



**DUKE POWER COMPANY**

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HAL B. TUGKER  
VICE PRESIDENT  
NUCLEAR PRODUCTION

July 24, 1987

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

Subject: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287

Dear Sir:

By letter dated April 10, 1987, the NRC issued a Confirmatory Order for Oconee Nuclear Station which established new interim maximum allowable power levels and corresponding changes to the Reactor Protective System (RPS) high flux trip setpoints for Units 1 and 2 while the Low Pressure Injection System (LPI) coolers and the Reactor Building Cooling Unit (RBCU) coolers were in a degraded mode. The order also imposed interim restrictions on Unit 3. By letter dated April 13, 1987, the NRC/Region II confirmed that the conditions of the April 10, 1987 Confirmatory Order had been met on Units 2 and 3, and therefore, the restrictions imposed by the order for Units 2 and 3 were lifted.

The Final Safety Analysis Report (FSAR) for Oconee states in various data tables that a lake temperature of 75 degrees F was used for certain equipment design and analysis. Recent studies by Duke and historical data has shown that the inlet lake water temperature may exceed 75 degrees F. Duke Power has evaluated this situation to determine the impact on station systems and components. Two specific lake water temperatures were evaluated, 80 degrees F and 85 degrees F. The evaluation indicated a need to further reduce the maximum allowable power level beyond what was specified by the order. The lake water temperature is measured at the condenser cooling water (CCW) inlet.

Accordingly, Duke Power requests that the April 10, 1987 Confirmatory Order for Unit 1 be modified. Attachment 1 contains the proposed amendment to the Order. The additional restriction in the maximum allowable power level as a function of lake water temperature will be temporary. The restriction should be limited until the End of Cycle 10, which is currently scheduled to occur September 2, 1987. In accordance with the requirements of the April 10, 1987 Order, the RBCU and LPI coolers will be cleaned, tested, evaluated for full power operation and approved for full power operation by the Region II Regional Administrator prior to returning to operation following the End of Cycle 10 Refueling Outage. The evaluation will consider the impact elevated lake water temperature has on the equipment. In addition, the RPS High Flux trip setpoint will be reduced to correspond to the appropriate maximum allowable power level in order to provide additional assurance that the power level will be maintained below the allowed maximum power level.

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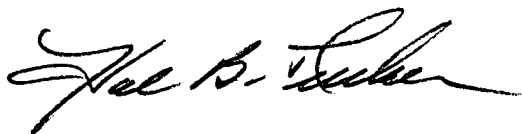
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U. S. Nuclear Regulatory Commission  
July 24, 1987  
Page Two

Attachment 2 provides the Technical Justification for the proposed amendment to the April 10, 1987 Confirmatory Order.

In accordance with 10 CFR 170, 170.12, please find enclosed a check in the amount of \$150.00 for the application fee.

Very truly yours,



Hal B. Tucker

PFG/55/sbn

Attachments

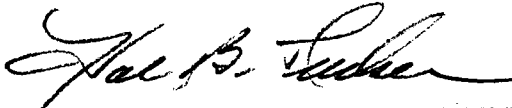
xc: Dr. J. Nelson Grace, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, NW, Suite 2900  
Atlanta, Georgia 30323

Ms. Helen Pastis  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Mr. J. C. Bryant  
NRC Resident Inspector  
Oconee Nuclear Station

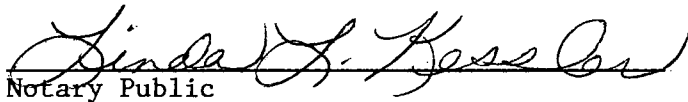
Mr. Heyward Shealy, Chief  
Bureau of Radiological Health  
South Carolina Department of Health &  
Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201

HAL B. TUCKER, being duly sworn, states that he is 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 revision to the Oconee Nuclear Station License Nos. DPR-38, DPR-47, and DPR-55; and that all statements and matters set forth therein are true and correct to the best of his knowledge.



Hal B. Tucker, Vice President

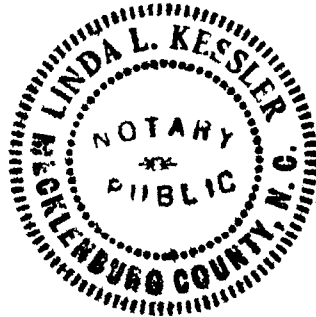
Subscribed and sworn to before me this 24th day of June, 1987.



Notary Public

My Commission Expires:

May 1, 1989



ATTACHMENT 1

DUKE POWER COMPANY  
OCONEE NUCLEAR STATION

PROPOSED CONFIRMATORY ORDER AMENDMENT

Accordingly, pursuant to Sections 103, 161b, and 161i, of the Atomic Energy Act of 1954, as amended and the Commission's regulations in 10 CFR 2.204 and Part 50, IT IS HEREBY ORDERED, EFFECTIVE IMMEDIATELY, that licenses DPR-38, DPR-47 and DPR-55 are amended as follows:

A. Oconee Unit 1, License No. DPR-38

1. Until the 1A LPI cooler is cleaned, tested, evaluated for full power operation, and approved for full power operation by the Regional Administrator, Region II, Oconee Unit 1 operation will be at reduced power levels and will have a reduced RPS high flux trip setpoint to ensure that adequate shutdown removal can be provided under accident conditions, as follows:
  - a. the RPS high flux trip setpoint shall be 91.5 percent rated power;
  - b. the maximum allowable power level shall be 91.5 percent rated power;  
and
  - c. in addition to the requirements of Technical Specification 3.3.2, the remaining non-ES LPI pump, capable of taking suction from the reactor building emergency sump and discharging into the RCS, shall be operable. The remaining non-ES LPI pump may be inoperable for a period of 24 hours. If the non-ES LPI pump is not restored to operable status within 24 hours, the reactor shall be placed in a hot shutdown condition within an additional 12 hours.
2. If the lake water temperature exceeds 75 degrees F, Oconee Unit 1 operation will be at reduced power levels and will have a reduced RPS high flux trip setpoint, as follows:
  - a. If the lake water temperature is equal to or less than 80 degrees F, the RPS high flux trip setpoint shall be 89.6% rated power; and the maximum allowable power level shall be 89.6% rated power;
  - b. If the lake water temperature is greater than 80 degrees F but equal to or less than 85 degrees F, the RPS high flux trip setpoint shall be 85.3% rated power; and the maximum allowable power level shall be 85.3% rated power;
  - c. If lake water temperature exceeds 85 degrees F, Unit 1 shall proceed to shutdown in accordance with Technical Specification 3.0.
3. Oconee Unit 1 shall not operate at any power level after the End of Cycle 10 unless the Regional Administrator, Region II, has approved the 1A LPI cooler for full power operation.

ATTACHMENT 2

DUKE POWER COMPANY  
OCONEE NUCLEAR STATION

TECHNICAL JUSTIFICATION

The proposed amendment to the April 10, 1987 Confirmatory Order establishes an interim maximum allowable power level and Reactor Protective System (RPS) High Flux trip setpoint for Unit 1. Analyses have been performed and the determination was made that due to elevated lake water temperatures and the fouling of the LPI and RBCU coolers, the maximum allowable power level should be limited to 89.6 percent rated power if lake water temperature is between 75 degrees F and 80 degrees F; and 85.3 percent rated power if lake water temperature is between 80 degrees F and 85 degrees F, in order to assure that the LPI and RBCU coolers can mitigate the consequences of a LOCA. To provide additional assurance that the operating power level is maintained below these power levels when the lake water temperature is greater than 75 degrees F, the RPS High Flux trip setpoint will be temporarily reduced to the appropriate power level.

The Oconee Final Safety Analysis Report (FSAR) states in various data tables that a lake temperature of 75 degrees F was used for certain equipment design and analysis. Recent studies by Duke Power have indicated, and historical data have shown, that 75 degrees F is not a conservative value. The recent design studies suggest a new hypothetical maximum intake temperature of 85 degrees F. By comparison, the maximum intake temperature recorded in 1986 was 81.8 degrees F on August 11, and in 1985, 79.6 degrees F was recorded on September 8. The intake temperature has exceeded 75 degrees F, for varying lengths of time, for 9 of the past 11 years, but has exceeded 80 degrees F only once in operating history. Table 1 summarizes these instances for the years 1976-1986. The 1986 meteorological and lake conditions resemble those assumed in design studies with respect to maximum and average air temperature, and sunlight available. In addition, precipitation and lake levels were slightly lower than values assumed in the design study. A compensating factor which contributed to intake temperatures not exceeding 81.8 degrees F was the outage of Unit 1 from February 13, 1986 to May 5, 1986 and a Unit 2 outage in August, 1986. Figure 1 shows the temperature vs. time data for 1985 and 1986 plotted graphically, and year-to-date temperature data for 1987. Evidently, 75 degrees F can be expected to be exceeded by July 28, 1987.

A Duke Power safety evaluation documented the impact on station systems and component operability on operation and design basis accidents of two selected lake temperatures above 75 degrees F, specifically 80 degrees F and 85 degrees F. Test data and analyses indicate the performance of the RBCU and LPI coolers are degraded, and thermal hydraulic and single failure analyses have developed a new power level limit in order to still satisfy the equipment qualification temperature curve (EQTC) inside containment for design basis accidents. In addition to the issue of operation at administratively reduced power levels relative to lake temperature and LPI cooler/RBCU test data, additional reviews have been conducted into the impact of operation of other equipment important to safety at lake temperatures of up to 85 degrees F. The following other areas have been reviewed:

- Radwaste Facility and Radiological Monitoring
- Keowee Hydro Emergency Power Capability
- Pipe Thermal Stress Analysis
- SSF Heat Exchangers and Auxiliary Feedwater
- HVAC
- Heat Exchanger Capability
- Motor Cooling
- NPSH of Service Water Pumps



The only equipment which may realize effects from the increased lake temperatures is the SSF HVAC System. To compensate for any problems both of the SSF HVAC cooling water pumps will be run during SSF operation. Even with elevated lake temperatures, there was no significant impact on the safe operation of the other equipment and areas which were reviewed.

Since the lake temperature issue is only a temporary problem, the LPI and RBCU coolers will be cleaned and tested at the next refueling outage, the changes to the confirmatory order only apply until the End of Cycle 10 which is currently scheduled to occur September 2, 1987. The basis of the analysis for maximum allowable power level was included in a technical specification amendment request provided by a Duke Power letter dated April 6, 1987.

TABLE 1  
OCONEE NUCLEAR STATION  
DURATION OF CCW INTAKE TEMPERATURES  
GREATER THAN OR EQUAL TO 75 DEGREES F

Observation	Start Date	End Date	Duration (Days)
1	08/29/76	10/05/76	38
2	09/25/77	10/06/77	11
3	08/27/78	10/09/78	44
4	08/80	10/80	Not Available
5	08/01/81	10/04/81	65
6	08/23/83	10/09/83	48
7	08/17/84	10/05/84	49
8	07/30/85	10/10/85	73
9	07/15/86	10/14/86	91

Figure 1

# OCONEE NUCLEAR STATION

## CCW INLET TEMPERATURE HISTORY

