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Research Reactor Facility

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February 5, 1981

Director of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Reference: Docket 50-186
University of Missouri
License R-103

Subject: Report as required by Technical
Specification 6.1.h(2).

Description

On January 9 and 10, 1981, the reactor was operating with low air flow through the stack radiation monitor due to the associated air blower being secured. The particulate, gas and iodine indication and alarm instrumentation was operating properly but the low air flow by the detectors resulted in unreliable information being presented to the reactor operator. Operating without sufficient reliable information is a violation of Technical Specification 3.4.a.

Analysis

At approximately 1630, during a reactor start-up check, the Electronic Shop personnel performed an electronic calibration of the iodine instrument. As a precaution, to prevent the test equipment cables from becoming entangled in the stack monitor blower fan belt, the blower was secured. Upon completion of the calibration, the iodine instrument was verified operable and returned to normal operation, but the blower was inadvertently left secured. The reactor was then operated at 10 MW from 1742, January 9, through 1422, January 10, with the blower secured. A total of 20 hours, 40 minutes elapsed with low stack monitor air flow. Technical specifications permit the monitor to be placed out of service for up to two hours providing there is no experiment or maintenance activities that would likely result in the release of unknown quantities of airborne radioactivity.

With the blower secured, the differential pressure across the stack monitor caused a flow rate of 7.5 liters/minute compared with the normal blower induced flow rate of 235 liters/minute. The reduced flow rate likewise reduced the deposition rate of activity on the filters used by the particulate and iodine detectors.

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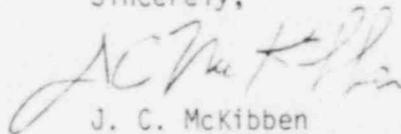
Therefore, the counts per minute indicated in the control room for a given amount of activity in the exhaust stack would be lower with the blower off. The stack monitor charts were reviewed and the stack monitor filters were counted to detect activity. Additionally, the charcoal filter from an experimental iodine monitor, which was functioning properly during this period, was pulled and counted for activity. All analyses showed the stack gas, particulate, and iodine activities to be normal and within technical specification limits during the period the blower was secured.

The stack monitor has a low/high flow alarm, but an investigation of the associated electrical circuitry revealed securing the blower electrical power also secured the alarm power thus making the control room alarm inoperable.

Corrective Action

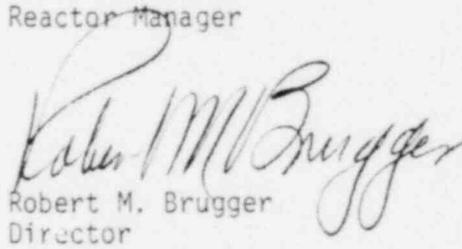
The blower was immediately turned on when found secured. As stated before, the stack monitor filters were pulled and counted. The stack monitor charts were reviewed. The electrical power for the alarm monitor circuit in the control room will be separated from the blower power and a run light indication will be added in the control room in addition to the existing high and low air flow alarm. An operability check of the air flow system will be added to the Standard Operating Procedures' Pre-start Up Check Sheet to be performed in conjunction with other stack monitor operational tests.

Sincerely,



J. C. McKibben
Reactor Manager

Endorsement
Reviewed and approved:



Robert M. Brugger
Director

JCMK:vs

cc: James Keppler, Director
Regulatory Operations - Region III
Reactor Advisory Committee
Reactor Safety Subcommittee
Document Management Branch, NRC