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 5

TITLE (4)

Containment Spray Vent Valve Found Open

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 6	2 7	8 4	8 4	0 2 5	0 0	1 1	0 9	8 4		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	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)	X 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)	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
Scott Gewehr - Licensing	AREA CODE 7 0 4 3 7 3 - 7 5 8 1

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 June 27, 1984, a 3/4 inch vent valve in the containment spray (NS) system was found open during a valve stroke timing test. Approximately 35 gallons of water from the residual heat removal system drained onto the floor of the mechanical penetration room in the auxiliary building. The most recent previous documented operation of the valve occurred on April 17, 1984, during another test. It cannot be verified if the valve was left open at that time or opened by mistake at some time in the interim. The cause of this event is attributed to personnel error. The unit was operating at 100% power when the incident was discovered.

The radioactive spill was successfully cleaned up without any workers receiving a dose in excess of any regulatory or administrative limits. Corrective actions include the use of appropriate independent verification, and a re-emphasis to appropriate personnel of the importance of removal and restoration procedures. The health and safety of the public were unaffected by this incident.

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The test procedure required each check valve in the system to be determined operable by lifting the check valve disk a small amount by the use of instrument air. Check valves will chatter on the valve seat at the slightest air flow, exhibiting free movement of the check valve disk. If water was in the lines, the air pressure could cause safety and radiological concerns by forcing high velocity water out of the discharge vent. On April 16, 1984, Operations personnel placed a drain hose on each spray header to determine if the header was free of water. A drain valve and vent valve were opened to perform this task.

It is theorized that when the header was drained on April 16, the reclosing of the vent valve 1NS-68 was overlooked. No documentation has been found to substantiate the theory that the vent valve was left open during preliminary draining on June 27. The procedure for Removal and Restoration (R&R) of Station Equipment, is required for the manipulation of any station equipment that is not covered by an established operating procedure. Review of completed R&Rs and the Reactor Operators logs have not identified and procedures for draining the spray header. Operation work lists have been found verifying that the line was drained. The pipe cap was found sitting next to the vent valve. A reducer coupler and a 1/2" nipple were attached to the valve. Interviews with the SSD personnel, that were in the same room as the vent valve and applied air pressure to the spray header, disclosed that no abnormal conditions were observed (such as air blowing out the vent valve). Applying air pressure to the drain valve 1NS-39 with vent valve 1NS-68 open should have caused high velocity audible air to exit the open vent valve, if the vent valve was open. This information is contrary to the theory that the vent was left open during draining. Background noise may have prevented the SSD personnel from hearing the noise.

Vent valve 1NS-68 is a manual, packless, 3/4" Kerotest valve, located in the Mechanical Penetration Room of the Auxiliary Building. The valve is located about 8' above the floor, not obstructed from view from the floor.

The Performance Test Supervisor sustained a contaminated shoe when he closed vent valve 1NS-68, but he did not receive a whole body dose above background radiation.

Corrective Actions:

The Operations Management procedure on independent verification and the valve checklist for the residual heat removal system operating procedure have been revised to require IV for vent, drain and test connection valves for train A & B on the ND to NS headers. Operations checked other vent and drain valves on all the NS spray headers. The pipe cap, on 1NS-68 was reinstalled.

The importance of the removal and restoration procedure in the removal of station equipment that is not covered by an established operating procedure, will be covered with all operators.

The arrangement for non-operators to cycle valves in isolated systems and verifying valve positions will be discussed in the Management Follow-up to Abnormal Event meeting. A review will be done to determine if IV may be applicable to valves on other headers.

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

Safety Analysis:

The safety analysis addressing the breach of containment integrity and the radiological consequences of leakage through the open vent valve 1NS-68, during a design basis loss of coolant accident, was approached from the following two perspectives.

The first approach involves the use of train B of the Residual Heat Removal (ND) system to reduce pressure in the containment building via the spray nozzles on the auxiliary spray header line. There are two auxiliary spray headers at McGuire, each supplied by a separate train of the ND system and used as a supplement to the normal Containment Spray (NS) system. Vent valve 1NS-68 is located on the auxiliary spray line supplied by ND train B.

In the event of a loss of coolant accident, a containment building pressure in excess of 3 psig would start the NS system pumps and open isolation valves on the main spray headers. The design basis of the NS system assumes only one of two trains to be operable during a double ended rupture of the largest pipe in the Reactor Coolant system. The auxiliary spray system is used when the NS system is inoperable or used as a supplement when building pressure remains in excess of 1 psig one hour following the loss of coolant accident (LOCA). When used as a supplement, auxiliary spray is terminated when building pressure falls below 1 psig.

Both NS trains were tested less than two weeks prior to the supposed date of misalignment (April 17) with all pumps and isolation valves operating properly. Spray nozzles were proven operable during tests in July of 1983 while spray header check valves were proven operable in April of 1984 (see original report).

Although both NS trains were available, there was still the possibility of selecting train A of the ND system, had an auxiliary spray header been required.

Elemental iodine partitioning was calculated by Mechanical Design Engineering personnel for the event using the ND train B spray header with consideration

given to sump water pH, leakage temperature, and post-LOCA iodine sump water concentrations. They concluded that over the 30 day period following the LOCA, with a continuous 50 gpm ECCS leakage, off-site doses would not have exceeded 10CFR100 values. Additionally, control room habitability was considered and determined that the 50 gpm ECCS leakage would have to be sustained for at least two days before operators' thyroid doses would have approached the 10CFR50, Appendix A, General Design Criteria (GDC) 19 value.

Vent valve 1NS-68 is located on the 750' elevation in the mechanical penetration room (room 815) on the west side of the auxiliary building. There are no floor drains in room 815; therefore, water would flow down the hallway (~ 60 ft) to the drain near the boric acid mix tank. If a need for boric acid occurred or if Unit 2 was allowed to continue to operate, boric acid would be added daily and the leak would be detected. Health Physics would also be determining access availability to all elevations following the LOCA and, since the drain is within 10 feet of the elevation stairwell door, would possibly detect the leak within the two day period should boric acid makeup be disallowed.

The second approach assumes gas and airborne particulates, ba kleaking through the spray nozzles and a partially closed check valve (1NS-41), would escape through the open vent valve due to the high building pressure. Containment leakage bypassing check valve 1NS-41 was estimated to be 3500 cc/minute by measuring backleakage on a similar check valve subjected to a 15 psig leakage test.

An off-site dose and control room habitability analysis indicates that the additional containment leakage, assumed to persist over the 30 days following the LOCA, would have possibly resulted in an increase whole body and thyroid doses of less than 10 percent of the values projected the Final Safety Analysis Report. The off-site dose would not have exceeded 10CFR100 values and the control room operators' dose would have remained below 10CFR50, Appendix A, GDC 19 values.

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

As a result of the incident, Operations personnel have revised the Operations Management procedure to apply independent verification to vent, drain, and test connection valves for train A and B on the ND and NS spray headers. Additionally, a review will be done by Design Engineering and Nuclear Production personnel to determine if independent verification may be applicable to valves on other headers.

Based on these conservatively calculated radiological dose assessments, the open vent would have posed no threat to the health and safety of the public or to McGuire Station personnel.