

DUKE POWER COMPANY

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June 7, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414

Dear Mr. Denton:

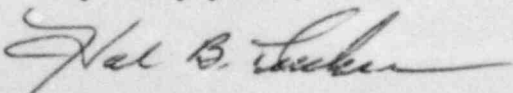
On May 10, 1984 Duke Power submitted a response to Catawba SER Open Item 17, Alarm in the Control Room for Boron Dilution Modes in All Modes of Operation. In order to validate the analysis assumptions the following changes to the Catawba Technical Specifications are requested:

1. Reactor Makeup Water Pump - Specifications 3/4.1.1.1 and 3/4.1.1.2 should be changed to limit flow to 120 gpm in Mode 5 and to 240 gpm in Modes 3 and 4.
2. High Flux at Shutdown Alarm - Note 9 to Technical Specification Table 4.3-1 already requires verification of a setpoint of less than or equal to one half decade above background. In order to maintain the setpoint in this range following shutdown, appropriate station procedures will be revised prior to initial criticality to require recalibration of the alarm setpoint as follows:

Following reactor shutdown -

- every 30 minutes for the first 2 hours;
- every 2 hours for the next 6 hours;
- every eight hours thereafter until the countrate stabilizes.

Very truly yours,



Hal B. Tucker

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Mr. Harold R. Denton, Director
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cc: Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
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NRC Resident Inspector
Catawba Nuclear Station

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SURVEILLANCE REQUIREMENTS (Continued)

- e. When in MODE 3 or 4, at least once per 24 hours by consideration of the following factors:
- 1) Reactor Coolant System boron concentration,
 - 2) Control rod position,
 - 3) Reactor Coolant System average temperature,
 - 4) Fuel burnup based on gross thermal energy generation,
 - 5) Xenon concentration, and
 - 6) Samarium concentration.

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within $\pm 1\% \Delta k/k$ at least once per 31 Effective Full Power Days (EFPD). This comparison shall consider at least those factors stated in Specification 4.1.1.1.1e., above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 EFPD after each fuel loading.

4.1.1.1.3 When in MODE 3 or 4, the Reactor Makeup Water pumps shall be demonstrated to have a total combined flow rate of less than or equal to 240 gpm at least once per 18 months.

REACTIVITY CONTROL SYSTEMS

DRAFT

SHUTDOWN MARGIN - $T_{avg} \leq 200^{\circ}\text{F}$

LIMITING CONDITION FOR OPERATION

3.1.1.2 The SHUTDOWN MARGIN shall be greater than or equal to $1\% \Delta k/k$.

APPLICABILITY: MODE 5.

ACTION:

With the SHUTDOWN MARGIN less than $1\% \Delta k/k$, immediately initiate and continue boration at greater than or equal to 30 gpm of a solution containing greater than or equal to 7000 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.2.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to $1\% \Delta k/k$:

- a. Within 1 hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s); and
- b. At least once per 24 hours by consideration of the following factors:
 - 1) Reactor Coolant System boron concentration,
 - 2) Control rod position,
 - 3) Reactor Coolant System average temperature,
 - 4) Fuel burnup based on gross thermal energy generation,
 - 5) Xenon concentration, and
 - 6) Samarium concentration.

4.1.1.2.2 One Reactor Makeup Water pump shall be demonstrated inoperable at least once per 31 days by verifying that the motor circuit breaker is secured in the open position.

4.1.1.2.3 The OPERABLE Reactor Makeup Water pump shall be demonstrated to have a flow rate of less than or equal to 120 gpm at least once per 18 months.

BASES

3/4.1.1 BORATION CONTROL

3/4.1.1.1 and 3/4.1.1.2 SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that: (1) the reactor can be made subcritical from all operating conditions, (2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and (3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, boron concentration, and T_{avg} . The most restrictive condition occurs at EOL, with T_{avg} at no load operating temperature, and is associated with a postulated steam line break accident and resulting uncontrolled Reactor Coolant System cooldown. In the analysis of this accident, a minimum SHUTDOWN MARGIN of 1.3% $\Delta k/k$ is required to control the reactivity transient. Accordingly, the SHUTDOWN MARGIN requirement is based upon this limiting condition and is consistent with FSAR safety analysis assumptions. With T_{avg} less than 200°F, the reactivity transients resulting from a postulated steam line break cooldown are minimal and a 1% $\Delta k/k$ SHUTDOWN MARGIN provides adequate protection.

3/4.1.1.3 MODERATOR TEMPERATURE COEFFICIENT

The limitations on moderator temperature coefficient (MTC) are provided to ensure that the value of this coefficient remains within the limiting condition assumed in the FSAR accident and transient analyses.

The MTC values of this specification are applicable to a specific set of plant conditions; accordingly, verification of MTC values at conditions other than those explicitly stated will require extrapolation to those conditions in order to permit an accurate comparison.

The most negative MTC value equivalent to the most positive moderator density coefficient (MDC), was obtained by incrementally correcting the MDC used in the FSAR analyses to nominal operating conditions. These corrections

The limits on Reactor Makeup Water pump flow ensures an adequate amount of time will be available for the operators to take corrective actions in the event of a boron dilution ~~incident~~ event.