LICENSEE EVENT REPORT (LER)

FACILITY NAME(1)	DOCKET NUMBER(2)	PAGE(3)
McGuire Nuclear Station, Unit 1	05000 369	1 OF 5

TITLE(4) Train B Of The Control Room Ventilation System Was Past Inoperable Resulting In A Technical Specification Violation Due To A Possible Fabrication/Installation Deficiency

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)
									McGuire, Unit 2	05000 370
04	01	93	93	03	0	05	03	93		05000

OPERATING MODE(9)	1	THIS REPORT IS SUBMITTED PURSUANT TO REQUIREMENTS OF 10CFR (Check one or more of the following)(11)							
POWER LEVEL(10)	100 %		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)
			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	
	AREA CODE	
Terry L. Pedersen, Supervisor, McGuire Safety Review Group	704	875-4487

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 March 1, 1993, Mechanical Maintenance (MM) personnel were performing work order 93015150, and procedure MP/0/A/7450/16, VC Filter Removal and Replacement. Air in leakage was detected at an expansion joint on the Control Room Air Handling Unit, Train B, of the Control Area Heating Ventilation and Air Conditioning (VC) system. The insulation was removed from the ductwork by MM personnel, who determined that there was air being drawn in at four locations beneath an angle iron brace used to support the duct. The immediate corrective action performed by MM personnel was to caulk around the angle iron brace and duct to prevent any further air in leakage. Mechanical Nuclear Engineering personnel, tasked with resolving the operability question, determined the VC system to be past inoperable due to the existing air in leakage rate which exceeded the maximum assumed rate for the dose calculations. The existing in leakage rate would produce dose calculations exceeding the 10CFR50, GDC-19 limits. Units 1 and 2 were in Mode 1 (Power Operation) at 100 percent power at the time of discovery. This event has been assigned a cause of Possible Fabrication/Installation Deficiency because the angle iron brace was not properly installed. Permanent repairs to seal the duct will be made.

EVALUATION:

Background

The Control Area Heating, Ventilation and Air Conditioning (VC) system [EIIS:VI] and Chilled Water (YC) system [EIIS:KM] combine to form one system designed to maintain the environment in the Control Room [EIIS:NA], Control Room Area, and Switchgear [EIIS:SWGR] Rooms within acceptable temperature limits for safe occupation by personnel performing maintenance and equipment operation. The system is also designed to maintain the Control Room in a habitable condition during and following post accident shutdown. The system is designed as an Engineered Safety Features (ESF) system with absolute and carbon filtration in the outside air intakes and with equipment redundancies for use as conditions require.

The Control Room is required to be maintained at a positive pressure of >/= 0.125 inches water gauge (w.g.), relative to outside atmosphere during an accident to prevent infiltration or in leakage of dust, dirt, smoke, radioactivity, etc., originating outside the Control Room, from entering the Control Room.

Technical Specification (TS) 3.7.6 includes requirements that in Mode 1 (Power Operation), Mode 2 (Startup), Mode 3, (Hot Standby), and Mode 4, (Hot Shutdown), with one train of the VC/YC system inoperable, the inoperable train must be restored to operable status within seven days or be in at least Hot Standby within the next six hours, and in Cold Shutdown within the next thirty hours.

Description of Event

On March 1, 1993, while performing a smoke test on the expansion joints of the Control Room Air Handling Unit (AHU), Train B, Mechanical Maintenance (MM) personnel discovered air in leakage in a joint adjacent to a point between the common plenum and an expansion joint. The work was being performed under work order (WO) 93015150, and procedure MP/0/A/7450/16, VC Filter Removal and Replacement. The responsible Component Engineering Staff (CES) person was notified of the situation. The CES person instructed the MM personnel to remove the insulation covering the duct and perform a smoke test. Four unsealed duct joint separations were located on the inlet to the Control Room Air Handling Unit (AHU) 2 fan. The CES personnel notified Operations personnel and requested they run Pressure Filter Train B. The smoke test was performed again, and the leakage was still observed.

At the direction of CES personnel, under WO 93016772, the leaking cracks were sealed by MM personnel, using Dow Corning RTV 732 caulking, on March 1, 1993. Problem Investigation

Process (PIP) 0-M93-0198 was generated to investigate the problem. On March 3, 1993, it was determined by Safety Review Group (SRG) personnel that the VC system, Train B, was presently operable. However, past operability would need to be addressed by Mechanical Nuclear Engineering (MNE). On April 1, 1993, MNE personnel determined Train B of the VC system to be past inoperable due to the air in leakage which is in excess of the assumption in the dose calculations. Based on the information provided to MNE personnel by CES and System Engineering Staff personnel, it was determined that during a system accident alignment, unfiltered air would leak into the ductwork and into the Control Room. The unfiltered in leakage was estimated to be 52 cubic feet per minute (CFM). This is more than the 10 CFM assumed in the Control Room dose analysis. It should be noted that the small amount of in leakage should not have impacted the past TS pressure testing which is currently performed bimonthly. This is based on judgement that the in leakage is relatively small compared with the required pressurization flow.

Conclusion

This event is assigned a cause of Possible Fabrication/Installation Deficiency because of the unsealed duct joint cracks found at the inlet to the Train B, Control Room AHU 2 Fan. For this particular section of ductwork, CES personnel stated that the insulation surrounding the duct has not been removed since initial installation. Due to the minimal clearance between the angle iron brace and the duct (1/16 inch), it is hard to determine if the cracks are along a duct seam that was left unwelded or if they occurred due to normal wear. It was noted that on the east side of the angle iron, the entire length is seal welded to the duct. However, on the west side of the angle iron, where the leaks were found, the angle iron is tack welded to the duct. Additionally, when the insulation was removed by MM personnel, a port was found in the ductwork near the leaks. The port, used for initial testing was left taped over instead of having a test port installed. The investigation was unable to determine how long the air in leakage has been present.

Smoke testing of the expansion joints has been performed over the last two years. During that time, in leakage has not been observed, as the testing does not require focusing on this particular area.

Work order 93018873 has been initiated to repair the affected ductwork which will include seal welding the angle iron brace to the duct, and installing a test port at the location of the taped port.

A review of the Operating Experience Program (OEP) database for the twenty-four months prior to this event revealed one event resulting in a TS violation due to a Possible Fabrication/Installation Deficiency. LER 369/91-07 dealt with the Inoperability of Train B of the Residual Heat Removal (ND) system [EIIS:BP] due to Inappropriate Actions and a

Possible Installation Deficiency. The equipment, activities, and group involved were different from this event, therefore this event is not considered to be recurring. There were no personnel injuries, radiation overexposures, or uncontrolled releases of radioactive material as a result of this event.

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

CORRECTIVE ACTIONS:

Immediate: MM personnel sealed the leaks on the Control Room AHU 2, Train B, with Dow Corning RTV 732 caulking.

Subsequent: Work order 93018873 was initiated to seal weld the angle iron brace to the duct and install a test port.

Planned: CES personnel will follow up to ensure repairs are made.

SAFETY ANALYSIS:

The design requirements of the VC system are to supply filtered air at a controlled temperature and humidity and to pressurize the Control Room to 0.125 inches w.g. which is to prevent in leakage of unfiltered air. A positive pressure of 0.05 inches w.g. is considered sufficient to prevent in leakage in excess of 10 CFM, which is the assumed leakage value used for radiation dose calculations in Chapter 15 of the FSAR. The VC system helps ensure radiation doses to the Control Room personnel remain below 10CFR50, GDC-19 limits.

The leaks located in the VC ductwork exceeded the assumptions of the dose calculations. However, there are factors which can be explored that are not considered in the design basis.

The principle contaminant contained in air leaking into the Control Room is assumed to be radioactive Iodine which is conservatively modeled in dose calculations. A dilution of this Iodine can be assumed to take place as a result of the Auxiliary Building Ventilation (VA) system [EIIS:VF]. Operation of the VA system exhaust filters would remove Iodine and particulates from the diluted air leaving the Auxiliary Building [EIIS:NF] would substantially reduce the dose contribution from assumed Emergency Core Cooling System leakage. Additionally, the Iodine releases in realistic accidents are substantially lower than those assumed in the design basis accident. Also, the Control Room dose calculations assumes operation of only one train of the Annulus Ventilation (VE) system [EIIS:VD] along with failure of one train of the VC system. This double failure assumption adds

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conservatism. Lastly, in the event the Control Room atmosphere became unbreathable, self contained breathing apparatus (SCBAs) provided in the Control Room area could be employed.

During this event, there were no accidents that would have required the operation of the VC system to maintain habitability of the Control Room.

The health and safety of the public were not affected by this event.