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SUBJECT: Forwards supplemental response to requirements for station blackout.

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DUKE POWER

April 4, 1990

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269, 50-270, and 50-287
10 CFR 50.63; Requirements for Station Blackout (SBO)

Gentlemen:

On January 4, 1990 NUMARC issued a letter to all utilities requesting that supplemental information be provided to the NRC concerning SBO. Based on the NUMARC letter, Duke Power Company has performed a review of its previous SBO response to the NRC as well as the supporting documentation to verify that:

1. Implementation is consistent with the supplemental guidance provided by the attachments to the January 4, 1990 NUMARC letter,

2. Applicability of NUMARC 87-00 assumptions is documented in utility files, and

3. Departures from the accepted NUMARC 87-00 methodology are identified.

Attached is an updated version of my April 17, 1989 submittal which provides additional details concerning Oconee's SBO capabilities. This submittal is based on the NUMARC 87-00 guidance including the clarifications transmitted by the NUMARC letter dated January 4, 1990. Deviations from the NUMARC 87-00 guidance are specifically noted.

With regard to Emergency AC Power reliability, it is Duke Power Company's intention to maintain the target reliability value of 0.975.

A program to track the Alternate AC (SSF D/G) reliability target value per Appendix B of NUMARC 87-00 will be implemented by the end of this year.

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There are no equipment modifications required or planned at Oconee to meet this rule.

Very truly yours,

Hal B. Tucker

RGM/03279002

Attachment

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A. Station Blackout Duration

NUMARC 87-00, Section 3 was used to determine the SBO required coping duration category. The results show that Oconee Units 1 and 2 are in the 4 hour coping duration category.

The following plant factors were identified in determining the proposed station blackout duration.

1. AC Power Design Characteristic Group is P1 based on:

   a. Expected frequency of grid-related LOOPS does not exceed once per 20 years (Section 3.2.1, Part 1A, p. 3-3).

   b. Estimated frequency of LOOPS due to extremely severe weather places the plant in ESW Group 1 (Section 3.2.1, Part 1B, p. 3-4). The estimated frequency is 1.13 x 10 -4 per year.

      Note: Site specific meteorological data was used in this evaluation.

   c. Estimated frequency of LOOPS due to severe weather places the plant in SW Group 1 (Section 3.2.1, Part 1C, p. 3-7); The estimated frequency is 0.00275 per year.

      Note: Site specific meteorological data was used in this evaluation.

   d. The offsite power system is in the I1/2 Group (Section 3.2.1, Part 1D, p. 3-10).

2. The emergency AC power configuration group is D based on: (Section 3.2.2, Part 2C, p. 3-13)

   a. There are 2 shared emergency AC power supplies not credited as alternate AC power sources (Section 3.2.2, Part 2A, p. 3-15).

   b. 1 emergency AC power supply is necessary to operate safe shutdown equipment following a loss of offsite power (Section 3.2.2, Part 2B, p. 3-15).

3. The target Emergency AC Power reliability is 0.975.

   A target Emergency AC Power reliability of 0.975 was determined based on having a nuclear unit average reliability for the last 100 demands greater than 0.975 consistent with NUMARC 87-00, Section 3.2.4.

4. An alternate AC (AAC) source is provided at Oconee which meets the criteria specified in NUMARC 87-00, Appendix B. The AAC source is the Standby Shutdown Facility (SSF) diesel generator which is the power source for the Standby Shutdown System (SSS). The SSF diesel generator is available within 10 minutes from the recognition of an SBO event. However, it cannot be started from the Oconee main Control Room which is an exception to the NUMARC 87-00 guidance. The SSF diesel generator is manually started from the SSF Control Room. Testing has demonstrated the ability of plant operators to start the SSF diesel within 10 minutes from the recognition of the SBO event which satisfies the intent of the NUMARC guidance. The SSF diesel generator has sufficient capacity and capability to operate equipment necessary to maintain a safe shutdown condition for the 4 hour SBO event.

   The SSF was originally designed to provide an alternate means of achieving and maintaining hot standby conditions following a postulated fire, sabotage, or turbine building flooding event. Loss of all normal and emergency station power (AC and DC) is assumed for these postulated events; therefore, the SSF diesel generator and the SSF are also designed to handle the SBO event. Specifically, the SSF has the capability of maintaining hot standby conditions for a period of approximately 72 hours following a loss of plant power. This is well in excess of the SBO required coping duration of 4 hours.

   The NRC has previously reviewed and approved the SSF design as noted in the SER issued by NRC letter dated April 28, 1983.

B. Procedure Description

Plant procedures have been reviewed and modified, as necessary, to meet the guidelines in NUMARC 87-00, Section 4 in the following areas. The following procedures have been reviewed:

Station Blackout Response Guidelines

Abnormal Procedure for Loss of Power - AP/1(2)(3)/A/1700/11
Abnormal Procedure for Loss of Main Feedwater - AP/1(2)(3)/A/1700/19
Standby Shutdown Facility Emergency Operating Procedure - OP/0/A/1600/11

AC Power Restoration

Abnormal Procedure for Loss of Power - AP/1(2)(3)/A/1700/11
Emergency Procedures for Capacity Shortage

Severe Weather Guidelines

Abnormal Procedure for Earthquake - AP/1(2)(3)/A/1700/05
Abnormal Procedure for Natural Disasters - AP/1(2)(3)/A/1700/06

The following procedures will be revised:

Abnormal Procedure for Loss of Power - AP/1(2)(3)/A/1700/11
Abnormal Procedure for Loss of Main Feedwater - AP/1(2)(3)/A/1700/19

C. Proposed Modifications and Schedules

There are no plant modifications required to use the SSF diesel generator as the AAC power source. Procedure changes resulting from a review of the SBO issue are discussed in Section B above.

D. Coping With a Station Blackout

Oconee is supplied emergency AC power from the Keowee Hydro Station which contains two highly reliable generating units which supply power through two separate and independent routes. Additionally, power is available to the Oconee standby power buses from Lee Steam Station via a 100KV transmission line connected on the opposite side of the station from the 230KV Switchyard. If an emergency occurs that would require the use of this 100KV line, it can be isolated from the balance of the transmission system to supply emergency power to Oconee. Located at Lee Steam Station are three combustion turbines, any one of which can be started within one hour and connected to the 100KV line. Oconee's highly reliable and diverse offsite power system would provide great flexibility to the Station in dealing with a Station Blackout event. Reference FSAR Chapter 8 for additional information on the offsite electrical system.

In addition to the emergency AC capabilities described above, Oconee is provided with an AAC source (i.e, the SSF diesel generator) which has the capacity and capability to power equipment necessary to achieve and maintain hot standby conditions for the 4 hour required coping duration.

Oconee is a 4 hour coping duration category plant with 10 minute alternate AC capability; therefore, per NUMARC 87-00 guidelines, only condensate inventory, effects of loss of ventilation, and reactor coolant system inventory need to be addressed.

1. Condensate Inventory for Decay Heat Removal

   It has been determined from Section 7.2.1 of NUMARC 87-00 that 58,116 gallons of water are required for decay heat removal for four hours. Technical Specification 3.7.1(i) which requires a lake level of at least 775' above sea level, provides more than the required quantity for coping with a four hour station blackout. The SSF auxiliary service water pump takes suction from the condenser cooling water piping, which is continously provided with water from the lake via an independent siphon. No plant modifications or procedure changes are needed to utilize these water sources.

2. Reactor Coolant Inventory

   The AAC source powers the necessary make-up systems to maintain adequate reactor coolant system inventory to ensure that the core is cooled for the required coping duration.

3. Effects of Loss of Ventilation

Since the SSF Auxiliary Service Water pump is inside the SSF, it is cooled by the SSF ventilation system which is powered by the SSF diesel generator. Therefore, no analysis of loss of ventilation for the steam driven auxiliary service water pump need be performed.

The assumption in NUMARC 87-00, Section 2.7.1 that the control room will not exceed 120°F during a station blackout has been assessed. The control room at Oconee, which is the SSF control room during a SBO, does not exceed 120°F during a station blackout. Therefore, the control room is not a dominant area of concern.

The only dominant area of concern identified at Oconee is the Reactor Building. The temperature following a SBO will not exceed 250°F in the containment during the four hour coping duration. The operability of SBO response equipment in this dominant area of concern is assured based upon the original design basis of the SSF systems. No modifications or procedure changes are required to provide reasonable assurance for equipment operability.