Duke Power Company
Oconee Nuclear Station

ATTACHMENT 1

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3.7.3 In the event that the conditions of Specifications 3.7.1 are not met within the time specified in Specification 3.7.2, except as noted below in Specification 3.7.4, 3.7.5, 3.7.6, 3.7.7, and 3.7.8, the reactor shall be placed in a hot shutdown condition within 12 hours. If these requirements are not met within an additional 48 hours, the reactor shall be placed in the cold shutdown condition within 24 hours.

3.7.4 In the event that all conditions in Specification 3.7.1 are met except that one of the two Keowee hydro units is expected to be unavailable for longer than the test or maintenance period of 72 hours, two reactors may be heated above 200°F if previously shutdown or be permitted or remain critical or be restarted provided the following following restrictions are observed.

(a) If a third reactor is greater than 200 psig and 200°F, it shall be placed in a cold shutdown condition with RCS pressure less than 200 psig and its associated standby bus to main feeder bus circuit breakers opened and blocked from automatically closing, prior to ener-gizing the 4160V standby buses through the 100 kV circuit.

(b) Prior to heating the reactor above 200°F or prior to the restart of a shutdown reactor or within 72 hours of the loss of one Keowee hydro unit, the 4160 volt standby buses shall be energized by a Lee gas turbine through the 100 kV circuit. The Lee gas turbine and 100 kV transmission circuit shall be electrically separate from the system grid and offsite non-safety-related loads.

(c) The remaining Keowee hydro unit shall be connected to the underground feeder circuit and this path shall be verified operable within 1 hour and weekly thereafter.

(d) The remaining Keowee hydro unit shall be available to the overhead transmission circuit but generation of the system grid shall be prohibited except for periods of test.

(e) Operation in this mode is restricted to periods not to exceed 45 days and the provisions of this specification may be utilized without prior NRC approval only once in three years for each Keowee hydro unit. The U.S. NRC Regional Office, Region II, will be notified within 24 hours.

3.7.5 In the event that all conditions of Specification 3.7.1 are met except that all 230 kV transmission lines are lost, two reactors shall be permitted to remain critical or be restarted provided the following restrictions are observed:

(a) If a third reactor is greater than 200 psig and 200°F, its associated stand-by bus to main feeder bus circuit breakers shall be opened and blocked from automatically closing prior to placing the 100 kV line on the standby bus. In addition, the third reactor shall be placed in hot shutdown conditions within 12 hours and in a cold shutdown condition with RCS pressure less than 200 psig within an additional 24 hours.

(b) Prior to the restart of a shutdown reactor or within 1 hour of losing all 230 kV transmission lines for an operating reactor, the 4160 volt standby buses shall be energized by one of the Lee gas turbines through the 100 kV transmission circuit. The Lee gas turbine and the 100kV transmission circuit shall completely separate from the system grid and offsite non-safety-related loads.

(c) The reactor coolant T_{avg} shall be above 525°F. Reactor coolant pump power may be used to elevate the temperature from 500°F to 525° in the case of restart. If T_{avg} decreased below 500°F, restart is not permitted by this specification.

(d) If all 230 kV transmission lines are lost, restore at least one of the inoperable 230kV offsite sources to operable status within 24 hours or be in at least hot standby within the next 6 hours. With only one offsite source restored, restore at least two 230kV offsite circuits to operable status within 72 hours from time of initial loss or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

(e) After loss of all 230 kV transmission lines, this information shall be reported within 24 hours to the U.S. NRC Regional Office, Region II. If the outage is expected to exceed 24 hours, a written report shall be submitted detailing the circumstances of the outage and the estimated time to return the 230 kV transmission lines to operating condition.

3.7.6* In the event that all conditions of Specification 3.7.1 are met, and planned tests or maintenance are required which will make both Keowee units unavailable, the 4160 volt standby buses shall first be energized by a Lee gas turbine through the 100 kV transmission circuit and shall be separate from the system grid and offsite non-safety-related loads. The reactor shall then be permitted to remain critical for periods not to exceed 72 hours with both Keowee units unavailable.

Prior to hot restart of a reactor from a tripped condition, the causes and the effects of the shutdown shall be established and analyzed. A restart will be permitted if the cause of such trips is the result of error or of minor equipment malfunctions. A restart will not be permitted if the trip is a result of system transients or valid protection system action.

*If this specification is applicable and three reactors are greater than 200 psig and 200°F, one unit shall be placed in a cold shutdown condition with RCS pressure less than 200 psig and then its associated standby bus to main feeder bus circuit breakers opened, and blocked from automatically closing. These actions shall be accomplished prior to entering this specification.

3.7.7 In the event that all conditions of Specification 3.7.1 are met except that both Keowee hydro units become unavailable for unplanned reasons, two reactors shall be permitted to remain critical for periods not to exceed 24 hours provided the 4160 volt standby buses are energized within 1 hour by the Lee gas turbine through the 100 kV transmission circuit and it shall be separate from the system grid and all offsite non-safety-related loads.

If a third reactor is greater than 200 psig and 200°F, its associated standby bus to main feeder bus circuit shall be opened and blocked from auto-matically closing prior to placing the 100 kV line on the standby bus. In addition, the third reactor shall be placed in hot shutdown conditions within 12 hours and in a cold shutdown condition with RCS pressure below 200 psig within an additional 24 hours.

Prior to hot restart of a reactor from a tripped condition, the causes and the effects of the shutdown shall be established and analyzed. A restart will be permitted if the cause of such trips is the result of error or of minor equipment malfunctions. A restart will not be permitted if the trip is a result of system transients or or valid protection system action.

3.7.8* In the event that all conditions in Specification 3.7.1 are met except that the Keowee Main Step-up Transformer is expected to be unavailable for longer than the test or maintenance period of 72 hours, as allowed by 3.7.2(a), the reactor may be heated above 200 degrees F if previously shutdown or be permitted to remain critical or be restarted provided the following restrictions are observed:

(a) Prior to heating the reactor above 200 degrees F or prior to the restart of a shutdown reactor or within 72 hours of the loss of the Keowee Main Step-up Transformer, the 4160 volt standby buses shall be energized by a Lee gas turbine through the 100kV circuit. The Lee gas turbine and 100kV transmission circuit shall be electrically separate from the system grid and off-site and non-safety-related loads.

(b) A Keowee hydro unit shall be connected to the underground feeder circuit and this path shall be verified operable within 1 hour and weekly thereafter.

(c) The remaining Keowee Hydro Unit shall be available to the underground feeder circuit.

(d) Operating in this mode is restricted to periods not to exceed 28 days and the provisions of this specification may be utilized without prior NRC approval. The U.S. NRC Regional Office, Region II, will be notified within 24 hours.

*If this specification is applicable and three reactors are greater than 200 psig and 200°F, one unit shall be placed in a cold shutdown condition with RCS pressure below 200 psig and then its associated standby bus to main feeder bus circuit breakers opened, and blocked from automatically closing. These actions shall be accomplished prior to entering this specification.

3.7.9 Any degradation beyond Specifications 3.7.2, 3.7.4, 3.7.5, 3.7.6, 3.7.7, and 3.7.8 above shall be reported to the U.S. NRC Regional Office, Region II, within 24 hours. A safety evaluation shall be performed by Duke Power Company for the specific situation involved which justified the safest course of action to be taken. The results of this evaluation together with plans for expediting the return to the unrestricted operating conditions of Specification 3.7.1 above shall be submitted in a written report to the Office of Nuclear Reactor Regulation with a copy to the U.S. NRC Regional Office, Region II, within five days.

Bases

The auxiliary electrical power systems are designed to supply the required Engineered Safeguards loads in one unit and safe shutdown loads of the other two units and are so arranged that no single contingency can inactivate enough engineered safety features to jeopardize plant safety. These systems were designed to meet the following criteria:

> "Alternate power systems shall be provided and designed with adequate independency, redundancy, capacity and testability to permit the functions required of the engineered safety features of each unit."

The auxiliary power system meets the above criteria and the intent of Criterion 17 of Appendix A to 10 CFR Part 50. The adequacies of the AC and DC systems are discussed below as are the bases for permitting degraded conditions for AC power.

Capacity of AC Systems

The auxiliaries of two units in hot shutdown (6.0MVa each) plus the auxiliaries activated by ESG signal in the other unit (4.8MVa) require a total AC power capacity of 16.8 MVa. The continuous AC power capacity available from the on-site power systems (Keowee Hydro Units) is 20 MVa (limited by transformer CT4).

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ATTACHMENT 2

TECHNICAL JUSTIFICATION

Technical Justification

The standby buses at Oconee Nuclear Station (ONS) are available to supply 4160V power to the main feeder buses in the event that power from the normal and/or startup auxiliary transformers is unavailable. The standby buses may receive power from transformer CT-4 via the Keowee hydro units, or CT-5 via the Central switchyard or Lee gas turbines. In the event that the Keowee Hydro units are unavailable, gas turbines at the Lee Steam Station are lined up through a dedicated transmission line to supply power to the standby buses (see FSAR Figure 8.1-1).

As detailed in Licensee Event Report 269/88-13, an electrical transient analysis revealed that the voltage profile from the Lee Steam Station to ONS may not support emergency loads if applied suddenly. Specifically, when powered from the Lee gas turbines, a less than adequate voltage level may exist on the standby bus under the following conditions:

1) All three units transfer to the standby bus simultaneously in the event of a Loss Of Offsite Power (LOOP);

2) Loss of Coolant Accident (LOCA) loads of one unit transferring to the standby bus followed by the transfer of LOOP loads of the other two units in the event of a LOCA/LOOP.

Further calculations have indicated that in conditions which require the standby buses be energized via a Lee gas turbine, only two Oconee units can remain in a condition with Reactor Coolant System (RCS) pressure above 200 psig based on the capability of the Lee gas turbine to maintain adequate voltage on the standby buses with the existing LOCA/LOOP loading sequence. The third Oconee unit must be placed in a condition with RCS pressure below 200 psig and with its standby breakers opened and blocked from automatically closing in order to prevent the possibility of an undervoltage condition on the standby bus. The third unit can be connected manually to the standby bus approximately 30 seconds after the other two units automatically transfer to the standby bus.

Technical Specifications proposed within Attachment 1 are provided to ensure that adequate standby bus voltage exists for all design basis accident scenarios. Briefly, these changes will require the following actions:

1) If for planned reasons a Lee gas turbine is required, then at least one unit shall be placed in a cold shutdown condition with RCS pressure below 200 psig and with its standby bus circuit breakers opened and blocked from automatically closing prior to energizing the 4160V standby buses through the Lee 100kV circuit;

2) If for unplanned reasons a Lee gas turbine is required, one unit's standby bus circuit breakers shall be opened and blocked from automatically closing and the unit shall be placed in a cold shutdown condition with RCS pressure below 200 psig within 36 hours.

The Technical Specifications proposed within Attachment 1 can be justified based on the fact that analysis has shown that CT-5 is able to start two units for both the LOOP and LOCA/LOOP events and then start the third unit loads after the standby bus voltage has stabilized (approximately 30 seconds).

Since the third (cold shutdown) unit would be prevented from automatically transferring to the standby bus after a LOOP, manual operator action would be required to align the unit to the standby bus. This means that the cold shutdown unit would be without power for a longer period of time. However, analysis has shown that greater than 30 minutes are available for operators to take manual action.

Specific changes included within this amendment request are:

1) Specification 3.7.4 has been changed to allow only two reactors be greater than 200 psig and 200°F in the event one Keowee hydro unit is expected to be unavailable for longer than 72 hours.

2) Existing Specifications 3.7.4(a),(b),(c), and (d) have been renumbered 3.7.4(b),(c),(d),and (e) respectively. A new Specification 3.7.4(a) has been added which requires the third unit be placed in a cold shutdown condition with RCS pressure below 200 psig and with the associated standby bus to main feeder bus circuit breakers opened and blocked from automatically closing in the event one Keowee hydro unit is expected to be unavailable for longer than 72 hours.

3) Specification 3.7.5 has been changed to allow only two reactors remain critical in the event that all 230 kV transmission lines are lost.

4) Existing Specifications 3.7.5(a),(b),(c), and (d) have been renumbered 3.7.5(b),(c),(d), and (e) respectively. A new Specification 3.7.5(a) has been added which in the event that all 230 kV transmission lines are lost requires the third unit have its standby bus to main feeder bus circuit breakers opened and blocked from automatically closing prior to placing the 100kV line on the standby bus. In addition, the third reactor shall be placed in hot shutdown conditions within 12 hours and in a cold shutdown condition with RCS pressure below 200 psig within an additional 24 hours.

5) A footnote has been added to Specification 3.7.6 which requires that prior to entering Specification 3.7.6, if three reactors are greater than 200 psig and 200°F, one unit shall be placed in a cold shutdown condition with RCS pressure below 200 psig and its associated standby bus to main feeder bus circuit breakers shall be opened and blocked from automatically closing.

6) The provisions of Specification 3.7.7 have been changed to allow only two units remain critical. In addition, if a third unit is above 200 psig and 200°F its associated standby bus to main feeder bus circuit breakers shall be opened and blocked from automatically closing prior to placing the 100 kV line on the standby bus. In addition, the third reactor shall be placed in hot shutdown conditions within 12 hours and in a cold shutdown condition with RCS pressure below 200 psig within an additional 24 hours.

7) A footnote has been added to Specification 3.7.8 which requires that prior to entering Specification 3.7.8, if three reactors are greater than 200 psig and 200°F, one unit shall be placed in a cold shutdown condition with RCS pressure below 200 psig and its associated standby bus to main feeder bus circuit breakers shall be opened and blocked from automatically closing.

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ATTACHMENT 3

No Significant Hazards Consideration Evaluation

No Significant Hazards Consideration Evaluation

Duke Power Company (Duke) has made the determination that this amendment request involves a No Significant Hazards Consideration by applying the standards established by NRC regulations in 10 CFR 50.92. This ensures that operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated:

Each accident analysis addressed within the Oconee Final Safety Analysis Report(FSAR) has been examined with respect to changes proposed within this amendment request. The probability of any Design Basis Accident (DBA) is not affected by this change, nor are the consequences of a DBA affected by this change since additional restrictions which assure adequate standby bus voltage during DBAs are not considered to be an initiator or contributor to any accident analysis addressed in the Oconee FSAR.

In order to assure availability of emergency power to Oconee during periods of inoperability of Keowee Hydro Station, a Lee gas turbine generator is used to energize the standby bus. The design basis of Lee gas turbine generators, the step-up transformer, the isolated 100 kV line, and transformer CT-5 is to provide emergency power to the standby buses. Analysis has shown that CT-5 is able to provide and adequate voltage level on the standby bus under the following most limiting DBA conditions:

1) Two unit transfer to the standby bus simultaneously in the event of a Loss of Offsite Power (LOOP);

2) LOCA loads of one unit transfer to the standby bus followed by the transfer of LOOP loads of another unit in the event of a LOCA/LOOP.

Changes to Technical Specifications provided within this amendment request are in support of this analysis. These changes assure that CT-5 remains operable through placing the third unit in a cold shutdown condition with RCS pressure below 200 psig and preventing the automatic transfer of the loads of that unit to the standby bus.

The consequences of a loss of all station power is analyzed in FSAR Section 15.8.3. The analysis demonstrates the features incorporated in the design to sustain loss of power conditions with only the station batteries to operate system controls. Each reactor can sustain a complete electrical power loss without emergency cooling for about 23 minutes before the steam volume in the pressurizer is filled with reactor coolant. Beyond this time reactor coolant will boil off, and an additional 83 minutes will have elapsed before the boiloff will start to uncover the core. This analysis bounds the consequences of CT-5 becoming inoperable for the two units which are able to automatically transfer to the standby bus.

While operation of the unit in cold shutdown with RCS pressure below 200 psig and automatic transfer to the standby bus prevented is not specifically addressed in the Oconee FSAR, it has been shown by analysis

to be acceptable. Greater than 30 minutes are available for an operator to manually reposition one switch in the control room to restore power while assuring the consequences for the unit are acceptable. As such, this change will not involve a significant increase in the probability or consequences of previously evaluated accidents.

(2) Create the possibility of a new or different kind of accident from any kind of accident previously evaluated.

Changes included within this amendment request constitute additional restrictions not presently included within the Technical Specifications. These changes assure adequate standby bus voltage during design basis accidents. Operation of two units which are able to automatically transfer to the standby bus in accordance with these proposed Technical Specifications will not create any failure modes not bounded by any accident analysis addressed in the Oconee FSAR, since analysis has shown that CT-5 is able to provide an adequate voltage level on the standby bus under the following most limiting DBA conditions:

1) Two units transfer to the standby bus simultaneously in the event of a LOOP;

2) LOCA loads of one unit transfer to the standby bus followed by the transfer of LOOP loads of another unit in the event of a LOCA/LOOP.

Consequently, this change will not create the possibility of a new or different kind of accident from any kind of accident previously evaluated.

Operation of the unit in cold shutdown with RCS pressure below 200 psig and with automatic transfer to the standby bus prevented while not specifically addressed in the Oconee FSAR has been shown by analysis to be acceptable. Greater than 30 minutes are available for an operator to manually reposition one switch located in the control room to restore power while assuring the consequences are acceptable. As such, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

(3) Involve a significant reduction in a margin of safety.

The bases for the auxiliary electrical power system are to supply the required Engineered Safeguards loads in one unit and safe shutdown loads of the other two units and are so arranged that no single contingency can inactivate enough engineered safety features to jeopardize plant safety. Analysis has shown that this is unaffected for the two units which are able to automatically transfer to the standby bus. In addition, if power is manually restored to the third (cold shutdown) unit within the allowed time (greater than 30 minutes), no key safety parameters will be adversely affected and the margin of safety will be preserved. As such, there will be no significant reduction in any margin of safety.

Duke has concluded based on the above and supporting Technical Justification provided in Attachment 2 that there is a no significant hazards consideration involved in the amendment request.