NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
McGuire Nuclear Station, Unit 1	0 5 0 0 0 3 6 9	1 OF 0 7

TITLE (4) A Fire Barrier Blanket was Breached Without Compensatory Action Due To Personnel Not Recognizing The Blanket As A Fire Barrier.

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 9	2 1	8 7	8 7	— 0 2 2	— 0 1	0 6	3 0	8 8	Unit 2	0 5 0 0 0 3 7 0
										0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Steven E. LeRoy, Licensing	AREA CODE 7 0 4 3 7 3 - 6 2 1 3

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On September 21, 1987 during an annual Fire Protection Audit, a breached fire blanket was discovered. The fire blanket covered an Auxiliary Feedwater (CA) pressure switch. The blanket had been cut to allow penetration to facilitate maintenance on the pressure switch instrument. It was determined that the breach occurred on September 12, 1987 when Instrument and Electrical personnel, who were unaware the blanket was a fire barrier, cut the blanket to perform preventative maintenance. The cause of the event was attributed to Management Deficiency because no training had been given to the technicians to enable them to recognize the covering (blanket) as a fire barrier. Placards were attached to the fire blankets over the instrumentation in both Unit 1 and 2 CA rooms identifying them as fire barriers. Training already in place as a result of a previous event will be modified to emphasize recognizing fire barriers. Instruments which have fire blanket coverings will be identified on their preventative maintenance/periodic tests work requests as such to aid in identifying this type of fire barrier.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

INTRODUCTION:

At approximately 1000, on September 21, 1987, while performing an annual Fire Protection Audit, a Quality Assurance (QA) audit team inspector discovered the seams on a fire blanket surrounding an Auxiliary Feedwater System (CA) [EIIS:BA] pressure switch [EIIS:PS] had been cut and the blanket had been penetrated. Within one hour Mechanical Maintenance (MNT) repaired the seams and returned the fire blanket to service.

It was determined during this investigation that the breach had occurred on September 12, 1987, when an Instrumentation and Electrical (IAE) crew had performed a periodic calibration on the pressure switch. The crew cut the seams for access to the instrument and believed the material covering the instrument was simply thermal insulation. They were completely unaware that the material was actually a fire barrier and that they should have implemented the compensatory measures specified in the station directive for fire penetrations.

Unit 1 was in Mode 5, Cold Shutdown, at the time of this event.

A classification of Management Deficiency has been assigned to this event because no training had been given to the technicians to enable them to recognize the covering over the instrumentation as a fire blanket (barrier).

EVALUATION:

Background

Technical Specification (TS) 3.7.11 requires all fire barriers separating portions of redundant systems important to safe shutdown within a fire area be operable at all times. When a fire barrier is determined to be inoperable, the action statement requires a continuous fire watch or an hourly fire watch, after verifying the operability of the area fire detectors [EIIS:DET], be established within one hour.

Station Directive 2.11.5, Tech Spec Fire Penetrations, contains specific administrative instructions on how to manage a breach in a fire barrier and refers to PT/0/A/4150/04, Fire Penetration Inspection, for a listing of all the fire barriers. The instructions include specific personnel contacts to make and identify the personnel responsible for taking action to comply with the TS action statements.

Two types of blanket coverings are used at McGuire Nuclear Station. They have very similar outward physical appearances in both color and texture. One type is a thermal insulation blanket and the other type is a fire blanket. The difference is in the composition of the covering fabric and the blanket stuffing. The fire blankets are able to withstand much higher temperature. The blankets take all manner of shapes from large contoured sheets to small pillow like pads. They are secured in a similar manner using stitching and retainer wires.

Description of Event

An IAE crew went to the Unit 1 CA Pump room on September 12, 1987 to perform several periodic calibrations on instrumentation in the room. A work request had been assigned to them to perform periodic maintenance and testing on instrument 1MCAPS5381 in accordance with specified procedures. Instrument 1MCAPS5381 required adjustment and access to the instrument was gained by cutting the threads of the seam on the blanket covering over the instrument. The physical appearance of the blanket was similar to thermal insulation blankets used throughout the plant and had no unusual coloring or labeling. All members of the crew thought the blanket was simply a thermal insulation blanket and were unaware that the blanket was a TS Fire Barrier (Blanket). When they completed their work, they left the blanket unrepaired intending to inform the insulation crew that the insulation needed repair. In the case of thermal insulation, the insulation crew would normally add the job to the bottom of their work list and repair the insulation as soon as they had time. They had not had an opportunity to repair the blanket before the Fire Protection audit took place.

At approximately 1000 on September 21, 1987, a member of the Fire Protection audit team performing the annual audit noticed the breach of the fire barrier and notified MNT personnel responsible for fire barriers. The MNT personnel responded immediately and repaired the seams within the hour.

Conclusion

The root cause of this event was the failure of the IAE personnel to recognize the blanket over the instrumentation as being a TS Fire Barrier. The supervisor for that crew admitted that he was also totally unaware that the blanket was a fire barrier. No training had been conducted on recognizing fire barriers, though some training has been conducted on the administrative procedures relative to fire barriers and fire doors [EIIS:DR]. Because the physical appearance of the fire blankets is very similar to the thermal blankets used to insulate valves throughout the plant, only adequate training or special markings on the blankets would have prevented this event.

A Classification of Management Deficiency has been assigned to this event because no training had been given to the technicians to enable them to recognize the covering over the instrumentation as a fire blanket (barrier).

A review of past Licensee Event Reports (LERs) indicates that breached fire barriers are a recurring problem. LERs 370/85-04, 370/87-07, 369/87-05, 369/87-10 and 370/87-13 are examples. In some of these cases the person(s) who breached the fire barriers could not be identified; therefore, the definitive root causes could not be identified. The corrective actions taken were primarily related to correcting the specific problems with the barriers and the initiation of generic training. Corrective actions initiated in July 87 and September 87 were more comprehensive than in previous cases, and had they been implemented, they would probably have prevented this event. This event occurred before those corrective actions could be implemented. The training is being given to appropriate station

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Description of Event

An IAE crew went to the Unit 1 CA Pump room on September 12, 1987 to perform several periodic calibrations on instrumentation in the room. A work request had been assigned to them to perform periodic maintenance and testing on instrument 1MCAPS5381 in accordance with specified procedures. Instrument 1MCAPS5381 required adjustment and access to the instrument was gained by cutting the threads of the seam on the blanket covering over the instrument. The physical appearance of the blanket was similar to thermal insulation blankets used throughout the plant and had no unusual coloring or labeling. All members of the crew thought the blanket was simply a thermal insulation blanket and were unaware that the blanket was a TS Fire Barrier (Blanket). When they completed their work, they left the blanket unrepaired intending to inform the insulation crew that the insulation needed repair. In the case of thermal insulation, the insulation crew would normally add the job to the bottom of their work list and repair the insulation as soon as they had time. They had not had an opportunity to repair the blanket before the Fire Protection audit took place.

At approximately 1000 on September 21, 1987, a member of the Fire Protection audit team performing the annual audit noticed the breach of the fire barrier and notified MNT personnel responsible for fire barriers. The MNT personnel responded immediately and repaired the seams within the hour.

Conclusion

The root cause of this event was the failure of the IAE personnel to recognize the blanket over the instrumentation as being a TS Fire Barrier. The supervisor for that crew admitted that he was also totally unaware that the blanket was a fire barrier. No training had been conducted on recognizing fire barriers, though some training has been conducted on the administrative procedures relative to fire barriers and fire doors [EIIS:DR]. Because the physical appearance of the fire blankets is very similar to the thermal blankets used to insulate valves throughout the plant, only adequate training or special markings on the blankets would have prevented this event.

A Classification of Management Deficiency has been assigned to this event because no training had been given to the technicians to enable them to recognize the covering over the instrumentation as a fire blanket (barrier).

A review of past Licensee Event Reports (LERs) indicates that breached fire barriers are a recurring problem. LERs 370/85-04, 370/87-07, 369/87-05, 369/87-15 and 370/87-13 are examples. In some of these cases the person(s) who breached the fire barriers could not be identified; therefore, the definitive root causes could not be identified. The corrective actions taken were primarily related to correcting the specific problems with the barriers and the initiation of generic training. Corrective actions initiated in July 87 and September 87 were more comprehensive than in previous cases, and had they been implemented, they would probably have prevented this event. This event occurred before those corrective actions could be implemented. The training is being given to appropriate station

personnel in accordance with planned corrective action described in LER 370/87-13 and was in progress on the date of this report; however at the time of this event the crew which breached the fire barrier had not received the training.

As part of this investigation the persons responsible for the breached fire barrier were not only identified, but interviews specifically identified the root cause. It was a lack of ability to recognize a fire barrier and a lack of understanding of exactly what constituted a breach of a fire barrier because the personnel involved had not been trained to recognize one. The ongoing training is currently being modified slightly to emphasize recognition factors and sensitize all personnel to what constitutes a breach of a fire barrier.

This event is not Nuclear Plant Reliability Data System (NPRDS) reportable.

CORRECTIVE ACTIONS:

Immediate: The breach in the fire barrier was repaired and MNT restored the fire blankets to the required configuration.

Subsequent:

1) Modifications in the emphasis given to the recognition of fire barriers and what constitutes a breach of a fire barrier were made in the special fire barrier training program being given to appropriate station personnel.

2) Placards were attached to the fire blankets over the instrumentation in the Units 1 and 2 CA Pump rooms warning that the blankets are TS fire barriers.

Planned: MNT and Planning will identify those instruments which have fire blankets over them and document the PM/PT work requests to indicate that a fire barrier may have to be breached to accomplish a calibration or repair.

SAFETY ANALYSIS:

Instrument 1MCAPS5381 functions to open valve 1RN-162B (1B Supply to Aux Feedwater Pump Isolation) when the Turbine [EIIS:TRB] Driven CA Pump [EIIS:TK] (TDCAP) suction pressure drops below a preset value. This alignment to the Nuclear Service Water System (RN) [EIIS:BI] provides assured makeup to the CA system. The suction supplies normally aligned to the TDCAP include the Upper Surge Tanks [EIIS:TK], Condenser [EIIS:COND] Hotwell, and Auxiliary Feedwater Condensate Storage Tank, for a total capacity of 250,000 gallons. At the design flow rate of 900 GPM, a minimum of 4.5 hours of supply would be available from these sources assuming no operator action is taken to replenish them.

In the event there had been a fire in the room where instrument 1MCAPS5381 was located, it is unlikely that it would have been disabled because of: 1) the presence of the fire blanket material around the instrument although breached, 2) the availability of the automatic sprinkler [EIIS:KK] system, and 3) the light combustible loading in the area.

If the instrument had been damaged by a fire there would have been a minimum of 4.5 hours available to extinguish the fire and take operator action to align suction supply to other alternate sources (another alignment to the Nuclear Service Water System is available).

There were no personnel injuries, radiation overexposures, or releases of radioactive material as a result of this event.

This event is considered to be of no significance with respect to the health and safety of the public.

SUPPLEMENTAL INFORMATION:

This revised report documents a problem discovered on September 21, 1987 with the fire blanket surrounding Unit 2 Auxiliary Feedwater (CA) pressure switch 2MCAPS5381. This problem was discovered and corrected at approximately the same time as the problem with the fire blanket surrounding the corresponding Unit 1 CA pressure switch 1MCAPS5381. The problem with pressure switch 2MCAPS5381 was not documented in Licensee Event Report 369/87-22. Quality Assurance (QA) personnel discovered this discrepancy in May 1988, while completing documentation of the annual Fire Protection Audit conducted in September 1987.

INTRODUCTION:

At approximately 1000 on September 21, 1987, while performing an annual Fire Protection Audit, a QA Audit Team Inspector discovered that the seams on a fire blanket surrounding pressure switch 1MCAPS5381 had been cut and the blanket had been penetrated. Within one hour, Mechanical Maintenance personnel repaired the seams and returned the fire blanket to service.

A Cause of Management/Quality Assurance Deficiency has been assigned to this event. Instrumentation and Electrical (IAE) personnel had cut the seams of the fire blanket to access pressure switch 1MCAPS5381 to perform a periodic calibration. They believed the material covering the instrument was thermal insulation because they had not been trained to recognize that the material was a fire barrier; and therefore, did not realize that compensatory measures should have been taken.

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Also, at approximately 1000 on September 21, 1987 during the Fire Protection Audit, the QA Audit Team Inspector discovered that the bottom edges of the fire blanket wrapped around the corresponding Unit 2 CA pressure switch 2MCAPS5381 had not been sewn together to enclose the bottom of the pressure switch. Within one hour of the discovery, Mechanical Maintenance personnel repaired the fire blanket. Unit 2 was in Mode 1, Power Operation, at 100% power at the time of the discovery of the inoperable fire blanket.

EVALUATION:

The cause of the improperly wrapped fire blanket on pressure switch 2MCAPS5381 has been classified as a Cause of Other/Unknown. No loose threads were hanging from the bottom of the fire blanket to indicate that it might have once been sewn together; therefore, the fire blanket may have been installed incorrectly during the original installation in September 1984. Originally, Construction and Maintenance Department (CMD) personnel installed the fire blanket around pressure switch 2MCAPS5381 according to Nuclear Station Modification MG-2497 and Shutdown Request 7803, and QA personnel inspected the completed work to ensure the fire blanket complied with QA Condition 3 requirements and manufacturer's recommendations.

If the fire blanket was installed incorrectly originally, it was also left inadequately covering the pressure switch on several subsequent occasions. Three periodic test calibrations of pressure switch 2MCAPS5381 were performed between the installation of the fire blanket in 1984 and the Fire Protection Audit in 1987. A calibration of 2MCAPS5381 was performed according to Work Request 042815 in July 1985. The IAE personnel performing the work do not remember any facts about the job. Another calibration was performed according to Work Request 048683 in March 1986, and the CMD personnel performing the work do not remember whether they had to manipulate a fire blanket to perform the work. However, one person feels certain that he did not contact insulation personnel to remove and restore a fire blanket around this pressure switch. He concludes this because he has calibrated the pressure switch recently and distinctly remembers the steps taken to legally remove the fire blanket. Another crew of IAE personnel calibrated pressure switch 2MCAPS5381 according to Work Request 065010 in May 1987. These persons believe that they were able to pull the fire blanket up slightly to access the pressure switch. They did not realize that the material was a fire blanket or that it should have been sewn to completely enclose the pressure switch.

The fire blanket around pressure switch 2MCAPS5381 is B & B Insulation, Inc. cable wrapping material. All McGuire B & B fire blanket material is inspected once every eighteen months according to procedure PT/0/A/4250/04, Fire Barrier Inspection. The fire blanket material on pressure switch 2MCAPS5381 was inspected in March 1986, and June 1987, and no problems were reported. However, this may not be conclusive because the position of the pressure switch causes very poor visibility of the problem area of the fire blanket.

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The fact that the fire blanket was not sewn together at the bottom could only be determined by touch since the bottom of the pressure switch was not visible from any normal vantage point, and there was not a lot of loose excess fire blanket material at the bottom of the pressure switch. The corrective actions as a result of Licensee Event Report 369/87-22 should heighten the awareness of station personnel of the existence of fire blankets and inform personnel of appropriate compensatory measures to be taken if necessary to remove a fire blanket.

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June 30, 1988

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: McGuire Nuclear Station
Docket No. 50-369
Licensee Event Report 369/87-22-01

Gentlemen:

Pursuant to 10CFR 50.73 Sections (a)(1) and (d), attached is revised Licensee Event Report 369/87-22-01 concerning a breached fire barrier blanket discovered on September 21, 1987. This revised report is being submitted to provide information concerning a Unit 2 pressure switch fire barrier breach that also occurred coincident to the event that was reported by Licensee Event Report 369/88-22, and is submitted in accordance with 10CFR 50.73(a)(2)(i)(B). Change bars are provided. This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

SEL/290/thp

Attachment

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