

LICENSEE EVENT REPORT (LER)

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TITLE (4)
Failure of Main Steam Isolation Valves to Meet Local Leak Rate Acceptance Criteria

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)					
MON	DAY	YR	YR	SEQUENTIAL NUMBER			REVISION NUMBER	MON	DAY	YR	FACILITY NAMES		DOCKET NUMBER (8)		
9	5	98	98	-	0	0	6	-	0	0	10	5	98	0 5 0 0 0	

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)	
POWER LEVEL (10) 0 0 0	<input checked="" type="checkbox"/> 10 CFR <u>50.73(a)(2)(i)(B)</u> <input type="checkbox"/> OTHER - _____ (Specify in Abstract below and in text, NRC Form 366A)	

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER
Ron W. Gaston, Compliance Supervisor		734 586-5134

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	
B	S	B I S V	A 5 8 5							
B	S	B I S V	A 5 8 5							

SUPPLEMENTAL REPORT EXPECTED (14)	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input type="checkbox"/> NO	11	15	98

ABSTRACT (16)

Local leak rate testing of the Main Steam Isolation Valves (MSIVs) was conducted during the Sixth Refueling Outage (RFO6) in accordance with Surveillance Requirement 3.6.1.2. Per Technical Specification (TS) 3.6.1.2.c, the leak rate of all four main steam lines is limited to less than or equal to 100 standard cubic feet (scf) per hour. On September 5, 1998, the 'C' main steam line (with MSIVs B2103F022C and B2103F028C) failed to meet this acceptance criteria. The minimum pathway leakage from this penetration was found to be 243.68 scf per hour, and the total minimum pathway leakage for the four main steam lines was 326.4 scf per hour. This exceeded the acceptance criteria and TS 3.6.1.2.c limit.

Evaluation of the effects of the main steam line leakage on accident analyses and post loss-of-coolant accident (LOCA) containment pressure response have been performed and have concluded that leakage less than 700 scf per hour will not impact the design basis analyses conclusions. Therefore, based on these further evaluations, the significance of the leakage found during RFO6 is minimal.

The cause of the failure has not been determined at this time; however, the cause will be determined and the affected MSIVs will be repaired or reworked, as necessary, and successfully retested prior to plant startup from RFO6. A supplement to this LER will be submitted to document the cause of the failure.

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INITIAL PLANT CONDITIONS:

Operating Condition: 4 (Cold Shutdown)
 Reactor Power: 0 Percent
 Reactor Pressure:: 0 psig
 Reactor Temperature: 150 degrees Fahrenheit

DESCRIPTION OF THE EVENT:

On September 5, 1998, local leak rate testing of the Main Steam Isolation Valves (MSIVs) [ISV] was being performed in accordance with the requirements of Surveillance Requirements 4.6.1.2. The leakage acceptance criteria for the MSIVs [ISV] as specified in Technical Specification (TS) 3.6.1.2.c is 100 standard cubic feet (scf) per hour for all four main steam lines when tested at 25 psig. Results of this testing indicated that the 'C' main steam line (with MSIVs [ISV] B2103F022C and B2103F028C) failed to meet this acceptance criteria. The minimum pathway leakage from this penetration was found to be 243.68 scf per hour. The total minimum pathway leakage from the four steam lines is summarized as follows:

A Steam Line - 68.02 scf per hour
 B Steam Line - 5.03 scf per hour
 C Steam Line - 243.68 scf per hour
 D Steam Line - 9.66 scf per hour
 Total Leakage - 326.4 scf per hour

This exceeded the acceptance criteria and TS 3.6.1.2.c limit.

CAUSE OF THE EVENT:

The cause of the magnitude of the valve leakage has not been determined at this time. However, the cause will be ascertained and appropriate corrective actions necessary to return the valves to compliance with the Technical Specifications will be implemented prior to restart from RFO6. A supplement to this LER is expected to be submitted by November 15, 1998, to document these findings and results.

ANALYSIS OF THE EVENT:

From review of the Updated Final Safety Analysis Report Chapter 15 Accident Analyses, two events were determined to be affected by the leakage past the MSIVs [ISV], 1) a steam system break outside containment, and 2) a Loss of Coolant Accident (LOCA) inside containment. The aspects of these accidents that are considered are:

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- 1) For a steam system break outside containment, the radiological consequences are evaluated wherein the activity of the primary coolant system is discharged prior to closure of the MSIVs [ISV]. This assumption is consistent with Regulatory Guide 1.5, Assumptions Used for Evaluating the Potential Consequences of a Steam Line Break Accident for BWRs.
- 2) For the LOCA inside containment, MSIV [ISV] leakage contribution to radiological dose is limited to that prior to MSIV [ISV] closure. The Fermi 2 Safety Evaluation Report, Section 15.2.3.1, Loss-of-Coolant Accident (Radiological Consideration), discusses the contribution of MSIV [ISV] leakage and the credit given for the positive seal system (i.e., MSIV Leakage Control System (MSIVLCS)).

The analyses for these accidents are bounding provided that the MSIVLCS has sufficient capacity to accommodate MSIV [ISV] leakage. As in the situation encountered during testing, any leakage past the inboard MSIV [ISV] will be into containment rather than out of containment because the MSIVLCS is designed to maintain pressure between the MSIVs [ISV] slightly higher (i.e., less than 10 psig) than that of primary containment. Leakage past the inboard MSIVs [ISV] from the four main steam lines found during RFO6 leak testing was approximately 326 scf per hour at a test pressure of 25 psig. It should be noted that since the pressure differential between the MSIVLCS and primary containment is less than 10 psig, inleakage would be expected to be smaller than this measured leakage; however, the leakage measured during the recent testing is well within the 50 scf per minute (i.e., 3000 scf per hour) capacity of the MSIVLCS (as cited in UFSAR Section 6.2.6.3).

The spectrum of postulated pipe breaks from UFSAR Chapters 6 and 15 were reviewed. Because the MSIVLCS would be placed into operation a short period of time (i.e., within 20 minutes) after a large break LOCA or an intermediate break LOCA, there is an interim period when leakage past the MSIVs [ISV] may occur. However, the leakage contribution is a very small part of overall primary containment leak rate. Similarly, for the small break LOCA wherein an orderly reactor shutdown is assumed, the MSIVLCS would not be placed into service until approximately 6 hours after the initiation of the accident. The mitigation of the accident assumed only the ECCS function to demonstrate compliance with 10CFR50.46 and Appendix K. As with the large break scenario, the contribution of leakage past the MSIVs [ISV] as compared to the total primary containment leak rate is small. In addition, the radiological consequences from a small break LOCA are bounded by the large break analyses.

Appendix E.5 of the Fermi 2 Final Safety Analysis Report (FSAR), item 310.23, discusses long term post-LOCA containment pressure response with 1000 scf per hour air inleakage from MSIVLCS. The primary containment leakage rate is assumed to be 0.5 percent per day for the duration of the accident, which would envelope the 1000 scf per hour of inleakage contribution of the MSIVs [ISV], to maintain releases within the limits of 10CFR100.

However, irrespective of the containment pressurization and containment leakage rate, the maximum allowable MSIV [ISV] inleakage into containment post LOCA has been calculated to be 700 scf per hour.

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This limitation is based on the constraints of achieving a 15 psig containment pressure for Thermal Recombiner operation at 30 days post LOCA to ensure an oxygen concentration of 5 volume percent is not exceeded.

Based on the above, the combined leakage of the MSIVs [ISV] identified during RFO6 (i.e., approximately 326 scf per hour minimum pathway leakage at a test pressure of 25 psig) does not adversely affect the ability to control the release of radioactive material or mitigate the consequences of an accident.

CORRECTIVE ACTIONS:

The affected MSIVs [ISV] will be repaired or reworked, as necessary, and retested to ensure the valve leakage rates are within the Technical Specification limit. These activities will be completed prior to restart from RFO6 and a supplement to this LER is expected to be submitted by November 15, 1998.

ADDITIONAL INFORMATION:

A. Failed Components:

Component: Main Steam Isolation Valve (B2103F022C and B2103F028C)
 Description: Air Operated Y-Pattern Globe Valve
 Manufacturer: Atwood & Morrill
 Type: H 21150M

B. Previous LERs on Similar Problems

LER 92-007-01, Exceeded Technical Specification Allowable Leakage for Containment Isolation Valves