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Carolina Power & Light Company

November 29, 1972

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

H. B. ROBINSON UNIT NO. 2
LICENSE DPR-23
FINAL REPORT ON BORON INJECTION TANK
DILUTION INCIDENT OF JULY 16, 1972

Dear Mr. O'Leary:

Our original letter to you on the boron injection tank dilution incident of July 16, 1972, stated that we would keep you informed of further developments concerning the incident. This letter is to provide you with the results of a thorough investigation of the cause of boric acid precipitation in the heat traced lines. Also, included are several additional corrective measures which have been initiated in order to prevent dilution of the boron injection tank and boric acid precipitation.

The investigation of the boric acid heat tracing performance on piping associated with the concentrated boric acid portions of the safety injection system was conducted under the supervision of Mr. J. R. Murphy, a consultant electrical engineer from Westinghouse. The investigation included all areas of the heat traced safeguards piping where large heat losses were probable. By measuring surface temperatures of various components, it was found that low sections of pipe, uninsulated valve bonnets, and piping adjacent to large pipe hangers were susceptible to large heat losses. Valves SI-841A and SI-841B, and SI-867A and SI-867B were particularly susceptible due to their installation and insulation.

Efforts were then made to reduce the heat losses. These efforts included the following:

1. All valve bonnets were insulated up to the packing gland.

2. Pipe hangers were insulated where the pipe could not be adequately insulated between the hangers and the pipe.

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3. Strip heaters were added where large heat sinks were present in the form of vertical pipe or adjacent unheat traced pipe.

4. The recording thermocouples were moved to the points where problems were most likely to occur.

These improvements have reduced heat losses as verified by checking during normal operations. Valves SI-841A, SI-841B, SI-867A and SI-867B are being maintained above 140°F.

Our investigation also revealed that the temperature of the metal surface on the bottom of "B" boric acid tank was near the point of precipitation for boric acid at the tank concentration. To correct this the temperature controller setpoints were increased 10°F.

The recirculation flow is now being verified and logged in the shift log during each period of recirculation. Verification of recirculation flow will ensure that the small diameter recirculation lines do not become plugged. This recirculation is performed at least once per day.

To improve the surveillance of the heat tracing, we are presently modifying the temperature recorders and installing local individual alarm panels for each circuit. The local alarm will initiate a RTGB annunciator and will clear after a local acknowledgement. In an effort to better comply with our Technical Specifications and Bases, we are initiating a weekly periodic test to ensure that both the primary and the secondary circuits of the heat tracing are operable.

To conclude the follow-up to the incident, we conferred with Westinghouse concerning the consequences of a probable accident with 3000 ppm boron in the boron injection tank. For both a credible break, as a stuck open safety valve, and an incredible break, as a double ended steam break, the resulting DNBR would not decrease below 1.30.

It is believed that these changes should improve the reliability of these systems.

Yours very truly,

E. E. Utley
Vice President
Bulk Power Supply

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cc: Mr. C. D. Barham
Mr. N. B. Bessac
Mr. B. J. Furr
Mr. S. Grant