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March 23, 2004

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

Attention: Document Control Desk

Subject: Oconee Nuclear Station
Docket Numbers 50-269, 270, and 287
Supplement 4 to the License Amendment Request for Temporary Extensions to the Completion Times for One or Two Keowee Hydro Units Inoperable
Technical Specification Change (TSC) Number 2002-05

In a submittal dated August 22, 2002, and supplemented by letters dated September 12, 2003, February 4, 2004, and February 16, 2004, Duke proposed to amend Appendix A, Technical Specifications, for Facility Operating Licenses DPR-38, DPR-47 and DPR-55 for Oconee Nuclear Station, Units 1, 2, and 3 to temporarily extend Technical Specification (TS) 3.8.1 Required Action Completion Times when in the Conditions for one or two Keowee Hydro Units (KHU) inoperable. This temporary change is needed to allow significant maintenance and upgrades to be performed.

Duke agreed to supplement the License Amendment Request (LAR) during a March 9, 2004, conference call with NRC Staff. Attachment 1 provides the requested information. In addition, Duke recently identified a necessary revision to make the proposed TS change apply as intended. The revised proposed TS change is described in Attachment 2.

Attachment 3 and 4 provide revised TS retyped pages and markup pages that reflect the changes proposed in Attachment 2.

The additional proposed changes do not affect the conclusions of the No Significant Hazards Consideration included in the August 22, 2002 LAR.

A001

Pursuant to 10 CFR 50.91, a copy of this proposed license amendment is being sent to the State of South Carolina.

If there are any questions regarding this submittal, please contact Boyd Shingleton at (864) 885-4716.

Very truly yours,

R. A. Jones, Vice President
Oconee Nuclear Site

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R. A. Jones, being duly sworn, states that he is Vice President, Oconee Nuclear Site, Duke Energy Corporation, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this revision to the Renewed Facility Operating License Nos. DPR-38, DPR-47, DPR-55; and that all the statements and matters set forth herein are true and correct to the best of his knowledge.

R. A. Jones, Vice President
Oconee Nuclear Site

Subscribed and sworn to before me this 23rd day of March, 2004

Notary Public

My Commission Expires:
6/12/2013

Attachment 1

Response to Request for Additional Information Related to PRA to Support Temporarily Extending the Required Action Completion Times for One or Two Keowee Hydro Units Inoperable

Introduction

During a March 9, 2004 teleconference with NRC Staff, Duke agreed to provide additional information related to the Probabilistic Risk Assessment (PRA) for the temporary Keowee License Amendment Request (LAR). Duke agreed to provide the following information:

1) A summary of the results of the Combustion Engineering (CE) flow calculation to give the basis for the .79 success probability of the seals. Include the leakage rate for the no seal failure portion and the leakage rate for the seal failure portion (including the probability that this would occur). Explain why it is acceptable to use 100 gpm leak rate per pump versus 182 gpm as a conservative estimate of the behavior of our Reactor Coolant Pumps (RCPs).

2) Reference the GSI-23 closeout package as the basis for the .21 failure probability as opposed to the Westinghouse Owners Group (WOG) RCP Seal Leakage Model.

3) A discussion of the RCP seal design that gives the basis for the conclusion that the Sulzer seals on the Westinghouse RCPs are as good as those on the Bingham RCPs.

Summary of the results of the CE flow calculation and basis for using 100 gpm leak rate per RCP

Oconee Nuclear Site (ONS) has Sulzer type RCP Seal packages on all three units. These type seal packages have multiple, redundant seals made with high temperature components. The Unit 1 RCPs have installed the Sulzer RCRW 950B-3 three stage seals while the Unit 2 & 3 RCPs have installed the Sulzer RQV 875B-3 three stage seals. The seals have the same basic design and mode of operation. With respect to design, the robustness of the seal packages having equal pressure distribution between stages but having each stage capable of withstanding full reactor coolant system pressure is incorporated in both the 950B-3 and 875B-3 seals. Furthermore, the materials of construction are similar (between the 950B-3 and 875B-3 seals) with respect to mechanical properties and operational limits.

As documented within the instruction manual for the 950B-3 and 875B-3 seals, the predicted nominal leakage rate from the upper seal is 0.0022 gpm. Furthermore, the instruction manual states that the predicted seal leakage during transient conditions is 0.39 gpm assuming no seal failure and the seal return (or controlled bleed-off (CBO)) line isolated.

Since their installation in December 2000, the Unit 1 RCP seals have experienced leakage by the third stage above that expected within manufacturer's documentation. Based on plant data (seal pressure distribution and leakage) and seal inspections, cause evaluations have attributed the problem to a single joint location associated with the third stage shaft to shaft sleeve o-ring. However, even assuming a complete failure of the third stage, the CE flow calculation for Oconee (CE NPSD-1199-P Addendum A, "Evaluation of RCP Seal Failure Given Loss of Seal Cooling for Oconee Units 1, 2 and 3") documents the maximum expected leakage rate from an individual seal as 1.84 gpm. Therefore, no more than 1.84 gpm of leakage should be assumed from a single RCP seal during post accident conditions with seal return (or CBO) isolated.

In the revised ONS LAR, a 0.21 probability of seal LOCA was applied to all cutsets which resulted in a total loss of RCP seal cooling. This implies that there is a 0.79 probability that no seal LOCA will develop and that the RCP seals will leak at a rate low enough that core damage will not occur (i.e. less than or equal to 1.84 gpm per seal from the discussion above) prior to recovery of offsite power or restoration of an emergency power supply. Also implicit in the ONS cutsets is the assumption that there is a 0.21 probability of a 400 gpm (100gpm/pump) total RCS leakage that if not recovered, will result in core damage. This is a simplification that has been used in several ONS risk analyses including several Significance Determination Processes (SDPs) and an Accident Sequence Precursor (ASP) analysis performed by the NRC (the ASP used 0.22). This is judged to be a very conservative way of accounting for the robustness of the current ONS RCP seals compared with Westinghouse seals and generally corresponds to the Rhodes model of Westinghouse seals with high temperature o-rings.

In July 2000, the CE Owners Group (CEOG) submitted a report entitled "Model for Failure of RCP Seals Given Loss of Seal Cooling" and requested formal review by the NRC. Following this same methodology, Westinghouse developed an Oconee specific evaluation titled, "Evaluation of RCP Seal Failure Given Loss of Seal Cooling for Oconee Units 1, 2 and 3", July 2001. This analysis concluded that the probability of RCP seal failure following an extended loss of RCP seal cooling was on the order of 1E-3. This evaluation also calculated the following leakage rates for the various combinations of seal failure.

Seal Stage Fail	Oconee Unit 1 Leakage Flow (GPM)	Oconee Units 2 & 3 Leakage Flow (GPM)
Stage 3 Failure	1.84	1.84
Stage 1 or 2 Failure	1.84	1.84
Any two seals failed	2.6	2.6
All seals failed	450-480	325

As long as at least one stage of ONS's three stage Sulzer seals remains intact, the leakage rates would be low and core cooling would be maintained well past the time that offsite power or emergency power would be recovered.

Throughout the past four years, the CEOG has continued to work with the NRC to achieve approval for the CEOG model. The latest submittal was in January, 2004. The current schedule is for the NRC to complete their SER in June, 2004. Although the ONS specific analysis does not contain the latest revisions to the CEOG model, the basic conclusions of low leakage rates and very low probability of seal failure are still supported by the most recent CEOG submittal. As stated above, the revised ONS LAR has used a 0.21 probability of seal Loss of Coolant Accident (LOCA) for all cutsets which resulted in a total loss of RCP seal cooling. This is considered very conservative compared to the CEOG model and is generally consistent with the treatment recommended by the NRC in the Generic Safety Issue 23 closeout letter.

Reference to GSI-23 closeout package

In the Generic Safety Issue 23 closure letter (Ashok C. Thadani to William D. Travers, Closeout of Generic Safety Issue 23, "Reactor Coolant Pump Seal Failure", November 8, 1999), the NRC recognized that the Rhodes model was conservative and stated that the staff would work with the industry to develop additional RCP seal models. In Attachment 2 of this letter, the NRC stated that "Based upon test results contained in NUREG/CR-4821, the staff assumed in this review that the RCP seals installed in plants with RCPs manufactured by other vendors, Byron-Jackson, KSB and Bingham, will not fail during SBO conditions as a result of elastomer failure." It also stated;

"Detailed information for RCPs manufactured by other vendors (Byron Jackson, Bingham International, KSB) is not currently available. From the design information that is available, the staff concludes that the pop-open mode of RCP seal failure, occurring at 10 minutes, with a leak rate of 182 gpm per pump and a 20% probability of occurrence, is a conservative estimate of the behavior of non-Westinghouse pumps. Additionally, based on tests and operating experience, the staff concludes that these RCPs are not vulnerable to secondary seal (such as O-ring) failure caused by a loss of cooling to the RCP seals."

In addition, a May 1, 2001 Memorandum from Patrick W. Baranowsky, Titled "Implications of Using Rhodes RCP Seal LOCA Model in Risk Assessments" stated that, "...the use of the Rhodes RCP Seal LOCA Model may be pessimistic, especially for plants, which have Byron-Jackson or Bingham seals installed in their reactor coolant pumps."

Discussion of RCP seal design

The Unit 1 RCPs have Sulzer RCRW 950B-3 three stage seals while the Unit 2 & 3 RCPs have Sulzer RQV 875B-3 three stage seals. The seals have the same basic design and mode of operation. With respect to design, the robustness of the seal packages having equal pressure distribution between stages but having each stage capable of withstanding full reactor coolant system pressure is incorporated in both the 950B-3 and 875B-3 seals. Furthermore, the materials of construction are similar (between the 950B-3 and 875B-3 seals) with respect to mechanical properties and operational limits.

The main differences between the Unit 1 RCP Seals (950B-3) and the Unit 2 & 3 RCP Seals (875B-3) are related to the retrofit necessary to install the seals on the Unit 1 Westinghouse RCPs (note that Units 2 & 3 are equipped with Bingham RCPs). The Unit 1 RCP Seals were required to be slightly larger in diameter than the Unit 2 & 3 RCP Seals. However, the size of the Unit 1 RCP Seals is not new to the industry. From discussions with Sulzer, the size of the Unit 1 RCP Seals is identical to that incorporated at Palo Verde. The interfaces with the Westinghouse RCP shaft and casing are unique to Oconee Unit 1. However, the elastomer materials as well as the joint designs (o-ring squeeze, etc.) are not unique to Oconee Unit 1 and are based on similar design principles incorporated in other Sulzer three and four stage seals.

Attachment 2

Revision to Proposed Change to the Technical Specifications

In a submittal dated August 22, 2002, and supplemented by letters dated September 12, 2003, February 4, 2004, and February 16, 2004, Duke proposed an extension to the Completion Time for restoring one KHU to operable status when two are inoperable. Duke recently identified a technical problem with the proposed Technical Specification (TS) change which would preclude the proposed extension of the dual unit inoperability from working as intended. Duke proposed to extend the Completion Time to TS 3.8.1 Required Action (RA) H.2 from 60 hours for each entry to an additional 120 hours to be used over two separate Condition H entries. Currently, TS 3.8.1, RA D.3 requires restoring the KHU associated with the underground emergency power path to operable status within 72 hours. Therefore, in order to go beyond 72 hours, it is also necessary to extend the Completion Time associated with one KHU and its required underground emergency power path inoperable consistent with the terms and conditions of the Note to RA H.2 Completion Time. Without this extension, the Conditions for entry into Condition M would be met (i.e., RA and associated Completion Time not met for RA D.1 or D.3) requiring all three Oconee Units to be in MODE 3 within 12 hours.

Duke proposes to add a Note to the first and second Completion Times for RA D.3 to indicate that the extended Completion Time of RA H.2 is applicable in lieu of these Completion Times when in Condition H to isolate, test and unisolate the KHUs during each of the two KHU Refurbishment Outages. This Note complements the RA H.2 Completion Time Note and is necessary to allow continued operation in Condition D while in Condition H. Otherwise, the Completion Time for one inoperable KHU would expire before the Completion Time for two KHUs inoperable and entry into Condition M would be required.

The proposed revision to the first and second Completion Times of RA D.3 makes the extension to RA H.2 Completion Time apply as intended. The justification provided in the initial submittal and subsequent supplements are applicable to this proposed change. As such, no further justification is necessary.

Attachments 3 and 4 provide the revised TS pages and markup pages that reflect the change described above. The Attachments also reflect changes to TS 3.8.1 RA C.2.2.5 and RA H.2 Completion Times previously provided in the original LAR and Supplements.

Attachment 3
March 23, 2004

ATTACHMENT 3

TECHNICAL SPECIFICATION

Remove Page	Insert Page
3.8.1-5 - 8	3.8.1-5 - 8
B 3.8.1-1 - 25	B 3.8.1-1 - 26

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.2.5 Restore KHU and its required overhead emergency power path to OPERABLE status.	28 days when Condition due to an inoperable Keowee main step-up transformer AND ----------NOTE---------- An additional 17 days is allowed when Condition entered to perform KHU Refurbishment Upgrades prior to April 30, 2005 except during March, April, May or June ---------- 45 days from discovery of initial inoperability when Condition due to an inoperable KHU if not used for that KHU in the previous 3 years

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. KHU or its required underground power path inoperable.	D.1	Perform SR 3.8.1.4 for OPERABLE KHU.	1 hour if not performed in previous 12 hours
	AND		
	D.2	Energize either standby bus from LCT via isolated power path.	24 hours AND 1 hour from subsequent discovery of deenergized required standby bus
	AND		
	D.3	Restore KHU and its required underground emergency power path to OPERABLE status.	----------NOTE---------- The extended Completion Time of Required Action H.2 is applicable in lieu of these Completion Times when in Condition H to isolate, test and unisolate the KHUs during each of the two KHU Refurbishment Outages. ---------- 72 hours AND 72 hours from discovery of inoperable KHU

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Required Action and associated Completion Time not met for Required Action D.2.	E.1	Be in MODE 3.	12 hours for one unit AND 24 hours for other unit(s)
	AND		
	E.2	Be in MODE 5.	84 hours
F. Zone overlap protection circuitry inoperable when overhead electrical disconnects for KHU associated with the underground power path are closed.	F.1	Restore zone overlap protection circuitry to OPERABLE status.	72 hours
	OR		
	F.2	Open overhead electrical disconnects for KHU associated with the underground power path.	72 hours
G. Both emergency power paths inoperable due to one inoperable E breaker and one inoperable S breaker on the same main feeder bus.	G.1	Restore one breaker to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
H. ----------NOTE---------- Condition may be entered only when both required offsite sources are verified by administrative means to be OPERABLE and the requirements of LCO 3.8.3, "DC Sources-Operating;" LCO 3.8.6, "Vital Inverters-Operating;" LCO 3.8.8, "Distribution Systems-Operating;" LCO 3.3.17, "EPSL Automatic Transfer Function;" LCO 3.3.18, "EPSL Voltage Sensing Circuits;" LCO 3.3.19, "EPSL 230 kV Switchyard DGVP," are verified by administrative means to be met. ---------- Both KHUs or their required emergency power paths inoperable for planned maintenance or test with both standby buses energized from LCT via isolated power path.	H.1	Energize both standby buses from LCT via isolated power path.	1 hour from discovery of deenergized standby bus
	AND		
	H.2	Restore one KHU and its required emergency power path to OPERABLE status.	----------NOTE---------- An additional cumulative 120 hours is allowed when Condition entered to isolate, test and un-isolate the KHUs during each of the two KHU Refurbishment Outages prior to April 30, 2005 provided the following conditions are met: 1) period of use not in March, April, May or June; 2) the SSF, EFW System and LCTs are verified OPERABLE prior to entering Condition, 3) RCS inventory is not reduced, 4) the SSF is manned, 5) a Jocassee Hydro Unit is verified available to provide power prior to entering Condition, 6) a 2 hour SSF DG operability test is performed prior to the start of the first dual unit outage, and 7) the Completion Time is only extended twice during each KHU Refurbishment Outage. ---------- 60 hours

(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources – Operating

BASES

BACKGROUND

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

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

BASES

BACKGROUND (continued)

receive power from a combustion turbine generator at the Lee Steam Station through a dedicated 100 kV transmission line, transformer CT-5, and both SL breakers. The 100 kV transmission line can be supplied from a Lee combustion turbine (LCT) and electrically separated from the system grid and offsite loads. The minimum capacity available from any of the multiple sources of AC power is 22.4MVA (limited by CT-4 and CT-5 transformer capacities).

APPLICABLE SAFETY ANALYSIS

The initial conditions of design basis transient and accident analyses in the UFSAR Chapter 6 (Ref. 4) and Chapter 15 (Ref. 5) assume ES systems are OPERABLE. The AC power system is designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ES systems so that the fuel, reactor coolant system, and containment design limits are not exceeded.

Consistent with the accident analysis assumptions of a loss of offsite power (LOOP) and a single failure of one onsite emergency power path, two onsite emergency power sources are required to be OPERABLE.

AC Sources – Operating are part of the primary success path and function to mitigate an accident or transient that presents a challenge to the integrity of a fission product barrier. As such, AC Sources – Operating satisfies the requirements of Criterion 3 of 10 CFR 50.36 (Ref. 3).

LCO

Two sources on separate towers connected to the 230 kV switchyard to a unit startup transformer and one main feeder bus are required to be OPERABLE. Two KHUs with one capable of automatically providing power through the underground emergency power path to both main feeder buses and the other capable of automatically providing power through the overhead emergency power path to both main feeder buses are required to be OPERABLE. The Keowee Reservoir level is required to be ≥ 775 feet above sea level to support OPERABILITY of the KHUs. The zone overlap protection circuitry is required to be OPERABLE when the overhead electrical disconnects for the KHU associated with the underground power path are closed to provide single failure protection for the KHUs. The zone overlap protection circuitry includes the step-up transformer lockout, the underground KHU lockout, the Keowee emergency start signal, and the underground breaker for the overhead KHU to ensure the zone overlap protection circuitry logic is OPERABLE.

BASES

LCO (continued)

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

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

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

BASES

LCO (continued)

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

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

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

Overhead Emergency Power Path

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

BASES

LCO (continued)

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

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

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

Underground Emergency Power Path

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

BASES

LCO (continued)

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

APPLICABILITY

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

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

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

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

ACTIONS

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

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

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

BASES

ACTIONS

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

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

If available, another Unit's startup transformer should be aligned to supply power to the affected Unit's auxiliaries so that offsite power sources and the KHU and its required overhead emergency power path will also be available if needed. Although this alignment restores the availability of the offsite sources and the KHU and its required overhead emergency power path, the shared startup transformer's capacity and voltage adequacy could be challenged under certain DBA conditions. The shared alignment is acceptable because the preferred mode of Unit shutdown is with reactor coolant pumps providing forced circulation and due to the low likelihood of an event challenging the capacity of the shared transformer during a 72 hour period to bring a Unit to MODE 5. Required Action A.3.1 requires that the unit startup transformer be restored to OPERABLE status and normal startup bus alignment in 36 hours or Required Action 3.2 requires designating one unit sharing the startup transformer, to be shutdown. For example, if Unit 1 and 2 are operating and CT-2 becomes inoperable, Unit 2 may align CT-1 to be available to the Unit 2 main feeder buses and continue operating for up to 36 hours. At that time, if CT-2 has not been restored to OPERABLE status, one Unit must be "designated" to be shutdown. The designated Unit must be shut down per ACTION B. Note that with one Unit in MODES 1, 2, 3 or 4 and another Unit in a condition other than MODES 1, 2, 3, or 4, the units may share a startup transformer indefinitely provided that the loads on the unit not in MODES 1, 2, 3 or 4 are maintained within acceptable limits. For example, if Unit 1 is in MODE 5 and CT-2 becomes inoperable, Unit 2 may align CT-1 to the Unit 2 main feeder buses and continue operation indefinitely.

BASES

ACTIONS (continued)

B.1 and B.2

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

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

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

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

BASES

ACTIONS

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

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

The extended Completion Times of Required Action C.2.2.5 apply when the KHU or its required overhead emergency power path is inoperable due to an inoperable Keowee main step-up transformer or an inoperable KHU (if not used for that KHU in the previous 3 years). In order to use the extended Completion Times, within 72 hours of entering Condition C both standby buses must be energized from an LCT (Required Action C.2.2.1), KHU generation to the grid except for testing must be suspended (Required Action C.2.2.2), the remaining KHU and its required underground emergency power path and both required offsite sources must be verified OPERABLE, the LCOs indicated in Required Action C.2.2.3 must be verified to be met, and alternate power source capability must be verified by performing SR 3.8.1.16.

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

Required Action C.2.2.5 also permits maintenance and repair of a KHU which requires longer than 72 hours. The primary long term maintenance items are expected to be hydro turbine runner and discharge ring welding

BASES

ACTIONS

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

repairs which are estimated to be necessary every six to eight years. Also, generator thrust and guide bearing replacements are necessary. Other items which manifest as failures are expected to be rare and may be performed during the permitted maintenance periods. As such, the 45 day restoration time of Required Action C.2.2.5 is allowed only once in a three year period for each KHU. This Completion Time is 45 days from discovery of initial inoperability of the KHU. This effectively limits the time the KHU can be inoperable to 45 days from discovery of initial inoperability rather than 45 days from entry into Condition C and precludes any additional time that may be gained as a result of switching an inoperable KHU from the underground to the overhead emergency power path. The 45 day Completion Time is modified by a note indicating that an additional 17 days is allowed when Condition C is entered to perform KHU Refurbishment Upgrades prior to April 30, 2005, except during March, April, May, or June. These upgrades include, but are not limited to, hydro turbine runner and discharge ring weld repair, governor, exciter and battery replacement, and an out-of-tolerance logic circuit modification. The additional 17 days is allowed to be used once for each KHU for upgrade work performed prior to April 30, 2005.

Required Actions C.2.2.1, C.2.2.2, C.2.2.3, and C.2.2.4 must be met in order to allow the longer restoration times of Required Action C.2.2.5. Required Action C.2.2.1 requires that both standby buses be energized using an LCT through the 100 kV transmission circuit. With this arrangement (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of reliability for the emergency power system is provided. In this configuration, the LCT is serving as a second emergency power source, however, since the 100 kV transmission circuit is vulnerable to severe weather a time limit is imposed. The second Completion Time of Required Action C.2.2.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost. Required Action C.2.2.2 requires suspension of KHU generation to the grid except for testing. The restriction reduces the number of possible failures which could cause loss of the underground emergency power path. Required Action C.2.2.3 requires verifying by administrative means that the remaining KHU and its required underground emergency power path and both required offsite sources are OPERABLE. This provides additional assurance that offsite power will be available. In addition, this assures that the KHU and its required underground emergency power path are available. Required Action C.2.2.3 also requires verifying by administrative means that the requirements of the following LCOs are met:

BASES

ACTIONS

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

LCO 3.8.3, "DC Sources – Operating;"

LCO 3.8.6, "Vital Inverters – Operating;"

LCO 3.8.8, "Distribution Systems – Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;"

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

LCO 3.3.21, "EPSL Keowee Emergency Start Function."

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

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

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

D.1, D.2 and D.3

With the KHU or its required underground emergency power path inoperable, sufficient AC power sources remain available to ensure safe shutdown of the unit in the event of a transient or accident. Operation may continue for 72 hours if the remaining KHU and its required overhead emergency power path are tested using SR 3.8.1.4 within one hour if not performed in the previous 12 hours. SR 3.8.1.4 is only required to be performed when the KHU associated with the overhead

BASES

ACTIONS

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

emergency power path is OPERABLE. This Required Action provides assurance that no undetected failures have occurred in the overhead emergency power path. Since Required Action D.1 only specifies "perform," a failure of SR 3.8.1.4 acceptance criteria does not result in a Required Action not met. However, if the KHU and its required overhead emergency path fails SR 3.8.1.4, both KHUs and their required emergency power paths are inoperable, and Condition I for both KHUs and their emergency power paths inoperable for reasons other than Condition G or H is entered concurrent with Condition D. This demonstration is to assure that the remaining emergency power path is not inoperable due to a common cause or due to an undetected failure. For outages of the KHU and its required underground emergency power path in excess of 24 hours, an LCT (using the 100 kV transmission circuit electrically separated from the grid and offsite loads) must energize a standby bus prior to the outage exceeding 24 hours. This ensures the availability of a power source on the standby buses when the KHU and its required underground emergency power path are out of service in excess of 24 hours. The second Completion Time of Required Action D.2 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost.

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

The first and second Completion Time for Required Action D.3 is modified by a Note indicating that the extended Completion Time of Required Action H.2 is applicable in lieu of these Completion Times when in Condition H to isolate, test and unisolate the KHUs during each of the two KHU Refurbishment Outages.. This Note complements the H.2 Note and is necessary to allow continued operation in Condition D while in Condition H. Otherwise, the Completion Time for one inoperable KHU would expire before the Completion Time for two KHUs inoperable and entry into Condition M would be required.

BASES

ACTIONS (continued)

E.1 and E.2

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

F.1 and F.2

With the zone overlap protection circuitry inoperable when the overhead electrical disconnects for the KHU associated with the underground power path are closed, the zone overlap protection circuitry must be restored to OPERABLE status or the overhead electrical disconnects must be opened within 72 hours. In this Condition, both KHUs and their required emergency power paths are OPERABLE, however a single failure could result in the loss of both KHUs.

G.1

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

H.1 and H.2

With both KHUs or their required emergency power paths inoperable for planned maintenance or test with both standby buses energized from an LCT via an isolated power path, the KHU must be restored to OPERABLE status within 60 hours. The 60 hour Completion Time is modified by a Note indicating that an additional cumulative 120 hours is allowed when Condition entered to isolate, test and un-isolate the KHUs during each of the two KHU Refurbishment Upgrades prior to April 30, 2005 provided the following conditions are met: 1) period of use not in March, April, May or June; 2) the SSF, EFW System and LCTs (4C, 5C, and 6C) are verified OPERABLE prior to entering Condition, 3) RCS inventory is not reduced (RCS < 50" on LT-5), 4) the SSF is manned, 5) a Jocassee Hydro Unit is verified available to provide power prior to entering Condition, 6) a 2 hour SSF DG operability test is performed prior to the start of the first dual unit outage, and 7) the Completion Time shall

BASES

ACTIONS

H.1 and H.2 (continued)

only be extended twice during each KHU Refurbishment Outage. For example, if 140 hours (an additional 80 hours) is required to isolate the KHUs then 100 hours (an additional 40 hours) is allowed to unisolate and test the KHU. If one of the systems/components in Item 2 (SSF, EFW System and LCTs) above becomes inoperable or in Item 5 above becomes unavailable after entering the condition, immediate action should be taken to restore the equipment to OPERABLE/available status. The Keowee Refurbishment Upgrades include, but are not limited to, hydro turbine runner and discharge ring weld repair, governor, exciter and battery replacement, and an out-of-tolerance logic circuit modification. Operation with both KHUs and their required power paths inoperable is permitted for 60 hours or the modified Completion Time allowed by the note provided that both standby buses are energized using an LCT through the 100 kV transmission circuit and the requirements of the Note to the Condition are met. The Note to the Condition indicates that it may only be entered when both offsite sources are verified by administrative means to be OPERABLE and the requirements of the following LCOs are verified by administrative means to be met:

LCO 3.8.3, "DC Sources – Operating;"

LCO 3.8.6, "Vital Inverters – Operating;"

LCO 3.8.8, "Distribution Systems – Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;" and

LCO 3.3.19, "EPSL 230 kV Switchyard DGVP."

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

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

BASES

ACTIONS

H.1 and H.2 (continued)

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

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

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

With both KHUs or their required emergency power paths inoperable for reasons other than Conditions G and H, insufficient standby AC power sources are available to supply the minimum required ES functions. In this Condition, the offsite power system is the only source of AC power available for this level of degradation. The risk associated with continued operation for one hour without an emergency power source is considered acceptable due to the low likelihood of a LOOP during this time period, and because of the potential for grid instability caused by the simultaneous shutdown of all three units. This instability would increase the probability of a total loss of AC power. Operation with both KHUs or their required power paths inoperable is permitted for 12 hours provided that Required Actions I.1 and I.2 are met. Required Action I.1 requires that both standby buses be energized using an LCT via an isolated power path. With this arrangement (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of reliability for the emergency power system is provided. In this configuration, the LCT is serving as a second emergency power source, however, since the Oconee Units are vulnerable to a single failure of the 100 kV transmission circuit a time limit of 12 hours is imposed. The second Completion Time of Required Action I.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost. Required Action I.2 requires that the OPERABILITY status of both offsite sources be determined by administrative means and that the OPERABILITY status of equipment required by the following LCOs be determined by administrative means:

BASES

ACTIONS

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

LCO 3.8.3, "DC Sources – Operating;"

LCO 3.8.6, "Vital Inverters – Operating;"

LCO 3.8.8, "Distribution Systems – Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;" and

LCO 3.3.19, "EPSL 230 kV Switchyard DGVP."

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

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

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

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

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

BASES

ACTIONS

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

time period, and because of the potential for grid instability caused by the simultaneous shutdown of all three units.

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

LCO 3.8.3, "DC Sources – Operating;"

LCO 3.8.6, "Vital Inverters – Operating;"

LCO 3.8.8, "Distribution Systems – Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;"

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

LCO 3.3.21, "EPSL Keowee Emergency Start Function."

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

Determining by administrative means allows a check of logs or other information to determine the OPERABILITY status of required equipment in place of requiring unique performance of Surveillance Requirements. If the AC Source is initially or subsequently determined inoperable, or an LCO stated in Required Action J.2 is initially or subsequently determined

BASES (continued)

ACTIONS

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

not met, continued operation up to a maximum of four hours is allowed by ACTION L.

K.1

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

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

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

With an AC Source inoperable or LCO not met, as stated in Note for Condition H entry; or with an AC Source inoperable or LCO not met, as stated in Required Action C.2.2.3 when in Condition C for > 72 hours; or with an AC Source inoperable or LCO not met, as stated in Required Action I.2 or J.2 when in Conditions I or J for > 1 hour; or with SR 3.8.1.16 not met, Required Action L.1, L.2 and L.3 requires restoration within four hours. Condition L is modified by a Note indicating that separate Condition entry is permitted for each inoperable AC Source, and

BASES (continued)

ACTIONS

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

LCO or SR not met. The Required Action is modified by a Note that allows the remaining OPERABLE KHU and its required emergency power path to be made inoperable for up to 12 hours if required to restore both KHUs and their required emergency power paths to OPERABLE status. This note is necessary since certain actions such as dewatering the penstock may be necessary to restore the inoperable KHU although these actions would also cause both KHUs to be inoperable.

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

M.1 and M.2

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

SURVEILLANCE REQUIREMENTS

SR 3.8.1.1

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.2

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

SR 3.8.1.3

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

SR 3.8.1.4

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.5

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

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

SR 3.8.1.6

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

This SR is modified by a Note which states the SR is not required to be performed for an S breaker when its standby bus is energized from a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and cycling the S breakers connects the standby buses with the main feeder buses which are energized from another source.

SR 3.8.1.7

The KHU tie breakers to the underground path, ACB3 and ACB4, are interlocked to prevent cross-connection of the KHU generators. The safety analysis utilizes two independent power paths for accommodating

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.7 (continued)

single failures in applicable accidents. Connection of both generators to the underground path compromises the redundancy of the emergency power paths. Installed test logic is used to verify a circuit to the close coil on one underground ACB does not exist with the other underground ACB closed. The 12 month Frequency for this surveillance is adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.8.1.8

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

SR 3.8.1.9

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

This SR is modified by a Note that allows the upper limits on KHU frequency and voltage to not be met until the NRC issues an amendment which removes this Note, with the license amendment request to be

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SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

submitted no later than April 5, 2001.delays the implementation of the surveillance requirement until the KHU digital governor modification is implemented. The acceptance testing for the modification will verify that the limits in the SR are met.

SR 3.8.1.10

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

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

SR 3.8.1.11

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The 12 month Frequency for this SR is consistent with manufacturers recommendations and IEEE-450 (Ref. 8), which recommends detailed visual inspection of cell condition and rack integrity on a yearly basis.

SR 3.8.1.12

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

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

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

SR 3.8.1.14

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

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

SR 3.8.1.15

This surveillance verifies proper operation of the 230 kV switchyard circuit breakers upon an actual or simulated actuation of the Switchyard Isolation circuitry. This test causes an actual switchyard isolation (by actuation of degraded grid voltage protection) and alignment of KHUs to

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.15 (continued)

the overhead and underground emergency power paths. An 18 month Frequency minimizes the impact to the Station and the operating Units which are connected to the 230 kV switchyard. The effect of this SR is not significant because the generator red bus tie breakers and feeders from the Oconee 230 kV switchyard red bus to the system grid remain closed. Either Switchyard Isolation Channel causes full system realignment, which involves a complete switchyard realignment. To avoid excessive switchyard circuit breaker cycling, realignment and KHU emergency start functions, this SR need be performed only once each SR interval.

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

SR 3.8.1.16

This SR verifies by administrative means that one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path. That is, when the KHU to the overhead emergency power path is inoperable, the SR verifies by administrative means that the overhead emergency power path is OPERABLE. When the overhead emergency power path is inoperable, the SR verifies by administrative means that the KHU associated with the overhead emergency power path is OPERABLE.

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

REFERENCES

1. UFSAR, Section 3.1.39
2. UFSAR, Chapter 16
3. 10 CFR 50.36
4. UFSAR, Chapter 6
5. UFSAR, Chapter 15

BASES

REFERENCES (continued)

6. Regulatory Guide 1.32

7. Regulatory Guide 1.129

8. IEEE-450-1980

9. UFSAR, Section 6.3.3.3

ATTACHMENT 4

MARKUP OF TECHNICAL SPECIFICATION

ACTIONS (continued)

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

(continued)

----------NOTE----------
An additional 17 days is allowed when Condition entered to perform KHU Refurbishment Upgrades prior to April 30, 2005 except during March, April, May or June
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ACTIONS (continued)

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

----------NOTE----------
The extended Completion Time of Required Action H.2 is applicable in lieu of these Completion Times when in Condition H to isolate, test and unisolate the KHUs during each of the two KHU Refurbishment Outages.

(continued)

ACTIONS (continued)

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

----------NOTE----------
An additional cumulative 120 hours is allowed when Condition entered to isolate, test and un-isolate the KHUs during each of the two KHU Refurbishment Outages prior to April 30, 2005 provided the following conditions are met: 1) period of use not in March, April, May or June; 2) the SSF, EFW System and LCTs are verified OPERABLE prior to entering Condition, 3) RCS inventory is not reduced, 4) the SSF is manned, 5) a Jocassee Hydro Unit is verified available to provide power prior to entering Condition, 6) a 2 hour SSF DG operability test is performed prior to the start of the first dual unit outage, and 7) the Completion Time is only extended twice during each KHU Refurbishment Outage.

(continued)

The 45 day Completion Time is modified by a note indicating that an additional 17 days is allowed when Condition C is entered to perform KHU Refurbishment Upgrades prior to April 30, 2005, except during March, April, May, or June. These upgrades include, but are not limited to, hydro turbine runner and discharge ring weld repair, governor, exciter and battery replacement, and an out-of-tolerance logic circuit modification. The additional 17 days is allowed to be used once for each KHU for upgrade work performed prior to April 30, 2005.

BASES

ACTIONS

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

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

Required Actions C.2.2.1, C.2.2.2, C.2.2.3, and C.2.2.4 must be met in order to allow the longer restoration times of Required Action C.2.2.5. Required Action C.2.2.1 requires that both standby buses be energized using an LCT through the 100 kV transmission circuit. With this arrangement (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of reliability for the emergency power system is provided. In this configuration, the LCT is serving as a second emergency power source, however, since the 100 kV transmission circuit is vulnerable to severe weather a time limit is imposed. The second Completion Time of Required Action C.2.2.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost. Required Action C.2.2.2 requires suspension of KHU generation to the grid except for testing. The restriction reduces the number of possible failures which could cause loss of the underground emergency power path. Required Action C.2.2.3 requires verifying by administrative means that the remaining KHU and its required underground emergency power path and both required offsite sources are OPERABLE. This provides additional assurance that offsite power will be available. In addition, this assures that the KHU and its required underground emergency power path are available. Required Action C.2.2.3 also requires verifying by administrative means that the requirements of the following LCOs are met:

LCO 3.8.3, "DC Sources – Operating;"

LCO 3.8.6, "Vital Inverters – Operating;"

LCO 3.8.8, "Distribution Systems – Operating;"

BASES

ACTIONS

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

"perform," a failure of SR 3.8.1.4 acceptance criteria does not result in a Required Action not met. However, if the KHU and its required overhead emergency path fails SR 3.8.1.4, both KHUs and their required emergency power paths are inoperable, and Condition I for both KHUs and their emergency power paths inoperable for reasons other than Condition G or H is entered concurrent with Condition D. This demonstration is to assure that the remaining emergency power path is not inoperable due to a common cause or due to an undetected failure. For outages of the KHU and its required underground emergency power path in excess of 24 hours, an LCT (using the 100 kV transmission circuit electrically separated from the grid and offsite loads) must energize a standby bus prior to the outage exceeding 24 hours. This ensures the availability of a power source on the standby buses when the KHU and its required underground emergency power path are out of service in excess of 24 hours. The second Completion Time of Required Action D.2 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost.

The first and second Completion Time for Required Action D.3 is modified by a Note indicating that the extended Completion Time of Required Action H.2 is applicable in lieu of these Completion Times when in Condition H to isolate, test and unisolate the KHUs during each of the two KHU Refurbishment Outages.. This Note complements the H.2 Note and is necessary to allow continued operation in Condition D while in Condition H. Otherwise, the Completion Time for one inoperable KHU would expire before the Completion Time for two KHUs inoperable and entry into Condition M would be required.

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

E.1 and E.2

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

BASES

ACTIONS (continued)

The 60 hour Completion Time is modified by a Note indicating that an additional cumulative 120 hours is allowed when Condition entered to isolate, test and un-isolate the KHUs during each of the two KHU Refurbishment Upgrades prior to April 30, 2005 provided the following conditions are met: 1) period of use not in March, April, May or June; 2) the SSF, EFW System and LCTs (4C,. 5C, and 6C) are verified OPERABLE prior to entering Condition 3) RCS inventory is not reduced (RCS < 50" on LT-5), 4) the SSF is manned, 5) a Jocassee Hydro Unit is verified available to provide power prior to entering Condition, 6) a 2 hour SSF DG operability test is performed prior to the start of the first dual unit outage, and 7) the Completion Time is only extended twice during each KHU Refurbishment Outage. For example, if 140 hours (an additional 80 hours) is required to isolate the KHUs then 100 hours (an additional 40 hours) is allowed to unisolate and test the KHU. If one of the systems/components in Item 2 (SSF, EFW System and LCTs) above becomes inoperable or in Item 5 above becomes unavailable after entering the condition, immediate action should be taken to restore the equipment to OPERABLE/available status. The Keowee Refurbishment Upgrades include, but are not limited to, hydro turbine runner and discharge ring weld repair, governor, exciter and battery replacement, and an out-of-tolerance logic circuit modification.

F.1 and F.2

With the zone overlap protection circuitry inoperable when the overhead electrical disconnects for the KHU associated with the underground power path are closed, the zone overlap protection circuitry must be restored to OPERABLE status or the overhead electrical disconnects must be opened within 72 hours. In this Condition, both KHUs and their required emergency power paths are OPERABLE, however a single failure could result in the loss of both KHUs.

G.1

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

H.1 and H.2

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

or the modified Completion Time allowed by the note

LCO 3.8.3, "DC Sources – Operating;"

LCO 3.8.6, "Vital Inverters – Operating;"

LCO 3.8.8, "Distribution Systems – Operating;"

LCO 3.3.17, "EPSL Automatic Transfer Function;"

LCO 3.3.18, "EPSL Voltage Sensing Circuits;" and

LCO 3.3.19, "EPSL 230 kV Switchyard DGVP."