ATTACHMENT 1

TECHNICAL SPECIFICATION SUPPLEMENT

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LIST OF TABLES

3.7 ELECTRICAL POWER SYSTEMS

3.7.1 AC Sources - Operating

TS 3.7.1 The following AC electrical power sources shall be OPERABLE:

1. One underground emergency power path from one Keowee Hydro Unit through the S breakers,

2. One overhead emergency power path from the other Keowee Hydro Unit through the E breakers, and

3. Two offsite sources on separate towers connected to the 230kV switchyard.

----------NOTE----------
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.

APPLICABILITY: Above COLD SHUTDOWN

----------NOTE----------
TS 3.7.0 does not apply when a Lee gas turbine is energizing the standby buses as required by Conditions G, H, or I.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Offsite sources and overhead emergency power path inoperable due to inoperable startup transformer.	A.1 Verify one Keowee Hydro Unit can energize two standby buses through the underground feeder.	---------NOTE-------- May be performed during preceding 12 hour period. ---------- 1 hour
	AND	AND
	A.2 Share another Unit's startup transformer.	Once per 12 hours thereafter. 12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	AND	
	A.3.1 Restore startup transformer to OPERABLE status.	36 hours
	OR	
	A.3.2 Designate shared startup transformer to one Unit.	36 hours
B. Startup transformer designated to another Unit.	B.1 Be in HOT SHUTDOWN	12 hours
OR	AND	
Required Actions and associated Completion Times not met for Condition A.	B.2 Be in COLD SHUTDOWN	36 hours
C. Overhead emergency power path inoperable due to reasons other than an inoperable startup transformer (Condition A).	C.1 Verify the remaining emergency power path OPERABLE.	--------NOTE-------- May be performed during preceding 12 hour period. ---------- 1 hour
		AND
		Once per 12 hours thereafter unless two standby buses are energized by a Lee gas turbine.
	AND	
	C.2.1 Restore emergency power path to OPERABLE status.	72 hours
	OR	
	C.2.2 Enter TS 3.7.1 Condition I ----------NOTE---------- Required Actions I.1 and I.2 must be completed prior to exceeding 72 hours. ----------	72 hours
		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Underground emergency power path inoperable.	D.1 Verify the remaining emergency power path OPERABLE.	--------NOTE-------- May be performed during preceding 12 hour period. ---------- 1 hour
	AND	AND
	D.2 Energize a standby bus by a Lee gas turbine. The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads.	Once per 12 hours thereafter unless two standby buses are energized by a Lee gas turbine. 24 hours
	AND	AND
	D.3 Restore emergency power path to OPERABLE status.	1 hour from subsequent discovery of deenergized standby buses. 72 hours
E. Lee gas turbine does not energize a standby bus within the associated Completion Times in Condition D.2.	E.1.1 Be in HOT SHUTDOWN	12 hours for a single Oconee unit shutdown. OR 24 hours for a shutdown of multiple Oconee units.
	AND	
	E.1.2 Be in COLD SHUTDOWN	84 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One inoperable E breaker and one inoperable S breaker on the same main feeder bus.	F.1 Declare associated main feeder bus inoperable.	Immediately
G. Both emergency power paths inoperable.	G.1 Energize two standby buses by a Lee gas turbine. The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads. AND	1 hour AND 1 hour from subsequent discovery of deenergized standby buses
	G.2.1 Verify by administrative means the operability status of: Two offsite sources (TS 3.7.1), AC Distribution (TS 3.7.2), EPSL (TSs 3.7.3-5, and 3.7.7), Vital I&C DC (TS 3.7.9), Switchyard DC (TS 3.7.10), and AC Vital Distr. (TS 3.7.11). AND	1 hour
	G.2.2 Restore inoperable components listed in G.2.1 to OPERABLE status. AND	4 hours from discovery of inoperable component.
	G.3 Restore one emergency power path to OPERABLE status.	60 hours (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Required offsite sources inoperable due to reasons other than an inoperable startup transformer (Condition A).	H.1 Energize two standby buses by a Lee gas turbine. The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads.	1 hour
	AND	AND
		1 hour from subsequent discovery of deenergized standby buses.
	H.2.1 Verify by administrative means the operability status of: Two emergency power paths (TS 3.7.1), AC Distribution (TS 3.7.2), EPSL (TSs 3.7.3-3.7.7), Vital I&C DC (TS 3.7.9), Switchyard DC (TS 3.7.10), and AC Vital Distr. (TS 3.7.11).	1 hour
	AND	
	H.2.2 Restore inoperable components listed in H.2.1 to OPERABLE status.	4 hours from discovery of inoperable component.
	AND	
	H.3 Restore required offsite sources to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. Keowee Hydro Unit or Keowee Main Step-up transformer inoperable > 72 hours.	----------NOTES---------- 1. 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. ----------	
	I.1 Energize two standby buses by a Lee gas turbine. The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads.	Prerequisite
	AND	AND
	I.2.1 Verify by administrative means the operability status of: two offsite sources and underground emergency power path (TS 3.7.1), AC Distribution (TS 3.7.2), EPSL (TSs 3.7.3-3.7.7), Vital I&C DC (TS 3.7.9), Switchyard DC (TS 3.7.10), and AC Vital Distr. (TS 3.7.11).	1 hour from subsequent discovery of deenergized standby buses. Prerequisite
	AND	
	I.2.2 Restore inoperable components required by I.2.1 to OPERABLE status.	4 hours from discovery of inoperable component
	AND	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. (continued)	I.3 Verify the underground emergency power path is OPERABLE. AND I.4 Restore Keowee Main Step-up transformer to OPERABLE status. AND I.5 Restore Keowee Hydro Unit to OPERABLE status.	Once per 7 days 28 days 45 days once in a 3 year period for each Keowee Hydro Unit.
J. Required Actions and associated Completion Times for Conditions C, D.1, D.3, F, G, H, and I not met.	J.1 Be in HOT SHUTDOWN AND J.2 Be in COLD SHUTDOWN	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Perform SRs 3.7.9.1 (Float Voltage), 3.7.9.3 (Service Test), 3.7.9.4 (Structural Surveillance), and 3.7.9.5 (Connection Surveillance) for the Keowee batteries.	As specified in the applicable SRs.
SR 3.7.1.2	Verify the underground emergency power path is OPERABLE by: 1) Auto-starting each Keowee Hydro Unit; and 2) Energizing the underground emergency power path and both standby buses with each Keowee Hydro Unit.	Monthly
SR 3.7.1.3	Verify the overhead emergency power path is OPERABLE by: 1) Auto-starting each Keowee Hydro Unit; and 2) Synchronizing with the Yellow bus with each Keowee Hydro Unit.	Monthly (continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.1.4	Verify the S and E breakers are OPERABLE by full cycling.	Monthly
SR 3.7.1.5	Verify OPERABILITY of the Keowee underground feeder breaker interlock and the underground to overhead ACB interlock.	Annually
SR 3.7.1.6	Verify the dedicated 100kV line is OPERABLE by energizing both standby buses by a Lee gas turbine within one hour.	Annually
SR 3.7.1.7	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
SR 3.7.1.8	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 3.7.1.9	Verify the ability of the Keowee Unit ACBs to close automatically to the underground path.	Annually
SR 3.7.1.10	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.	Refueling
SR 3.7.1.11	Perform an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers.	Refueling
SR 3.7.1.12	Verify the ability of the Keowee Hydro units to supply emergency power from the initial condition of commercial power generation.	Refueling
SR 3.7.1.13	Verify that the Keowee Hydro units load rejection response is bounded by the design criteria used to develop the Keowee operating restrictions.	Refueling

3.7 ELECTRICAL POWER SYSTEMS

3.7.3 Emergency Power Switching Logic (EPSL) Automatic Transfer Functions

TS 3.7.3 The following EPSL automatic transfer functions shall be OPERABLE:

1. Channel A and B of Load Shed/Transfer to Standby;
2. Channel A and B of Retransfer to Startup.

APPLICABILITY: Above COLD SHUTDOWN

ACTIONS

NOTE

Separate Condition entry is allowed for each inoperable Automatic Transfer Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Channel A of one or both functions inoperable. OR Channel B of one or both functions 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 3.7.3.1 Perform SR 3.7.1.11 (EPSL automatic transfer)	As specified in applicable SR.

3.7 ELECTRICAL POWER SYSTEMS

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

TS 3.7.6 Two channels of the EPSL Keowee Emergency Start Function shall be OPERABLE.

APPLICABILITY: Above COLD SHUTDOWN

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.6.1 Perform SR 3.7.1.8 (Keowee emergency start) and SR 3.7.1.11 (EPSL automatic transfer).	As specified in applicable SR.

3.7 ELECTRICAL POWER SYSTEMS

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

TS 3.7.7 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 voltage sensing relay 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 Verify 230kV switchyard voltage greater than or equal to the minimum voltage necessary to assure actuation of all ES loads.	Once per 2 hours
D. Two or more voltage sensing relays inoperable.	D.1 Verify 230kV switchyard voltage greater than or equal to the minimum voltage necessary to assure actuation of all ES loads. AND D.2 Verify one Keowee Hydro Unit can energize two standby buses through the underground feeder.	Once per 2 hours ---------NOTE-------- May be performed during preceding 12 hour period. ---------- 1 hour (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two actuation logic channels inoperable.	E.1 Verify 230kV switchyard voltage greater than or equal to the minimum voltage necessary to assure actuation of all ES loads. AND E.2 Verify one Keowee Hydro Unit can energize two standby buses through the underground feeder.	Once per 2 hours ---------NOTE-------- May be performed during preceding 12 hour period. ---------- 1 hour
F. Required Actions and associated Completion Times not met for Conditions C, D, or E.	F.1 Be in HOT SHUTDOWN AND F.2 Be in COLD SHUTDOWN	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.7.1 1) Verify any 2 of 3 undervoltage inputs will provide undervoltage permissive at $\geq$ 219kV; 2) Verify associated time delay relays actuate as required with a time response of $\leq$ 10 seconds; 3) Verify any single channel, single Unit ES signal will provide permissive to undervoltage logic for system actuation.	Refueling
SR 3.7.7.2 Perform a switchyard isolation test.	Refueling

3.7 ELECTRICAL POWER SYSTEMS

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

TS 3.7.8 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 Restore voltage sensing relay to OPERABLE status.	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. OR C.2 Energize two standby buses by a Lee gas turbine. The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads.	1 hour 1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.8.1 1) Verify any 2 of 3 first level undervoltage inputs will provide undervoltage permissive at $\geq$ 4155V; 2) Verify associated time delay relays actuate as required with a response time of $\leq$ 10 seconds; 3) Verify any 1 of 2 second level undervoltage inputs will provide permissive to undervoltage logic for system actuation at $\geq$ 3874V.	Refueling

B 3.7 ELECTRICAL POWER SYSTEMS

B 3.7.1 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). This system is designed to supply the required engineered safety features (ESF) 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. In accordance with the intent of proposed Atomic Energy Commission (AEC) general design criterion 39, the design of the AC Power System provides independence and redundancy to ensure an available source of power to the ESF systems (FSAR 3.1.39). The Keowee Hydro 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 Duke Power Company (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 230kV switchyard to the units startup transformer and the E breakers. The 230kV switchyard is electrically connected to the 525kV switchyard via the autobank transformer. The standby buses may receive offsite power from the 100kV transmission system through CT-5 and the SL breakers. The two emergency power paths are the overhead path and the underground path. The underground emergency power path is from one Keowee Hydro Unit through the S breakers. The overhead emergency power path is from the other Keowee Hydro Unit through the E breakers. In addition to supplying emergency power for Oconee, the Keowee Hydro units provide peaking power to the Duke Power generation system. During periods of commercial power generation, the Keowee Hydro units are operated within the acceptable region of the Keowee Hydro operating restrictions. This will ensure that the Keowee Hydro units will be able to perform their emergency power functions from an initial condition of commercial power generation. The Keowee Hydro operating restrictions for commercial power generation are contained in the Selected Licensee Commitment manual. Changes to these operating restrictions would be performed in accordance with 10 CFR 50.59, which would include an evaluation to determine if any unreviewed safety questions exist. The standby buses can also receive power from a combustion turbine generator at the Lee Steam Station through a dedicated 100kV transmission line, transformer CT-5, and both SL breakers. The 100kV transmission line is electrically separated from the system grid and offsite loads. This source is required to be OPERABLE only when specified in TS 3.7.1 Conditions G, H, or I and is considered to be an onsite power source in this mode of operation.

The auxiliaries of two units in HOT SHUTDOWN plus the auxiliaries of the one unit with a LOCA require a total AC power capacity as shown in FSAR Table 8-1.

(continued)

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

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,

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

* Enabled by one channel of Switchyard Isolate Complete.

(continued)

BASES (continued)

TS (continued)

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,

6) Keowee reservoir level ≥775 feet above sea level,
7) The underground feeder,
8) Transformer CT-4,
9) Both SK breakers,
10) Both standby buses, and
11) 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 energized startup transformer. If both E breakers are inoperable, then neither the 230kV sources nor the overhead emergency power path can energize the main feeder buses, therefore, the startup transformer is considered to be inoperable. The voltage provided to the startup transformer by the two independent offsite sources must be sufficient to

(continued)

BASES (continued)

TS

Offsite Sources (continued)

ensure all engineered safeguard equipment will operate (Ref. 3). 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) 525kV line.

APPLICABILITY

The AC power sources for ESF systems are required to be OPERABLE above COLD SHUTDOWN to ensure that:

1. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of anticipated operational occurrences or abnormal transients, and

2. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

AC source requirements during COLD SHUTDOWN and REFUELING SHUTDOWN are addressed in the Bases for TS 3.7.13 (AC Sources - Shutdown/High Decay Heat/Reduced Inventory) and TS 3.7.14 (AC Sources - Shutdown).

The APPLICABILITY has been modified by a NOTE which provides an exception to TS 3.7.0 when a Lee gas turbine is energizing the standby buses as required by Conditions G, H, or I. This exception allows the Unit to heat up above COLD SHUTDOWN when both emergency power paths are inoperable, or a Keowee Hydro Unit or the Keowee Main Step-up transformer is inoperable > 72 hours provided a Lee gas turbine is energizing the standby buses.

ACTIONS

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

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

In the event a startup transformer becomes inoperable, it effectively causes one of the emergency power paths (overhead path) and both of the offsite sources to be inoperable. One emergency power path remains available through the underground

(continued)

BASES (continued)

ACTIONS

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

feeder to ensure safe shutdown of the unit in the event of a transient or accident without a single failure.

Operation may continue for 12 hours if the availability of the underground emergency power path is demonstrated within 1 hour. This Required Action provides assurance that no previously undetected failures have occurred in the underground emergency power path. 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 overhead path will also be available if needed. Although this alignment restores the availability of the offsite sources and 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 COLD SHUTDOWN. Required Actions A.3.1 and A.3.2 allow the option of restoring the affected Unit's startup transformer or designating an OPERABLE startup transformer from another Unit. For example, if Unit 1 and 2 are operating and CT-2 becomes inoperable, Unit 2 may align CT-1 to the Unit 2 main feeder buses and continue operating for up to 36 hours. At that time either CT-2 must be restored to OPERABLE status or CT-1 must be "designated" to one Unit. Once CT-1 has been designated to a Unit, the other Unit must begin shutting down per Condition B. Note that one Unit above COLD SHUTDOWN and a Unit in COLD SHUTDOWN may share a startup transformer indefinitely provided that the loads on the COLD SHUTDOWN Unit are maintained within acceptable limits (Ref. 2). For example, if Unit 1 is already in COLD SHUTDOWN 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

In the event a startup transformer has been designated to another Unit per Required Action A.3.2, the Unit must be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in another 24 hours since the shared startup transformer's capacity could be challenged under certain DBA conditions. In addition, if the Required Actions and associated Completion Times for Condition A cannot be met, the Unit must be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in another 24 hours. These times allow for a controlled shutdown without placing undue stress on plant operators or plant systems.

C.1, C.2.1, and C.2.2

With the 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 could safely continue for 72 hours if the operability of the remaining

(continued)

BASES (continued)

ACTIONS

C.1, C.2.1, and C.2.2 (continued)

emergency power path is demonstrated within 1 hour and every 12 hours thereafter. 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. When the standby buses are energized by a Lee gas turbine, the likelihood that the OPERABLE emergency power path will be required is decreased, thus testing on a 12 hour frequency is no longer necessary. Testing on a 7 day frequency will be commenced if Condition I is entered. If the inoperable emergency power path is not restored to OPERABLE status within 72 hours, a controlled shutdown must be initiated per Condition J or the Required Actions of Condition I must be completed for the inoperable Keowee Hydro Unit or Keowee Main Step-up transformer. A NOTE has been included to specify that Required Actions I.1 (Lee on the standby buses) and I.2 (verification of operability) must be completed prior to exceeding 72 hours.

D.1, D.2, and D.3

With the 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 could safely continue for 72 hours if the operability of the remaining emergency power path is demonstrated within 1 hour and every 12 hours thereafter. 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. When the standby buses are energized by a Lee gas turbine, the likelihood that the OPERABLE emergency power path will be required is decreased, thus testing on a 12 hour frequency is no longer necessary. For outages of the underground power path in excess of 24 hours, a Lee gas turbine must energize a standby bus prior to the outage exceeding 24 hours. This ensures the availability of a power source on the standby buses while the underground power path is out of service in excess of 24 hours.

E.1.1 and E.1.2

If the underground power path is out of service due to reasons that prevent energization of a standby bus from a Lee gas turbine, then the underground power path shall not be out of service for more than 24 hours and a controlled shutdown will be initiated per Condition E.1 once the 24 hour period is exceeded.

F.1

With an E breaker and S breaker inoperable on the same main feeder bus the affected main feeder bus cannot receive power from either on-site emergency power source. In this case, the affected main feeder bus must be declared inoperable. Appropriate Required Actions are specified in TS 3.7.2 (AC Distribution - Operating). Both on-site emergency power paths are considered OPERABLE in this case since, without a single failure, both on-site emergency paths can provide power to the remaining main feeder bus.

(continued)

BASES (continued)

ACTIONS

G.1 through G.3

With both emergency on-site power paths inoperable, insufficient standby AC power sources are available to feed the minimum required ESF functions. 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 simultaneous shutdown of all three units. This instability would increase the probability of a total loss of AC power. Operation with both Keowee units inoperable is permitted for 60 hours provided that the actions detailed below are taken prior to exceeding one hour. Further, with the exception of Lee energizing the standby buses, in the event these actions are not met during the inoperability of both emergency power paths, a period of 4 hours is allowed by Required Action G.2.2 to restore the inoperable component. For example if both Keowee Units have been inoperable 24 hours and one channel of load shed (required by TS 3.7.3) is discovered to be inoperable, the channel must be restored to OPERABLE status within the next 4 hours.

1. The standby buses are continuously energized by a Lee gas turbine through the 100kV transmission circuit. The 100kV transmission circuit would be electrically separated from the system grid and all offsite loads. This arrangement provides a high degree of reliability for the emergency power system. In this configuration, the Lee gas turbine is serving as an onsite emergency power source, however since the Oconee Units are vulnerable to single failure of the 100kV transmission circuit a time limit of 60 hours is imposed. Required Action G.1 permits the standby buses to be re-energized by a Lee gas turbine within 1 hour in the event this source is lost. For example if both Keowee Units have been inoperable 12 hours and the Lee gas turbine feeding the 100kV line trips, the 100kV line must be re-energized from a Lee gas turbine within the next hour.

2. Two offsite sources are verified and maintained OPERABLE by complying with TS 3.7.1. This Required Action provides additional assurance that offsite power will be available while both Keowee Units are inoperable.

3. AC Distribution is verified and maintained OPERABLE by complying with TS 3.7.2. This Required Action increases the probability that AC power will be available to ESF equipment even in the unlikely event of a single failure unrelated to the inoperability of both emergency power paths.

4. EPSL with the exception of the Keowee Emergency Start Function (TS 3.7.6) is verified and maintained OPERABLE by complying with TSs 3.7.3, 3.7.4, 3.7.5, and 3.7.7. This Required Action increases the probability that EPSL will function as required even in the unlikely event of a single failure unrelated to the inoperability of both emergency power paths.

(continued)

BASES (continued)

ACTIONS

G.1 through G.3 (continued)

5. Vital I&C DC Sources and distribution are verified and maintained OPERABLE by complying with TS 3.7.9. This Required Action increases the probability that the Vital I&C DC system will function as required to support EPSL even in the unlikely event of a single failure unrelated to inoperability of both emergency power paths.

6. Switchyard DC Sources and Distribution are verified and maintained OPERABLE by complying with TS 3.7.10. This Required Action increases the probability that the 230kV switchyard DC system will function as required to support EPSL even in the unlikely event of a single failure unrelated to the inoperability of both emergency power paths.

7. AC Vital Distribution is verified and maintained OPERABLE by complying with TS 3.7.11. This Required Action increases the probability that the vital instrumentation power panelboards will function as required to support EPSL even in the unlikely event of a single failure unrelated to the inoperability of both emergency power paths.

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 both Keowee units are restored, unrestricted operation may continue. If only one unit is restored within 60 hours, operation may continue per the Required Actions of Condition C, D or G.

H.1 through H.3

With all of the required offsite sources inoperable due to degraded grid, loss of voltage, or other causes, sufficient standby AC power sources are available to maintain the unit in a safe shutdown condition in the event of a DBA. However, since the AC power system is degraded below the TS requirements, a time limit on continued operation is imposed. With only one of the required offsite sources OPERABLE, the likelihood of LOOP is increased such that the same Required Actions for all required offsite sources inoperable are conservatively followed. The risk associated with continued operation for one hour without a Lee gas turbine energizing the standby buses is considered acceptable due to the low likelihood of a failure of both emergency power paths during this time period, and because of the potential for grid instability caused by the simultaneous shutdown of all three units. Operation with the available offsite sources less than required by the TS is permitted for 24 hours provided that the actions detailed below are taken prior to exceeding one hour. Further, with the exception of Lee energizing the standby buses, in the event these actions are not met during the inoperability of the required offsite sources, a period of 4 hours is allowed by Required Action H.2.2 to restore the

(continued)

BASES (continued)

ACTIONS

H.1 through H.3 (continued)

inoperable component. For example if both required offsite sources have been inoperable 12 hours and one channel of load shed (required by TS 3.7.3) is discovered to be inoperable, the channel must be restored to OPERABLE status within the next 4 hours.

1. The standby buses are continuously energized by a Lee gas turbine through the 100kV transmission circuit. The 100kV transmission circuit would be electrically separated from the system grid and all offsite loads. This arrangement provides a high degree of reliability for the emergency power system. In this configuration, the Lee gas turbine is serving as an onsite emergency power source. Required Action H.1 permits the standby buses to be reenergized by Lee gas turbine within 1 hour in the event this source is lost. For example, if both required offsite sources have been inoperable 12 hours and the Lee gas turbine feeding the 100kV line trips, the 100kV line must be reenergized from Lee gas turbine within the next hour.

2. Two emergency power paths are verified and maintained OPERABLE by complying with TS 3.7.1. This Required Action provides additional assurance that the emergency power paths will be available if required while the required offsite sources are inoperable.

3. AC Distribution is verified and maintained OPERABLE by complying with TS 3.7.2. This Required Action increases the probability that AC power will be available to ESF equipment even in the unlikely event of a single failure unrelated to the inoperability of the required offsite sources.

4. EPSL is verified and maintained OPERABLE by complying with TSs 3.7.3, 3.7.4, 3.7.5, 3.7.6, and 3.7.7. This Required Action increases the probability that EPSL will function as required even in the unlikely event of a single failure unrelated to the inoperability of the required offsite sources.

5. Vital I&C DC Sources and distribution are verified and maintained OPERABLE by complying with TS 3.7.9. This Required Action increases the probability that the Vital I&C DC system will function as required to support EPSL even in the unlikely event of a single failure unrelated to inoperability of the required offsite sources.

6. Switchyard DC Sources and Distribution are verified and maintained OPERABLE by complying with TS 3.7.10. This Required Action increases the probability that the 230kV switchyard DC system will function as required to support EPSL even in the unlikely event of a single failure unrelated to the inoperability of the required offsite sources.

(continued)

BASES (continued)

ACTIONS

H.1 through H.3 (continued)

7. AC Vital Distribution is verified and maintained OPERABLE by complying with TS 3.7.11. This Required Action increases the probability that the vital instrumentation power panelboards will function as required to support EPSL even in the unlikely event of a single failure unrelated to the inoperability of the required offsite sources.

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.

I.1 through I.5

Condition I has been established to allow maintenance and repair of a Keowee Hydro Unit and transformers which requires longer than 72 hours per Condition C. 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. If both Keowee auxiliary transformers (1X and 2X) are inoperable the Keowee main step-up transformer is considered to be inoperable, because one of the functions of the main step-up transformer is supplying auxiliary loads for the overhead emergency power path. 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. Transformer replacement is rare but would be time extensive. 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. A maximum period of 28 days is for Keowee main step-up transformer. This would allow a reasonable period of time for transformer replacement. The 28 day Completion Time for the Keowee main step-up transformer is not counted toward the 45 day Completion Time for each Keowee Hydro unit.

The Required Actions for the special inoperability period have been modified by two 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. 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

(continued)

BASES (continued)

ACTIONS

I.1 through I.5 (continued)

by Required Action I.2.2 to restore the inoperable component. For example, if the Keowee Main Step-up transformer has been inoperable for 15 days and one ES power system string (required by TS 3.7.2) is discovered to be inoperable, the ES power system string must be restored to OPERABLE status within the next 4 hours.

1. The standby buses are continuously energized by a Lee gas turbine through the 100kV transmission circuit. The 100kV transmission circuit would be electrically separated from the system grid and all offsite loads. This arrangement provides a high degree of reliability for the emergency power system. In this configuration, the Lee gas turbine is serving as the second onsite emergency power source, however since the 100kV transmission circuit is vulnerable to severe weather a time limit is imposed. Required Action I.1 permits the standby buses to be reenergized by Lee gas turbine within 1 hour in the event this source is lost. For example, if one Keowee Unit has been inoperable for 20 days and the Lee gas turbine feeding the 100kV line trips, the 100kV line must be reenergized from Lee gas turbine within the next hour.

2. Two offsite sources and the underground emergency power path are verified and maintained OPERABLE by complying with TS 3.7.1. This Required Action provides additional assurance that offsite power will be available during the special inoperability period. In addition this Required Action assures that underground emergency power path is available.

3. AC Distribution is verified and maintained OPERABLE by complying with TS 3.7.2. This Required Action increases the probability that AC power will not be lost to ESF equipment even in the unlikely event of single failures unrelated to the special inoperability period.

4. EPSL is verified and maintained OPERABLE by complying with TSs 3.7.3, 3.7.4, 3.7.5, 3.7.6, and 3.7.7. This Required Action increases the probability that EPSL will function as required even in the unlikely event of single failures unrelated to the special inoperability period.

5. Vital I&C DC Sources and Distribution are verified and maintained OPERABLE by complying with TS 3.7.9. This Required Action increases the probability that the Vital I&C DC System will function as required to support EPSL even in the unlikely event of single failures unrelated to the special inoperability period.

6. Switchyard DC Sources and Distribution is verified and maintained OPERABLE by complying with TS 3.7.10. This Required Action increases the probability that the 230kV switchyard DC system will function as required to support EPSL even in the unlikely event of single failures unrelated to the special inoperability period.

(continued)

BASES (continued)

ACTIONS

I.1 through I.5 (continued)

7. AC Vital Distribution is verified and maintained OPERABLE by complying with TS 3.7.11. This Required Action increases the probability that the vital instrumentation power panelboards will function as required to support EPSL even in the unlikely event of single failures unrelated to the special inoperability period.

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.

Following completion of the prerequisites for the special inoperability period, the underground emergency power path must be demonstrated to be OPERABLE. This demonstration is to assure that the underground emergency power path is not inoperable due to a common cause or due to an undetected failure. When the standby buses are energized by a Lee gas turbine, the likelihood that the OPERABLE emergency power path will be required is decreased, thus testing on a 7 day frequency is adequate. Credit can be taken for the operability of the SK and S breakers per the routine surveillance test (SR 3.7.1.2 and SR 3.7.1.4).

J.1 and J.2

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

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

SRs 3.7.9.1, 3.7.9.3, 3.7.9.4, and 3.7.9.5 are performed to ensure Keowee battery OPERABILITY.

SR 3.7.1.2

This surveillance is to verify the availability of underground emergency power path. Utilization of the Auto-start sequence assures the control function operability by verifying proper speed control and voltage. Power path verification is included to demonstrate breaker operability from each of the Keowee Units onto the Standby Buses. This is accomplished by exercising the Keowee Feeder Breakers (SK) to energize both Standby Buses. The Monthly frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing. For cases where a Keowee unit can only be connected to one emergency power path, this monthly surveillance will only be performed on the one emergency power path.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.3

This surveillance is to verify the availability of overhead emergency power path. Utilization of the Auto-start sequence assures the control function operability by verifying proper speed control and voltage. The ability to supply the Overhead path is satisfied by demonstrating the ability to synchronize each Keowee Unit with the Grid system. The remaining path components are considered OPERABLE by the existence of adequate power to each of the Oconee Unit Startup Transformers. The Monthly frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing. For cases where a Keowee unit can only be connected to one emergency power path, this monthly surveillance will only be performed on the one emergency power path.

SR 3.7.1.4

Infrequently used source breakers need to be cycled to ensure availability. The Standby breakers are to be cycled one breaker on one Unit 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 Monthly frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.7.1.5

The Keowee tie breakers to the Underground Path, ACB3 and ACB4, are interlocked to prevent cross-connection of the Keowee Generators. The safety analysis utilizes two independent power paths for accommodating single failures in applicable DBAs. Connection of both generators to the Underground path would compromise the redundancy of the emergency power paths. Test logic is installed to verify a circuit to the close coil on one Underground ACB does not exist with the other Underground ACB closed. Interlocks preventing the Keowee Unit which is aligned to the underground path from automatically closing to the overhead path are also verified OPERABLE. The annual frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.7.1.6

The Lee Gas Turbines can be used as a reliable alternate "onsite" power source when connected through a 100kV line which is not connected to any other load or system. Since the use of this source is not frequent, the integrity and validity of the path must be verified by actually powering the Standby Buses with the Lee Gas Turbines within one hour. More frequent cycling of the Standby breakers is already performed per SR 3.7.1.4. The annual frequency for this surveillance is reasonable based on operating experience and the one hour time response required of the source.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.7

The Design Bases response for the Lee Gas Turbines is to supply power to the Oconee Site equal to one Unit's maximum safeguards and two Unit's HOT SHUTDOWN loads. The Oconee Site cannot provide equivalent loads without establishing an unanalyzed electrical system alignment. Therefore, the load capability is established by requiring connection to the system grid and loading to the accident equivalent load. The annual frequency for this surveillance is reasonable based on operating experience.

SR 3.7.1.8

This surveillance verifies the Keowee Units' response time to an Emergency Start signal to ensure ES equipment will have adequate power for Design Accident mitigation. Two locations exist for Control Room manual initiation of Keowee Emergency Start logic. Oconee Units 1 & 2 or Unit 3 Control Room. Each Unit has individual logic which actuates the associated Emergency Start relays. This provides the ability to verify operability of each Control Room Logic independent of each Oconee Unit. A Refueling frequency surveillance, SR 3.7.1.9 (EPSL functional test), verifies the ES input. FSAR Section 6.3.3.3 establishes the 23 second time requirement for each Keowee Unit to obtain full speed and voltage. Since the only available loads of adequate magnitude for simulating a DBA is the Grid, subsequent loading on the Grid is required to verify the Unit's ability to assume rapid loading under accident conditions. Ideally, sequential block loads would be applied to fully test this function, but such loads are not available. This explains the requirement to load the Keowee Units at the maximum practical rate to the equivalent of a LOCA/LOOP situation. Current value for the maximum accident loads may be found in FSAR Table 8-1. The Annual frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.7.1.9

The Keowee Underground ACBs have a control feature which will automatically close the Keowee Unit, 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 Keowee Unit 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 will be performed on an annual frequency.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.10

The Design Bases response for the Lee Gas Turbines is to supply power to the Oconee site. The Oconee Site cannot provide loads equivalent to one Unit's maximum safeguards and two Unit's HOT SHUTDOWN loads without establishing an unanalyzed electrical system alignment. 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). The Refueling frequency for this surveillance is reasonable based on operating experience.

SR 3.7.1.11

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.

SR 3.7.1.12

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 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.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.13

A maximum power dual unit load rejection will be performed on a refueling 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.

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

2. 4160V Auxiliary Power System DBD, OSS-0254.00-00-2000.

3. 230kV Switchyard Power System DBD, OSS-0254.00-00-2004.

4. Keowee Emergency Power System DBD, OSS-0254.00-00-2005.

5. Oconee FSAR Section 3.1.39, Criterion 39

BASES (continued)

ACTIONS

A.1 (continued)

time required to complete the required action and the availability of the remaining channel.

Channel A and B provide redundant transfer functions. The retransfer to startup function of each channel is actuated by its associated channel of transfer to standby function (through the RX relay).

Additionally, each channel of transfer functions provide a permissive in its associated SK breaker (through the RX relay) to allow its automatic closure (i.e., channel A with SK1 channel B with SK2). Also, an S breaker can close automatically only when its associated bus is energized. If a channel of transfer to standby is inoperable then the associated RX relay may not be OPERABLE (depending on what portion of transfer to standby function is inoperable). This could keep the associated SK breaker from automatically closing and cause the associated retransfer to startup function to be inoperable. The remaining channel of transfer to standby function and retransfer to startup function needs to be OPERABLE to restore power during LOCA/LOOP events. The S breaker associated with the OPERABLE transfer channel also needs to be OPERABLE, since the other S breaker may not be capable of automatically closing due to its standby bus being deenergized (SK breaker not closed).

For these reasons, transfer functions of the same channel are allowed to be inoperable only when both functions of the other channel are OPERABLE and the other channel's associated S breaker is OPERABLE (i.e., channel A with S1 and channel B with S2).

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

See Bases for SR 3.7.1.11 (EPSL automatic transfer).

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

2. 4160V Auxiliary Power System DBD,OSS-0254.00-00-2000.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

See Bases for SR 3.7.1.8 (Keowee Emergency Start) and SR 3.7.1.11 (EPSL automatic transfer).

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

2. 4160V Auxiliary Power System DBD, OSS-0254.00-00-2000.

3. Keowee Emergency Power System DBD, OSS-0254.00-00-2005.

BASES (continued)

ACTIONS

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

A.1

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

If the Required Actions and associated Completion Times cannot be met for Conditions A or B, then the 230kV switchyard voltage shall be verified to be greater than or equal to the minimum voltage necessary to assure actuation of all ES loads ($\geq$ 219kV). The 2 hour frequency for monitoring 230kV switchyard voltage 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 voltage sensing relay or actuation logic channel.

D.1 and D.2

Two or more voltage sensing relays inoperable removes Degraded Grid Protection from being available to the Station during ES actuation. Continued operation is allowed provided that the 230kV switchyard voltage is verified to be greater than or equal to the minimum voltage necessary to assure actuation of all ES loads ($\geq$ 219kV) every two hours, and within one hour one Keowee Hydro Unit is verified to energize two standby buses through the underground feeder. The loss of protection exposes any Unit to an inadequate power supply during a degraded grid situation concurrent with a LOCA on that Unit. 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)

ACTIONS (continued)

E.1

Both actuation logic channels inoperable removes Degraded Grid Protection from being available to the Station during ES actuation. If both DGPS actuation logic channels are inoperable as a result of inoperability of both channels of Switchyard Isolate, this also results in inoperability of the overhead emergency power path. Continued operation is allowed provided that the 230kV switchyard voltage is verified to be greater than or equal to the minimum voltage necessary to assure actuation of all ES loads ($\geq$ 219kV) every two hours, and within one hour one Keowee Hydro Unit is verified to energize two standby buses through the underground feeder. The loss of protection exposes any Unit to an inadequate power supply during a degraded grid situation concurrent with a LOCA on that Unit. 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.

F.1 and F.2

If the Required Actions and associated Completion Times 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.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

This surveillance verifies the logic of the DGPS. Test circuitry is used to demonstrate that when any 2 of the 3 yellow bus phases indicate degraded source voltage of $\geq$ 219kV with any Unit ES Channel 1 or 2 signal present, the actuation logic is satisfied following a time delay of $\leq$ 10 seconds. System continuity through the relays is verified by the installed monitoring circuitry. Timer setpoints are also verified during this test. 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.

SR 3.7.7.2

This surveillance verifies actuation of the Switchyard Isolation circuitry. This test will cause an actual switchyard isolation and alignment of Keowee Units to the Overhead and Underground Paths. A Refueling frequency minimizes the impact to the Station and the operating Units which are connected to the 230kV Switchyard. The effect will be negligible because the Generator Red Bus tie breakers and Feeders from the Oconee 230kV Switchyard Red Bus to the System Grid remain closed. Only a single

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.7.2 (continued)

Switchyard Isolation Channel is required to cause full system realignment. In order to test both Switchyard Isolation Channels, the Switchyard Isolation test would need to be performed twice. To avoid excessive Switchyard breaker cycling, channel verification for breaker realignment, and Keowee Unit Emergency Start functions, the Switchyard Isolation test will be performed on a single Switchyard Isolation Channel on a refueling frequency. The Switchyard Isolation Channel actuated during the test should be alternated between the tests.

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

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

B 3.7 ELECTRICAL POWER SYSTEMS

B 3.7.8 Emergency Power Switching Logic (EPSL) CT-5 Degraded Grid Voltage Protection

BASES

BACKGROUND

Two levels of protection are provided for the standby buses to assure that degradation of voltage from the 100kV transmission system through the Central Switchyard 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 TS 3.7.4, EPSL Voltage Sensing Circuits) which protects from loss of voltage.

APPLICABLE SAFETY ANALYSES

The purpose of the CT-5 Degraded Grid Protection System is to ensure adequate voltage is available during a ES actuation concurrent with a loss of offsite power (LOOP) or degraded voltage from the 230 kV switchyard.

Based on design calculations, 93.23% is the minimum switchyard voltage that will ensure proper operation of loads during ES actuation without being subject to damage or protective relay actuation.

This system is only required when any Oconee Unit is above COLD SHUTDOWN and the Standby Buses are supplied by Central Switchyard. System design is to provide protection for ES components caused by voltage droop due to inrush as the ES unit ties to the Standby Buses. The system is not a substitute for the dedicated line from Lee Gas Turbines used per TS 3.7.1 Conditions G, H, or I. 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.

When the standby buses are powered from the 100kV transmission system through the Central Switchyard, the EPSL CT-5 Degraded Grid Voltage Protection is part of the primary success path and functions to mitigate a DBA or transient that presents a challenge to the integrity of a fission product barrier. As such, EPSL CT-5 Degraded Grid Voltage Protection satisfies the requirements of selection criterion 3 of the NRC interim policy statement (Reference 1).

TS

All three of the undervoltage sensing relays (27CT5/A, B, C) are required as a common input device to both channels of actuating logic. In addition to the three phase undervoltage sensing relays, each channel requires one time-delay relay, one auxiliary relay, and one associated single phase undervoltage sensing relay

(continued)

BASES (continued)

TS (continued)

(27SL1 or 2). 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

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)

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 a Lee gas turbine. If the standby buses are energized by a 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 3.7.8.1

This surveillance verifies the logic of the EPSL CT-5 Degraded Grid Protection system. Test circuitry is used to demonstrate when any 2 of 3 voltage sensing relays indicate degraded voltage of $\geq$ 4155V, the undervoltage logic is armed following a time delay of $\leq$ 10 seconds. Once the undervoltage logic is armed, a voltage degradation below 3874V is simulated to ensure that the undervoltage logic is achieved. System continuity through the relays is verified by the installed monitoring circuitry. Timer set-points are also verified during this test. 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.

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

2. Lee Emergency Power DBD, OSS-0254.00-00-2004

BASES (continued)

ACTIONS (continued) D.1 and D.2

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

SURVEILLANCE REQUIREMENTS SR 3.7.10.1

SRs 3.7.9.1, 3.7.9.3, 3.7.9.4, and 3.7.9.5, which are specified for the Vital I&C Sources and Distribution System, are also performed for the 230kV SY 125VDC Sources and Distribution System. Omitted SRs from 3.7.9 are not applicable to the 230kV SY 125VDC Sources and Distribution System. Reference 3 provides the load requirements for the 230kV SY 125VDC Batteries.

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors, February 6, 1987

2. IEEE450-1980, IEEE Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

3. Duke Design Engineering Calculation OSC-661,230kV Switchyard Battery.

4. DBD,OSS-0254.00-00-2009, 230kV SY 125 VDC Power System.

6.6.3 Special Reports

Special reports shall be submitted to the Regional Administrator, Region II, within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

a. (Not Used)

b. (Not Used)

c. (Not Used)

d. Reactor Coolant System Surveillance,
Inservice Inspection, Specification 4.2.1
Reactor Vessel Specimen, Specification 4.2.4

e. Reactor Building Surveillance,
Containment Leakage Tests, Specification 4.4.1

f. Structural Integrity Surveillance,
Tendon Surveillance, Specification 4.4.2.2

g. (Not Used)

h. (Not Used)

ATTACHMENT 2

TECHNICAL SPECIFICATION MARKUP

LIST OF TABLES

~~Amendment No. 209 (Unit 1)~~
~~Amendment No. 209 (Unit 2)~~
~~Amendment No. 206 (Unit 3)~~

3.7 ELECTRICAL POWER SYSTEMS

3.7.1 AC Sources - Operating

TS 3.7.1 The following AC electrical power sources shall be OPERABLE:

1. One underground emergency power path from one Keowee Hydro Unit through the S breakers,

2. One overhead emergency power path from the other Keowee Hydro Unit through the E breakers, and

3. Two offsite sources on separate towers connected to the 230kV switchyard.

APPLICABILITY: Above COLD SHUTDOWN

---NOTE---
TS 3.7.0 does not apply when a Lee gas turbine is energizing the standby buses as required by Conditions ~~E, F, or G~~. G, H, or I.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Offsite sources and overhead emergency power path inoperable due to inoperable startup transformer.	A.1 Verify one Keowee Hydro Unit can energize two standby buses through the underground feeder.	---NOTE--- May be performed during preceding 12 hour period. 1 hour
	AND	AND Once per 12 hours thereafter.
	A.2 Share another Unit's startup transformer.	12 hours
	AND	

(continued)

---NOTE---
During periods of commercial power generation, the operability of the Keowee Hydro units shall be based on lake levels and the power levels of the Keowee Hydro units. The Keowee Hydro operating restrictions for commercial power generation shall be contained in the ONS Selected Licensee Commitment manual.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3.1 Restore startup transformer to OPERABLE status. OR A.3.2 Designate shared startup transformer to one Unit.	36 hours 36 hours
B. Startup transformer designated to another Unit. OR Required Actions and associated Completion Times not met for Condition A.	B.1 Be in HOT SHUTDOWN AND B.2 Be in COLD SHUTDOWN	12 hours 36 hours
C. Overhead ~~One~~ emergency power path ~~inoperable~~ due to reasons other than an inoperable startup transformer (Condition A).	C.1 Verify the remaining emergency power path OPERABLE. AND C.2.1 Restore emergency power path to OPERABLE status. --------NOTE-------- Required Actions C.1 and C.2 must be completed prior to exceeding 72 hours. ----------	--------NOTE-------- May be performed during preceding 12 hour period. ---------- 1 hour AND Once per 12 hours thereafter unless two standby buses are energized by a Lee gas turbine. 72 hours

(continued)

OR

C.2.2 Enter TS 3.7.1 Condition I 72 hours

See next page for text insert

Added to Page 3.7-3

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Underground emergency power path inoperable.	D.1 Verify the remaining emergency power path OPERABLE.	------NOTE------ May be performed during preceding 12 hour period. ---------- 1 hour <u>AND</u> Once per 12 hours thereafter unless two standby buses are energized by a Lee gas turbine.
	<u>AND</u>	
	D.2 Energize a standby bus by a Lee gas turbine. The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads.	24 hours <u>AND</u> 1 hour from subsequent discovery of deenergized standby buses.
	<u>AND</u>	
	D.3 Restore emergency power path to OPERABLE status.	72 hours
E. Lee gas turbine does not energize a standby bus within the associated Completion Times in Condition D.2.	E.1.1 Be in HOT SHUTDOWN	12 hours for a single Oconee unit shutdown. <u>OR</u>

		24 hours for a shutdown of multiple Oconee units.
<u>AND</u>		
E.1.2	Be in COLD SHUTDOWN	84 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F ~~D~~. One inoperable E breaker and one inoperable S breaker on the same main feeder bus.	F ~~D~~.1 Declare associated main feeder bus inoperable.	Immediately
G ~~E~~. Both emergency power paths inoperable.	G ~~E~~.1 Energize two standby buses ~~by a Lee gas turbine~~. The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads.	1 hour
	AND	AND
	G ~~E~~.2.1 Verify by administrative means the operability status of: Two offsite sources (TS 3.7.1), AC Distribution (TS 3.7.2), EPSL (TSs 3.7.3-5, and 3.7.7), Vital I&C DC (TS 3.7.9), Switchyard DC (TS 3.7.10), and AC Vital Distr. (TS 3.7.11).	1 hour from subsequent discovery of deenergized standby buses 1 hour
	AND	
	G ~~E~~.2.2 Restore inoperable components listed in G ~~E~~.2.1 to OPERABLE status.	4 hours from discovery of inoperable component.
	AND	
	G ~~E~~.3 Restore one emergency power path to OPERABLE status.	60 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~F.~~ H Required offsite sources inoperable due to reasons other than an inoperable startup transformer (Condition A).	~~F~~ H.1 Energize two standby buses by a ~~Lee gas turbine.~~ The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads.	1 hour
	AND	AND
	~~F~~ H.2.1 Verify by administrative means the operability status of: Two emergency power paths (TS 3.7.1), AC Distribution (TS 3.7.2), EPSL (TSs 3.7.3-3.7.7), Vital I&C DC (TS 3.7.9), Switchyard DC (TS 3.7.10), and AC Vital Distr. (TS 3.7.11).	1 hour from subsequent discovery of deenergized standby buses.
	AND	
	~~F~~ H.2.2 Restore inoperable components listed in ~~F~~ H.2.1 to OPERABLE status.	1 hour
	AND	
	~~F~~ H.3 Restore required offsite sources to OPERABLE status.	4 hours from discovery of inoperable component.
		24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~G~~. I Keowee Hydro Unit or Keowee Main Step-up transformer inoperable > 72 hours.	----------NOTES---------- 1. 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. ----------	
	~~G~~.1 I Energize two standby buses by a ~~Lee gas turbine~~. The 100kV transmission circuit will be electrically separated from the system grid and all offsite loads. AND	Prerequisite AND 1 hour from subsequent discovery of deenergized standby buses.
	~~G~~.2.1 I Verify by administrative means the operability status of: two offsite sources and underground emergency power path (TS 3.7.1), AC Distribution (TS 3.7.2), EPSL (TSs 3.7.3-3.7.7), Vital I&C DC (TS 3.7.9), Switchyard DC (TS 3.7.10), and AC Vital Distr. (TS 3.7.11). AND	Prerequisite
	~~G~~.2.2 I Restore inoperable components required by ~~G~~.2.1 I to OPERABLE status. AND	4 hours from discovery of inoperable component

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~G.~~ I (continued)	~~G.~~ I.3 Verify the underground emergency power path is OPERABLE.	Once per 7 days
	AND	
	~~G.~~ I.4 Restore Keowee Main Step-up transformer to OPERABLE status.	28 days
	AND	
	~~G.~~ I.5 Restore Keowee Hydro Unit to OPERABLE status.	45 days ~~in~~ once a 3 year period for each Keowee Hydro Unit.
~~H.~~ J Required Actions and associated Comp~~letion Times~~ for Conditions C, ~~through G~~ D, E, F, G, H, and I not met.	~~H.~~ J.1 Be in HOT SHUTDOWN	12 hours
	AND	
	~~H.~~ J.2 Be in COLD SHUTDOWN	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.1.1 Perform SRs 3.7.9.1 (Float Voltage), 3.7.9.3 (Service Test), 3.7.9.4 (Structural Surveillance), and 3.7.9.5 (Connection Surveillance) for the ~~Keowee batteries~~.	As specified in the applicable SRs.
SR 3.7.1.2 Verify the underground each emergency power path is OPERABLE ~~by~~: 1) Auto-starting ~~the~~ Keowee Hydro Unit, ~~pre-selected to the underground emergency power path;~~ and 2) Energizing the underground emergency power path and both standby buses. with each Keowee Hydro Unit	Monthly
SR 3.7.1.3 Verify the overhead each emergency power path is OPERABLE by: 1) Auto-starting ~~the~~ Keowee Hydro Unit, ~~pre-selected to the overhead emergency power path;~~ and 2) Synchronizing with the Yellow bus. with each Keowee Hydro Unit	Monthly

(continued)

SR 3.7.1.9 Verify the ability of the Keowee Unit ACBs to close automatically to the underground path. Annually

SURVEILLANCE ~~REQUIREMENTS~~ (continued)

SURVEILLANCE	FREQUENCY
SR 3.7.1.4 Verify the S and E breakers are OPERABLE by full cycling.	Monthly
SR 3.7.1.5 Verify OPERABILITY of the Keowee underground feeder breaker interlock and the underground to overhead ACB interlock.	~~6 months~~ Annually
SR 3.7.1.6 Verify the dedicated 100kV line is ~~OPERABLE by energizing~~ both standby buses by a Lee gas turbine. within one hour	Annually
SR 3.7.1.7 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 ~~within one hour.~~ on the system grid.	Annually
SR 3.7.1.8 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 3.7.1.9 Perform an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers.	Refueling

SR 3.7.1.10 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. Refueling

SR 3.7.1.12 Verify the ability of the Keowee Hydro Units to supply emergency power from the initial condition of commercial power generation. Refueling

SR 3.7.1.13 Verify that the Keowee Hydro Units load rejection response is bounded by the design criteria used to develop the Keowee operating restrictions. Refueling

3.7 ELECTRICAL POWER SYSTEMS

3.7.3 Emergency Power Switching Logic (EPSL) Automatic Transfer Functions

TS 3.7.3 The following EPSL automatic transfer functions shall be OPERABLE:
1. Channel A and B of Load Shed/Transfer to Standby;
2. Channel A and B of Retransfer to Startup.

APPLICABILITY: Above COLD SHUTDOWN

ACTIONS

NOTE

Separate Condition entry is allowed for each inoperable Automatic Transfer Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Channel A of one or both functions inoperable. OR Channel B of one or both functions 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 3.7.3.1 Perform SR 3.7.1.~~8~~ 11 (EPSL automatic transfer)	As specified in applicable SR.

3.7 ELECTRICAL POWER SYSTEMS

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

TS 3.7.6 Two channels of the EPSL Keowee Emergency Start Function shall be OPERABLE.

APPLICABILITY: Above COLD SHUTDOWN

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.6.1 Perform SR 3.7.1.8 (Keowee emergency start) and SR 3.7.1.~~9~~ 11 (EPSL automatic transfer).	As specified in applicable SR.

3.7 ELECTRICAL POWER SYSTEMS

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

TS 3.7.7 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 voltage sensing relay to OPERABLE status.	~~7 days~~ 72 hours
B. One channel of actuation logic inoperable.	B.1 Restore channel to OPERABLE status.	~~7 days~~ 72 hours
C. Required Actions and associated Completion Times not met for Conditions A or B.	C.1 Verify 230kV switchyard voltage greater than or equal to the minimum voltage necessary to assure actuation of all ES loads.	Once per 2 hours
D. Two or more voltage sensing relays inoperable.	D.1 Verify 230kV switchyard voltage greater than or equal to the minimum voltage necessary to assure actuation of all ES loads. AND D.2 Verify one Keowee Hydro Unit can energize two standby buses through the underground feeder.	Once per 2 hours --------NOTE------- May be performed during preceding 12 hour period. ---------- 1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two actuation logic channels inoperable.	E.1 Verify 230kV switchyard voltage greater than or equal to the minimum voltage necessary to assure actuation of all ES loads. AND E.2 Verify one Keowee Hydro Unit can energize two standby buses through the underground feeder.	Once per 2 hours --------NOTE-------- May be performed during preceding 12 hour period. ---------- 1 hour
F. Required Actions and associated Completion Times not met for Conditions C, D, or E.	F.1 Be in HOT SHUTDOWN AND F.2 Be in COLD SHUTDOWN	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

with a time response ≤10 seconds

SURVEILLANCE	FREQUENCY
SR 3.7.7.1 1) Verify any 2 of 3 undervoltage inputs will provide undervoltage permissive, at ≥ 219kV 2) Verify associated time delay relays actuate as required, 3) Verify any single channel, single ~~Unit ES~~ signal will provide ~~permissive to undervoltage logic for system actuation.~~	Refueling
SR 3.7.7.2 Perform a switchyard isolation test.	Refueling

3.7 ELECTRICAL POWER SYSTEMS

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

TS 3.7.8 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 Restore voltage sensing relay to OPERABLE status.	~~7 days~~ 72 hours
B. One channel of actuation logic inoperable.	B.1 Restore channel to OPERABLE status.	~~7 days~~ 72 hours
C. Two actuation logic channels inoperable.	C.1 Open SL breakers. OR C.2 Energize two standby buses by a Lee gas turbine. The 100 kV transmission circuit will be electrically separated from the system grid and all off site loads.	1 hour 1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.8.1 ~~Perform a CHANNEL TEST.~~ * See next page.	Refueling

OR

Two or more voltage sensing relays inoperable.

OR

Required Actions and associated Completion Times cannot be met for Conditions A or B.

Added to Page 3.7-16

1) Verify any 2 of 3 first level undervoltage inputs will provide undervoltage permissive at $\geq$ 4155V;

2) Verify associated time delay relays actuate as required with a response time of $\leq$ 10 seconds;

3) Verify any 1 of 2 second level undervoltage inputs will provide permissive to undervoltage logic for system actuation at $\geq$ 3874V.

B 3.7 ELECTRICAL POWER SYSTEMS

B 3.7.1 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). This system is designed to supply the required engineered safety features (ESF) 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. In accordance with the intent of proposed Atomic Energy Commission (AEC) general design criterion 39, the design of the AC Power System provides independence and redundancy to ensure an available source of power to the ESF systems (FSAR 3.1.39). The Keowee Hydro 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 Duke Power Company (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 230kV switchyard to the units startup transformer and the E breakers. The 230kV switchyard is electrically connected to the 525kV switchyard via the autobank transformer. The standby buses may receive offsite power from the 100kV transmission system through CT-5 and the SL breakers. The two emergency power paths are the overhead path and the underground path. The underground emergency power path is from one Keowee Hydro Unit through the S breakers. The overhead emergency power path is from the other Keowee Hydro Unit through the E breakers. The standby buses can also receive power from a combustion turbine generator at the Lee Steam Station through a dedicated 100kV transmission line, transformer CT-5, and both SL breakers. The 100kV transmission line is electrically separated from the system grid and offsite loads. ~~This source is~~ required to be OPERABLE only when specified in TS 3.7.1 Conditions ~~E, F, or G~~ G, H, or I and is considered to be an onsite power source in this mode of operation.

see next page for text insert

The auxiliaries of two units in HOT SHUTDOWN plus the auxiliaries of the one unit with a LOCA require a total AC power capacity as shown in FSAR Table 8-1.

(continued)

Added to Page B3.7-1

In addition to supplying emergency power for Oconee, the Keowee Hydro units provide peaking power to the Duke Power generation system. During periods of commercial power generation, the Keowee Hydro units are operated within the acceptable region of the Keowee Hydro operating restrictions. This will ensure that the Keowee Hydro units will be able to perform their emergency power functions from an initial condition of commercial power generation. The Keowee Hydro operating restrictions for commercial power generation are contained in the Selected Licensee Commitment manual. Changes to these operating restrictions would be performed in accordance with 10 CFR 50.59, which would include an evaluation to determine if any unreviewed safety questions exist.

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

Either of the following combinations provide an acceptable overhead emergency power path. ~~Other acceptable alignments are provided within the Design Basis Document (DBD) (Ref. 4).~~

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 Panelboard KA,~~	~~5B)~~	~~Keowee panelboard KB,~~
~~6A)~~ 5	~~Keowee Battery #1,~~ Charger ~~#1,~~ and Distribution center 1DA,	~~6B)~~ 5	Keowee Battery ~~#2,~~ Charger ~~#2,~~ and Distribution ~~Center 2DA,~~ or Standby Charger

or Standby Charger

6 ~~7~~)	Keowee reservoir level ≥775 feet above sea level,
7 ~~8~~)	Keowee main step-up transformer,
8 ~~9~~)	PCB 9,*
9 ~~10~~)	The 230kV switchyard yellow bus capable of being isolated by one channel of Switchyard Isolate,
10 ~~11~~)	A unit startup transformer and associated yellow bus PCB (CT-1 / PCB 18, CT-2 / PCB 27, CT-3 / PCB 30), and
11 ~~12~~)	Both E breakers.

* Enabled by one channel of Switchyard Isolate Complete.

(continued)

BASES (continued)

TS (continued)

Underground Emergency Power Path

Either of the following combinations provide an acceptable underground emergency power path. ~~Other acceptable alignments are provided within the DBD (Ref. 4).~~

1A)	Keowee Unit 1 generator,	1B)	Keowee Unit 2 generator,
2A)	Keowee ACB 3,	2B)	Keowee ACB 4,
3A.1)	Keowee auxiliary transformer CX, ~~capable of feeding~~ Keowee Load Center 1X, ~~through ACB 7,~~	3B.1)	Keowee auxiliary transformer CX, ~~capable of feeding~~ Keowee Load Center 2X, ~~through ACB 8,~~
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 Panelboard KA,~~	~~5B)~~	~~Keowee Panelboard KB,~~
~~6~~ 5A)	Keowee Battery #1, Charger #1, and Distribution Center 1DA,	~~6~~ 5B)	Keowee Battery #2, Charger #2, and Distribution Center 2DA,

6 ~~7~~) Keowee reservoir level ≥775 feet above sea level,
7 ~~8~~) The underground feeder,
8 ~~9~~) Transformer ~~CT-4~~,
9 ~~10~~) Both SK breakers,
10 ~~11~~) Both standby buses, and
11 ~~12~~) Both S breakers.

or Standby Charger

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 ~~closed~~ PCBs and disconnects such that both sources are ~~connected~~ available to ~~and~~ energize~~ing~~ the Unit's startup transformer. 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 energized startup transformer. If both E breakers are inoperable, then neither the 230kV sources nor the overhead emergency power path can energize the main feeder buses, therefore, the startup transformer is considered to be inoperable. The voltage provided to the startup transformer by the two independent offsite sources must be sufficient to ensure

(continued)

either automatically or with operator action

BASES (continued)

TS

Offsite Sources (continued)

all engineered safeguard equipment will operate (Ref. 3). 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) 525kV line.

APPLICABILITY

The AC power sources for ESF systems are required to be OPERABLE above COLD SHUTDOWN to ensure that:

1. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of anticipated operational occurrences or abnormal transients, and

2. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

AC source requirements during COLD SHUTDOWN and REFUELING SHUTDOWN are addressed in the Bases for TS 3.7.13 (AC Sources - Shutdown/High Decay Heat/Reduced Inventory) and TS 3.7.14 (AC Sources - Shutdown).

The APPLICABILITY has been modified by a NOTE which provides an exception to TS 3.7.0 when a Lee gas turbine is energizing the standby buses as required by Conditions ~~E, F, or G~~ G, H, or I. This exception allows the Unit to heat up above COLD SHUTDOWN when both emergency power paths are inoperable, or a Keowee Hydro Unit or the Keowee Main Step-up transformer is inoperable > 72 hours provided a Lee gas turbine is energizing the standby buses.

ACTIONS

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

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

In the event a startup transformer becomes inoperable, it effectively causes one of the emergency power paths (overhead path) and both of the offsite sources to be inoperable. One emergency power path remains available through the underground

(continued)

BASES (continued)

ACTIONS

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

feeder to ensure safe shutdown of the unit in the event of a transient or accident without a single failure.

Operation may continue for 12 hours if the availability of the underground emergency power path is demonstrated within 1 hour. This Required Action provides assurance that no previously undetected failures have occurred in the underground emergency power path. 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 overhead path will also be available if needed. Although this alignment restores the availability of the offsite sources and 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 COLD SHUTDOWN. Required Actions A.3.1 and A.3.2 allow the option of restoring the affected Unit's startup transformer or designating an OPERABLE startup transformer from another Unit. For example, if Unit 1 and 2 are operating and CT-2 becomes inoperable, Unit 2 may align CT-1 to the Unit 2 main feeder buses and continue operating for up to 36 hours. At that time either CT-2 must be restored to OPERABLE status or CT-1 must be "designated" to one Unit. Once CT-1 has been designated to a Unit, the other Unit must begin shutting down per Condition B. Note that one Unit above COLD SHUTDOWN and a Unit in COLD SHUTDOWN may share a startup transformer indefinitely provided that the loads on the COLD SHUTDOWN Unit are maintained within acceptable limits (Ref. 2). For example, if Unit 1 is already in COLD SHUTDOWN 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

In the event a startup transformer has been designated to another Unit per Required Action A.3.2, the Unit must be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in another 24 hours since the shared startup transformer's capacity could be challenged under certain DBA conditions. In addition, if the Required Actions and associated Completion Times for Condition A cannot be met, the Unit must be in HOT SHUTDOWN in 12 hours and COLD SHUTDOWN in another 24 hours. These times allow for a controlled shutdown without placing undue stress on plant operators or plant systems.

C.1 and C.2

With one 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 could safely continue for 72 hours if the operability of the remaining emergency

(continued)

BASES (continued)

ACTIONS

C.1 and C.2.1 (continued)

power path is demonstrated within 1 hour and every 12 hours thereafter. 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. When the standby buses are energized by a Lee gas turbine, the likelihood that the OPERABLE emergency power path will be required is decreased, thus testing on a 12 hour frequency is ~~no longer~~ necessary. Testing on a 7 day frequency will be commenced if Condition ~~G~~ I is entered. If the inoperable emergency power path is not restored to OPERABLE status within 72 hours, a controlled shutdown must be initiated per Condition ~~H~~ J or the Required Actions of Condition ~~G~~ I must be completed for the inoperable Keowee Hydro Unit or Keowee Main Step-up transformer. A NOTE has been included to specify that Required Actions ~~G~~ I.1 (Lee on the standby buses) ~~and G.2 (verification of~~ operability) must be completed prior to exceeding 72 hours. * see next page for additional Bases information

F ~~D~~.1

With an E breaker and S breaker inoperable on the same main feeder bus the affected main feeder bus cannot receive power from either on-site emergency power source. In this case, the affected main feeder bus must be declared inoperable. Appropriate Required Actions are specified in TS 3.7.2 (AC Distribution - Operating). Both on-site emergency power paths are considered OPERABLE in this case since, without a single failure, both on-site emergency paths can provide power to the remaining main feeder bus.

G ~~E~~.1 through G ~~E~~.3

With both emergency on-site power paths inoperable, insufficient standby AC power sources are available to feed the minimum required ESF functions. 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 simultaneous shutdown of all three units. This instability would increase the probability of a total loss of AC power. Operation with both Keowee units inoperable is permitted for 60 hours provided that the actions detailed below are taken prior to exceeding one hour. Further, with the exception of Lee energizing the standby buses, in the event these actions are not met during the inoperability of both emergency power paths, a period of 4 hours is allowed by Required Action G ~~E~~.2.2 to restore the inoperable component. For example if both Keowee Units have ~~been~~ inoperable 24 hours and one channel of load shed (required by TS 3.7.3) is discovered to be inoperable, the channel must be restored to OPERABLE status within the next 4 hours.

(continued)

D.1, D.2, and D.3

With the 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 could safely continue for 72 hours if the operability of the remaining emergency power path is demonstrated within 1 hour and every 12 hours thereafter. 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. When the standby buses are energized by a Lee gas turbine, the likelihood that the OPERABLE emergency power path will be required is decreased, thus testing on a 12 hour frequency is no longer necessary. For outages of the underground power path in excess of 24 hours, a Lee gas turbine must energize a standby bus prior to the outage exceeding 24 hours. This ensures the availability of a power source on the standby buses while the underground power path is out of service in excess of 24 hours.

E.1.1 and E.1.2

If the underground power path is out of service due to reasons that prevent energization of a standby bus from a Lee gas turbine, then the underground power path shall not be out of service for more than 24 hours and a controlled shutdown will be initiated per Condition E.1 once the 24 hour period is exceeded.

BASES (continued)

ACTIONS

~~E~~.1 through ~~E~~.3 (Continued)

1. The standby buses are continuously energized by a Lee gas turbine through the 100kV transmission circuit. The 100kV transmission circuit would be electrically separated from the system grid and all offsite loads. This arrangement provides a high degree of reliability for the emergency power system. In this configuration, the Lee gas turbine is serving as an onsite emergency power source, however since the Oconee Units are vulnerable to single failure of the 100kV transmission circuit a time limit of 60 hours is imposed. Required Action ~~E~~.1 permits the standby buses to be re-energized by a Lee gas turbine within 1 hour in the event this source is lost. For example if both Keowee Units have been inoperable 12 hours and the Lee gas turbine feeding the 100kV line trips, the 100kV line must be re-energized from a Lee gas turbine within the next hour.

2. Two offsite sources are verified and maintained OPERABLE by complying with TS 3.7.1. This Required Action provides additional assurance that offsite power will be available while both Keowee Units are inoperable.

3. AC Distribution is verified and maintained OPERABLE by complying with TS 3.7.2. This Required Action increases the probability that AC power will be available to ESF equipment even in the unlikely event of a single failure unrelated to the inoperability of both emergency power paths.

4. EPSL with the exception of the Keowee Emergency Start Function (TS 3.7.6) is verified and maintained OPERABLE by complying with TSs 3.7.3, 3.7.4, 3.7.5, and 3.7.7. This Required Action increases the probability that EPSL will function as required even in the unlikely event of a single failure unrelated to the inoperability of both emergency power paths.

5. Vital I&C DC Sources and distribution are verified and maintained OPERABLE by complying with TS 3.7.9. This Required Action increases the probability that the Vital I&C DC system will function as required to support EPSL even in the unlikely event of a single failure unrelated to inoperability of both emergency power paths.

6. Switchyard DC Sources and Distribution are verified and maintained OPERABLE by complying with TS 3.7.10. This Required Action increases the probability that the 230kV switchyard DC system will function as required to support EPSL even in the unlikely event of a single failure unrelated to the inoperability of both emergency power paths.

7. AC Vital Distribution is verified and maintained OPERABLE by complying with TS 3.7.11. This Required Action increases the probability that the vital instrumentation power panelboards will function as required to support EPSL even in the unlikely event of a single failure unrelated to the inoperability of both emergency power paths.

(continued)

BASES (continued)

ACTIONS

~~E.1~~ G through ~~E.3~~ G (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 both Keowee units are restored, unrestricted operation may continue. If only one unit is restored within 60 hours, operation may continue per the Required Actions of Condition C or D G.

~~F.1~~ H through ~~F.3~~ H

With all of the required offsite sources inoperable due to degraded grid, loss of voltage, or other causes, sufficient standby AC power sources are available to maintain the unit in a safe shutdown condition in the event of a DBA. However, since the AC power system is degraded below the TS requirements, a time limit on continued operation is imposed. With only one of the required offsite sources OPERABLE, the likelihood of LOOP is increased such that the same Required Actions for all required offsite sources inoperable are conservatively followed. The risk associated with continued operation for one hour without a Lee gas turbine energizing the standby buses is considered acceptable due to the low likelihood of a failure of both emergency power paths during this time period, and because of the potential for grid instability caused by the simultaneous shutdown of all three units. Operation with the available offsite sources less than required by the TS is permitted for 24 hours provided that the actions detailed below are taken prior to exceeding one hour. Further, with the exception of Lee energizing the standby buses, in the event these actions are not met during the inoperability of the required offsite sources, a period of 4 hours is allowed by Required Action ~~F.2~~ H.2 to restore the inoperable component. For example if both required offsite sources have been inoperable 12 hours and one channel of load shed (required by TS 3.7.3) is discovered to be inoperable, the channel must be restored to OPERABLE status within the next 4 hours.

1. The standby buses are continuously energized by a Lee gas turbine through the 100kV transmission circuit. The 100kV transmission circuit would be electrically separated from the system grid and all offsite loads. This arrangement provides a high degree of reliability for the emergency power system. In this configuration, the Lee gas turbine is serving as an onsite emergency power source. Required Action ~~F.1~~ H.1 permits the standby buses to be reenergized by Lee gas turbine within 1 hour in the event this source is lost. For example, if both required offsite sources have been inoperable 12 hours and the Lee gas turbine feeding the 100kV line trips, the 100kV line must be reenergized from Lee gas turbine within the next hour.

(continued)

BASES (continued)

ACTIONS

H ~~F.1~~ through H ~~F.3~~ (continued)

2. Two emergency power paths are verified and maintained OPERABLE by complying with TS 3.7.1. This Required Action provides additional assurance that the emergency power paths will be available if required while the required offsite sources are inoperable.

3. AC Distribution is verified and maintained OPERABLE by complying with TS 3.7.2. This Required Action increases the probability that AC power will be available to ESF equipment even in the unlikely event of a single failure unrelated to the inoperability of the required offsite sources.

4. EPSL is verified and maintained OPERABLE by complying with TSs 3.7.3, 3.7.4, 3.7.5, 3.7.6, and 3.7.7. This Required Action increases the probability that EPSL will function as required even in the unlikely event of a single failure unrelated to the inoperability of the required offsite sources.

5. Vital I&C DC Sources and distribution are verified and maintained OPERABLE by complying with TS 3.7.9. This Required Action increases the probability that the Vital I&C DC system will function as required to support EPSL even in the unlikely event of a single failure unrelated to inoperability of the required offsite sources.

6. Switchyard DC Sources and Distribution are verified and maintained OPERABLE by complying with TS 3.7.10. This Required Action increases the probability that the 230kV switchyard DC system will function as required to support EPSL even in the unlikely event of a single failure unrelated to the inoperability of the required offsite sources.

7. AC Vital Distribution is verified and maintained OPERABLE by complying with TS 3.7.11. This Required Action increases the probability that the vital instrumentation power panelboards will function as required to support EPSL even in the unlikely event of a single failure unrelated to the inoperability of the required offsite sources.

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.

(continued)

BASES (continued)

ACTIONS

~~G~~I.1 through ~~G~~I.5

Condition ~~G~~I has been established to allow maintenance and repair of a Keowee Hydro Unit and transformers which requires longer than 72 hours per Condition C. 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. If both Keowee auxiliary transformers (1X and 2X) are inoperable the Keowee main step-up transformer is considered to be inoperable, because one of the functions of the main step-up transformer is supplying auxiliary loads for the overhead emergency power path. 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. Transformer replacement is rare but would be time extensive. 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~~s~~ period~~s~~ of up to 45 days for each Keowee Hydro unit is ~~are~~ permitted every three years. A maximum period of 28 days is for Keowee main step-up transformer. This would allow a reasonable period of time for transformer replacement. The 28 day Completion Time for the Keowee main step-up transformer is not counted toward the 45 day Completion Time for each Keowee Hydro unit.

The Required Actions for the special inoperability period have been modified by two 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. 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 ~~G~~I.2.2 to restore the inoperable component. For example, if the Keowee Main Step-up transformer has been inoperable for 15 days and one ES power system string (required by TS 3.7.2) is discovered to be inoperable, the ES power system string must be restored to OPERABLE status within the next 4 hours.

1. The standby buses are continuously energized by a Lee gas turbine through the 100kV transmission circuit. The 100kV transmission circuit would be electrically separated from the system grid and all offsite loads. This arrangement provides a high degree of reliability for the emergency power system. In this configuration, the Lee gas turbine is serving as the second onsite emergency power source, however since the 100kV transmission circuit is vulnerable to severe weather a time limit is imposed. Required Action ~~G~~I.1 permits the standby buses to be reenergized by Lee gas turbine within 1 hour

(continued)

BASES (continued)

ACTIONS

~~G~~.1 through ~~G~~.5 (continued)

in the event this source is lost. For example, if one Keowee Unit has been inoperable for 20 days and the Lee gas turbine feeding the 100kV line trips, the 100kV line must be reenergized from Lee gas turbine within the next hour.

2. Two offsite sources and the underground emergency power path are verified and maintained OPERABLE by complying with TS 3.7.1. This Required Action provides additional assurance that offsite power will be available during the special inoperability period. In addition this Required Action assures that underground emergency power path is available.

3. AC Distribution is verified and maintained OPERABLE by complying with TS 3.7.2. This Required Action increases the probability that AC power will not be lost to ESF equipment even in the unlikely event of single failures unrelated to the special inoperability period.

4. EPSL is verified and maintained OPERABLE by complying with TSs 3.7.3, 3.7.4, 3.7.5, 3.7.6, and 3.7.7. This Required Action increases the probability that EPSL will function as required even in the unlikely event of single failures unrelated to the special inoperability period.

5. Vital I&C DC Sources and Distribution are verified and maintained OPERABLE by complying with TS 3.7.9. This Required Action increases the probability that the Vital I&C DC System will function as required to support EPSL even in the unlikely event of single failures unrelated to the special inoperability period.

6. Switchyard DC Sources and Distribution is verified and maintained OPERABLE by complying with TS 3.7.10. This Required Action increases the probability that the 230kV switchyard DC system will function as required to support EPSL even in the unlikely event of single failures unrelated to the special inoperability period.

7. AC Vital Distribution is verified and maintained OPERABLE by complying with TS 3.7.11. This Required Action increases the probability that the vital instrumentation power panelboards will function as required to support EPSL even in the unlikely event of single failures unrelated to the special inoperability period.

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.

(continued)

BASES (continued)

ACTIONS

~~G~~ I.1 through ~~G~~ I.5 (continued)

Following completion of the prerequisites for the special inoperability period, the underground emergency power path must be demonstrated to be OPERABLE. This demonstration is to assure that the underground emergency power path is not inoperable due to a common cause or due to an undetected failure. When the standby buses are energized by a Lee gas turbine, the likelihood that the OPERABLE emergency power path will be required is decreased, thus testing on a 7 day frequency is adequate. Credit can be taken for the operability of the SK and S breakers per the routine surveillance test (SR 3.7.1.2 and SR 3.7.1.4).

~~H~~ J.1 and ~~H~~ J.2

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

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

SRs 3.7.9.1, 3.7.9.3, 3.7.9.4, and 3.7.9.5 are performed to ensure Keowee battery OPERABILITY.

SR 3.7.1.2

This surveillance is to verify the availability of underground emergency power path. Utilization of the Auto-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 Keowee Units onto the Standby Buses. This is accomplished by exercising the Keowee Feeder Breakers (SK) to energize both Standby Buses. The Monthly frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

For cases where a Keowee unit can only be connected to one emergency power path, this monthly surveillance will only be performed on the one emergency power path.

SR 3.7.1.3

This surveillance is to verify the availability of overhead emergency power path. Utilization of the Auto-start sequence assures the control function operability by verifying proper speed control and voltage. The ability to supply the Overhead path is satisfied by demonstrating the ability to synchronize the Keowee Unit with the Grid system. The remaining path components are considered OPERABLE by the existence of adequate power to each of the Oconee Unit Startup Transformers. The Monthly 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 (continued)

SURVEILLANCE

SR 3.7.1.4

Infrequently used source breakers need to be cycled to ensure availability. The Standby breakers are to be cycled one breaker on one Unit 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 Monthly frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.7.1.5

The Keowee tie breakers to the Underground Path, ACB3 and ACB4, are interlocked to prevent cross-connection of the Keowee Generators. The safety analysis utilizes two independent power paths for accommodating single failures in applicable DBAs. Connection of both generators to the Underground path would compromise the redundancy of the emergency power paths. Test logic is installed to verify a circuit to the close coil on one Underground ACB does not exist with the other Underground ACB closed. Interlocks preventing the Keowee Unit which is aligned to the underground path ~~from~~ automatically closing to the overhead path are also verified OPERABLE. The ~~6 month~~ frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing. annual

SR 3.7.1.6

within one hour.

The Lee Gas Turbines can be used as a reliable alternate "onsite" power source when connected through a 100kV line which is not connected to any other load or system. Since the use of this source is not frequent, the integrity and validity of the path must be verified by actually powering the Standby Buses with the Lee Gas Turbines. More frequent cycling of the Standby breakers is already performed per SR 3.7.1.4. The annual frequency for this surveillance is reasonable based on operating experience and the one hour time response required of the source.

SR 3.7.1.7

The Design Base s response for the Lee Gas Turbines is to supply power to the Oconee Site ~~equal to one Unit's~~ maximum safeguards and two Unit's HOT SHUTDOWN loads ~~within one hour.~~ The Oconee Site cannot provide equivalent loads without establishing an unanalyzed electrical system alignment. Therefore, the load capability is established ~~by requiring connection to the system grid and loading to the accident equivalent load,~~ ~~within the required response time of one hour~~. The annual frequency for this surveillance is reasonable based on operating experience. ~~and the one hour time response required of the source.~~

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.1.8

This surveillance verifies the Keowee Units' response time to an Emergency Start signal to ensure ES equipment will have adequate power for Design Accident mitigation. Two locations exist for Control Room manual initiation of Keowee Emergency Start logic. Oconee Units 1 & 2 or Unit 3 Control Room. Each Unit has individual logic which actuates the associated Emergency Start relays. This provides the ability to verify operability of each Control Room Logic independent of each Oconee Unit. A Refueling frequency surveillance, SR 3.7.1.9 (EPSL functional test), verifies the ES input. FSAR Section 6.3.3.3 establishes the 23 second time requirement for each Keowee Unit to obtain full speed and voltage. Since the only available loads of adequate magnitude for simulating a DBA is the Grid, subsequent loading on the Grid is required to verify the Unit's ability to assume rapid loading under accident conditions. Ideally, sequential block loads would be applied to fully test this function, but such loads are not available. This explains the requirement to load the Keowee Units at the maximum practical rate to the equivalent of a LOCA/LOOP situation. Current value for the maximum accident loads may be found in FSAR Table 8-1. The Annual frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.7.1.9 → see next page for Bases info

SR 3.7.1.10 see next page for Bases info

SR 3.7.1.~~8~~ 11

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.

(continued)

SR 3.7.1.12

SR 3.7.1.13

See next page for Bases info

SR 3.7.1.9

The Keowee Underground ACBs have a control feature which will automatically close the Keowee Unit, 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 Keowee Unit 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 will be performed on an annual frequency.

SR 3.7.1.10

The Design Bases response for the Lee Gas Turbines is to supply power to the Oconee site. The Oconee Site cannot provide loads equivalent to one Unit's maximum safeguards and two Unit's HOT SHUTDOWN loads without establishing an unanalyzed electrical system alignment. 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). The refueling frequency for this surveillance is reasonable based on operating experience.

SR 3.7.1.12

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 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 3.7.1.13

A maximum power dual unit load rejection will be performed on a refueling 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.

BASES (continued)

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

2. 4160V Auxiliary Power System DBD, OSS-0254.00-00-2000.

3. 230kV Switchyard Power System DBD, OSS-0254.00-00-2004.

4. Keowee Emergency Power System DBD, OSS-0254.00-00-2005.

5. Oconee FSAR Section 3.1.39, Criterion 39

For information only

No changes made to this page.

BASES (continued)

ACTIONS

A.1 (continued)

time required to complete the required action and the availability of the remaining channel.

Channel A and B provide redundant transfer functions. The retransfer to startup function of each channel is actuated by its associated channel of transfer to standby function (through the RX relay).

Additionally, each channel of transfer functions provide a permissive in its associated SK breaker (through the RX relay) to allow its automatic closure (i.e., channel A with SK1 channel B with SK2). Also, an S breaker can close automatically only when its associated bus is energized. If a channel of transfer to standby is inoperable then the associated RX relay may not be OPERABLE (depending on what portion of transfer to standby function is inoperable). This could keep the associated SK breaker from automatically closing and cause the associated retransfer to startup function to be inoperable. The remaining channel of transfer to standby function and retransfer to startup function needs to be OPERABLE to restore power during LOCA/LOOP events. The S breaker associated with the OPERABLE transfer channel also needs to be OPERABLE, since the other S breaker may not be capable of automatically closing due to its standby bus being deenergized (SK breaker not closed).

For these reasons, transfer functions of the same channel are allowed to be inoperable only when both functions of the other channel are OPERABLE and the other channel's associated S breaker is OPERABLE (i.e., channel A with S1 and channel B with S2).

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

See Bases for SR 3.7.1.~~X~~ 11 (EPSL automatic transfer).

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

2. 4160V Auxiliary Power System DBD,OSS-0254.00-00-2000.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

See Bases for SR 3.7.1.8 (Keowee Emergency Start) and SR 3.7.1.~~9~~ 11 (EPSL automatic transfer).

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

2. 4160V Auxiliary Power System DBD, OSS-0254.00-00-2000.

3. Keowee Emergency Power System DBD, OSS-0254.00-00-2005.

BASES (continued)

ACTIONS

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

A.1

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 ~~7 day~~ 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.

72 hour

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 ~~7 day~~ 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.

72 hour

C.1

If the Required Actions and associated Completion Times cannot be met for Conditions A or B, then the 230kV switchyard voltage shall be verified to be greater than or equal to the minimum voltage necessary to assure actuation of all ES loads (≥ 219kV). The 2 hour frequency for monitoring 230kV switchyard voltage 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 voltage sensing relay or actuation logic channel.

D.1 and D.2

Two or more voltage sensing relays inoperable removes Degraded Grid Protection from being available to the Station during ES actuation. Continued operation is allowed provided that the 230kV switchyard voltage is verified to be greater than or equal to the minimum voltage necessary to assure actuation of all ES loads (≥ 219kV) every two hours, and within one hour one Keowee Hydro Unit is verified to energize two standby buses through the underground feeder. The loss of protection exposes any Unit to an inadequate power supply during a degraded grid situation concurrent with a LOCA on that Unit. 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.

BASES (continued)

ACTIONS (continued)

E.1

Both actuation logic channels inoperable removes Degraded Grid Protection from being available to the Station during ES actuation. If both DGPS actuation logic channels are inoperable as a result of inoperability of both channels of Switchyard Isolate, this also results in inoperability of the overhead emergency power path. Continued operation is allowed provided that the 230kV switchyard voltage is verified to be greater than or equal to the minimum voltage necessary to assure actuation of all ES loads (≥ 219kV) every two hours, and within one hour one Keowee Hydro Unit is verified to energize two standby buses through the underground feeder. The loss of protection exposes any Unit to an inadequate power supply during a degraded grid situation concurrent with a LOCA on that Unit. 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.

F.1 and F.2

If the Required Actions and associated Completion Times 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.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

This surveillance verifies the logic of the DGPS. Test circuitry is used to demonstrate that when any 2 of 3 ~~Startup transformers~~ the yellow bus phases indicate degraded source voltage of ≥ 219kV with any Unit ES Channel 1 or 2 signal present, ~~the~~ actuation logic is satisfied following a time delay of ≤ 10 seconds. System continuity through the relays is verified by the installed monitoring circuitry. Timer setpoints are also verified during this test. 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.

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

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

SR 3.7.7.2
See next page for Bases info

Added to Page B3.7-36

This surveillance verifies actuation of the Switchyard Isolation circuitry. This test will cause an actual switchyard isolation and alignment of Keowee Units to the Overhead and Underground Paths. A Refueling frequency minimizes the impact to the Station and the operating Units which are connected to the 230kV Switchyard. The effect will be negligible because the Generator Red Bus tie breakers and Feeders from the Oconee 230kV Switchyard Red Bus to the System Grid remain closed. Only a single Switchyard Isolation Channel is required to cause full system realignment. In order to test both Switchyard Isolation Channels, the Switchyard Isolation test would need to be performed twice. To avoid excessive Switchyard breaker cycling, channel verification for breaker realignment, and Keowee Unit Emergency Start functions, the Switchyard Isolation test will be performed on a single Switchyard Isolation Channel on a refueling frequency. The Switchyard Isolation Channel actuated during the test should be alternated between the tests.

B 3.7 ELECTRICAL POWER SYSTEMS

B 3.7.8 Emergency Power Switching Logic (EPSL) CT-5 Degraded Grid Voltage Protection

BASES

BACKGROUND

Two levels of protection are provided for the standby buses to assure that degradation of voltage from the 100kV transmission system through the Central Switchyard 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 TS 3.7.4, EPSL Voltage Sensing Circuits) which protects from loss of voltage.

APPLICABLE SAFETY ANALYSES

The purpose of the CT-5 Degraded Grid Protection System is to ensure adequate voltage is available during a ES actuation concurrent with a loss of offsite power (LOOP) or degraded voltage from the 230 kV switchyard.

Based on design calculations, 93.23% is the minimum switchyard voltage that will ensure proper operation of loads during ES actuation without being subject to damage or protective relay actuation.

This system is only required when any Oconee Unit is above COLD SHUTDOWN and the Standby Buses are supplied by Central Switchyard. System design is to provide protection for ES components caused by voltage droop due to inrush as the ES unit ties to the Standby Buses. The system is not a sub~~stitute for the~~ dedicated line from Lee Gas Turbines used per TS 3.7.1 Conditions ~~E, F, or G~~ G, H, or I. 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.

When the standby buses are powered from the 100kV transmission system through the Central Switchyard, the EPSL CT-5 Degraded Grid Voltage Protection is part of the primary success path and functions to mitigate a DBA or transient that presents a challenge to the integrity of a fission product barrier. As such, EPSL CT-5 Degraded Grid Voltage Protection satisfies the requirements of selection criterion 3 of the NRC interim policy statement (Reference 1).

TS

All three of the undervoltage sensing relays (27CT5/A, B, C) are required as a common input device to both channels of actuating logic. In addition to the three phase undervoltage sensing relays, each channel requires one time-delay relay, one auxiliary relay, and one associated single phase undervoltage sensing relay

(continued)

BASES (continued)

TS (continued)

(27SL1 or 2). 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

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 ~~7 day~~ 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 ~~7~~ 72 ~~day~~ 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 both actuation logic channels ~~are inoperable,~~ two or more voltage sensing relays or 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

(continued)

BASES (continued)

In addition, if the Required Actions and associated Completion Times cannot be met, the standby buses must be separated from the 100 kV transmission system within 1 hour.

ACTIONS

C.1 (continued)

equipment damage, but not low enough for the EPSL standby bus undervoltage relays to cause breaker operation. Therefore, 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 a Lee gas turbine. If the standby buses are energized by a Lee gas turbine, the 100kV transmission circuit must be electrically separated from the system grid and all offsite loads. 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 3.7.8.1

of ≥ 4155V

following a time delay of ≤ 10 seconds

This surveillance verifies the logic of the EPSL CT-5 Degraded Grid Protection system. Test circuitry is used to demonstrate when any 2 of 3 voltage sensing relays indicate degraded voltage, the ~~actuation~~ undervoltage logic is ~~satisfied~~ armed. System continuity through the relays is verified by the installed monitoring circuitry. Timer set ~~points are~~ also verified during this test. ~~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.

Once the undervoltage logic is armed, a voltage degradation below 3874V is simulated to ensure that the undervoltage logic is achieved.

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, February 6, 1987.

2. Lee Emergency Power DBD, OSS-0254.00-00-2004

BASES (continued)

ACTIONS (continued) D.1 and D.2

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

SURVEILLANCE REQUIREMENTS SR 3.7.10.1

SRs 3.7.9.1, 3.7.9.3, 3.7.9.4, and 3.7.9.5, which are specified for the Vital I&C Sources and Distribution System, are also performed for the 230kV SY 125VDC Sources and Distribution System. Omitted SRs from 3.7.9 are not applicable to the 230kV SY 125VDC Sources and Distribution System. Reference 3 provides the load requirements for the 230kV SY 125VDC Batteries.

REFERENCES

1. 52FR3788, NRC Interim Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors, February 6, 1987

2. IEEE450-1980, IEEE Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

3. Duke Design Engineering Calculation OSC-661,230kV Switchyard Battery.

4 ~~10~~. DBD,OSS-0254.00-00-2009, 230kV SY 125 VDC Power System.

6.6.3 Special Reports

Special reports shall be submitted to the Regional Administrator, Region II, within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

a. ~~Auxiliary Electrical Systems, Specification 3.7~~ (Not Used)

b. (Not Used)

c. (Not Used)

d. Reactor Coolant System Surveillance,
   Inservice Inspection, Specification 4.2.1
   Reactor Vessel Specimen, Specification 4.2.4

e. Reactor Building Surveillance,
   Containment Leakage Tests, Specification 4.4.1

f. Structural Integrity Surveillance,
   Tendon Surveillance, Specification 4.4.2.2

g. (Not Used)

h. (Not Used)

Amendment No. 194 (Unit 1)
Amendment No. 194 (Unit 2)
Amendment No. 191 (Unit 3)

ATTACHMENT 3

TECHNICAL JUSTIFICATION

TECHNICAL JUSTIFICATION

Background

On March 11, 1993, Duke submitted a Technical Specifications amendment request which was a complete re-write of the Oconee Electrical Technical Specification Sections 3.7 and 4.6. The electrical specification re-write formatted the Technical Specification requirements in Sections 3.7 and 4.6 into a format similar to the B&W Standard Technical Specifications that were under development at the time of the submittal. In addition, the amendment request revised existing Technical Specification requirements, added new requirements to the Technical Specifications, and deleted non-essential requirements from the Technical Specifications.

In a letter dated September 29, 1993, the NRC staff requested additional information about the proposed Electrical Technical Specification amendment. A meeting was held in Washington, DC on October 7, 1993, to discuss the NRC's request for additional information. A formal submittal of the response to the NRC's request for additional information was provided by Duke in letters dated November 29, 1993, and December 6, 1993.

During the review of the amendment request and the supplemental information, the NRC staff had additional questions concerning clarification of the information provided by Duke. The NRC discussed these questions with Duke during the fourth quarter of 1994. In addition, new issues were identified by the NRC staff in the first quarter of 1995. In a conference call on March 8, 1995, Duke and the NRC staff discussed the outstanding questions and issues associated with the proposed Technical Specification Section 3.7 amendment. Duke provided a response to the NRC's questions and issues in a letter dated October 3, 1995.

In addition, Duke provided additional information, in a letter dated October 31, 1996, to the NRC in response to the AEOD and NRR draft reports on the Oconee emergency power system. Duke's responses to the issues in the draft emergency power system reports contained proposed Technical Specification amendments.

The above submittals contain commitments to include additional information in the proposed Technical Specification amendment and to revise certain statements in the proposed Technical Specification amendment. The following list summarizes the changes contained in the Technical Specification amendment request supplement.

Description of Change

1. **Pages iv and vi** - The Table of Contents are revised to indicate that Section 4.6 and Table 3.7-1 are no longer used in the Oconee Technical Specifications.

2. **Pages 3.7-2 and B3.7-1** - A note about the operability of the Keowee Hydro units during periods of commercial power generation is added to the Technical Specification Section 3.7.1 requirements and associated bases information.

3. **Pages 3.7-3 and B3.7-6** - Condition C is changed to apply only to the overhead emergency power path instead of to both emergency power paths.

4. **Pages 3.7-3 and B3.7-7** - New Conditions D and E are added to separate the underground power path conditions from the overhead power path conditions.

5. **Pages 3.7-2 through 3.7-7, B3.7-1, B3.7-5, B3.7-7 through B3.7-13, and B3.7-37** - Editorial changes are made to the Condition lettering due to the addition of new Conditions D and E which apply to the underground power path.

6. **Page 3.7-3, B3.7-6, and B3.7-7** - An "OR" statement is added to the required action section of Condition C of Technical Specification 3.7.1 to allow movement from Condition C to Condition G.

7. **Pages 3.7-4, 3.7-5, 3.7-6, and 3.7-16** - The requirement to maintain the 100kV transmission circuit electrically separated from the grid and offsite loads is added for the use of Lee to energize the standby buses.

8. **Pages 3.7-7 and B3.7-11** - The allowance of 45 days over a 3 year period for outages of the Keowee Hydro Unit is changed to a one time outage of 45 days in a 3 year period.

9. **Pages 3.7-7 and B3.7-13** - Technical Specification surveillances SR 3.7.1.2 and 3.7.1.3 are revised to require verification of operability of both Keowee units to both emergency power paths.

10. **Pages 3.7-8 and B3.7-14** - Technical Specification surveillance SR 3.1.7.5 is extended from six months to annually.

11. **Pages 3.7-8, B3.7-14, and B3.7-15** - A surveillance is added to the proposed Technical Specification amendment as SR 3.7.1.10 to require verification of the ability of a Lee combustion turbine to energize the standby buses. In addition, proposed Technical Specification surveillance SR 3.7.1.7 is revised to delete redundant requirements contained in proposed SR 3.7.1.10. SR 3.7.1.6 is revised to incorporate the requirements of loading the standby buses within one hour.

12. **Pages 3.7-8 and B3.7-15** - A new surveillance to verify annually the ability of the Keowee unit ACBs to close automatically to the underground power path is added as SR 3.7.1.9.

13. **Pages 3.7-8, 3.7-10, 3.7-13, B3.7-23, B3.7-32, and B3.7-15** - Proposed Technical Specification surveillance SR 3.7.1.9 is renumbered to SR 3.7.1.11.

14. **Pages 3.7-8 and B3.7-15** - Surveillance SR 3.7.1.12 is added to the proposed Technical Specification amendment. The surveillance ensures that the Keowee units are operable during periods of commercial generation.

15. **Pages 3.7-8 and B3.7-15** - Surveillance SR 3.7.1.13 is added to the proposed Technical Specification amendment. The surveillance ensures that the Keowee units are bounded by the load rejection responses used to develop the Keowee operating restrictions.

16. **Pages 3.7-14 and B3.7-35** - The completion time for the required actions to Conditions A and B of proposed Technical Specification 3.7.7 has been reduced to 72 hours.

17. **Pages 3.7-15 and B3.7-36** - Technical Specification surveillance SR 3.7.7.1 is revised to add the setpoints for the Degraded Grid Voltage Protection undervoltage permissive and timers and to correct a typographical error.

18. **Pages 3.7-15 and B3.7-36** - Technical Specification surveillance SR 3.7.7.2 is added to the Technical Specifications to require performance of the Switchyard Isolation functional test.

19. **Pages 3.7-16 and B3.7-38** - The completion time for the required actions to Conditions A and B of Technical Specification 3.7.8 has been reduced to 72 hours.

20. **Pages 3.7-16, B3.7-38, and B3.7-39** - Two additional action statements are added to Condition C of Technical Specification 3.7.8.

21. **Pages 3.7-16 and B3.7-39** - Technical Specification SR 3.7.8.1 is revised to add the setpoints for the CT5 Degraded Grid Voltage Protection undervoltage permissives and timers and to make it consistent with SR 3.7.7.1.

22. **Pages B3.7-3 and B3.7-4** - The reference to the Design Basis Document (DBD) for acceptable emergency power path alignment is removed from the Technical Specification Bases.

23. **Pages B3.7-3 and B3.7-4** - Keowee Panelboards KA and KB are deleted from the list of components required for an acceptable overhead and emergency power path. In addition, the numbers for the equipment listed after the panelboards are revised due to the deletion of the panelboards.

24. **Pages B3.7-3 and B3.7-4** - The list of acceptable equipment is revised to add the Standby Charger as an acceptable substitute for Charger #1 or #2.

25. **Page B3.7-4** - An editorial change is made to the underground power path equipment listed in 3A.1 and 3B.1 to make the wording consistent with the overhead power path equipment listed on Page B3.7-3 in 3A and 3B.

26. **Page B3.7-4** - The Bases information for the Offsite Sources has been revised in order to allow the 230kV switchyard breakers to be considered in an operable condition even though the breakers are not closed. This change is made to support the addition of the switchyard isolation surveillance.

27. **Page B3.7-13** - A sentence is added to the Technical Specification Bases for SR 3.7.1.2 and SR 3.7.1.3 to clarify that the surveillance will not be performed when a Keowee unit cannot be connected to both emergency power paths.

28. **Page B3.7-15** - A sentence is added to the Bases of the EPSL functional surveillance to indicate that the surveillance will be performed during the refueling outage for each Oconee unit.

29. **Page B3.7-36** - The Bases for Technical Specification surveillance SR 3.7.7.1 is revised to incorporate a recent modification to the Degraded Grid Protection System.

30. **Page B3.7-52** - The reference section is revised to correct a typographical error.

31. **Page 6.6-5** - The reference to Technical Specification 3.7 is deleted.

Justification of Each Change

Each Technical Specification change request that is identified by the preceding list is covered in the following justification. A separate justification is provided for the

changes and is referenced to the associated change description number.

1. Technical Specification Section 4.6 currently contains the surveillance requirements for the electrical power systems. In addition, Table 3.7-1 currently contains the operability requirements for the EPSL circuitry. The Technical Specification 3.7 and 4.6 change request that is dated March 11, 1993, revises Technical Specification 3.7 to a standard Technical Specification format. The standard Technical Specification format combines Technical Specification action statements and surveillances into one section. This will move the surveillance requirements to Technical Specification 3.7 and deletes Section 4.6 of the Technical Specifications. Also, the EPSL operability requirements are moved into specific sections of the Technical Specification. Therefore, the Table of Contents for the Oconee Technical Specifications need to be revised to indicate these changes.

2. In a Technical Specification amendment request dated February 15, 1996, Duke proposed the addition of operability requirements to the Oconee Technical Specifications for commercial operation of the Keowee Hydro units. The operability requirements which were proposed in the earlier submittal ensure that the Keowee units can perform their emergency power functions from an initial condition of commercial power generation. During periods of commercial power generation, the Keowee units are operated within the acceptable region of the Keowee operating restrictions. The Keowee operating restrictions are contained in the Selected Licensee Commitment manual. These restrictions and the associated control logic prohibit overfrequency effects of a load rejected Keowee unit from being applied to Oconee. The amendment request submitted in the February 15, 1996, letter is still under review by the NRC and must be approved prior to the approval of the proposed re-write of the Oconee Electrical Technical Specifications. The operability requirements are being added to this supplement to make the re-write of the Electrical Technical Specifications consistent with the Oconee Technical Specifications

which will be in affect at the time of the approval of the proposed re-write.

3. Condition C is changed to apply only to the overhead power path instead of to both emergency power paths. The information contained in Condition C is consistent with the current Technical Specifications for the overhead emergency power path. The separation of the conditions for both emergency power paths into separate condition statements is done to simplify the Technical Specifications for plant personnel.

4. In order to separate the two emergency power paths into separate conditions, Conditions D and E have been added for the underground emergency power path. Condition D moves the underground emergency power path conditions which were previously in Condition C to Condition D. These conditions are contained in the Required Actions D.1 and D.3 and their associated Completion Times. These conditions are consistent with the current Oconee Technical Specifications for the underground emergency power path and are identical to the conditions contained in the proposed re-write of the Electrical Technical Specifications.

   The current Technical Specifications allow the underground power path to be inoperable for 72 hours. The outage time for the underground power path is maintained at a low level due to the fact that the Keowee unit outages are performed when the Keowee unit is aligned to the overhead power path. Given the importance of the underground power path, Duke believes that it is reasonable to require a Lee gas turbine to energize a standby bus if the underground power path will be unavailable for greater than 24 hours. The 24 hours was selected by balancing the risk associated with the underground power path being out of service against the need to start a Lee gas turbine and energize a standby bus for underground power path outages of short duration. This requirement is added into the proposed re-write of the Electrical Technical Specifications as Required Action D.2.

   If the underground power path is unavailable for greater than 72 hours, a shutdown of the Oconee units

will commence in accordance with the Technical Specifications. This requirement is contained in Condition J as Required Actions J.1 and J.2 and their associated Completion Times. This requirement is consistent with the current Technical Specification requirements for the underground emergency power path.

In addition, outages of the underground power path for reasons which prohibit energization of a standby bus from a Lee gas turbine will be limited to 24 hours by the proposed Technical Specification. If the underground power path cannot be restored to an operable status within the Completion Times associated with Required Action D.2, the appropriate Oconee unit(s) will be shutdown in accordance with Required Actions E.1.1 and E.1.2. Required Action E.1.1 has two Completion Times which depend on the number of Oconee units which must be shutdown as a result of the Condition. Twelve hours are allowed to place a single Oconee unit in a hot shutdown condition. This is more restrictive than current Technical Specifications. Current Technical Specifications would allow 72 hours for any underground emergency power path outage and 12 hours to shutdown the affected Oconee unit.

Due to the fact that the underground power path conditions have been shortened when a Lee gas turbine cannot energize a single Oconee standby bus, additional time is allowed for the shutdown of multiple Oconee units. This is more restrictive than current Technical Specifications because under current Technical Specifications 72 hours are allowed for any underground power path outage and 12 hours are allowed to shutdown multiple Oconee units. Therefore, conditions where a Lee gas turbine cannot energize a single standby bus will require multiple Oconee units to be in hot shutdown in 48 hours instead of 84 hours.

5. With the addition of new Conditions D and E to separate the conditions for the overhead and underground emergency power paths, editorial changes are necessary to correct the lettering of Conditions D through H in the proposed Electrical Technical Specification re-write. This change is performed on several pages in

the proposed Technical Specification 3.7.1 and Technical Specification Bases B3.7.1 and B3.7.8.

6. An "OR" statement is added to the required action section of Condition C of Technical Specification 3.7.1 to allow movement from Condition C to Condition I. The "OR" statement will allow ONS to enter an extended Keowee unit outage or main stepup transformer outage. This is necessary for conditions that cannot be corrected within the 72 hour AOT timeframe. This is consistent with requirements of the existing Oconee Technical Specifications. In addition, this step cannot be taken unless the reason for the power path outage is an inoperable Keowee unit or a main stepup transformer. This condition does not permit the underground power path to be out of service simultaneous to a Keowee unit or Keowee main stepup transformer. The note which requires that actions I.1 and I.2 must be met as a prerequisite ensures that the underground power path is operable prior to entering Condition I. In Condition I, simultaneous work on portions of the overhead power path during a Keowee unit or Keowee main stepup transformer outage is allowed.

   The addition of the "OR" statement results in changes in the lettering associated with Required Action C.2. Required Action C.2 has been relabeled as Required Actions C.2.1 and C.2.2. The associated Technical Specification Bases have been revised to reflect this change.

7. The requirement to maintain the 100kV transmission circuit electrically separated from the grid and offsite loads is added for the use of Lee to energize the standby buses. This requirement is contained in the Bases section of the proposed Technical Specification amendment. Currently, the existing Technical Specification actions section, instead of the Bases section, contains the requirement to separate the Lee gas turbine from the grid and offsite loads prior to energizing the standby buses. Placement of the requirement in the Technical Specification action statements makes the proposed Technical Specification

amendment consistent with the current Technical Specification requirements.

8. In the proposed Technical Specification amendment, Oconee had requested to revise the current Technical Specification requirement which allows a one-time outage up to 45 days once every three years of a Keowee unit. The proposed amendment revised the 45 day AOT to allow outages in excess of 72 hours over a three year period as long as the total outage time during the three years did not exceed 45 days. After additional consideration, the allowance of 45 days over a 3 year period for outages of the Keowee Hydro Unit is changed to a one time outage of 45 days in a 3 year period. This change makes the proposed Technical Specification amendment consistent with the existing Technical Specification requirements.

9. The proposed Technical Specification amendment revised the current surveillance that requires an operability evaluation of both Keowee units to both emergency power paths on a monthly frequency. The proposed amendment requested that the monthly surveillance of the operability of the emergency power paths be limited to the Keowee unit pre-selected to the associated power path. After additional consideration, Duke has decided to perform a monthly surveillance of the operability of both Keowee units to both emergency power paths. Thus, the proposed Technical Specification amendment is revised to be consistent with the current Technical Specifications.

10. In the supplemental response for the proposed Technical Specification 3.7 amendment the proposed semi-annual surveillance requirements are extended to an annual frequency. This extension is based on the fact that the underground feeder breaker interlock and the underground to overhead breaker interlock have not been susceptible to any failures in the past. During the past 5 years, the interlocks on the underground power path between ACB 3 and ACB 4 have not failed during any of the surveillances. Also, the underground to overhead power path breaker interlocks have not failed during past surveillances. Due to the reliable history of these interlocks, the testing frequency for the

interlocks will be extended to an annual frequency in order to be consistent with the zone overlap protection interlocks. The zone overlap protection interlock surveillance was added to the Oconee Technical Specifications by Amendment numbers 210, 210, and 207 to the Oconee operating licenses for Units 1, 2, and 3, respectively. Reliability of the interlocks is due to their type and manufacturing. The control interlocks, which prevent one Keowee underground breaker from closing if the other breaker and associated disconnects are closed, are made up of breaker and disconnect auxiliary "b" contacts. These contacts are part of the breaker and disconnects which are both located within the Keowee breaker vault.

11. The current Oconee Technical Specifications require that the main feeder buses be energized by a Lee gas turbine and loaded to the equivalent of the maximum safeguard loads for one Oconee unit within one hour. In addition, a Lee gas turbine is required to be loaded on the system grid to the equivalent of one Oconee unit's maximum safeguard loads and the hot shutdown loads of two Oconee unit's. In the proposed re-write of the Electrical Technical Specifications, the two current Lee gas turbine loading tests were combined into one proposed surveillance requirement (SR 3.7.1.7). While responding to the NRC's draft reports on the Oconee emergency power system, Duke reconsidered the combination of the Lee gas turbine loading surveillance requirements. In Duke's response dated October 31, 1996, to the NRC's draft reports, Duke indicated that the Lee gas turbine loading test which energizes the main feeder buses from an isolated Lee gas turbine within one hour would be included in the supplement to the Electrical Technical Specification re-write.

    Surveillance SR 3.7.1.10 has been added to the proposed Technical Specification by this supplement. This surveillance demonstrates that a Lee gas turbine can be started, connected to the isolated 100kV line and carry the equivalent of a single Oconee unit's maximum safeguard loads. This surveillance is consistent with the current Oconee Technical Specification surveillance requirement for the Lee gas turbine except the one hour

requirement has been relocated to SR 3.7.1.6. The one hour requirement of starting a Lee gas turbine and supplying power to Oconee via a dedicated line can be demonstrated by energizing the standby buses instead of the main feeder buses. This exception is a change to the commitment made by Duke in the letter dated October 31, 1996.

This change is necessary to reduce operator burden during the performance of the Lee gas turbine test. The one hour clock starts when the call is made from Oconee to Lee with the request to start a gas turbine. It takes approximately thirty minutes for a Lee gas turbine to be started and reach rated speed. Once the gas turbine is at rated speed, the Oconee shutdown loads are placed on the Lee gas turbine. After the Lee gas turbine is loaded, additional Oconee loads are started to obtain loads that are equivalent to the accident loads of a single Oconee unit. Since approximately thirty minutes are required to allow the Lee gas turbine to reach rated speed, the Oconee operators are left with only 30 minutes to close the Lee gas turbine into the Oconee main feeder buses and to start additional loads to obtain a loading equivalent to the accident loads of a single Oconee unit. Once the power is supplied from a Lee gas turbine to the Oconee standby buses via a dedicated line, the only remaining operator action to power the main feeder buses is the closure of the SL breakers.

After adding the surveillance requirement to perform a loading test of a Lee gas turbine utilizing the loads from the Oconee main feeder buses, the proposed surveillance SR 3.7.1.7 was revised to delete the redundant requirement of verification of loading capability of a Lee gas turbine within one hour to the system grid. This is consistent with the current Oconee Technical Specification surveillance 4.6.8 which is the surveillance that is associated with the proposed surveillance SR 3.7.1.7.

12. The zone overlap protection interlock surveillance was added to the Oconee Technical Specifications by Amendment numbers 210, 210, and 207 to the Oconee operating licenses for Units 1, 2, and 3, respectively.

The zone overlap surveillance was not in the Oconee Technical Specifications when the proposed Technical Specification for Section 3.7 was submitted on March 11, 1993. Thus, this supplement to the proposed Technical Specification 3.7 submittal includes the zone overlap surveillance as SR 3.7.1.9 in order to be consistent with the existing Technical Specifications.

13. The insertion of the Lee combustion turbine step load test as SR 3.7.1.10 and the zone overlap surveillance as SR 3.7.1.9 requires that the surveillance for verification of the transfer functions of the main feeder buses (proposed SR 3.7.1.9) be renumbered. Thus, the supplement to the proposed Technical Specification 3.7 amendment request renumbers the proposed SR 3.7.1.9 to SR 3.7.1.11.

14. In a Technical Specification amendment request dated February 15, 1996, Duke proposed the addition of surveillance requirements to the Oconee Technical Specifications for commercial operation of the Keowee Hydro units. A Technical Specification surveillance 4.6.13 was added to ensure that the Keowee units are operable during periods of commercial power generation. In order to ensure that the Keowee Hydro units are operable during periods of commercial power generation, the protection circuitry is tested on a refueling frequency. This surveillance ensures 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 is verified during this surveillance. Failure to meet the acceptance criteria is evaluated in the corrective action program to determine the impact on the operability of the emergency power paths. The Keowee Watt/VAR meter, frequency relays, and governor magnetic speed switch will be calibrated prior to the performance of this surveillance.

The proposed Technical Specification surveillance 4.6.13 is being added to the proposed re-write of the Electrical Technical Specifications as SR 3.7.1.12. The proposed Technical Specification surveillance stated a frequency of at least once every 18 months.

In the Technical Specification 3.7 supplement, the frequency has not been changed. However, it is written as a refueling frequency to be consistent with other electrical Technical Specification surveillances.

Also, a sentence has been added to the Bases of the Technical Specification surveillance. The sentence indicates that the surveillance can be performed with one or both Keowee units generating to the grid at any load below the maximum power level as defined by the Keowee operating restrictions. The surveillance verifies the ability of the logic circuits to realign the Keowee units to the appropriate paths as the frequency decreases below 110 percent following a load rejection. This logic circuitry verification can be performed by a load rejection at any power level. The addition of this sentence clarifies the power level at which the surveillance can be performed and does not change the Technical Specification surveillance.

The amendment request submitted in the February 15, 1996, letter is still under review by the NRC and must be approved prior to the approval the proposed re-write of the Oconee Electrical Technical Specifications.

15. In a Technical Specification amendment request dated February 15, 1996, Duke proposed the addition of surveillance requirements to the Oconee Technical Specifications for commercial operation of the Keowee Hydro units. Technical Specification surveillance 4.6.14 was added to verify that the Keowee response to a load rejection is bounded by the design criteria used to develop the Keowee operating restrictions. A maximum power dual unit load rejection will be performed on a refueling frequency. The power level for the dual unit load rejection will be 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.

The proposed Technical Specification surveillance 4.6.14 is being added to the proposed re-write of the Electrical Technical Specifications as SR 3.7.1.13. The proposed Technical Specification surveillance stated a frequency of at least once every 18 months. In the Technical Specification 3.7 supplement, the frequency has not been changed. However, it is written as a refueling frequency to be consistent with other electrical Technical Specification surveillances.

The amendment request submitted in the February 15, 1996, letter is still under review by the NRC and must be approved prior to the approval of the proposed re-write of the Oconee Electrical Technical Specifications.

16. The completion time for the required actions to Conditions A and B of the proposed Technical Specification 3.7.7 was originally listed as 7 days. The 7 day completion time was based on engineering judgment which took into account the infrequency of actual grid system voltage degradation, the probability of a simultaneous engineered safeguards actuation, and the availability of the sensing relays from the other Oconee units. The B&W Standard Technical Specifications (STS) were not approved until late in the development of the original submittal. A review of revision 1 of the B&W STS dated April 7, 1995, indicates that the completion time for the corresponding conditions for an inoperable voltage sensing relay or actuation logic channel is 72 hours. Thus, the proposed Technical Specification amendment completion time is being revised from 7 days to 72 hours to be consistent with the B&W STS since this is a new requirement in the Oconee Technical Specifications. The 72 hour completion time is adequate to perform the necessary activities to restore a voltage sensing relay or actuation logic channel to an operable status. In

addition, the 72 hour completion time ensures that the degraded grid voltage protection system availability is adequate considering the infrequency of actual grid system voltage degradation, the probability of a simultaneous engineered safeguards actuation, and the availability of the sensing relays from the other Oconee units.

17. On Page 3.7-15 and B3.7-36 of the supplement to the proposed Technical Specification amendment, the setpoints for the undervoltage permissive and timer are included in the Technical Specification surveillance requirements. This ensures that the Degraded Grid Voltage Protection system actuates at a switchyard voltage of greater than or equal to 219kV with a time response $\leq$ 10 seconds. The time delay prevents brief fluctuations in the switchyard voltage from causing inadvertent actuation of the Degraded Grid Voltage Protection system. In addition, the time delay ensures that the engineered safeguards equipment is separated from a degraded grid prior to damage of the equipment. This voltage level ensures that engineered safeguards equipment operates properly should an engineered safeguards actuation occur at a voltage level greater than or equal to 219kV.

    The addition of the time delay value to the Technical Specification surveillance is a revision to the commitment, which is contained in the letter dated October 3, 1995, to add the time delay setpoint and tolerance to the Technical Specification Bases. During the development of the Technical Specification supplement, Duke decided that it would be best to include the time delay allowable value with no tolerances in the Technical Specification surveillance.

    Another change on page 3.7-15 is the correction of a typographical error. The word "delays" in SR 3.7.7.1 should actually be "delay".

18. In previous correspondence and meetings with the NRC, Duke committed to include a Technical Specification surveillance requirement in the proposed electrical specification amendment for the switchyard isolation circuitry. In order to satisfy the commitment, SR

3.7.7.2 is being added to the Oconee Technical Specifications to require the performance of the switchyard isolation functional test on a refueling frequency. SR 3.7.7.2 verifies actuation of the switchyard isolation circuitry. This test will cause an actual switchyard isolation and alignment of the Keowee units to the overhead and underground paths. A refueling frequency minimizes the impact to Keowee and the operating Oconee units which are connected to the 230kV switchyard. The effect will be negligible because the generator red bus tie breakers and feeders from the Oconee 230kV switchyard red bus to the system grid remain closed.

Only a single switchyard isolation channel is required to cause full system realignment. While system continuity through the actuating relays can be verified by the installed test circuitry, there is no method to verify function without causing realignment of the switchyard and a Keowee emergency start. In order to test both switchyard isolation channels, the switchyard isolation test would need to be performed twice. To avoid excessive switchyard breaker cycling, channel verification for breaker realignment, and Keowee emergency start functions, the switchyard isolation test will be performed on a single switchyard isolation channel on a refueling frequency. This is acceptable since only one channel of switchyard isolation is required to cause a full system realignment and to meet the single failure criteria for the emergency power system. The switchyard isolation channel actuated during the test should be alternated between tests. This results in each switchyard isolation channel being tested approximately every 36 months.

19. The completion time for the required actions to Conditions A and B of the proposed Technical Specification 3.7.8 was originally listed as 7 days. The 7 day completion time was based on engineering judgment which took into account 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 engineered safeguards actuation and the loss of the 230kV switchyard. The B&W Standard

Technical Specifications (STS) were not approved until late in the development of the original submittal. A review of revision 1 of the B&W STS dated April 7, 1995, indicates that the completion time for the corresponding conditions for an inoperable voltage sensing relay or actuation logic channel is 72 hours. Thus, the proposed Technical Specification amendment completion time is being revised from 7 days to 72 hours to be consistent with the B&W STS since this is a new requirement in the Oconee Technical Specifications. The 72 hour completion time is adequate to perform the necessary activities to restore a voltage sensing relay or actuation logic channel to an operable status. In addition, the 72 hour completion time ensures that the CT-5 degraded grid voltage protection system availability is adequate considering 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 engineered safeguards actuation and the loss of the 230kV switchyard.

20. Condition C of proposed Technical Specification 3.7.8 is not complete in the proposed amendment dated March 11, 1993. Condition C of proposed Technical Specification 3.7.8 should contain requirements similar to Conditions D, E, and F for proposed Technical Specification 3.7.7. The proposed Technical Specification 3.7.8 does not contain requirements for occasions where more than one voltage sensing relay is inoperable or the required actions and associated completion times are not met for Conditions A and B. In order to add the requirements discussed above to the proposed Technical Specification 3.7.8, Condition C has been revised to include the above requirements. The required actions for the various situations in Condition C are the same for each situation. The proposed Technical Specification 3.7.7 which has separate required actions for each situation places the situations in different conditions. The required actions for the situations added to Condition C of proposed Technical Specification 3.7.8 ensure that Oconee is separated from the Central switchyard if the CT-5 degraded grid protection system is inoperable. Once the Oconee units are separated from the Central

switchyard, no completion times are associated with the restoration of the CT-5 degraded grid protection system. This is acceptable since the Central switchyard is not automatically utilized as an emergency power source during an engineered safeguards actuation.

21. On Page 3.7-16 and B3.7-39 of the supplement to the proposed Technical Specification amendment, the setpoints for the undervoltage permissive and timer are included in the Technical Specification surveillance requirements. This ensures that the CT-5 Degraded Grid Voltage Protection system actuates at a standby bus voltage of greater than or equal to 3874V. This voltage level ensures that engineered safeguards equipment operates properly should an engineered safeguards actuation occur at a voltage level greater than or equal to 3874V. The first level of undervoltage permissives are set $\geq$ 4155V to provide a permissive that will arm the second level of protection following the time delay. The setpoints for the time delay relays are added to the Bases section of the proposed Technical Specification amendment. The time delay relays are currently configured for a delay $\leq$ 10 seconds. This time delay prevents brief fluctuations in the Central switchyard voltage from causing inadvertent actuation of the CT-5 Degraded Grid Voltage Protection system. In addition, the time delay ensures that the engineered safeguards equipment is separated from a degraded grid prior to damage of the equipment.

    The addition of the time delay value to the Technical Specification surveillance is a revision to the commitment, which is contained in the letter dated October 3, 1995, to add the time delay setpoint and tolerance to the Technical Specification Bases. During the development of the Technical Specification supplement, Duke decided that it would be best to include the time delay allowable value with no tolerances in the Technical Specification surveillance.

22. In the Bases section for Technical Specification 3.7.1, the necessary equipment alignments for an acceptable overhead and underground power path are listed on page B3.7-3 and B3.7-4. The list of the alignments are

prefaced with a statement that other acceptable alignments are provided in the design basis document (DBD). Following discussions with the NRC, the statement about other acceptable alignments being provided in the DBD has been removed from the Bases of the proposed Technical Specification. In addition, the list of equipment alignments has been reviewed and is complete for the most probable scenarios of equipment unavailability.

23. Panelboards KA and KB have been removed from the lists of required equipment necessary to provide an acceptable emergency power path. This revision was based on the fact that the panelboards are no longer listed in the Design Basis Document as a component that is required to be operable for Keowee to perform its intended safety function. The panelboards supply power to lights, receptacles, non-safety heaters and equipment used to shutdown the Keowee units. Since the equipment is not necessary for Keowee to perform its intended safety function, the panelboards are removed from the Technical Specification Bases. As a result of the deletion of the panelboards, the item numbers for equipment listed below the panelboards are revised. The change in the item numbers is an editorial change that is necessary to keep the items in order.

24. As a result of the review of the acceptable alignments provided in the Design Basis Documents, the Keowee Standby Charger is being listed as an acceptable substitute for Keowee Battery Charger #1 or #2. The Keowee Standby Charger is a swing charger that can be connected to Keowee Battery #1 or #2. The connection of the Standby Charger to one of the Keowee batteries does not impact the ability of the Keowee batteries or Keowee units to perform their intended safety function.

25. On page B3.7-4, the listing of the equipment required for an acceptable underground power path is similar to the equipment listed on page B3.7-3 for the overhead power path. In order to be consistent between the two lists of equipment, an editorial revision is made to the list of equipment in 3A.1 and 3B.1 on page B3.7-4. This change does not revise the equipment that is required for an acceptable underground power path.

26. The Bases information for the offsite sources has been revised in order to allow the 230kV switchyard offsite sources to be considered in an operable condition even though the associated breakers to the Oconee startup transformers are not closed. This change is made to support the addition of the switchyard isolation surveillance. During the switchyard isolation test, the 230kV switchyard yellow bus and Oconee startup transformers will be isolated from the offsite power supply even though two offsite sources are available. During the switchyard isolation test, the offsite power source will be available with manual operator action. When the associated PCBs are closed and the Oconee startup transformers are energized from the 230kV switchyard, the offsite power source will be available automatically. This change is acceptable since both emergency power paths and the two offsite sources are operable and available during the performance of the switchyard isolation test.

27. A sentence is added to the Technical Specification Bases for SR 3.7.1.2 and SR 3.7.1.3 to clarify that the surveillance will not be performed when a Keowee unit cannot be connected to both emergency power paths. This is currently allowed by Technical Specification 4.0.3. Current Technical Specifications allow ONS to waive surveillances if the surveillance of the item is not necessary to assure that operation is within the safety limits and limiting conditions for operation. However, the waived surveillance must be completed prior to returning to conditions for which the surveillance is necessary to assure operation within the safety limits and limiting conditions for operation. This is necessary for cases of extended Keowee maintenance where the surveillance cannot be performed. When the overhead ACB for the underground Keowee unit or underground ACB for the overhead Keowee unit are out of service for an extended period, ONS will not be in an action statement since the required ACBs are operable. However, the associated Keowee unit cannot be verified to be operable to both power paths during the ACB maintenance.

28. SR 3.7.1.11 performs a functional verification of the EPSL logic. In the current Oconee Technical Specifications, this surveillance is required to be performed during the refueling outage for each Oconee unit. The proposed Technical Specification re- write does not change the current Technical Specification surveillance requirement for the EPSL functional test. A sentence is added to the Bases of SR 3.7.1.11 to indicate the requirements for the frequency of the test.

29. Previously, the Degraded Grid Protection System sensed voltage from the 230kV transformer buses on the Z phase only. A modification to the Degraded Grid Protection System installed Capacitor Coupled Voltage Transformers (CCVTs) on each phase of the yellow bus. Therefore, the Bases for the Degraded Grid Protection System has been revised to incorporate this modification. Additional information pertaining to the modification is contained in the Duke letter dated July 26, 1995.

30. On page B3.7-52, the references for Section 3.7.10 are listed. The list of references jump from number 3 to number 10. This is a typographical error and reference 10 is renumbered to reference 4.

31. In the submittal dated March 11, 1993, the reporting requirements associated with the current Technical Specifications 3.7.4, 3.7.5, 3.7.8 and 3.7.9 were removed from the Oconee Technical Specification. In the current Oconee Technical Specification, Section 6.6.3 lists the special reports that must be made to the NRC in accordance with the Oconee Technical Specifications. Currently, Section 6.6.3 references the auxiliary electrical systems Technical Specification 3.7 as a section with special reporting requirements. Since no special reporting requirements are contained in the proposed Technical Specification amendment, Section 6.6.3 is revised to delete the reference to the auxiliary electrical systems Technical Specification 3.7.

Based on the information provided in this attachment and the Bases of the Technical Specifications, Duke Power concludes that the proposed amendment is necessary and acceptable.

ATTACHMENT 4

REVISIONS TO THE ORIGINAL TECHNICAL SPECIFICATION
MARKUPS AND TECHNICAL JUSTIFICATION

4.6 EMERGENCY POWER PERIODIC TESTING

Applicability

Applies to the periodic testing surveillance of the emergency power sources.

Objective

To verify that the emergency power sources and equipment will respond promptly and properly when required.

Specification

80 SR 3.7.1.2 & SR 3.7.1.3

4.6.1 Monthly, a test of the Keowee Hydro units shall be performed to verify proper operation of these emergency power sources and associated equipment. This test shall assure that:

a. Each hydro unit can be automatically started from the Unit 1 and 2 control room.

b. Each hydro unit can be synchronized through the 230 kV overhead circuit to the startup transformers.

c. Each hydro unit can energize the 13.8 kV underground feeder.

81 ~~SR3.7.1.3d.~~ SR3.7.1.4 The 4160 volt startup transformer main feeder bus breakers and standby bus breaker shall be exercised.

82 ~~SR3.7.1.7~~ SR 3.7.1.8

4.6.2 a. Annually, the Keowee Hydro units will be started using the emergency start circuits in each control room to verify that each hydro unit and associated equipment is available to carry load within 25 seconds of a simulated requirement for engineered safety features.

b. Promptly following the above annual test, each hydro unit will be loaded to at least the combined load of the auxiliaries actuated by ESG signal in one unit and the auxiliaries of the other two units in hot shutdown by synchronizing the hydro unit to the offsite power system and assuming the load at the maximum practical rate.

83 4.6.3 ~~SR3.7.1.4~~ SR 3.7.1.5 Monthly, the Keowee Underground Feeder Breaker Interlock shall be verified to be operable.

84 4.6.4 ~~SR3.7.1.8~~ SR 3.7.1.9 During each refueling outage, a simulated emergency transfer of the 4160 volt main feeder buses to the startup transformer (i.e., CT1, CT2 or CT3) and to the 4160 volt standby buses shall be made to verify proper operation.

85 4.6.5 SR 3.7.7.1 RELOCATED TO SLC Quarterly, the External Grid Trouble Protection System logic shall be tested to demonstrate its ability to provide an isolated power path between Keowee and Oconee.

86 4.6.6 ~~SR 3.7.1.5~~ SR 3.7.1.6 Annually and prior to planned extended Keowee outages, it shall be demonstrated that a Lee Station combustion turbine can be started and

87 ~~SR 3.7.1.5~~ SR 3.7.1.6

connected to the 100 kV line. It shall be demonstrated that the 100 kV line can be separated from the rest of the system and supply powe to the 4160 volt main feeder buses.

88 4.6.7 ~~SR 3.7.1.6~~ SR 3.7.1.7

At least once every 18 months, it shall be demonstrated that a Lee station combustion turbine can be started and connected to the isolated 100 kV line and carry the equivalent of the maximum safeguards load of one Oconee unit (4.8 MVA) within one hour.

89 4.6.8 ~~SR 3.7.1.6~~ SR 3.7.1.7

Annually, it shall be demonstrated that a Lee station combustion turbine can be started and carry the equivalent of the maximum safeguards load of one Oconee unit plus the safe shutdown loads of two Oconee units on the system grid.

90 4.6.9 TS 3.7.12

Batteries in the Instrumentation and Control, Keowee, and Switching Station shall have the following periodic inspections performed to assure maximum battery life. Any battery or cell not in compliance with these periodic inspection requirements shall be corrected to meet the requirements within 90 days or the battery shall be declare inoperable.

a. Weekly verify that:

91 SR 3.7.12.3 (1) The electrolyte level of each pilot cell is in between the minimum and maximum level indication marks.

92 SR 3.7.12.2 (2) The pilot cell specific gravity, corrected to 77°F and full electrolyte level, is ≥ 1.200.

93 SR 3.7.12.1 (3) The pilot cell float voltage is ≥ 2.12 (2.13) VDC.

94 SR 3.7.9.1 (4) The overall battery float voltage is ≥ 125 VDC.

b. Quarterly verify that:

95 (A) SR 3.7.12.5 (B) SR 3.7.12.8 (1) The specific gravity of each cell corrected to 77°F and full electrolyte level, is ≥ 1.200 and is not less than 0.010 below the average of all cells measured.

96 SR 3.7.12.4 (2) The voltage of each cell under float charge is ≥ 2.12 (2.1) VDC.

97 SR 3.7.12.6 (3) The electrolyte level of each connected cell is between the minimum and maximum level indication marks.

c. Annually verify that:

98 ~~SR 3.7.9.5~~ SR 3.7.9.4 (1) The cells, end-cell plates and battery racks show no visual indication of structural damage or degradation.

99 ~~SR 3.7.9.6~~ SR 3.7.9.5 (2) The cell to cell and terminal connections are clean, tight and coated with anti-corrosion grease.

(100) ~~4.6.10~~
~~SR 3.7.9.4~~
SR 3.7.9.3

Annually, a one hour discharge service test at the required maximum load shall be made on the instrument and control batteries, the Keowee batteries, and the switching station batteries.

4.6.11
(101)
~~SR 3.7.9.2~~
Deleted

Monthly, the operability of the individual diode monitors in the Instrument and Control Power System shall be verified by imposing a simulated diode f------ --gnal on the monitor.

4.6.12
(102)
~~SR 3.7.9.3~~
SR 3.7.9.2

Semiannually, the peak inverse voltage capability of each auctioneering diode in the 125 VDC Instrument and Control Power System shall be measured and recorded.

Bases

The Keowee Hydro units, in addition to serving as the emergency power sources for the Oconee Nuclear Station, are power generating sources for the Duke system requirements. As power generating units, they are operated frequently, normally on a daily basis at loads equal to or greater than required by Table 8.1-1 of the FSAR for ESF bus loads. Normal as well as emergency startup and operation of these units will be from the Oconee Unit 1 and 2 Control Room. The frequent starting and loading of these units to meet Duke system power requirements assures the continuous availability for emergency power for the Oconee auxiliaries and engineered safety features equipment. It will be verified that these units will carry the equipment of the maximum safeguards load within 25 seconds, including instrumentation lag, after a simulated requirement for engineered safety features. To further assure the reliability of these units as emergency power sources, they will be, as specified, tested for automatic start on a monthly basis from the Oconee control room. These tests will include verification that each unit can be synchronized to the 230 kV bus and that each unit can energize the 13.8 kV underground feeder.

The interval specified for testing of transfer to emergency power sources is based on maintaining maximum availability of redundant power sources.

Starting a Lee Station gas turbine, separation of the 100 kV line from the remainder of the system, and charging of the 4160 volt main feeder buses are specified to assure the continuity and operability of this equipment. The one hour time limit is considered the absolute maximum time limit that would be required to accomplish this.

REFERENCE

FSAR, Section 8

Unit" to be inoperable at a time, unless the inoperability is due to loss of power from a 125VDC I&C panelboard. TS 3.7.5 allows one trip coil on one or more breakers to be inoperable regardless of the cause. This is acceptable since the trip coils would be capable of performing the required safety function with with one inoperable on each breaker. Further details are provided in Justification 29-32.

B. Currently no surveillance requirements are specified for the N and SL breakers. SR 3.7.5.1 has been added to require a monthly breaker exercise. This is an additional restriction not presently included in the technical specifications.

80) [4.6.1] The monthly tests of the emergency power paths have been retained as SR 3.7.1.2 and SR 3.7.1.3. There is no technical change from current requirements.

81) [4.6.1.d] The monthly exercise of the E breakers and S breakers has been retained as SR 3.7.1.~~3~~4. There is no technical change from current requirements.

82) [4.6.2] The annual test of the overhead emergency power path has been retained as SR 3.7.1.~~7~~8. There is no technical change from current requirements.

83) [4.6.3] The test of the Keowee underground feeder breaker interlock has been retained as SR 3.7.1.~~4~~5. The test interval has been extended to 6 months based on evaluation of previous test data and interlock design. The interlock is accomplished by use of breaker auxiliary contacts which are not expected to change or fail without hardware modifications. These contacts are excercised routinely during breaker operation.

84) [4.6.4] The simulated emergency transfer of the main feeder buses to the startup transformer and to the standby buses has been retained as SR 3.7.1.~~8~~9. In addition, SR 3.7.1.~~8~~9 also requires a retransfer to startup. This is an additional restriction not presently included in the technical specifications.

85) [4.6.5] The quarterly test of the external grid trouble protection system logic has been replaced by a refueling frequency test of the new EPSL Degraded Grid Voltage Protection System per SR 3.7.7.1. Analysis has shown grid voltage values become critical for ES actuation at voltages less than normal values and greater than the External Grid Trouble Protection System (EGTPS) setpoints. The new system provides protection for safety systems. Therefore, primary DBA protection is provided by the new system. The frequency portion of the EGTPS will be maintained as safety related. A Selected Licensee Commitment (SLC) will be provided to contain the logic test requirement of 4.6.5.

86/87) [4.6.6] The annual test from a Lee Gas Turbine to the main feeder buses has been replaced with a test which does not imply connection

to the main feeder buses. More frequent cycling of the standby breakers is performed per SR 3.7.1.~~3~~.7 The new surveillance is SR 3.7.1.~~5~~.6 4.6.6 infers that there is a separate surveillance performed prior to "planned extended Keowee outages." TS 3.7.1 Required Action G.1 effectively includes this requirement for all extended Keowee outages by requiring the standby buses be energized by a Lee gas turbine prior to exceeding 72 hours. There are no technical changes from current requirements.

88) [4.6.7] The 18 month loading (to max ES load of one Oconee Unit) of a Lee gas turbine through the isolated 100kV line has been combined with 4.6.8 to require annual ~~loading (to~~ one Unit's ES load plus two Unit's hot shutdown load) on the system grid within one hour. The new surveillance is SR 3.7.1.~~8~~.7 SR 3.7.1.~~8~~7 does not require loading 4.8MVA onto the isolated 100kV line. The 4.8MVA value was based on previous load demand calculations for a single unit with a LOCA. Current calculations show that the load demand would be significantly more. It is not possible to provide this load from a shutdown unit for testing, therefore the load testing requirements for the isolated 100kV line have been made consistent with the test requirements for the Keowee Units.

89) [4.6.8] The requirements of 4.6.8 have been retained as SR 3.7.1.~~6~~.7 By combining 4.6.8 with 4.6.7, SR 3.7.1.~~8~~7 includes the time restriction of 1 hour. This is an additional restriction not presently included in the technical specifications.

90) [4.6.9] The 90 day AOT for battery cell parameters has been retained as TS 3.7.12 Required Actions D.1, E.1, F.1, and G.1. There is no technical change from current requirements.

91) [4.6.9a(1)] The weekly verification of pilot cell electrolyte level has been retained as SR 3.7.12.3. There is no technical change from current requirements.

92) [4.6.9a(2)] The weekly verification of pilot cell specific gravity has been retained as SR 3.7.12.2. There is no technical change from current requirements.

93) [4.6.9a(3)] The weekly verification of pilot cell float voltage has been retained as SR 3.7.12.1. The acceptance criterion has been increased from 2.12VDC to 2.13VDC consistent with IEEE 450-1980 guidance.

94) [4.6.9a(4)] The weekly verification of overall battery float voltage has been retained as SR 3.7.9.1. There is no technical change from current requirements.

95) [4.6.9b(1)]
A. The quarterly verification of specific gravity has been retained as SR 3.7.12.5. There is no technical change from current requirements.

B. The quarterly comparison of average cell specific gravity has been retained as SR 3.7.12.8. There is no technical change from current requirements.

96) [4.6.9b(2)] The quarterly verification of cell float voltage has been retained as SR 3.7.12.4. The acceptance criterion has been increased from 2.12VDC to 2.13VDC consistent with IEEE 450-1980 guidance.

97) [4.6.9b(3)] The quarterly verification of electrolyte level has been retained as SR 3.7.12.6. There is no technical change from current requirements.

98) [4.6.9c(1)] The annual verification of battery integrity has been retained as SR 3.7.9.~~8~~ 4. There is no technical change from current requirements.

99) [4.6.9c(2)] The annual verification of battery connections has been retained as SR 3.7.9.~~8~~ 5. There is no technical change from current requirements.

100) [4.6.10] The annual battery service test has been retained as SR 3.7.9.~~4~~ 3. There is no technical change from current requirements.

101) [4.6.11] The monthly test of the diode monitors has not been retained. ~~as SR 3.7.9.2. There is no technical change from current requirements.~~

102) [4.6.12] The semiannual test of the auctioneering diodes has been retained as SR 3.7.9.~~8~~ 2. There is no technical change from current requirements.

ADDITIONAL REQUIREMENTS NOT CURRENTLY INCLUDED IN TECHNICAL SPECIFICATIONS

1) There are currently no Tech Spec requirements for operability of the SL breaker trip coils. If power is lost to transformer CT-5 while it is energizing the standby buses, the SL breakers must open to allow CT-4 to energize the standby buses. Thus, the SL breaker function is similar to that of the N breakers. TS 3.7.5 has been developed to address requirements for the N and SL breakers.

2) There are currently no Tech Spec requirements to exercise the N and SL breakers. 4.6.1.d requires exercise of the E breakers and S breakers to ensure availability of these infrequently used breakers. Since the N and SL breakers are used infrequently, SR 3.7.5.1 has been developed to require a monthly exercise. Currently, the N breakers are cycled with the E breakers.

3) There are currently no Tech Spec requirements to verify proper AC distribution system alignment. SR 3.7.2.1 has been developed to require