March 6, 1990

Docket No. 50-324

Mr. Lynn W. Eury
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Dear Mr. Eury:

SUBJECT: CORRECTION TO TECHNICAL SPECIFICATION PAGES FOR AMENDMENT NO. 171, TABLE 4.3.6.1-1, ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS - BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2 (TAC 72062)

This letter is in response to your February 23, 1990 request to correct pages 2-5, B2-6, B2-7, and B2-8 of the Brunswick Steam Electric Plant, Unit 2, Technical Specifications (TS) because the pages submitted earlier failed to incorporate changes from the previously issued Amendment No. 168.

Those changes are incorporated and new TS pages are enclosed.

Sincerely,

Original Signed By:

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Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

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TABLE 2.2.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. Intermediate Range Monitor, Neutron Flux - High[a]	≤ 120 divisions of full scale	≤ 120 divisions of full scale
2. Average Power Range Monitor		
a. Neutron Flux - High, 15%[b]	≤ 15% of RATED THERMAL POWER	≤ 15% of RATED THERMAL POWER
b. Flow Biased Simulated Thermal Power - High[c][d]	≤ (0.66 W + 64%) with a maximum ≤ 113.5% of RATED THERMAL POWER	≤ (0.66 W + 67%) with a maximum ≤ 115% of RATED THERMAL POWER
c. Fixed Neutron Flux - High[d]	≤ 120% of RATED THERMAL POWER	≤ 120% of RATED THERMAL POWER
3. Reactor Vessel Steam Dome Pressure - High	≤ 1045 psig	≤ 1045 psig
4. Reactor Vessel Water Level - Low, Level 1	≥ +162.5 inches[g]	≥ +162.5 inches[g]
5. Main Steam Line Isolation Valve - Closure[e]	≤ 10% closed	≤ 10% closed
6. Main Steam Line Radiation - High[h]	≤ 3 x full power background	≤ 3.5 x full power background
7. Drywell Pressure - High	≤ 2 psig	≤ 2 psig
8. Scram Discharge Volume Water Level - High	≤ 109 gallons	≤ 109 gallons
9. Turbine Stop Valve-Closure[f]	≤ 10% closed	≤ 10% closed
10. Turbine Control Valve Fast Closure, Control Oil Pressure-Low[f]	≥ 500 psig	≥ 500 psig

TABLE 2.2.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

NOTES

(a) The Intermediate Range Monitor scram functions are automatically bypassed when the reactor mode switch is placed in the Run position and the Average Power Range Monitors are on scale.

(b) This Average Power Range Monitor scram function is a fixed point and is increased when the reactor mode switch is placed in the Run position.

(c) The Average Power Range Monitor scram function is varied, Figure 2.2.1-1, as a function of the fraction of rated recirculation loop flow (W) in percent.

(d) The APRM flow-biased simulated thermal power signal is fed through a time constant circuit of approximately 6 seconds. The APRM fixed high neutron flux signal does not incorporate the time constant, but responds directly to instantaneous neutron flux.

(e) The Main Steam Line Isolation Valve-Closure scram function is automatically bypassed when the reactor mode switch is in other than the Run position.

(f) These scram functions are bypassed when THERMAL POWER is less than 30% of RATED THERMAL POWER as measured by turbine first stage pressure.

(g) Vessel water levels refer to REFERENCE LEVEL ZERO.

(h) The Hydrogen Water Chemistry (HWC) system shall not be placed in service until reactor power reaches 20% of RATED THERMAL POWER. After reaching 20% of RATED THERMAL POWER, the normal full power background radiation level and associated trip setpoints may be increased to compensate for increased radiation levels as a result of full power operation with hydrogen injection. Prior to decreasing power below 20% of RATED THERMAL POWER and after the HWC system has been shut off, the background level and associated setpoint shall be returned to the normal full power values. Control rod motion shall be suspended, when the reactor power is below 20% of RATED THERMAL POWER, until the necessary adjustment is made (except for scram or other emergency action).

4. Reactor Vessel Water Level-Low, Level #1

The reactor water level trip point was chosen far enough below the normal operating level to avoid spurious scrams but high enough above the fuel to assure that there is adequate water to account for evaporation losses and displacement of cooling following the most severe transients. This setting was also used to develop the thermal-hydraulic limits of power versus flow.

5. Main Steam Line Isolation Valve-Closure

The low-pressure isolation of the main steam line trip was provided to give protection against rapid depressurization and resulting cooldown of the reactor vessel. Advantage was taken of the shutdown feature in the run mode which occurs when the main steam line isolation valves are closed, to provide for reactor shutdown so that high power operation at low pressures does not occur. Thus, the combination of the low-pressure isolation and isolation valve closure reactor trip with the mode switch in the Run position assures the availability of neutron flux protection over the entire range of the Safety Limits. In addition, the isolation valve closure trip with the mode switch in the Run position anticipates the pressure and flux transients which occur during normal or inadvertent isolation valve closure.

6. Main Steam Line Radiation - High

The Main Steam Line Radiation detectors are provided to detect a gross failure of the fuel cladding. When the high radiation is detected, a scram is initiated to reduce the continued failure of fuel cladding. At the same time, the Main Steam Line Isolation Valves are closed to limit the release of fission products. The trip setting is high enough above background radiation levels to prevent spurious scrams, yet low enough to promptly detect gross failures in the fuel cladding.

The Main Steam Line Radiation detectors setpoints may be adjusted prior to placing the hydrogen water chemistry (WHC) system in service. If the setpoints are adjusted, the HWC system shall be placed in service or the setpoints shall be returned to the normal full power values within 24 hours. If the HWC system is not placed in service and the setpoints are not readjusted within 24 hours, control rod motion shall be suspended (except for scram or other emergency action) until the necessary adjustments are made. Hydrogen injection may cause the radiation levels in the main steam lines to increase. After shutting off the HWC system or decreasing power, the setpoints shall be returned to the normal full power values.

The Technical Specification wording was derived using the EPRI "Guidelines for Permanent BWR Hydrogen Water Chemistry Installations, 1987 Revision".

7. Drywell Pressure-High

High pressure in the drywell could indicate a break in the nuclear process systems. The reactor is tripped in order to minimize the possibility of fuel damage and reduce the amount of energy being added to the coolant. The trip setting was selected as low as possible without causing spurious trips.

8. Scram Discharge Volume Water Level-High

The scram discharge tank receives the water displaced by the motion of the control rod drive pistons during a reactor scram. Should this tank fill up to a point where there is insufficient volume to accept the displaced water, control rod movement would be hindered. The reactor is therefore tripped when the water level has reached a point high enough to indicate that it is indeed filling up, but the volume is still great enough to accommodate the water from the movement of the rods when they are tripped.

9. Turbine Stop Valve-Closure

The turbine stop valve closure trip anticipates the pressure, neutron flux, and heat flux increases that would result from closure of the stop valves. With a trip setting of 10% of valve closure from full open, the resultant increase in heat flux is such that adequate thermal margins are maintained even during the worst case transient that assumes the turbine bypass valves remain closed. This scram is bypassed when the turbine steam flow is below that corresponding to 30% of RATED THERMAL POWER, as measured by the turbine first-stage pressure.

10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low

Low turbine control valve hydraulic pressure will initiate the Select Rod Insert function and the preselected group of control rods will be fully inserted. Select Rod Insert is an operational aid designed to insert a predetermined group of control rods immediately following either a generator load rejection, loss of turbine control valve hydraulic pressure, or by manual operator action using a switch on the R-T-G board. The assignment of control rods to the Select Rod Insert function is based on the start-up and fuel warranty service associated with each control rod pattern, on RCS considerations, and on a dynamic function of both time and core patterns.

Approximately ten percent of the control rods in the reactor will be assigned to the Select Rod Insert function by the operator. This selection will be accomplished by moving the rod scram test switch for those rods from the Normal position to the Select Rod Insert position.

10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (Continued)

Any rod selected for Select Rod Insert shall also have other rods in its notch group selected to ensure that the RSCS criteria of plus-minus one notch position equality is met when the rod pattern is greater than 50% ROD DENSITY and THERMAL POWER $\leq$ 20% of RATED THERMAL POWER. It is possible that a rod pattern within these limits may occur after the Select Rod Insert function operates.

In order to reduce the number of reactor scrams, a 200 millisecond time delay, referenced from the low turbine control valve hydraulic pressure and Select Rod Insert signals, was incorporated to determine turbine bypass valve status via limit switches prior to initiating a reactor scram. If the turbine bypass valves opened in < 200 milliseconds, the reactor scram was bypassed. It was found that during certain reload cycles the MCPR penalties involved with this time delay were more penalizing than the number of scrams saved; therefore, CP&L requested and received NRC approval to set this time at "0" in Amendment No. 14. With the timer set at "0", Select Rod Insert and RPS trip will be initiated simultaneously.

The control valve closure time is approximately twice as long as that for the stop valves which means that resulting transients, while similar, are less severe than for stop valve closure. No fuel damage occurs, and reactor system pressure does not exceed the safety relief valve setpoint. This is an anticipatory scram and results in reactor shutdown before any significant increase in pressure or neutron flux occurs. This scram is bypassed when turbine steam flow is below that corresponding to 30 percent of RATED THERMAL POWER, as measured by turbine first-stage pressure.

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