circuits. ~~The Refueling~~ frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing. This surveillance will be performed during the refueling outage for each Oconee unit.

An 18month

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.15

This surveillance is modified by a NOTE which indicates that the surveillance is only required to be met during periods of commercial power generation using the Keowee Hydro Units. The logic which aligns the Keowee Hydro Units following a load rejection from commercial power generation is not required to be operable when the Keowee Hydro Units are not providing commercial power.

In order to ensure that the Keowee Hydro units are operable during periods of commercial power generation, the protection circuitry will be tested on ~~a refueling~~ an 18month frequency. This surveillance will ensure that the adverse effects of ~~overspeed~~ following a load rejection will be precluded and the appropriate emergency power paths will be aligned. In addition, the speed sensing governor failure logic will be verified during this surveillance. The Keowee Watt/VAR meter, frequency relays, and governor magnetic speed switch will be calibrated prior to the performance of this surveillance. This surveillance can be performed with one or both Keowee units operating at any load below the maximum power level as defined by the Keowee operating restrictions.

SR 3.7.1.16

This surveillance is modified by a NOTE which indicates that the surveillance is only required to be met during periods of commercial power generation using the Keowee Hydro Units. The response of the Keowee Hydro Units following a load rejection from commercial power generation is not required to be bounded by the design criteria, which were used to develop the Keowee operating restrictions, when the Keowee Hydro Units are not providing commercial power.

A maximum power dual unit load rejection will be performed on ~~a refueling~~ an 18month frequency. This surveillance will verify that the Keowee Hydro units ~~response to a load~~ rejection is bounded by the design criteria used to develop the Keowee operating restrictions. The design criteria are defined in the calculation that determines the Keowee operating restrictions. A power level for the dual unit load rejection will be defined based on the operating conditions for the day of the test. In addition, a revision of the operating restrictions for simultaneous operation of both Keowee units will require that a maximum power dual unit load rejection test be performed prior to implementing the revision. A revision of the operating restrictions for a single Keowee unit will require only a maximum power single unit load rejection as defined by the conditions for the day of the test. However, if a load rejection test is performed to support a revision to the operating restrictions, then no additional load rejection test will be required until the next surveillance. The Keowee Watt/VAR meter and frequency relays will be calibrated prior to the performance of this surveillance.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.17

This surveillance is modified by two NOTES. NOTE 1 indicates that the surveillance is only required to be met when the associated breaker is closed. The trip function is not necessary when the breaker is already open. NOTE 2 to this surveillance states that the surveillance is not required to be performed for the SL breakers when the overhead emergency power path is inoperable $\geq$ 72 hours. When the overhead emergency power path is inoperable for $\geq$ 72 hours, the SL breakers must remain closed to energize the standby buses from an OPERABLE Lee gas turbine.

This surveillance verifies operability of the trip functions of the SL and N breakers. This surveillance verifies that 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 Refueling~~ frequency is based on engineering judgement and provides reasonable assurance that the SL and N breakers will trip when required.

An 18 month

SR 3.7.1.18

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 the Keowee Hydro Units to the overhead and underground emergency power paths. An 18 month ~~A Refueling~~ frequency minimizes the impact to Keowee and the operating Units which ~~are connected~~ to the 230 kV switchyard. The effect of this surveillance 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 Keowee Hydro Unit emergency start functions, this surveillance need be performed for only one Switchyard Isolation Channel each surveillance interval. This is acceptable since operability of the overhead emergency power path requires only one channel of the Switchyard Isolation circuitry to be capable of isolating the switchyard. Functional verification of the Switchyard Isolation Channel logic is addressed in Technical Specification 3.7.6, "Emergency Power Switching Logic (EPSL) Degraded Grid Voltage Protection."

This surveillance is modified by a NOTE. This NOTE states that the redundant breaker trip coils ~~may~~ will be verified on a STAGGERED TEST BASIS. This can be accomplished by ~~alternating~~ the switchyard isolation channels which are actuated during each test. Verifying the trip coils on a STAGGERED TEST BASIS precludes unnecessary breaker operation and minimizes the impact to Keowee and the operating Units which are connected to the 230 kV switchyard.

(continued)

BASES (continued)

ACTIONS

The Required Actions have been established based on the level of degradation of the DGPS.

A.1

Insert information on attached page.

~~A single voltage sensing relay inoperable (unable to trip) means the affected Unit must rely on the other Unit's sensing relays. The logic is also degraded to 2-out-of-2 versus 2-out-of-3. Failure of a second sensing relay to trip when required will render both channels inoperable.~~ The 72 hour completion time is based on ~~engineering judgement~~ taking into consideration the infrequency of actual Grid system voltage degradation, the probability of a simultaneous ES actuation, and the availability of other Unit's sensing relays.

B.1

In the event one channel of actuation logic is inoperable (unable to trip) then a single failure of the other channel to trip when required would remove protection from a Degraded Grid condition concurrent with ES actuation. The 72 hour completion time to restore the inoperable channel is based on engineering judgement taking into consideration the infrequency of actual grid system degradation, the probability of a simultaneous ES actuation, and the availability of the OPERABLE channel.

C.1 and C.2

If the Required Actions and associated Completion Times for Condition A or B cannot be met, the unit must be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in 84 hours. These times allow for a controlled shutdown of one or all three Units without placing undue stress on plant operators or plant systems.

D.1 and D.2

Two or more voltage sensing relays inoperable or two actuation logic channels inoperable removes Degraded Grid Protection from being available to the Station during ES actuation. The loss of protection exposes any Unit to an inadequate power supply during a degraded grid situation concurrent with a LOCA on that Unit. In addition, the inoperability of the Degraded Grid Voltage Protection system prevents switchyard isolation during a LOCA. Since switchyard isolation is inoperable, the overhead emergency power path is declared inoperable in accordance with the requirements in Technical Specification 3.7.1. The Completion Times are based on engineering judgement taking into consideration the infrequency of actual grid system degradation, and the probability of a simultaneous ES actuation.

(continued)

Insert for page B3.7-47

If a single voltage sensing relay is inoperable, the relay must be placed in trip within 72 hours. Tripping the affected relay places the function in a 1-out-of-2 configuration. Operation in this configuration may continue indefinitely since the DGPS function is capable of performing its function in the presence of a single failure. With one relay inoperable, the remaining relays are capable of providing the DGPS function.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

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 ~~a refueling~~ an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.7.6.2

A CHANNEL TEST is performed on each DGPS voltage sensing channel and DGPS 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 TEST of the DGPS actuation logic channels includes verifying actuation of both channels of the switchyard isolation circuitry. The Frequency is based on engineering judgment and operating experience that determined testing on an 18 month ~~refueling~~ interval provides reasonable assurance that the circuitry is available to perform its safety function.

(continued)

REFERENCES

1. 10 CFR 50.36.
2. 230kV Switchyard Power System DBD, OSS-0254.00-00-2004.

BASES (continued)

TS (continued) 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 relay is defined as unable to trip. This condition reduces the logic for the given channel to a 2 of 2 logic for the 27CT5/A, B, C configuration.~~ Loss of the 27SL1 or 2 relay makes the affected channel inoperable. Loss of ~~two or more~~ voltage sensing relays results in inoperability of both channels of actuation logic.

APPLICABILITY This system is required when the Standby Buses are energized by Central Switchyard and any Unit is above COLD SHUTDOWN. This ensures adequate voltage protection should an ES Unit be transferred to the Standby Bus during an event and coincides with requirements for ES and other support/protective systems used to ensure adequate power is available for core and containment protection.

ACTIONS The Required Actions have been established based on the level of degradation of the Degraded Grid Protection System.

A.1

Insert information on attached page

~~Any one phase A, B, or C undervoltage relay inoperable reduces the logic of both channels to 2/2 requirement, however both channels can still perform the intended function.~~ The 72 hour completion time is based on engineering judgement taking into consideration the remaining OPERABLE undervoltage relays, the availability of the 230kV switchyard, the infrequency of actual Grid system voltage degradation, and the probability of a simultaneous ES actuation and loss of the 230kV switchyard.

B.1

In the event one channel of actuation logic is inoperable then a single failure of the other channel would remove protection from a degraded grid condition at the Central Switchyard concurrent with ES actuation and loss of the 230kV switchyard. The 72 hour completion time is based on engineering judgement taking into consideration the remaining OPERABLE channel of actuation logic, the availability of the 230kV switchyard, the infrequency of actual Grid system voltage degradation, and the probability of a simultaneous ES actuation and loss of the 230kV switchyard.

C.1

When two or more voltage sensing relays or both actuation logic channels are inoperable, there is no automatic protection from degraded grid voltage for the standby buses powered from the 100kV transmission system through the Central Switchyard. EPSL response from ES events could be inhibited by Standby Bus voltage being allowed low enough to cause equipment damage, but not low enough for the EPSL standby

(continued)

Insert for page B3.7-50

If a single voltage sensing relay is inoperable, the relay must be placed in trip within 72 hours. Tripping the affected relay places the function in a 1-out-of-2 configuration. Operation in this configuration may continue indefinitely since the DGPS function is capable of performing its function in the presence of a single failure. With one relay inoperable, the remaining relays are capable of providing the DGPS function.

BASES (continued)

ACTIONS

C.1 (continued)

bus undervoltage relays to cause breaker operation. Therefore, the standby buses must be separated from the 100kV transmission system within 1 hour. In addition, if the Required Actions and associated Completion Times cannot be met, the standby buses must be separated from the 100kV transmission system within 1 hour. This is accomplished by either opening both SL breakers, or by energizing both standby buses by an OPERABLE Lee gas turbine. If the standby buses are energized by an OPERABLE Lee gas turbine, the 100kV transmission circuit must be electrically separated from the system grid and all offsite loads. In addition, if the Required Actions and associated Completion Times cannot be met, the standby buses must be separated from the 100kV transmission system within 1 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 availability of the 230kV switchyard, the infrequency of actual grid system voltage degradation, the probability of simultaneous ES actuation and loss of the 230kV switchyard, and the time to complete the Required Action.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

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 ~~a refueling~~ an 18month calibration interval in the determination of the magnitude of equipment ~~drift in the~~ setpoint analysis.

SR 3.7.7.2

A CHANNEL TEST is performed on each CT-5 DGPS voltage sensing channel and each CT-5 DGPS 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 is based on engineering judgment and operating experience that determined testing on ~~a refueling~~ an 18month interval provides reasonable assurance that the circuitry is available to perform ~~its safety~~ function.

BASES (continued)

ACTIONS

D.1 (continued)

three Units, and retransfer to startup logic for all three Units. In this condition, a single failure of that battery (or its associated equipment) could cause loss of both panelboards, so that required automatic EPSL functions for all three units might 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 both DC panelboards 1DIC and 1DID. 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.

A NOTE has been included to clarify that Condition D is not applicable to Unit 1. Condition C applies to Unit 1. It is acceptable for Units 2 and 3 to be in Conditions C and D simultaneously since the 1DIC and 1DID are not redundant to any Unit 2 or Unit 3 panelboards.

E.1 and F.1

With one of the required 230kV SY DC Sources inoperable, the remaining source is fully capable of providing adequate voltage to all connected panelboards, assuming no single failure. In addition, with one of the required DC sources inoperable, the remaining source is fully capable of powering the necessary panelboards, assuming no single failure. However, overall reliability is reduced because of the potential for a single failure in the remaining DC source or in a redundant panelboard. Loss of the remaining DC source or 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. Therefore, the inoperable source must be restored to OPERABLE status within 24 hours. A required battery may be inoperable for a period of 72 hours to perform equalizer charge following the performance test or service test (SR 3.7.8.3).

The completion times for actions in this TS are 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.

G.1 and G.2

If the Required Actions and associated Completion Times cannot be met, all three Units must ~~be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in the following 72 hours. This Required Action and associated Completion Time also applies to conditions where two or more required 125 VDC Vital I&C power sources or two 230kV switchyard 125VDC power sources are inoperable~~. These times allow for a controlled shutdown of all three units without placing undue stress on plant operators or plant systems.

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H.1

The inoperability of two or more required 125 VDC Vital I&C power sources or two 230kV switchyard 125VDC power sources could result in a loss of safety function. Therefore, the provisions of TS 3.0 apply.