50-269

APR 1 1970

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THRU: V. A. Moore, Chief, Electrical Systems Branch, DRS

MEETING WITH DUKE POWER COMPANY ON OCONEE NUCLEAR STATION, DOCKET NOS. 50-269, 50-270, and 50-287

A meeting was held with Duke Power Company on April 2, 1970, to discuss the instrumentation and power systems schematic drawings for the Oconee Nuclear Station. An attendance list is attached.

In addition to an explanation of "normal" circuit operation, test procedures for the Reactor Protection System and Engineered Safeguards were explained. Other items discussed concerned areas where the schematics appeared to be incorrect, disagreed with the information in the FSAR, or the design appeared not to meet IEEE 279 criteria. Since the schematic errors were confirmed to be only drafting errors, the applicant was informed that corrected drawings need not be submitted.

Details of the discussions are given below. Items which require further evaluation or documentation are identified by an asterisk.

Off-site Power

1. In accordance with the applicant's station, rather than unit, operation concept, controls for the 230 kV and 500 kV switchyard breakers are located in the Unit 1 - Unit 2 control room. The Unit 3 operator has direct control of only those breakers needed to synchronize Unit 3 to the off-site power system. Information regarding switchyard condition is provided by status lights in the Unit 3 control room.

2. Although the three gas turbines at the Lee Steam Station cannot be started from Oconee, the controls necessary to separate the 100 kV transmission line from the 100 kV system are provided in the Unit 1 - Unit 2 control room. A maximum time of 15 minutes is required to provide power to Oconee from the gas turbines.

On-site Power

1. The applicant described the automatic breaker sequence upon unit trip. This sequence is applicable to each unit.

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a. If the 230 kV system is available, the reactor coolant pump buses and the main feeder buses are transferred to the start-up transformer.

b. If the 230 kV system is unavailable and an accident signal is present, the main feeder buses receive power from one preselected hydro unit via the 13 kV underground feeder and the standby buses.

c. If the underground feeder path is unavailable, the other hydro unit will automatically supply power to the main feeder buses via the 230 kV switchyard and the start-up transformer.

Prior to the meeting, I had interpreted the FSAR description to mean that the transfer to the second hydro unit was a manual rather than automatic operation. Since this is a significant feature of the power system design, the applicant agreed to review the FSAR to determine if the existing description is adequate.

2. Regardless of the source, all a-c power to the main feeder buses of Units 1 and 2 is routed through the B1T and B2T switchgear. Power from the standby buses to Unit 3 main feeder buses also passes through this switchgear. The applicant stated that this switchgear is located in a Class I room, the redundant sections are separated by a distance of ten feet, no other equipment is located in the room and no automatic fire protection is provided.

3. Page 8-10 of the FSAR states that any unit can supply power to another through the standby buses. The applicant stated that the switching to accomplish this is under manual control.

4. Equipment installation prior to the operation of Unit 2 and 3 was discussed.

a. The start-up transformers will go into operation with their associated unit.

b. The 230 and 500 kV system will be interconnected when Unit 3 begins operation.

c. Unit 2 125 Vdc system will go into operation with Unit 1. Similarly, Unit 3 125 Vdc system will go into operation with Unit 2.

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5. Both hydro units are automatically started by a fault in the 230 kV system or an accident signal in any Oconee unit. Duke drawings OEE-120 and OEE-120-1 were clarified. Each Keowee unit has two redundant start channels, one from Units 1 and 2 and the other from Unit 3. Manual start switches for each hydro are provided in each Oconee control room.

*6. Each of the redundant 600 V and 208 V MCC's which supply power to ESF components has two feeders. The applicant was requested to confirm and document in the FSAR that no automatic switching of the power supplies to these load centers is provided.

*7. Long term availability of the Keowee units was discussed. We stated that the reservoir level was a matter to be discussed during the technical specification meetings.

*8. The 125 Vdc Instrumentation and Control Power System of each unit includes four distribution panels. Each panel receives power via isolating transfer diodes from either of two batteries, one battery in the associated unit and the other in a different unit.

a. Each of the sixteen diodes of a particular panel is rated at twice the full load current and approximately 1200 volts reverse voltage.

b. Within each diode bank, the diodes associated with one battery are separated by a metal sheet from those associated with the other battery.

c. Each diode bank is monitored by a system of proprietary design which can detect an open or shorted diode. Alarms in the control room identify the faulty bank; local lights identify the particular diode.

d. The ground detection system is designed only to detect grounds on the battery side of the diodes.

The applicant was informed that, since prompt detection of failures is a significant factor to be considered in evaluating the system design, we may request detailed information regarding the diode monitoring system and the ground detection system.

*9. Page 8-7 of the FSAR states that the 125 Vdc batteries are sized to carry the continuous emergency load for one hour. The applicant stated that this time could be extended by reducing the unnecessary loads, e.g., the ICS and the computer. We requested that the applicant clarify the FSAR to reflect this reduced power/extended time capability.

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*10. The applicant agreed to revise FSAR Figure 8-5 to eliminate the "Control & Instr. Unit 2" load on panel 1DIC and the "Eng. Sfgds. Actuation System 3A" load on bus 1KVID which are incorrect.

11. The applicant stated that there are no 250 Vdc loads which are required for safety.

Reactor Protection System

1. Revision 3 to the FSAR deleted the reference to the pump circuit breakers in describing the Power/Pump reactor trip. The applicant stated that the circuit retains the pump breaker contacts but a power sensing circuit has been added.

2. We questioned the applicant regarding the justification for bypassing the Power/Pump, Power/Flow, and Pressure/Temperature trips with the shutdown bypass switch. The applicant stated that since these trips did not add to the protection of the reactor while in the shutdown condition they are bypassed regardless of whether they are in the tripped mode or not.

3. The applicant explained the administrative controls applicable to the Channel Bypass Switch. Only one key is readily available for use and it cannot be removed from the switch while in the bypass position. Administrative controls require that the channel be placed in the tripped mode prior to being bypassed. The applicant intends to bypass the channel during periodic testing to reduce the possibility of spurious reactor trip. During this time, the reactor protection trip logic will be 2/3.

4. Page 7-1 of the FSAR states that the RPS is designed to meet the single failure criterion of IEEE 279. The applicant stated that the phrase "no single component failure" was not intended to modify the interpretation of IEEE 279 and could be interpreted as "no single failure."

*5. Table 7-1 and Technical Specification 15.2.3 of the FSAR disagree regarding the Power/Pump reactor trip set points. The applicant stated that no attempt has been made to keep the technical specifications in agreement with the remainder of the FSAR pending future meetings on technical specification. The applicant stated that Table 7-1 is correct.

*6. FSAR Page 4-1 states that "Operation on a single loop will require unit shutdown and adjustment of high reactor outlet temperature trip settings." We stated that this procedure did not meet our interpretation of Section 4.15, Multiple Set Points, of IEEE 279. In response to questions, B&W stated that since this was a drawing meeting they did not have the right technical people present to answer questions in this area. We agreed to postpone discussion of this item.

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*7. The FSAR states that the reactor trip channels will be tested every four weeks, but the reactor trip breakers, and their associated logic, will be tested only every 20 weeks. Upon questioning, the applicant stated that the reactor trip breakers would not endure monthly trip testing. Since the provision for breaker testing is incorporated in the system design, we stated that a discussion of the testing frequency could be postponed.

Engineered Safety Features

*1. The applicant stated that FSAR Figure 7-3 is incorrect and will be revised. We pointed out that to agree with the advance copy of the revised figure (received at the November, 1969, meeting) other FSAR revisions are needed, e.g., Page 7-13 and Figure 6-3.

*2. Duke drawings OEE 158-1, -3, and -6 indicate that the station stack radiation monitor interlock has been deleted from some reactor building purge isolation valves. We pointed out that the interlock on the remaining valves does not meet the single failure criterion. The applicant stated that this interlock is not required for safety. We will need to obtain confirmation of this statement from DRL, but Figure 6-5 will need revision in any case.

3. We noted that several dc powered containment isolation pilot solenoid valves must energize to close. When questioned about the lack of "fail-safe" design, the applicant stated that the normal position of the valve was chosen to be the de-energized position regardless of the accident position. Since redundant ac operated valves are provided, we agreed that the design is acceptable.

*4. The test procedure for the engineered safety feature instrumentation was explained. In general, the instrumentation is designed to be tested in parts which overlap so that the entire circuit from sensor to actuated component can be tested. No additional information is needed at this time but my evaluation of the circuits' testability is continuing based on information received at the meeting.

R. D. Pollard
Electrical Systems Branch
Division of Reactor Standards

ESB-15
DRS:ESB:RDP

Enclosure:
List of Attendees

cc w/encl:
E. G. Case, DRS
K. C. DeYoung, DRL
G. G. Long, DRL
O.D. Parr, DRL
AEC Attendees

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DATE	4/15/70	4/16/70

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LIST OF ATTENDEES*

DUKE POWER COMPANY MEETING

APRIL 2, 1970

AEC

A. Schwencer (part time)
T. Ippolito
R. Pollard
C. Murphy

Duke Power

Paul H. Barton
Bill Foley
Bill Rice
K. S. Canady
O. S. Bradham
C. A. Price
J. S. Davis
Wm. Parker,
C. J. Wylie
R. A. Waltman
L. E. Summerlin

Babcock & Wilcox

W. R. Smith
E. S. Patterson
H. H. Stevens
R. V. Straub
R. Craig (excused early)

Bailey Meter Company

C. A. McGunnigle
J. C. McCreary
D. E. Wurster

*Duke Power, Babcock & Wilcox, and Bailey Meter personnel were excused as discussion of their area of expertise was completed.