Wisconsin Electric POWER COMPANY
231 WEST MICHIGAN, MILWAUKEE, WISCONSIN 53201

June 8, 1974

Mr. John F. O'Leary, Director
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. O'Leary:

DOCKET NO. 50-266
VIOLATION OF TECHNICAL SPECIFICATION LIMITING
CONDITION FOR OPERATION 15.3.10.A.4
POINT BEACH NUCLEAR PLANT

This letter is to report the details of an abnormal occurrence at Point Beach Nuclear Plant, Facility Operating License No. DPR-24, as defined by Section 15.1.a.B of the Technical Specifications. This written report, filed in accordance with Section 15.6.6.A.2 of the Technical Specifications, follows a telephone report made on the incident to Mr. K. R. Baker of Region III, Directorate of Regulatory Operations, on May 30, 1974, as required by Section 15.6.6.A.1 of the Technical Specifications.

Following the Unit 1 refueling shutdown of April 6 to May 26, 1974, and prior to power operation of the unit, a minor leak of a main steam safety valve was discovered May 29, 1974, and the decision wasmade to substantially reduce secondary side steam pressure to see if a lower secondary steam pressure would permit reseating of the safety valve and termination of the minor leak. While not the subject of this report, this action was in fact successful.

Partial cooldown of the reactor coolant system for the above mentioned purpose was accomplished between 0140 hours and 0600 hours on May 30, 1974, and heatup was initiated at approximately 0730 hours the same date.

In conjunction with the heatup, the Reactor Engineer utilized the opportunity to perform additional core physics tests to substantiate and verify previously collected data. The reactor was taken critical during the course of these physics tests at 1010 hours on May 30, 1974. The data collected at this time was such as to raise a question on the part of the Reactor Engineer and he requested that an analysis of the boron concentration of

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the reactor coolant system be conducted. The analysis indicated a boron concentration of 1435 ppm, this being 43 ppm below the expected valve of 1478 ppm. Boration was immediately initiated to return the reactor coolant system to the desired concentration.

An investigation of the reasons leading to the 43 ppm reduction in boron concentration disclosed that during the cooldown of the reactor coolant system the blender controls had been correctly set to maintain the correct concentration of 1478 ppm but the blender, in fact, had delivered borated water to the reactor at approximately 20% less concentrated than the desired value. The lower boron concentration from the blender was caused by the actual concentrated boric acid flow rate to the blender being lower than the flow rate instrumentation indicated to the operator.

Calculations by Reactor Engineering then determined that based on the gradual reduction to 1435 ppm boron concentration during the cooldown, the Technical Specification provision 15.3.10.A.4 was violated at approximately 0200 hour on May 30, 1974, and continued until the commencement of the physics test program at 0950 hour the same date.

For convenience in analyzing this report, Section 15.3.10.A.4 of the Point Beach Nuclear Plant Technical Specifications is quoted in full, as follows:

> "When the reactor is subcritical, except for physics tests, the critical rod position, i.e., the rod position at which criticality would be achieved if the control rods were withdrawn in normal sequence with no other reactivity changes, shall not be lower than the insertion limit for zero power."

It should be stressed that at all times the reactor was sufficiently subcritical to protect the core from all potential reactivity accidents.

Following the loading of two regions of new fuel in the Point Beach Nuclear Plant Unit 1, core physics tests indicated that the temperature coefficient for the core was less negative than design calculations had indicated, this becoming more pronounced, of course, as boron concentration increased. Conservative calculations indicated a negative temperature coefficient commenced at 530°F and 1505 ppm boron; 1500 ppm boron was therefore chosen as the maximum permissible boron concentration at the BOL zenon free condition. Critical rod position under these conditions was calculated

to be between 160 and 170 steps on Control Bank B. With the zero power insertion limit at 153 steps on B, it was decided to insert the part length rods to their maximum integral worth to gain some additional maneuverability for operation. This raised the critical rod position to 190-200 steps on Control Bank B, thus giving the operator a "window" from 153 to 200 steps on Bank B in which to take the reactor critical while still maintaining a conservatively negative temperature coefficient and being above the insertion limit.

The reactor was taken subcritical prior to the reduction in secondary system pressure because the primary system has to be cooled down and this would cause the temperature coefficient to become positive. This cooldown resulted in the reduction of the boron concentration which caused the critical rod position to move down, eventually closing the window described above and creating a violation of Technical Specification Section 15.3.10.A.4.

Calculations indicated that throughout this occurrence a shutdown margin in excess of 4% $\Delta k/k$ remained at all times. These calculations accounted for such possibilities as (a) a stuck rod of maximum worth .66 $\Delta k/k$; (b) an ejected rod of .91 $\Delta k/k$ worth; (c) depressurization of the reactor coolant system. It should be noted that by shutting down the reactor prior to the cooldown, the stuck rod worth was reduced from 1.13 to 0.66 $\Delta k/k$ because the higher worth stuck rods were inserted in the core.

No attempt was made to take the reactor critical until the commencement of the core physics test. Achieving criticality below the minimum rod insertion limit during a physics test is covered by Section 15.3.10.A.4 of the Point Beach Nuclear Plant Technical Specifications.

An analysis of the reactor configuration at the time of the occurrence and a review of the event by the Manager's Supervisory Staff has determined that the occurrence did not pose a hazard to the health and safety of the public.

A tag has been placed on the controls of the boric acid blender to indicate to the operator the present percentage error between actual and indicated flow rate of boric acid to the blender. A maintenance request has been issued to the Instrument and Control Department to place a correction factor into the instrumentation such that the indicated and actual flow rates for boric acid injection to the blender coincide.

Very truly yours,

Sol Burstein

Executive Vice President

cc: Mr. James G. Keppler, Regional Director
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