

DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N.C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

May 12, 1981

TELEPHONE: AREA 704
373-4083

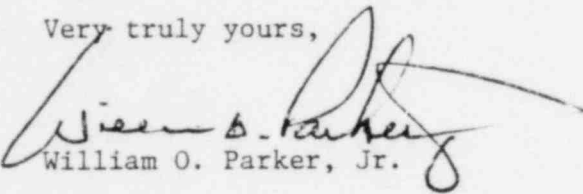
Mr. James P. O'Reilly, Director
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Re: McGuire Nuclear Station Unit 1
Docket No. 50-369

Dear Mr. O'Reilly:

Please find attached Reportable Occurrence Report RO-369/81-52. This report concerns the UHI diaphragm in the Safety Injection System being ruptured. This incident was considered to be of no significance with respect to the health and safety of the public.

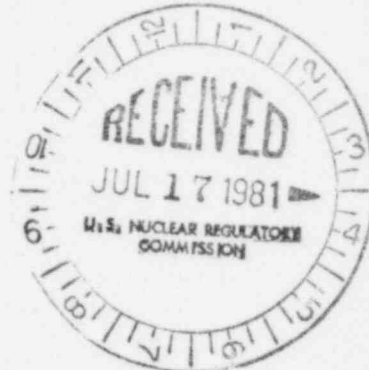
Very truly yours,


William O. Parker, Jr.

RWO:pw
Attachment

cc: Director
Office of Management & Program Analysis
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. Bill Lavallee
Nuclear Safety Analysis Center
Post Office Box 10412
Palo Alto, CA 94303



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McGUIRE NUCLEAR STATION
INCIDENT REPORT

Report Number: 81-52

Report Date: April 27, 1981

Occurrence Date: April 12, 1981

Facility: McGuire Unit 1, Cornelius, N.C.

Identification of Occurrence: Upper Head Injection (UHI) diaphragm in the Safety Injection (SI) System ruptured.

Conditions Prior to Occurrence: Mode 3, Hot Standby

Description of Occurrence: Approximately two hours after opening the UHI block valves and declaring the UHI system operable, the UHI rupture diaphragm alarm was received in the Control Room. Further investigation revealed that the diaphragm had ruptured. Since it could not be determined how long the total dissolved nitrogen in the water accumulator would be within Technical Specification Surveillance Requirement 4.5.1.2c, it was decided that this was reportable pursuant to Technical Specification 3.5.1.2.

Apparent Cause of Occurrence: The Operating Procedure, Upper Head Injection, did not contain steps to fill and vent the piping between the UHI discharge block valves prior to opening the valves.

Analysis of Occurrence: On April 12, 1981, the Operating Procedure, Upper Head Injection, was being used to fill and vent the piping between the UHI water accumulator discharge block valves and the reactor vessel head. At approximately 1630 hours, the UHI discharge block valves were opened to declare the UHI system operable so that Reactor Coolant System (RCS) pressure could be increased above 1900 psig. Immediately, a decrease of approximately 50 psig and a 20 percent level decrease occurred in the UHI surge tank. The drain on the standpipe feeding the level switch which gives the membrane rupture alarm was opened. There was very little water and mostly a vapor/gas mixture in the standpipe. Since it didn't appear that the diaphragm had ruptured, RCS pressure was increased.

At approximately 1830 hours, the "UHI Membrane Leakage" alarm in the Control Room was received. The drain on the standpipe was opened and about 10 gallons of water drained out. The Operating Procedure, Annunciator Response for Panel IAD8, required no immediate action be taken for a diaphragm leak and its supplementary action required a work request be initiated to replace the diaphragm during the next plant shutdown. In addition, Technical Specification 3.5.1.2 does not address the problem of a leaking diaphragm. The Shift Supervisor also believed that only a small leak had occurred and thus, RCS System pressure was increased further. The decision was made to decrease RCS System pressure to 1800 psig and replace the diaphragm since it could not be determined how quickly nitrogen would saturate the water in the accumulator.

After the diaphragm was replaced, at 1600 hours on April 15, 1981, a sample was taken from the normal point at the bottom of the water accumulator and the nitrogen concentration was found to be 99.6 SCF/1800 ft³ water. Since Technical Specification 4.5.1.2 requires a concentration of less than 80 SCF/1800 ft³, the decision was made to feed and bleed the accumulator to get it back into specification. This was accomplished by feeding (15 gpm) from and bleeding to the Refueling Water Storage Tank (FWST) using the NI pump. At 0600 hours on April 16, 1981, a sample showed 102 SCF/1800 ft³. A sample was taken at the top of the accumulator at 1500 hours and showed 63 SCF/1800 ft³. It was decided that there was a dead spot in the bottom of the tank where the normal sample was taken and the top sample was more representative of the tank contents. Thus, the Technical Specification requirement (80 SCF/1800 ft³) was met, the feed and bleed was stopped, and NC pressurization was resumed. The UHI discharge block valves were opened without incident. When the NC System normal pressure of 2235 psig was reached, the feed and bleed was restarted. Finally, on April 17, 1981 a top sample was taken at 0900 hours and showed 53.7 SCF/1800 ft³ and a bottom sample at 1045 hours indicated 56.8 SCF/1800 ft³.

Safety Analysis: Since there was only new fuel in the core, plant safety and the health and safety of the public were not affected by the rupture of the diaphragm. If the reactor had been at power, the UHI System would still have been operable since the diaphragm is designed to rupture when the system is actuated anyway.

In this case, the nitrogen saturated the water in the accumulator quicker than expected since a bottom sample taken on April 8, 1981 showed 42.8 SCF/1800 ft³. The Operating Procedure, Annunciator Response for Panel 1AD8 (1AD8-F6, UHI Membrane Leakage), is being studied to determine what further action is needed to insure that the Technical Specification requirement of less than 80 SCF/1800 ft³ is met if a diaphragm leak should occur during power operation.

Corrective Action: A change was issued to the Operating Procedure, Upper Head Injection, to fill and vent the piping between the UHI discharge block valves. This should prevent a rapid change in the water volume in the water accumulator and surge tank when the UHI System is put into operation.