

TABLE 2.3-1

Reactor Protective System Trip Setting Limits

<u>RPS Trip</u>	<u>RPS Trip Setpoint</u>	<u>Shutdown Bypass</u>
1. Nuclear Overpower	105.5% Rated Power ⁽⁴⁾	5.0% Rated Power ⁽¹⁾
2. Flux/Flow/Imbalance	1.07	Bypassed
3. Pump Monitors	a. > 0% Rated Power loss of two pumps in one reactor coolant loop b. > 55% Rated Power loss of two pumps c. > 0% Rated Power loss of one or two pumps during two pump operation	Bypassed
4. High Reactor Coolant System Pressure	2300 psig	1720 ⁽²⁾
5. Low Reactor Coolant System Pressure	1800 psig	Bypassed
6. Variable Low Reactor Coolant System Pressure	$P \text{ (psig)} = (11.14 T_{\text{out}} - 4706)$ ⁽³⁾	Bypassed
7. High Reactor Coolant Temperature	618°F	618°F
8. High Reactor Building Pressure	4 psig	4 psig

(1) Administratively controlled reduction set only during reactor shutdown.

(2) Automatically set when other segments of the RPS are bypassed.

(3) T_{out} is in degrees Fahrenheit (°F).

(4) Until the end of Unit 2 Cycle 9, with the CCW inlet water temperature greater than 80 degrees F and less than or equal to 85 degrees F, the Unit 2 setpoint shall be 93% rated power.

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ATTACHMENT 2
TECHNICAL JUSTIFICATION

TECHNICAL JUSTIFICATION

The attached proposal consists of a revision to Table 2.3-1 for the Reactor Protective System (RPS) Trip Setting Limits. Presently the RPS trip setpoint is listed as 105.5% rated power. Analyses have been performed and the determination made that due to elevated lake water temperatures (measured as average condensor cooling water (CCW) inlet temperature) and the fouling of RBCU coolers, the maximum allowable power level should be limited to 93% rated power to assure that the RBCU coolers can mitigate the consequences of a LOCA. To provide additional assurance that the operating power level is maintained below 93% power level when the lake water temperature is greater than 80 degrees F and less than or equal to 85 degrees F, the RPS High Flux trip setpoint will be temporarily reduced to 93% rated power.

The Oconee 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 level were slightly lower than what was assumed in the design studies. 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, however based on temperature trend data, it is not anticipated that the lake temperature will exceed 80 degrees F this year.

A Duke Power safety evaluation documented the impact on the RBCU system 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 that 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. A safety analysis of maximum allowable power levels has been conducted, resulting in the recommended value of 93% rated power.

In addition to the issue of operation at administratively reduced power levels relative to lake temperature and 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 significant effects from the increased lake temperatures is the SSF HVAC System. To compensate for these effects, operational procedure changes are being implemented. 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 caused by degraded RBCU coolers, which will be cleaned and tested at the next refueling outage, the changes to the technical specifications only apply until the End of Cycle 9 which is currently scheduled to occur January 15, 1988. 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. Unit 2 operation at full power is justified for lake temperatures less than or equal to 80 degrees F, however the reactor trip setpoint will be lowered to 93% rated power for lake temperatures greater than 80 degrees F and less than or equal to 85 degrees F.

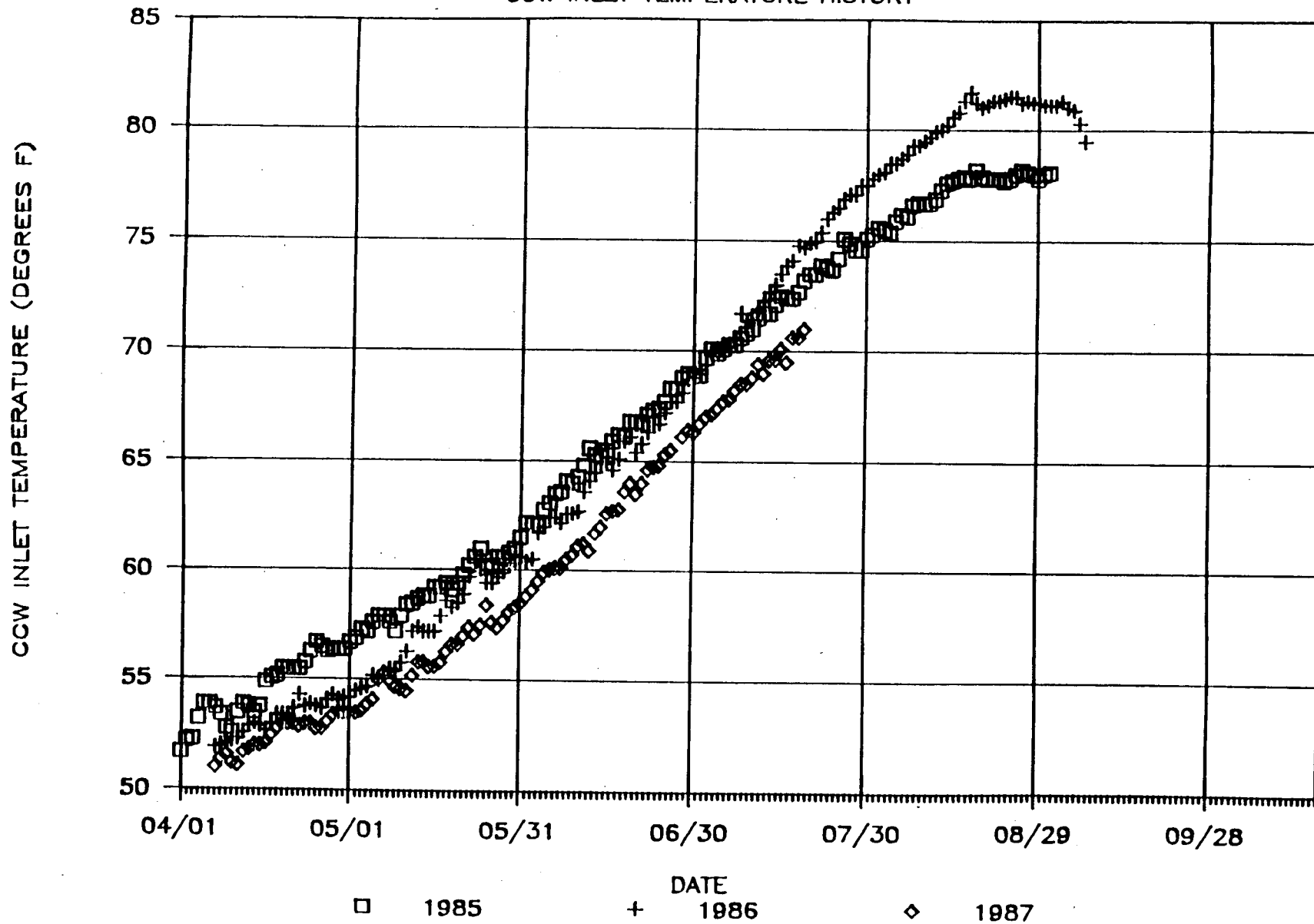
TABLE 1
 OCONEE NUCLEAR STATION
 DURATION OF CCW INTAKE TEMPERATURES
 GREATER THAN OR EQUAL TO 75 DEGREES F

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



ATTACHMENT 3

NO SIGNIFICANT HAZARDS CONSIDERATION EVALUATION

NO SIGNIFICANT HAZARDS CONSIDERATION EVALUATION

Duke has determined that the proposed amendment request poses no significant hazards as defined 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; or
- (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (3) Involve a significant reduction in margin of safety.

The proposed amendment establishes an interim maximum allowable power level and Reactor Protective System (RPS) high flux trip setpoint for Unit 2. The maximum allowable power level and the RPS High Flux trip setpoint will be 93% rated power if the lake water temperature is greater than 80 degrees F and less than or equal to 85 degrees F for a period in which the Reactor Building Cooling Unit (RBCU) coolers are operating in a degraded mode from original design capacities. These cooling units will be cleaned and tested during the next refueling outage on Unit 2.

The following provides a discussion of how the proposed amendment satisfies each of the three standards provided by 10 CFR 50.92(c).

First Standard

The proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

Each accident analysis addressed in the Oconee Final Safety Analysis Report (FSAR) has been examined with respect to the proposed changes. Operation of the unit at a reduced power level and the reduction of the RPS high flux trip setpoint does not increase the probability or consequences of any FSAR accident that has been evaluated. The RBCUs and the LPI coolers are part of the plant's accident mitigation system which removes heat from the containment during a design basis accident. Their degraded condition, as well as a maximum lake temperature of 85 degrees F, do not act as an initiator for any of the design basis accidents previously evaluated in the FSAR. The sensitivity study of all other systems important to safety did not identify any failure modes which are more likely to initiate an accident as a result of lake temperatures of up to 85 degrees F. Although Unit 2 LPI coolers have been cleaned as specified in the previous confirmatory order (dated April 10, 1987), the postulated heat load during a LOCA is such that an administrative limit less than 100 percent power is necessary in order to maintain the containment temperature within EQTC for lake temperature above 80 degrees F but less than or equal to 85 degrees F. However the Unit 2 power limitation due to steam generator high level between now and the next refueling outage, when generators will be cleaned, is sufficient to ensure conservatism with respect to maximum allowable power level due to lake temperature. The reactor trip setpoint has been lowered to correspond to lake temperature administrative limits as calculated. This reduced setpoint provides additional assurance that the consequences of an accident previously evaluated in the FSAR will not be increased.

The sensitivity study of systems and components at 85 degrees F did not identify any items important to nuclear safety which were more prone to failure at these slightly increased temperatures. This evaluation included consideration of accident mitigating components. The evaluation also concluded that the coolers are operable and capable of performing their accident mitigating functions at the reduced power level. Accordingly, the proposed amendment does not increase the probability or consequences of a previously evaluated accident.

Second Standard

The proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

The reduction in power level and the resetting of the RPS High Flux setpoint for Unit 2 will not create the possibility of a new or different kind of accident. The lower power level assures that the RBCU coolers are capable of mitigating the consequences of an accident. Operation at a reduced power does not, in itself, create a new or different kind of accident. Further, the time period in which the unit will be operating at its reduced power level is relatively short. A review of the plant operation does not indicate the potential for any new failure modes that would affect RCS pressure boundary, reactor operation, loss of heat sink or radiation release. With the current power limitations on Unit 2 due to steam generator high levels, as well as reducing the reactor trip setpoint, this unit will continue to perform within its design bases. The operability of all systems and components important to nuclear safety has been evaluated at 85 degrees F to ensure that no common mode failures exist which could introduce any new accident.

Third Standard

The proposed amendment would not involve a significant reduction in a margin of safety.

The reduction of the RPS High Flux trip setpoint provides an additional margin of safety beyond what is currently present with the setpoint at 105.5 percent rated power. This trip setpoint prevents fuel clad damage that could possibly occur due to a rapid reactivity excursion. A reactivity excursion to cause fuel clad damage at the reduced power levels will need to be significantly greater than what would be required at operation at or near 100 percent rated power. Operating at a reduced power level assures that the RBCU coolers will, for all situations including elevated lake temperatures, perform their intended safety function. Sensitivity studies of other equipment important to safety have been performed at lake temperatures of up to 85 degrees F. Based upon these evaluations the power output of the plant is being administratively reduced in order to maintain a safety margin equivalent to the original design basis.

The above evaluation shows that the the three standards of 10 CFR 50.92(c) are satisfied. Accordingly, Duke Power concludes that the proposed changes do not represent any significant hazard.