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POWER BUILDING
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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

June 11, 1981

81-071-03L


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-369/81-85. This report concerns the concentrations of oxygen and hydrogen in the Waste Gas System exceeding Technical Specification limits. 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

Ms. M. J. Graham
Resident Inspector - NRC
McGuire Nuclear Station

Mr. Bill Lavallee
Nuclear Safety Analysis Center
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McGUIRE NUCLEAR STATION
INCIDENT REPORT

Report Number: 81-85

Report Date: June 1, 1981

Occurrence Date: May 13, 1981

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

Identification of Occurrence: The concentration of oxygen ($O_2$) and hydrogen ($H_2$) in the Waste Gas (WG) System exceeded the limits set forth as a limiting condition for operation.

Conditions Prior to Occurrence: Mode 5: Cold Shutdown. Prior to initial criticality.

Description of Occurrence: Vent gases were being transferred from the Pressurizer Relief Tank (PRT) which were high in oxygen concentration to the WG Shutdown Tank B (SDT-B); hydrogen was being added to this volume of gas and this gas was passed through the Hydrogen Recombiner System to reduce the $O_2$ concentration. Too much $H_2$ was added, however, and this high $H_2$ concentration (10%) in conjunction with the concentration of $O_2$ (7%) already present in the system, constituted a degraded mode of operation and was reportable pursuant to Technical Specification 3.11.2.5.

Apparent Cause: The high $O_2$ concentration was caused by venting the Reactor Coolant (NC) System during filling operations into the PRT and then into the WG System. $H_2$ from the Hydrogen Bulk Storage (GS) System was added to the WG System so that the gaseous mixture could be passed through the hydrogen recombiner.

Analysis of Occurrence: Following the escalation of the plant from Mode 6 to Mode 5 the NC System was being refilled. The area under the reactor head contained a "bubble" of air which was entrapped in the NC System. This and other pockets of air were vented into the PRT, using an approved procedure, Filling and Venting of Reactor Coolant System. This volume of gas was, in turn, transferred to the WG System into the SDT-B between 0100 hours and 0330 hours on May 13, 1981. The concentration of $O_2$ was 7% by volume. The bulk of gas within the WG System was composed of nitrogen ($N_2$).

Preparations were being made to add hydrogen to SDT-B from the GS System. The resulting mixture would than be passed through one of the hydrogen gas recombiners to convert the $O_2$ and $H_2$ gases into water. A mixed volume of gas with a 10% concentration of $H_2$ by volume was obtained inadvertently.

The resulting mixture of gases was diluted with nitrogen and processed through the recombiner. At 0525, the $H_2$ and the $O_2$ concentration were each 2.5% by volume.

Safety Analysis: The Specification, 3.11.2.5, is provided to ensure that the concentration of potentially explosive gas mixtures contained in the WG System is maintained below the flammability limits of $H_2$ and $O_2$; The lower flammability limit for $H_2$ is 4% and for $O_2$ is 4.5%. Any mixture within the limits of flammability is classified as explosive. Maintaining the concentration of $H_2$ and $O_2$ below their flammability/explosive limits provides assurance that the release of radioactive materials will be controlled in conformance with the requirements of General Design Criterion 60 of Appendix A 10CFR Part 50.

Since analysis of the NC and WG Systems proved that no radiation was present at the time of this incident and no ignition source was present to ignite the mixture of gases, the health and safety of the public were not affected by this incident.

Corrective Action: The immediate corrective action was to reduce the $H_2$ and $O_2$ concentration to acceptable levels. This was accomplished by introducing additional nitrogen into the process stream and passing this diluted mixture through the recombiner. This action brought the concentration within acceptable limits within 35 minutes.

Changes were made to the operating procedure to allow the excess gases trapped in the NC System to be released from the PRT into containment atmosphere. This would prevent putting such an $O_2$-rich load into the WG System and would, in turn, reduce the need for adding $H_2$.