DEFENSE NUCLEAR AGENCY
ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE
BETHESDA, MARYLAND 20814-5145

SUBJECT: Licensee Event Report 29 march 1990

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen

In accordance with 10 CFR 50.73, the attached Licensee Event Reports are submitted for your consideration. The point of contact for further information concerning these events is the Reactor Facility Director, M.L. Moore, (301) - 295-1290.

GEORGE W. IRVING, III
Colonel, USAF, BSC
Director

Enclosures:
as stated

cc: USNRC - Region 1 - Project Engineer
Division of Reactor Projects

USNRC - Headquarters - Project Manager
Nuclear Reactor Regulation

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Licensee Event Report

for the

AFRRI TRIGA Reactor Facility

Prepared by:

Maj James R. Felty
Robert George

Mr. Mark Moore

Mark Moore 28 Mar 1990
Reactor Facility Director

Approved for Release:

George W. Irving, III
Colonel, USAF, BSC
Director, AFRRI

Abstract

On 28 February 1990 during a routine daily check of the Continuous Air Monitors (CAMs) it was discovered that the chamber door of the primary reactor CAM had inadvertently been left partially open during the daily startup. This CAM is used to monitor reactor room air for radioactive particulate material. When this CAM detects a level of radioactive particulate material on its filter greater than a preset level, the alarm will sound and positive sealing dampers in the ventilation system will close thereby isolating the Reactor Room from the environment. A back up CAM in the reactor room was operating properly during the early morning reactor operations and an analysis of the charts and filter papers from both CAMs as well as pool water samples showed no release of fission fragments. Had there been a fission fragment release, high efficiency particulate filters located in the ventilation exaust system would have backed up the dampers until the back up CAM alarm had prompted an operator to manually close the dampers.

Narrative Description of Event

Background. The primary CAM is wired into the positive sealing dampers in the reactor room ventilation system such that if it alarms these dampers will close to restrict airflow into and out of the reactor room. The CAM samples particulate material from air by filtering it and and reading the counts from decaying radioactive material that is trapped on the filter. Two CAMs are

located about twenty feet from the Reactor dolly (the device used to move the reactor across the pool). Both air intake hoses from the CAMs take their air sample from above the reactor pool.

Event Description. The chamber door on the primary CAM was inadvertently left open. This caused the filter to be several centimeters further from the detector than normal. The primary CAM was still filtering reactor room air. However, the air sample was not being taken from directly over the pool.

Chronology of Events. For 28 February 1990

0535 CAM was checked during morning startup. Chamber door inadvertently left open.

0556 Startup is completed and rods are raised to measure reactor excess reactivity.

0600 Reactor critical at 15 watts for eight minutes.

0614 Reactor Critical at 1 Megawatt for twenty two minutes.

0755 Reactor critical at 500 Kilowatt for three minutes.

0826 Reactor critical at 500 Kilowatt for thirteen minutes.

0840 (Approximately) Primary Reactor CAM chamber door discovered open by Safety & Health Department representative. The Reactor Operations Supervisor was immediatly notified of the situation. The CAM filter was replaced and the chamber door was closed.

0850 Reactor Facility Director was notified.

0855 Filters for both CAMs were taken to the radioanalysis lab and analysed.

0900 Pool water sample was taken and analysed.

1045 Maj. J. R. Felty notifies Mr. Paul Kaufman of the NRC Region I.

1 March 1990

1545 Fact sheet faxed to NRC Region I, Mr. Paul Kaufman.

Method of Discovery. The open door on the CAM was discovered during the routine daily check of the CAMs by a Safety and Health Department representative.

Automatically Initiated Safety System Response. The primary CAM causes an air damper system that regulates the flow of air into and out of the reactor room to close whenever this CAM alarms. Because the door was open, the collecting response of the primary CAM would probably have been delayed due to the time for the fission products to travel to the filter as well as the increased quantity that would have to be accumulated on the filter to initiate a responce of the primary CAM detector. The back up CAM was operating properly. If a release of fission fragments had occured, the back up CAM would have alarmed.

This would have alerted the reactor operator of a problem and the operator would have scramed the reactor and investigated the alarm.

Assessment of Safety Consequences

The Absolute filters in the ventilation exaust system will stop 99.97% of partical material greater than 0.3 microns. These highly efficient exaust filters would have removed much of the contamination from a fission fragment release. The back up CAM ,which was operating properly, would have alarmed and alerted the operator of a problem in the reactor room. By procedure, the operator would have scrammed the reactor and manually closed the air dampers by means of a switch in the control room. Closing the dampers would have sealed the room thereby stoping the release of radioactive material from the reactor room.

Description of Corrective Actions

To ensure that the dampers will close in the event of a release of radioactive material in the reactor room, the backup CAM will be wired into the damper isolation system, in parallel to the primary CAM. This corrective action provides for a backup system that is fully capable of functioning exactly like the primary system in the event that the primaty system is ever rendered inoperable.

Reference to any previous similar events

None

Point of Contact for any Questions

Points of contact for further information are the Reactor Facility Director, Mr. Mark Moore and/or the Reactor Operations Supervisor, Maj. James Felty. Telephone Number: 301-295-1290

George W. Irving, III
Colonel, USAF, BSC
Director