

JUN 28 1982



GPU Nuclear
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Writer's Direct Dial Number:

May 28, 1982
4400-82-L-0089

Office of Inspection and Enforcement
Attn: Mr. Ronald C. Haynes, Director
Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Licensee Event Report 82-013/03L-0

Attached please find Licensee Event Report 82-013/03L-0 concerning the inoperability of in-containment smoke detection on April 28, 1982.

This event concerns Section 3.3.3.8 and is considered reportable under Section 6.9.2 of the Interim Recovery Technical Specifications.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. I. Barton', written over a circular stamp or watermark.

J. I. Barton
Acting Director, TMI-2

JJB:SDC:djb

Attachments

cc: L. H. Barrett, Deputy Program Director - TMI Program Office
Dr. B. J. Snyder, Program Director - TMI Program Office
V. Stello, Deputy Executive Director
Operations & Generic Requirements
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

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LICENSEE EVENT REPORT
NARRATIVE REPORT
TMI-II
LER 82-013/03L-0
EVENT DATE - April 28, 1982

I. EXPLANATION OF OCCURRENCE

At 1040 hours on April 28, 1982, the Reactor Building smoke detector portion of Surveillance Procedure 4333-SA1 "Fire System Detector Instrument Functional Test" was initiated. Seven smoke detectors were tested. They were:

FS-XD-6279-1 which is located in the Reactor Building air cooling duct to the "B" D-ring at approximately the 305' elevation.

FS-XD-6275 - 2, 4, 5 which are located on the inside perimeter of the "B" D-ring just below the 367' elevation.

FS-XD-6276 - 2, 4, 5 which are located on the inside perimeter of the "A" D-ring just below the 367' elevation.

Of the seven smoke detectors in the Reactor Building that were tested, all failed to activate the interlocks and alarms at either the local panel (panel 720, outside containment) or in the control room. However, a few of the detectors did provide momentary visual indication of tripping at the detector (note: each smoke detector is equipped with a small red lamp to provide indication to the immediate area that the detector has tripped. The detector system is designed such that the light remains lit until the trip signal is reset at panel 720. Panel 720 is where the Fire Indicating Unit (FIU) for the inside containment fire detection strings is located. The FIU is essentially the main control unit of the fire detection and alarm/interlock systems).

Based on the failure to the required trip functions and alarms, the tested detectors were declared inoperable. This placed the unit in the action statement of Tech Spec 3.3.3.8 due to having an insufficient number of operable smoke detectors inside the Reactor Building.

This event is considered reportable under Section 6.9.2 of the Recovery Tech Specs due to the requirements of the action statement of Tech Spec 3.3.3.8.

II. CAUSE OF THE OCCURRENCE

The inoperability of the smoke detectors was the result of a partial failure of the high voltage dc supply unit in the FIU. It appears that the AC transformer, which supplies the rectifier section of the dc power supply, failed to provide the proper output voltage when supplied with its rated input voltage.

III. CIRCUMSTANCES SURROUNDING THE OCCURRENCE

At the time of the occurrence, the Unit 2 facility was in a long-term cold shutdown state. The reactor decay heat was being removed via loss to ambient. Throughout the event there was no effect on the Reactor Coolant System or the core.

IV. CORRECTIVE ACTIONS TAKEN OR TO BE TAKEN

Subsequent investigation and results are listed below.

- o The detector strings were meggered and indicated that not only was there continuity in the detector string loop conductor but that there were no appreciable difference since the last megger check.
- o The Fire Indicating Unit (FIU) was checked for proper operation. A deficiency was identified in the FIU's high voltage DC power supply.

The high voltage DC power supply provides the operating voltage for the smoke detectors. The unit was delivering approximately 190 Vdc as opposed to 220 Vdc to 240 vdc as specified for an unloaded state. When a detector tripped, i.e. when the power supply became loaded, the voltage would drop to approximately 125 Vdc. Based on the investigation, it is believed that the 125 Vdc signal was insufficient to trigger and/or maintain the FIU in an alarm state. As a result, the FIU was replaced on May 7, 1982.

- o With the external to containment portion of the smoke detection in operational order and with the detector loop (22D) inside containment verified as acceptable, the only segment remaining to be verified operable were the smoke detectors. This was accomplished during a containment entry on May 26, 1982. During the retest all of the detectors listed above, except FS-XD-6274-4 which was not retested, the required alarms were received both at panel 720 and the control room. However, interlock function with AH-F-12B did not perform as required.

This deficiency was cleared and the fire protection system returned to operable station at 1037 hours on May 28, 1982.

V. COMPONENT FAILURE DATA

Panel 720 Fire Indicating Unit (FIU)

Manufactured by Pyrotronics

Model #FIU-6

Catalog #405-5