Attachment 1

DUKE POWER COMPANY
OCONEE NUCLEAR STATION

PROPOSED TECHNICAL SPECIFICATION REVISION

Revised Pages

2.3-1
2.3-7

TABLE 2.3-1

Reactor Protective System Trip Setting Limits

	RPS Trip	RPS Trip Setpoint	Shutdown Bypass
1.	Nuclear Overpower	105.5% Rated Power	5.0% Rated Power (1)
2.	Flux/Flow/Imbalance	1.07	Bypassed
3.	Pump Monitors	At Power Operation > 2.0% Rated Power and loss of two pumps	Bypassed
4.	High Reactor Coolant System Pressure	2355 psig	1720(2)
5.	Low Reactor Coolant System Pressure	1800 psig	Bypassed
6.	Variable Low Reactor Coolant System Pressure	P (psig) = (11.14 T_{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).

2.3 LIMITING SAFETY SYSTEM SETTINGS, PROTECTIVE INSTRUMENTATION

Applicability

Applies to instruments monitoring reactor power, reactor power imbalance, reactor coolant system pressure, reactor coolant outlet temperature, flow, number of pumps in operation, and high reactor building pressure.

Objective

To provide automatic protective action to prevent any combination of process variables from exceeding a safety limit.

Specification

The reactor protective system trip setpoints and the permissible bypasses for the instrument channels shall be as stated in Table 2.3-1 and Figure 2.3-2.

The pump monitors shall produce a reactor trip when a loss of two pumps occurs and the reactor is at power operation greater than 2.0% of rated power.

Bases

The reactor trip setpoints for reactor protective system (RPS) instrumentation are given in Table 2.3-1. The trip setpoints have been selected to ensure that the core and reactor coolant system are prevented from exceeding their safety limits. The various reactor trip circuits automatically open the reactor trip breakers whenever a parameter monitored by the RPS deviates from an allowed range. The RPS consists of four instrument channels for redundancy. The plant safety analyses are based on the trip setpoints given in Table 2.3-1 plus calibration and instrumentation errors.

Nuclear Overpower

A reactor trip at high power level (neutron flux) is provided to prevent damage to the fuel cladding from reactivity excursions too rapid to be detected by pressure and temperature measurements.

During normal plant operation with all reactor coolant pumps operating, a reactor trip is initiated when the reactor power level reaches 105.5% of rated power. Adding to this the possible variation in the trip setpoint due to calibration and instrument errors, the maximum actual power at which a trip would be actuated could be 112%, which is the value in the safety analysis. (1)

Attachment 2

Duke Power Company
Oconee Nuclear Station

Technical Justification for the Proposed Changes to
Technical Specification 2.3

Introduction

The current Technical Specification 2.3 establishes requirements for the Reactor Protective System (RPS) trip setpoints including a setpoint for the reactor coolant pump monitor. The pump monitor trip function generates a signal if reactor thermal power exceeds 0.0% Full Power (FP) and less than three pumps are operating. The proposed technical specification revision specifies the pump monitor trip setpoint at power operation greater than 2.0% FP to allow tolerance for electrical noises that can cause spurious reactor trips as with the present setpoint of 0.0% FP.

This proposed amendment is prompted due to a recent event (see LER 269/90-06 dated May 30, 1990) in which the pump monitor trip function generated a trip signal during the cooldown following Unit 1 End-of-Cycle 12. At the time of the trip, the reactor was subcritical with control rod Groups 2-7 fully inserted and Group 1 50% withdrawn. Two reactor coolant pumps were operating to minimize the heat load on the Reactor Coolant System. The trip appears to have been caused by electrical noise in the excore detector signal. This noise caused the 0.0% FP setpoint to be exceeded. This proposed technical specification revision will increase the setpoint for the pump monitors trip function to power operation greater than 2.0% FP in order to avoid future spurious reactor trips during cooldowns with two reactor coolant pumps operating.

It should be noted that on September 25, 1989, Duke Power submitted a change to the Oconee Technical Specifications deleting provisions for operation with two reactor coolant pumps operating and the reactor at power. A change to the RPS trip setpoint for the pump monitor trip function was proposed such that a trip signal is generated if thermal power exceeds 0.0% FP and less than three pumps are operating. The NRC approved this technical specification change on December 15, 1989 (Amendment Nos. 180, 180, 177). Prior to these amendments, power operation of up to 55% FP was analyzed and allowed with two pumps operating. However, from a procedural point of view, this mode of operation was not desirable and therefore was removed from the technical specifications. Therefore, power operation with two pumps operating is not unprecedented and was allowed until the issuance of recent amendment Nos. 180, 180 and 177 to the Oconee Nuclear Station licenses.

Proposed Technical Specification Revisions

The proposed technical specification revision (Attachment 1) includes two changes to the current Technical Specification 2.3 and Table 2.3-1. These changes are:

a) A revision to Technical Specification 2.3 which would require pump monitors to produce a reactor trip when a loss of two pumps occur and the reactor is at power operation greater than 2.0% FP compared to the current 0.0% FP.

b) A revision to Table 2.3-1 to reflect the above change.

The following paragraphs provide technical justification for these changes.

Safety Analysis

The pump monitor trip setpoint of 2.0% FP is proposed for two reasons. First, a review of the excore detector signal response indicate that a 2.0% FP setpoint provides adequate margin to account for noise in the excore detector signal while the reactor is subcritical. Second, this setpoint is consistent with the definition of power operation given in Technical Specification 1.2.5 which states "The reactor is in a power operating condition when the indicated neutron power is above 2 percent of rated power as indicated on the power range channels." The impact of this setpoint change on the Oconee Nuclear Station FSAR Chapter analyses is described below.

The pump monitors trip function, in conjunction with the flux/flow trip function, provides protection during loss of reactor coolant flow accidents. These accidents are analyzed in Section 15.6 of the Oconee FSAR. The only accident analyzed in Section 15.6 of the Oconee FSAR which takes credit for the pump monitors trip function is the loss of all four reactor coolant pumps. The acceptance criterion for this accident is that the minimum DNBR remains above the correlation safety limit. Since a larger heat flux is conservative with respect to DNB, the four pump coastdown is analyzed from full power initial conditions. The proposed setpoint of 2.0% FP is considerably less than the initial conditions for this accident. In addition, all four reactor coolant pumps coast down in this accident. Thus, the proposed increase in the setpoint from 0.0% FP to 2.0% FP will have no effect on the results of the FSAR Chapter 15 loss of reactor coolant flow accident analyses.

In addition to the loss of flow accident analyses presented in Section 15.6 of the Oconee FSAR, the flux/flow ratio is determined in the core reload design process by analyzing partial pump coastdowns. The limiting transient with respect to determining the flux/flow ratio is the coastdown of two reactor coolant pumps from full power initial conditions. The pump monitors trip function generates a reactor trip signal earlier than the flux/flow trip function. Therefore, the results of a partial loss of flow accident are more limiting when a reactor trip on flux/flow must be assumed. The limiting partial loss of reactor coolant flow accident is determined by a single failure analysis of the pump monitors trip function. Presently, the two pump coastdown from full power initial conditions is the limiting partial loss of reactor coolant flow transient. The proposed increase in the pump monitors setpoint will have no impact on the partial loss of reactor coolant flow analyses. The two pump coastdown from full power initial conditions remains the limiting partial loss of reactor coolant flow transient. Therefore, it is concluded that the proposed setpoint change will have no impact on the licensing basis safety analyses for Oconee Nuclear Station.

Attachment 3

Duke Power Company
Oconee Nuclear Station

No Significant Hazards Consideration Evaluation

Duke Power Company has made the determination, based on the evaluation presented in Attachment 2, that this amendment request involves a no significant hazards consideration by applying the standards established by NRC regulations in 10 CFR 50.92. This assures 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.

Each accident analysis addressed within the Oconee FSAR has been examined with respect to changes proposed within this amendment request. As discussed in Attachment 2, the proposed change would revise the Reactor Protective System (RPS) trip setpoint for the reactor coolant pump monitors trip function from the current value of 0.0% FP to 2.0% FP. The proposed Technical Specification 2.3 would require pump monitors to produce a reactor trip when a loss of two pumps occurs and the reactor is at power operation greater than 2.0% FP instead of the current 0.0% FP requirement. The 2.0% FP trip setpoint is consistent with definition of power operation given in Technical Specification 1.2.5. In addition, the 2.0% FP setpoint would allow tolerance for electrical noises that can otherwise cause spurious reactor trips with the present 0.0% FP setpoint.

This change has no significant impact on the results of FSAR Chapter 15 analyses and does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2) Create the possibility of a new or different kind of accident from any kind of accident previously evaluated.

The increase from 0.0% FP to 2.0% FP of the pump monitors trip setpoint in the proposed Technical Specification 2.3 would serve to prevent spurious reactor trips due to electrical noise during subcritical conditions. Operation of Oconee in accordance with this proposed technical specification will not create any failure modes not bounded by previously evaluated accidents. As such, this change will not create the possibility of a new or different kind of accident from any kind of accident previously evaluated.

3) Involve a significant reduction in a margin of safety.

The proposed Technical Specification 2.3 would revise the RPS setpoint for the pump monitors trip function to a value of 2.0% FP instead of the current 0.0% FP setpoint to prevent spurious reactor trips due to electrical noise in the RPS trip function. This indeed will enhance the margins of safety by preventing reactor trips which can result in

unanalyzed plant conditions. This change does not involve a significant reduction in a margin of safety since this change has no significant effect on FSAR Chapter 15 analyses, as explained in Attachment 2.

Duke has determined, based on the above discussion, that there is no Significant Hazards Consideration involved in this amendment request.