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AUTH.NAME	AUTHOR AFFILIATION
THIES,A.C.	Duke Power Co.

RECIP.NAME	RECIPIENT AFFILIATION
DENTON,H.R.	Office of Nuclear Reactor Regulation, Director
STOLZ,J.F.	Operating Reactors Branch 4

SUBJECT: Forwards response to NRC 810225 Generic Ltr 81-04 re emergency procedures & training for station blackout events. No changes necessary other than mod to turbine driven pump. Eight oversize drawings encl.Aperture cards will be in PDR.

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DUKE POWER COMPANY

CHARLOTTE, N. C. 28242

A. C. THIES
SENIOR VICE PRESIDENT
PRODUCTION AND TRANSMISSION

(704) 373-4249

July 1, 1981

RECEIVED JUL 07 1981 U.S. NUCLEAR REGULATORY COMMISSION

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: J. F. Stolz, Chief
Operating Reactors Branch No. 4

Re: Docket Nos. 50-269, -279, -287

Dear Sir:

In an NRC letter dated February 25, 1981, the staff requested a review of emergency procedures and training for station blackout events.

Please find attached the Duke Power Company response to this request for Oconee Nuclear Station. My letter of June 1, 1981 addresses the delay associated with providing this submittal.

Very truly yours,

A. C. Thies

A. C. Thies

RLG/php

Attachment

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A. C. Thies, being duly sworn, states that he is Senior Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this review of emergency procedures and training; and that all statements and matters set forth therein are true and correct to the best of his knowledge.

A. C. Thies

A. C. Thies, Senior Vice President

Subscribed and sworn to before me this 1st day of July, 1981.

Sue C. Sherrill

Notary Public

My Commission Expires:

September 20, 1984

DUKE POWER COMPANY
OCONEE NUCLEAR STATION
RESPONSE TO NRC GENERIC LETTER 81-04
EMERGENCY PROCEDURES AND TRAINING FOR
STATION BLACKOUT EVENTS

The Staff has requested that the current operations at Oconee Nuclear Station be reviewed to determine the capability to mitigate a station blackout event and to promptly implement, as necessary, emergency procedures and a training program for station blackout events. The following is an assessment of the existing facility procedures and training programs with respect to the matters described the staff's letter. Based on the results of this review, it is considered that no changes to the Oconee operations, design, or training program are necessary in the unlikely event of a station blackout, other than the modification to the turbine driven pump described herein.

I. THE DESIGN OF THE ELECTRICAL DISTRIBUTION SYSTEM OF OCONEE

A. The emergency electric power system provided for each Oconee unit possesses certain inherent design features which improve its reliability over limited capacity split-bus arrangements usually provided in nuclear power plants.

The basic design criteria of the entire emergency electric power system of a nuclear unit, including the generating sources, distribution system and controls, is that a single failure of any component passive or active will not preclude the system from supplying emergency power when required. Special provisions have been employed to accomplish this which include a double bus - double breaker distribution system, redundant circuit breaker trip coils and circuits, diverse protective relaying for each circuit breaker, redundant load shedding and transfer logic equipment, physical separation and other features.

The reliability afforded by the split bus concept is included in the design of the double bus - double breaker system employed here. Consideration has been given to the capacity of the emergency power sources, the method of switching, redundancy utilized and the protective features. For example, the electrical system together with the sources of electric power which are installed to supply emergency power to a nuclear unit possesses the following design features:

1. Each electric power source is extremely large for the requirements. For example, each of the redundant on-site Keowee hydro electric units is rated 87,500 kVA while the maximum combined load demand on one nuclear unit with a LOCA and the other two nuclear units in a hot shutdown condition is 16,730 kVA. The emergency power source via the connection to the 100 kV transmission system through trans-CT-5 which has a maximum continuous rating of 22,500 kVA; and when the underground path is powered through CT-4, 20 MVa. The significant effect of these large sources of emergency power is to improve the overall reliability of the electric system for several reasons; namely, the transient effects of both fault clearing and switching required loads to any of the sources is negligible. In addition, a greater number of plant auxiliaries may be run and used to help cope with the incident as well as shut down conditions as compared to nuclear plants which have limited capacity emergency power sources such as diesel generators.

2. The Keowee hydroelectric units are inherently reliable sources of power as proven by years of operating experience with similar generating units. Since they are stored energy type machines, their realibility in both starting and running for extended periods is far greater than the diesel generator which is an internal combustion type machine.

3. Each electric power distribution system is designed with redundant full capacity buses to match the capacity of the large emergency power source. This thereby provides two continuous

sources of supply from the two full capacity main feeder buses to each of the three engineered safeguards load buses.

4. Reliability of the engineered safeguards load buses is assured by the following protective features:

   a. Engineered safequards load bus faults or bus overload conditions are protected against by both ground fault overcurrent relays and phase overcurrent relays. These relays are provided on each load bus feeder breaker and function to open the associated breaker to isolate the load bus from the main feeder buses, thereby maintaining the integrity of the main feeder buses.

   b. Each load bus feeder breaker is also included in the zone of protection afforded by the main feeder bus differential current relays which would function to isolate a faulted breaker from any source of supply.

   c. Each load bus feeder breaker is provided with breaker failure protective relaying. This feature will initiate action to isolate the breaker from any source of supply if the breaker fails to open upon a protective relay trip. The maximum equipment this would remove from service is one load bus and one main feeder bus, leaving two load buses and the other main feeder bus to supply the required loads which are sufficient to perform the necessary safety functions.

   d. Each load bus feeder breaker is provided with redundant trip coils, supplied from seperate DC supplies, assuring positive trip action.

   With the above protective features plus their metal-clad construction and the physical separation maintained, failure of any one of the three redundant load buses or components will not affect the ability of the other two buses to supply their engineered safeguards loads.

5. Reliability of the main feeder buses and the standby buses is assured by the following protective features:

   a. Each main feeder bus and each standby bus is protected independently by differential current relays. These relays will sense any fault condition in the zone between the high side of the incoming feeder breakers to the low side of the outgoing feeder breakers. The outgoing feeder breakers on the standby bus would be the breakers connecting to the main feeder buses and they would have overlapping differential protection from both buses. The outgoing feeder breaker of the main feeder buses would be the feeder breakers to the engineered safeguards load buses. If a fault condition occurs, the relays will function to isolate the affected bus from all sources of supply by opening all circuit breakers associated with that bus. The other redundant bus will still provide the required power to all three engineered safeguards load buses.

b. Each feeder breaker to each of the buses is protected with phase overcurrent and ground fault overcurrent protective relaying. These relays function to open the breaker and isolate the main feeder bus from the power source upon occurrence of these overcurrent conditions. This thereby maintains the integrity of the power source and allows the continued supply of power to the other bus and all three engineered safequards load buses. The comparable condition on a split bus concept would cause the loss of one engineered safeguards bus.

c. Each feeder breaker is also provided with breaker failure protective relaying. This feature will initiate action to isolate the breaker from any source of supply if the breaker fails to open on a protective relays trip. The maximum loss on this condition would be the connected source of supply and the associated bus. The other bus would transfer by the redundant transfer logic to the alternate source of supply and continue supplying power to all three engineered safeguards load buses. The maximum loss under the split bus concept would not only be the source of supply, but also the associated engineered safeguards load bus.

d. Each feeder breaker is provided with redundant trip coils supplied from separate DC supplies, assuring positive trip action.

With the above protective features, their metal-enclosed construction and their physical separatin, failure of any one of the redundant bus sections or components will not affect the ability of the other buses to supply the engineered safeguards loads.

B. The emergency power sources are independent of each other and switched on to the main feeder buses such that this independency is maintained. Paralleling of emergency power sources is prevented by redundancy in transfer logic equipment and interlocking. For example, each hydro generating unit and transformer is an independent entity in itself.

In the event of an accident requiring engineered safeguards, and the simultaneous loss of the complete external transmission network, power is provided from either or both of the two on-site Keowee generating units. The independency and redundancy of these power sources are maintained by electrically separate switchgear, feeders, transformers, and motor controls from the source to the engineered safeguards auxiliaries. Redundant instrumentation, control equipment, and vital power supplies are provided to assure reliability in selection and switching of the emergency power. The following is a more detailed description of these provisions made to assure emergency power availabiltiy to engineered safeguards.

1. Engineered Safeguards Auxiliary Buses:

The engineered safequards are provided with redundancy. To maintain this redundancy, the engineered safeguards equipment is connected to three redundant switchgear buses such that engineered safeguards equipment performing the same function is connected to different switchgear buses. Each of these switchgear buses is supplied from both of the redundant 4160 volt main feeder buses which are supplied from redundant sources. In the event of an accident and the simultaneous loss of the external transmission network, the switchgear buses are supplied emergency power through both 4160 volt main feeder buses from either the 4160 volt startup transformers through their respective feeder breakers or from both of the redundant standby power buses. The standby power buses receive emergency power from either the Keowee Hydro Station or the 100 kV transmission line. In the event of a Loss of Coolant Accident (LOCA), any breakers supplying the engineered safeguards loads are closed automatically. In the event of a LOCA and the simultaneous loss of both the normal auxiliary source and the startup source, the non-essential load breakers are tripped. Redundant engineered safeguards load-shedding logic equipment assures positive shedding of non-essential equipment by energizing separate trip coils provided in their circuit breakers. Redundant engineered safeguards actuation channels initiate closing of the essential equipment feeder breakers.

2. Keowee Hydro Station

Two 87,500 kVA generating units are installed and generate power at 13.8 kV. Except for the penstock, each unit is entirely independent of the other, consisting of its own turbine, governor system, generator, exciter, voltage regulator, generator circuit breaker, synchronizing equipment, protective relaying, automatic startup control equipment, manual controls, unit DC control battery, etc. Each unit is provided with its own automatic startup equipment located in separate cubicles within the Keowee control room. The initiation of startup is accomplished by control signals from the Oconee control area. Normal startup of either unit is by operator action while emergency startup is automatic. Both units are started automatically and simultaneously and run on standby on either of two conditions; namely, if the external transmission system is lost or if engineered safeguards action is required. If the units are already operating when either of the above conditions occur, they are separated from the network and continue to run on standby until needed. Each unit's voltage regulator is equipped with a volts-per-cycle limiting feature which permits it to accept full emergency power load as it accelerates from zero to full speed within 23 seconds from receipt of the emergency startup initiation signal.

On normal automatic startup, each unit is automatically connected and supplies power to the Oconee 230 kV switching station through the step-up transformer by its respective 13.8 kV generator circuit breaker. This is accomplished by the automatic synchronizing equipment of each unit. On emergency automatic startup, both units are started; the unit with the 13.8 kV underground feeder connected to it supplies that feeder and the other unit is available to supply the 230 kV Oconee switching station. If there is a system disturbance, this unit is connected automatically to the Oconee 230 kV switching station through interlocks indicating the 230 kV switching station is isolated from the system and the bus voltage has decayed. The redundant External Grid Trouble Protective Systems are provided to isolate the 230 kV switching station on failure of the external transmission network. Therefore, on loss of the external transmission network, both of the Keowee hydro units can provide emergency power to any of the Oconee units through either the 230 kV switching station to the unit's respective startup transformer or the 13.8 kV underground feeder and its 4160 volt transformer at Oconee. This 13.8 kV underground feeder is connected to the terminals of one hydro electric generator by air circuit breakers and is energized whenever that generator is in service in either emergency or normal mode.

Hydro units are extremely reliable sources of electrical power, as proven by years of operating experience. The independent Keowee units, along with the alternate circuits, provide the required redundance to assure reliable emergency power. Storage capacity of the Keowee reservoir and naturally occurring minimum streamflow are such that the generating untis can provide continuous emergency power following an accident. The Keowee reservoir, between its normal elevation and maximum planned drawdown, has sufficient storage which, when combined with minimum recorded streamflow on the Keowee River will permit a hydro unit to carry continuously one nuclear unit's emergency auxiliary loads for 126 days.

Additional redundant equipment provided to assure reliable control and operation of the units includes:

a. Two separate and redundant groups of underground multi-conductor control cables between the Keowee and Oconee control room, each of which carries separate startup and control signals.

b. Redundant control initiating signal devices in the Oconee station to initiate manual and automatic startup of each of the Keowee generating units.

c. Redundant control receiving devices in the Keowee station to receive redundant signals to initiate manual and automatic startup of each of the Keowee generating units.

3. Emergency Power Switching

Emergency power from the Keowee generating station is available through two circuits; the overhead 230 kV circuit through the startup transformers, and the underground 13.8 kV circuit through a transformer to the 4160 volt standby power buses and feeder circuit breakers. The power from the startup transformer circuits is available to each unit's redundant 4160 volt main feeder buses through redundant startup circuit breakers. The power from the 4160 volt standby power buses is available to each unit's main feeder buses through redundant circuit breakers. This arrangement assures that sufficient emergency power for engineered safeguards of any unit can be supplied from the 13.8 kV undergrond feeder from Keowee.

Redundant systems of emergency power switching equipment are provided to switch the emergency power to the unit's 4160 volt redundant main feeder buses. The redundant transfer logic will seek the most available source of power and, when it becomes available, close into it. If this source is then subsequently lost, the switching logic and equipment will transfer to the other source automatically. Without offsite power, the power sources are as follows: (1) power from Keowee through the startup transformer and (2) power from Keowee through the 13.8 kV underground feeder to the standby buses.

In the unlikely circumstance that power is unavailable to all of the 4160 volt main feeder buses of Units 1, 2, and 3, a source of power will be made available to supply the shutdown loads of all three units through the standby power buses. This source consists of one or two available 44.1 MVA gas turbine generating units located 30 miles away at the Lee Steam Station and arranged to supply power over the 100 kV transmission line from Lee to Oconee via Central. Under this circumstance, the 100 kV transmission line is isolated from the 100 kV transmission system to supply power solely to Oconee. The 100 kV transmission line is located above the level of any flood that is postulated on the Keowee River. Should maintenance requirements make both Keowee hydro units unavailable, a Lee gas turbine can be brought to speed-no-load and directly connected to Oconee through the 100 kV line, and if an emergency occurs, this 100 kV line can be separated from the balance of the transmission system.

The seismic design basis for the emergency power system and its controls is based on the design or maximum hypothetical earthquake. The equipment is designed to assure it will not lose its capability to perform its intended function during and following the design bases event. If a seismic disturbance occurrs after a major accident, the emergency power system will perform its intended function.

C. Currently, Duke Power has under construction at Oconee a dedicated Standby Shutdown Facility, which has been designed to maintain all three units in a hot shutdown condition, without reliance on existing electrical power sources. A complete design description of this facility was submitted for staff review on March 28, 1980.

D. For each unit, two separate emergency lighting systems are provided; namely, an emergency 250 volt DC lighting system and a separate engineered safeguards 208/120 volt AC lighting system. These two systems are separate and distinct.

The 250 volt DC lighting system, which is normally deenergized, provides operating level lighting in the control room and lighting at selected stairs and corridors in the Auxiliary, Turbine, and Reactor Buildings. The emergency lighting is energized automatically by an undervoltage sensing relay mounted on the individual panelboards located in their associated areas. Control power for the undervoltage transfer circuit is provided from the 250 volt DC station batteries. A test button is also provided at each panelboard to test the operability of the system without affecting normal lighting. All associated lighting units are incandescent.

The engineered safeguards lighting system, which is normally deenergized, provides lighting in the following parts of the auxiliary building: control room, cable room, equipment room, stairs, exits, corridors, hot machine shop, spent fuel pool room, fuel unloading area, decontamination rooms, pump and tank room area, fan and ventilation rooms of roof elevation, penetration rooms, and purge rooms. The stairs and platforms in the reactor building are also provided lighting to enable personnel to leave or enter the entire building. Power is provided from two engineered safeguards 600 volt AC control centers through two 600/208/120 volt AC dry type transformers which in turn feed each of two panelboards located in the equipment room area. The engineered safeguard lighting is energized automatically by undervoltage sensing relays monitoring the normal 600 volt AC feeder voltage.

II. ASSESSMENT OF TOTAL LOSS OF AC POWER EVENT

The Oconee Nuclear Station Final Safety Anaylsis Report addresses a hypothetical condition which results in a complete loss of all system and station power. Reactor protection criteria are considered such that fuel damage will not occur from an excessive power-to-flow ratio nor will the reactor coolant system pressure exceed design pressure.

A loss of all power or station blackout would exist only when both Keowee Hydro Units, which supply normal emergency power, fail to start after a loss of all offsite power. Thereafter, until a Lee Gas Turbine is on line or one of the Keowee generators is started, the only power available to the plant auxiliaries are the 125 V DC battery banks. This results in a loss of power to the following major components in addition to those lost due to the loss of offsite power:

- Motor Driven Emergency Feedwater Pumps
- High Pressure Injection Pumps
- Pressurizer Heaters

The sequence of events and an evaluation of the consequences relative to this accident are:

1. A loss of power results in gravity insertion of the control rods and trip of the turbine stop valves.

2. The main steam safety valves actuate after the turbine stop valves trip and prevent excessive temperatures and pressures in the reactor coolant system.

3. The reactor coolant system flow decays without fuel damage occurring. Decay heat removal after coastdown of the reactor coolant pumps is provided by the natural circulation characteristics of the system.

4. The Main Feedwater Pumps have tripped placing the plant into a loss of feedwater transient. The plant relies on only the Turbine Driven Emergency Feedwater Pump for the injection of emergency feedwater into the steam generator for natural circulation. The emergency feedwater pump takes suction from the condenser hotwell and the upper surge tank and is driven by steam from either or both steam generators. Based on an independent evaluation of the emergency feedwater system, it was determined that some design changes were warranted to further assure that the turbine driven emergency feedwater pump could fully function independent of AC power. This modification is being implemented at Oconee in accordance with the schedule provided by Duke letter of June 1, 1981 on this subject.

5. Each unit condenser cooling water system is arranged to provide cooling water even in the unlikely event that all power is lost. Condenser cooling water intake is obtained from a point below minimum level in the Little River branch of Lake Keowee. Circulating water pumps are provded during normal operations to overcome line

friction and to discharge condenser flow to Lake Keowee. An emergency line, discharging to the Keowee Dam tailrace and normally closed by a power-to-close valve, is provided to obtain cooling water circulation by gravity head even if power is lost.

The turbine bypass valves would open during this event after the turbine stop valves close, therefore, admitting steam to the condenser. However, because the bypass valves fail closed on loss of instrument air - heat removal via the condenser would continue only as long as reserve instrument air pressure keeps the bypass valves open.

6. The High Pressure Injection Pumps are not powered and thus HPI cooling cannot be initiated.

The features described above would permit decay heat cooling of the unit for an extended period of time folliwng a hypothetical complete loss of electric power.

The above evaluation demonstrates the features incorporated in the design to sustain los of power conditions with only the station batteries to operate system controls. Immediate operation of the emergency feedwater pump and the emergency condenser cooling water system is not of critical nature.

Each reactor can sustain a complete electric power loss without emergency cooling for several minutes.

Beyond this time, reactor coolant will boil off, and several additional minutes will have elapsed before the boil off will start to uncover the core.

This situation cannot be maintained indefinitely because of the lack of primary inventory control and a finite supply of good quality secondary water (seondary side heat removal is via the main steam relief valves. A minimum of 72,000 gallons of water is maintained in the Upper Surge Tank, Condensate Storage Tank, and Hotwell which is the amount needed for 11 hours of operation per Unit. However, severe RCP seal damage can occur within 10-12 minutes and can result in significant leakage within about 60 minutes without seal injection.

Therefore, the operator is directed by procedure to start at least one hydro generator or lineup power via the Lee station 100 KV feeder so that emergency feedwater and makeup can be remotely initiated and controlled.

Since the pressurizer heaters and injection pumps have lost power, the operator has no control of primary pressure or inventory. Any voids that form in the primary will tend to accumulate in the hot leg and obstruct natural circulation. With no loss of RCS mass (only volume shrinkage), hot-leg voids will be collapsed as RCS swells after circulation is interrupted. Therefore, natural circulation should be re-established even if steam generators are not at the 95% level. The operator should monitor natural circulation and, if necessary, raise the steam generator level to 95% on the operating range. Offsite power must be regained or a Keowee Hydro Unit started or the Lee station started before primary inventory control is lost.

Two documents which have been prepared in response to NUREG-0737, Item I.C.1 (formerly NUREG-0578, Item 2.1.9) are attached. These are the Oconee Safety Sequence Diagram for Loss of Offsite AC Power (EDS-0114-011-003) and the Oconee Event Tree for Loss of Offsite Power (1120026 F Rev.1). They present in graphic form the sequence of events associated with the postulabed loss of offsite power transient. The event tree also shows the sequence of events that would occur under the condition of failure of both Keowee hydro units to start. (These documents were used to develop operator guidelines, as required by the NUREG, which undergoing review by Duke personnel.)

Finally, the Oconee Probabilistic Risk Analysis effort, currently ongoing, is reviewing this postulated event to determine its contribution to overall plant risk.

III. ASSESSMENT OF LOSS OF POWER EMERGENCY PROCEDURES

Two submittals of documents have been made to the staff on separate issues which have provided copies of the pertinent loss of power emergency procedures. By letter dated March 2, 1981, ten copies of the Oconee Nulcear Station Emergency Plan Implementing Procedures were provided for Staff use. This submittal included: EP/O/A/1800/16, Loss of Power; EP/O/A/1800/25, Loss of 4160V Power and BWST; EP/O/A/1800/31, Loss of 3 KI Bus. By letter dated April 3, 1981, four copies of the Oconee 3 Abnormal Transient Operator Guidelines were provided for Staff review as required by NUREG-0737, Item I.C.1.

The actions for restoring offsite AC power when its loss is due to postulated onsite equipment failures or loss of the grid are covered by the above listed Emergency Procedures.

The operator receives instructions per the Oconee Loss of Power Emergency Procedure concerning power restoration for a loss of the 230 kV grid. The operator is required to trip the operating reactors and complete the normal actions following a reactor trip. The following automatic actions must then be verified; if the actions have not occurred, the operator must perform them manually.

1. Switchyard is isolated.

2. Both Keowee Units start.

3. The hydro unit connected to the 13.8 kV underground feeder energizes CT-4. PCB-9 closes and the 230 kV yellow bus is energized from the second hydro unit. PCB-18, 27 and 30 close, energizing CT-1, CT-2, and CT-3.

4. If turbine-generator trip occurs, and CT-1, CT-2, CT-3 are energized, startup buses will be supplied through CT-1, CT-2, or CT-3.

5. If turbine-generator trip ocurs and power is not available to CT-1, CT-2, CT-3, power will be supplied through standby buses.

   NOTE: If power is not available on the startup transformers, Emergency Power Switching Logic will energize the main feeder buses from CT-4 through the standby buses.

After verifying station loads are being supplied, the operator is required to determine the cause of the switchyard isolation and coordinate efforts with the dispatcher on returning the switchyard to normal.

If both Keowee Units do not start following a loss of the grid, the station will experience a loss of power on the main feeder buses. The operator is directed then to verify the following automatic actions:

1. Turbine Generator/Reactor Trip
2. Turbine Driven Emergency Feedwater Pump Automatic Start
3. CCW gravity flow to the Keowee tailrace
4. DC power maintains AC and DC instrumentation and emergency oil pumps.

The operator is then required to perform the following manual actions:

1. Operate breakers to line up service to CT-5 direct from Lee Steam Station. Notify Lee Steam Station to energize 100 kV service to Oconee Nuclear Station.

2. Close in breaker CT-5 (4.16 kV to Bus One and to Bus Two) to supply 4160 standby buses.

3. Close breakers to energize 4160 main feeder bus from standby bus.

4. Verify all essential loads are operating; if not, close in manually.

5. Determine the cause and correct the loss of 4160.

Oconee procedures address the restoration of power when the loss is due to onsite equipment failure in the following situations:

1. Loss of the Engineered Safeguards 4160 V Switchgear

2. Loss of power on the Vital Bus which supplies AC and DC instrumentation and the 125 VDC control power panelboard

3. Loss of Control Battery

4. Loss of Normal Transformer

5. Loss of Startup Transformer

6. Loss of KI Bus

The loss of onsite AC power at Oconee results in the restoration of emergency power with the Keowee Hydro Units. The Keowee Hydro Units will automatically start under the following conditions to supply the necessary emergency power:

1. Engineered Safeguards actuation of channels one or two will cause an emergency start signal to be sent to both Keowee Units.

2. Both hydro units will also receive an emergency start signal if an undervoltage condition is detected on at least two of the three phases of the main feeder bus for 20 seconds by the Main Feeder Bus Monitoring System.

3. Both hydro units will also receive an emergency start signal in a switchyard isolation situation where an undervoltage or underfrequency condition is detected on at least two of the three phases of both the Red and Yellow Bus.

   As noted earlier, the Keowee Units are considered quite reliable. The hydro units do <u>not</u> have a history of failing to start when an emergency start signal is received, but startup by the Oconee operators may be performed as needed.

Sufficient guidelines and precautions are described to prevent equipment damage during the return to normal operations. The restoration of power and return to service sequence requirements for station equipment are covered by appropriate operating procedures. Equipment will be returned to service per normal operating procedures per normal system limits and precautions. Specific recovery procedures do not appear to be necessary at this time.

With regard to Reactor Coolant Pumps, the instructions to restart a pump following an extended loss of seal injection water and/or component cooling water are addressed in the Oconee Reactor Coolant Pump Operating Procedures in a section titled "Abnormal Operation".

Based on review of these procedures, it is considered that the existing operating instructions adequately address the issue of a postulated loss of AC power event.

IV. ASSESSMENT OF OPERATOR TRAINING

The requlaification training program conducts review of all emergency procedures on an annual basis. The Loss of Power Emergency Procedure is, of course, included in this review. The loss of power event is also discussed in detail when the electricial system lesson plan is covered every two years (normal requlaification training program requires material to be covered every two years). Simulator exercises are currently scheduled on a two year basis (minimum) for all licensed operators which includes exercises concerning loss of station power.

Through continued training, the operators at Oconee Nuclear Station will continue to be capable of responding to a station blackout event therefore ensuring continued safe operation of the units.