NON-PUBLIC?: N
ACCESSION #: 8709230109
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Three Mile Island Unit 2 PAGE: 1 of 5

DOCKET NUMBER: 05000320

TITLE: Low Pressure in the Cable Room and Transformer Room Halon System
EVENT DATE: 08/07/87 LER #: 87-007-00 REPORT DATE: 09/17/87

OPERATING MODE: N POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(i)

LICENSEE CONTACT FOR THIS LER:
NAME: Russell D. Wells, TMI-2 Licensing Engineer TELEPHONE #: 717-948-8693

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: KQ COMPONENT: PSV MANUFACTURER: C125
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: During the 2300-0700 shift commencing on August 7, 1987, a Quality Assurance (QA) monitor observed an apparent abnormal pressure indication on one (1) of 19 halon cylinders for the Cable Room and Transformer Room Halon System. Specifically, halon bottle FH-165-002164 indicated approximately 340 psig. It was later determined that this indication was 200 psig less than the minimum limit, i.e., 90% of full pressure, required by the Limiting Condition of Operation (LCO) Technical Specification (Tech. Specs.) 3.7.10.3. However, the QA monitor did not realize that the observed condition constituted noncompliance with the referenced LCO until August 18, 1987, when the event was discussed with the TMI-2 Fire Protection Engineer. Accordingly, at 1408 hours on August 18, 1987, the action statement of Tech. Spec. 3.7.10.3 was entered. The required hourly firewatch and backup fire suppression equipment were established within one (1) hour and restoration of the system to operable status was accomplished within 14 days. A replacement halon bottle was installed and the system was initially restored to operable status at 0740 hours on August 20, 1987. Although compliance with the 14-day timeclock was achieved, the failure to establish the hourly firewatch on August 7, 1987, resulted in a condition prohibited by the Tech. Specs. and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B). On September 6, 1987, the pressure of the replacement

halon bottle was observed to be less than the minimum Tech. Spec. limit. An investigation determined that the root cause was a deficient solenoid pilot valve. The valve was replaced and the system was returned to operable status on September 12, 1987. A procedure change will be initiated to require leak testing of the cylinder valve and solenoid pilot valve fittings upon replacement of a halon bottle.

This LER is similar in nature to LERs 83-55, 83-15, and 83-12.

(End of Abstract)

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

The TMI-2 facility was in a long-term cold shutdown state; the defueling evolution is in progress. The reactor decay heat was being removed via loss to ambient. Throughout this event there was no affect on the Reactor Coolant System or the core.

II. STATUS OF STRUCTURES, COMPONENTS, OR SYSTEMS THAT WERE INOPERABLE
AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

N/A

I
I. EVENT DESCRIPTION

During the 2300-0700 shift commencing on August 7, 1987, a Quality Assurance (QA) Monitor was performing a tour of the TMI-2 plant. During this tour, the QA monitor observed an apparent abnormal pressure indication on one (1) of 19 halon cylinders for the Cable Room and Transformer Room Halon System (IEEE Code-KQ). This system is located at the 305 foot elevation of the TMI-2 Control Building. Specifically, the QA monitor observed that the indicated pressure of halon bottle FH-165-002164 was approximately 340 psig which was 200 psig less than the indicated pressure for the remaining halon cylinders.

The Limiting Condition for Operation (LCO) of TMI-2 Technical Specification (Tech. Specs.) 3.7.10.3, "Halon System," requires that the subject halon system be operable with the halon bottles having at least 95% full charge by weight and 90% of full charge by pressure (corrected to 70 degrees F). The full charge pressure of the halon bottles, corrected to 70 degrees F, is 600 psig. At the time the

abnormal pressure indication was observed, the ambient temperature was greater than 70 degrees F; thus, the minimum allowable Tech. Spec. pressure for the halon bottles was 540 psig (i.e., 90% of 600 psig).

The discovery of the above condition should have required compliance with the action statement of Tech. Spec. 3.7.10.3. This action statement requires the establishment of an hourly roving firewatch equipped with backup fire suppression equipment within one (1) hour and restoration of the system to operable status within 14 days.

The QA Monitor did not recognize that the observed condition resulted in a noncompliance with the LCO for Tech. Spec. 3.7.10.3; therefore, he did not notify the TMI-2 Control Room. Subsequently, on August 18, 1987, during a discussion with the TMI-2 Fire Protection Engineer, the QA Monitor mentioned the abnormal halon bottle pressure indication. The TMI-2 Fire Protection Engineer, realizing the significance of the information, verified that the pressure indication was low and notified the Control Room. At 1408 hours on August 18, 1987, the Control Room entered the action statement of Tech. Spec. 3.7.10.3.

A replacement halon bottle (i.e., FH-165-002634) was obtained, installed, and leak tested. The Cable Room and Transformer Room Halon System was restored to full operable status at 0740 hours on August 20, 1987, within the 14-day timeclock (i.e., since initial discovery on August 7, 1987). However, the failure to establish the hourly roving firewatch and backup fire suppression equipment within one (1) hour of discovery resulted in a condition prohibited by the plant's Tech. Specs. and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

At 1350 hours on September 6, 1987, the replacement halon bottle (i.e., FH-165-002634) also was observed to have an indicated pressure below the minimum Tech. Spec. required limit. The action statement of Tech. Spec. 3.7.10.3 was entered. Following an investigation of the cause of this condition, the Cable Room and Transformer Room Halon System was restored to operable status at 1030 hours on September 12, 1987.

Since the specific event date (i.e., the date the abnormal pressure condition occurred in halon bottle FH-165-02164) of this Licensee Event Report (LER) cannot be determined, the event date and the discovery date (i.e., August 7, 1987) are assumed to be the same for

purpose of a reportability determination. The reportability date (i.e., the date the event was determined to be reportable) of this LER is August 18, 1987. Thus, the due date of the LER is September 17, 1987.

This LER is similar in nature to LERs 83-55, 83-15, and 83-12.

IV. ROOT CAUSE OF THE EVENT

Based on the following information, it can be reasonably concluded that the initiating cause of this event is a defect external to the halon bottle.

o On July 17, 1987, during the six (6) month Tech. Spec. Surveillance of the Cable Room and Transformer Room Halon System, halon bottle FH-165-002215 indicated a pressure below the minimum Tech. Spec. limit. This halon bottle was replaced with bottle FH-165-002164 which is the subject of this LER.

o On August 20, 1987, halon bottle FH-165-002164 was replaced with bottle FH-165-002634.

o On September 6, 1987, the indicated pressure of halon bottle FH-165-002634 was observed to be below the minimum Tech. Spec. required limit.

Thus, in approximately two (2) months, three (3) halon bottles located in the same position in the halon bank had indicated pressures below the minimum Tech. Spec. Limit.

An investigation was performed to determine the cause of the above failures. This investigation determined that during replacement of halon bottle FH-165-002634, only the cylinder valve fitting was leak-tested. A potential source of leakage also exists through the normally closed solenoid pilot valve. The solenoid pilot valve for the above referenced halon bottles was replaced. This resulted in a pressure indication for halon bottle FH-165-002634 being restored to acceptable Tech. Spec. limits. Thus, the root cause of this event is attributable to a deficiency in the solenoid pilot valve resulting in a leak.

V. CORRECTIVE ACTIONS

Short-Term

o Halon bottle FH-165-002164 was replaced with spare bottle FH-165-002634 and the Cable Room and Transformer Room Halon System was initially restored to operable status at 0740 hours on August 20, 1987.

o Unit Work Instruction (UWI) 4220-3310-87-H617 was issued to determine the generic cause of the failure of the halon bottles described in this LER. The cause of the abnormal pressure indication was attributed to a deficiency in the solenoid pilot valve. The Cable Room and Transformer Room Halon System was again restored to operable status at 1030 hours on September 12, 1987. Completion of the above referenced UWI is pending monitoring of the pressure indication for the replacement halon bottle to ensure that no further leakage is occurring.

Long-Term

o TMI-2 Surveillance Procedure 4224-SUR-3812-03, "Fire System Halon System Check," will be revised to require leak testing of the cylinder valve and solenoid pilot valve fittings upon replacement of a halon bottle.

o This event will be discussed with QA Monitors to emphasize the need to report any abnormal condition to the Control Room immediately upon discovery.

VI. COMPONENT FAILURE DATA

Solenoid pilot valve manufactured by Cardox Corporation. Model 7-061-0005, valve number V5D26985.

VII. AUTOMATIC OR MANUALLY INITIATED SAFETY SYSTEM RESPONSES

N/A

VIII. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The Cable Room and Transformer Room Halon System has one (1) operable bank of 19 halon bottles. Each container can hold a maximum of 158 lbs. of Halon 1301 which is superpressurized with dry nitrogen to 600 psig at 70 degrees F. The entire bank is required to achieve the 7% volume concentration of halon necessary to extinguish or suppress a fire. The Tech. Spec. limit of 150 lbs./cylinder multiplied by 19

cylinders yields 2850 lbs. of halon required to be available. For administrative purposes, GPU Nuclear has established the minimum halon weight as 155 lbs./cylinder or 2945 lbs. Halon bottle FH-165-002164, was determined to have had 130 lbs. (i.e., 25 lbs. less than the administrative limit) of halon when the low pressure indicator was observed. It was verified that the weight of remaining bottles exceeded the administrative limit. Thus, the total theoretical minimum weight of halon available was 2920 lbs. or approximately 2% in excess of the total minimum required by the Tech. Spec. limit. Thus, even with the low indicated pressure condition in the one (1) halon bottle, the system would have had sufficient halon to extinguish any postulated fire.

Had the system not been able to extinguish the fire, indicators in the Control Room would have alerted the operators to the presence of a fire and operators would have taken appropriate actions to mitigate the damage caused by the fire. Additionally, the TMI-2 Fire Protection Program Evaluation, which has been reviewed and approved by the NRC, notes that a Design Basis Fire in the Cable Room and Transformer Room could have resulted in the loss of remote operation/indication for various systems but would not have jeopardized the safe shutdown condition of the plant. Thus, this event did not present undue risk to the health and safety of the public.

ATTACHMENT # 1 TO ANO # 8709230109 PAGE: 1 of 1

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September 17, 1987

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Dear Sirs:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)

Operating License No. DPR-73
Docket No. 50-320
Licensee Event Report 87-07

Attached is Licensee Event Report 87-07 concerning the inoperability of the Cable Room and Transformer Room halon system. This event was determined to be reportable on August 18, 1987.

This event is considered reportable pursuant to Title 10 of the Code of Federal Regulations, Section 50.73(a)(2)(i)(B)).

Sincerely,
/s/ F. R. STANDERFER
F. R. Standerfer
Director, TMI-2

FRS/RDW/eml
Attachment

cc: Regional Administrator, Region 1 - W. T. Russell
Director, TMI-2 Cleanup Project Directorate - Dr. W. D. Travers

GPU Nuclear Corporation is a subsidiary of the General Public Utilities Corporation

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