



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

Dear Mr. O'Leary:

TURKEY POINT UNIT NO. 4
DOCKET NUMBER 50-251
ABNORMAL OCCURRENCE NO. 4-73-11
INTRUSION OF DILUTE WATER INTO THE
CONCENTRATED BORIC ACID SYSTEM

I. Introduction

This report is submitted in accordance with Technical Specification 6.6.2a, Operating License No. DPR-41. This Abnormal Occurrence Report No. 4-73-11 describes an abnormal occurrence identified on September 20, 1973. The Directorate of Regulatory Operation, Region II, was notified on September 21, 1973.

II. Description of Occurrence

On September 20, 1973 a sample from the inlet piping to the Unit No. 4 boron injection tank (BIT) was analyzed and found to contain less than the 20,000 ppm boron specified in section 3.4 of the Technical Specifications. A second sample was drawn for verification and it also contained less than the specified minimum of 20,000 ppm boron. A sample drawn from the outlet of the BIT showed the boron concentration to be greater than the specified 20,000 ppm. Suspecting leakage by the BIT inlet isolation valves, the valves were cycled and checks were made verifying proper seating of the valves. To insure that the BIT boron concentration was within specifications the BIT contents were recirculated through a boric acid storage tank. The sample following recirculation showed boron concentration greater than 20,000 ppm. Investigation of the problem continued and surveillance of BIT concentration was increased to once per day. The BIT boron samples indicated the boron to be within specification until September 26, 1973 when a sample from the BIT inlet piping again showed less than the specified minimum 20,000 ppm boron.

Handwritten: 50251

The BIT contents were again recirculated through a boric acid storage tank and subsequently sampled and the boron concentration was found to be within specification. A short time later on September 26, 1973 the continuing investigation revealed that a valve was leaking in the suction of the boric acid transfer pumps, allowing intrusion of primary water into the boric acid storage system and ultimately into the BIT inlet piping through the BIT to boric acid storage tank recirculation path.

III. Analysis of the Occurrence

The leakage of primary water into the boric acid transfer pump suction was the main source of dilution of the borated water in the BIT inlet piping. If there was any leakage by the BIT inlet isolation valves it was very small. During the investigation the safety injection pumps were run, pressuring the upstream side of the BIT inlet isolation valves to approximately 1,500 psig for about one half hour. Monitoring of the pressure on the BIT side of the valves during this time revealed no detectable increase in pressure indicating that if there was any leakage it was minor. Increased frequency of recirculation through the boric acid storage tanks will compensate for any leakage from this source. The inleakage from the primary makeup water system was probably also of a small amount but the proximity of the BIT inlet sample line connection to the point of inleakage made the sample more susceptible to dilution. In all likelihood the BIT contents were never diluted, but rather only a small portion of the contents of the BIT inlet piping. Samples of boric acid storage tank contents showed that they remained within specification for the entire time and in fact never experienced a significant change in boron concentration.

IV. Corrective Action to Prevent Recurrence

The corrective action taken was as follows:

1. The primary water supply valve to the 4B boric acid transfer pump suction was replaced.
2. Associated piping which could possibly contribute to inleakage into the No. 4 BIT has been checked and determined not to be a source of leakage.
3. The sampling frequency of the No. 4 boron injection tank has been increased to once per day and circulation of the No. 4 boron injection tank through a boric acid storage tank has been increased to once every four hours. This will be continued until satisfactory assurance has been obtained that all sources of dilution have been eliminated.

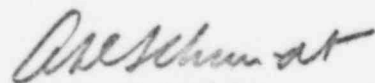
V. Analysis and Evaluation of Safety Implications of the Occurrence

The role of the BIT is to provide a source of negative reactivity to alleviate the consequences of the postulated steam break accident described in the FSAR. The safety analysis is conservative in that credit is only taken for the amount of boron in the BIT itself and no credit is taken for the amount of boron in the safety injection system piping. In addition, the actual rate of boron injection in the unlikely event of a steam break, would be greater than that utilized in the FSAR because actual safety injection flow rates would be higher than those analyzed in the FSAR. These factors coupled with high probability that the BIT itself was never diluted all indicate that the consequences of a steam line break would have been within the limits presented in the FSAR.

VI. Conslusions

- a. The BIT inlet piping boron concentration was reduced by inleakage from the primary water makeup system via the leaking valve in the 4B boric acid transfer pump suction.
- b. Leakage by BIT inlet isolation valves, if any, is small.
- c. The corrective actions taken provide an adequate solution to the problem and will reduce the probability of similar incidents.
- d. The abnormal occurrence did not result in any danger to the public health and safety nor was the safe operation of the reactor jeopardized.

Very truly yours,



A. D. Schmidt
Director of Power Resources

cc: Mr. Norman C. Moseley, Director
Region II
Directorate of Regulatory Operation
U.S. Atomic Energy Commission
Suite 818
230 Peachtree Street, N.W.
Atlanta, Georgia 30303