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DTE Energy



10 CFR 50.73

April 22, 2008
NRC-08-0030

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

Reference: Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

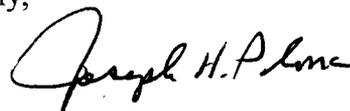
Subject: Licensee Event Report No. 2008-002, "Secondary Containment to
Suppression Chamber Vacuum Breaker Functionality"

Pursuant to 10 CFR 50.73(a)(2)(v)(D), Detroit Edison is hereby submitting the enclosed Licensee Event Report (LER) No. 2008-002. This LER documents a condition that impacted the safety function of the reactor building to suppression chamber vacuum breaker isolation valves.

No commitments are made in this LER.

Should you have any questions or require additional information, please contact Mr. Ronald W. Gaston of my staff at (734) 586-5197.

Sincerely,



cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 4, Region III
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

JE22
NRR

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollect@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE
Secondary Containment to Suppression Chamber Vacuum Breaker Functionality

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	12	2008	2008	- 002	- 00	04	22	2008	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE 1	11. THIS REPORT SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)			
10. POWER LEVEL 100%	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Jerome P. Flint – Principal Technical Specialist	TELEPHONE NUMBER (Include Area Code) (734) 586-5212
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
E	BF	VACB	I204	Y					

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On March 13, 2008 at 1445 hours, with Fermi 2 operating at 100 percent power, it was identified that the differential pressure switches that operate to open the reactor building to suppression chamber vacuum breaker isolation valves would not perform their safety function. The condition impacted the function of both reactor building to suppression chamber vacuum breaker isolation valves. These isolation valves are in series with the reactor building to suppression chamber vacuum breakers and automatically open to establish a flowpath to the vacuum breakers for equalizing the pressure between the suppression chamber and the reactor building during postulated accident events involving failure to secure drywell spray following a steam leak in the drywell and following a design basis accident (DBA). The failure was caused by operation of the pressure switches outside their qualified range.

This event was evaluated and determined to have no significant safety implications based on the change in Large Early Release Frequency of 8.4E-8/yr, which is less than the limit of 1.0E-7/yr. The differential pressure switches were replaced with a model having a range that encompasses the normal suppression chamber pressure. This event is being reported under 10 CFR 50.73(a)(2)(v)(D), as a condition that could have prevented the fulfillment of the safety function of a system needed to mitigate the consequences of an accident.

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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

Initial Plant Conditions:

Mode 1
Reactor Power 100 percent

Description of the Event

During the performance of Preventive Maintenance event T272070100 for T23N010B, Division 2 Reactor Building to Torus Vacuum Breaker [BF] Isolation Valve Pressure Differential Switch [PDS], the differential pressure switch failed calibration. On March 13, 2008 at 1445 hours, an engineering analysis identified that the differential pressure switches (T23N010A and B) for both Reactor Building to Torus Vacuum Breaker Isolation Valves (T2300F409 and T2300F410) would not perform their design function. This condition would have prevented the fulfillment of the safety function of structures or systems needed to mitigate the consequences of an accident. The condition impacted the function of both reactor building to suppression chamber vacuum breaker isolation valves.

Fermi 2 is a General Electric Boiling Water Reactor (BWR) with a Mark I primary containment comprised of a Drywell and Suppression Chamber. The primary containment is designed for an external pressure of 2 psi. The function of the reactor building to suppression chamber vacuum breakers is to relieve vacuum when primary containment depressurizes below reactor building pressure. The design of the reactor building to suppression chamber vacuum relief line consists of two vacuum breakers (an air operated butterfly isolation valve [ISV] and a self actuating vacuum breaker [VACB]), located in series in each of two penetrations from the reactor building to the suppression chamber airspace. The butterfly valve is actuated by differential pressure sensors which result in air operated actuators opening the isolation valve. The two vacuum breakers in series are normally closed to maintain a leak tight primary containment boundary. The butterfly valve is actuated by a differential pressure signal of 0.25 psid and the vacuum breaker opens at a maximum differential pressure of 0.5 psid. The valves and piping in either of the two penetrations are sized to provide sufficient flow to equalize the pressure between the suppression chamber and the reactor building during postulated accident events involving failure to secure drywell spray following a steam leak in the drywell and following a design basis accident (DBA).

Technical Specification (TS) 3.6.1.7, Reactor Building to Suppression Chamber Vacuum Breakers, Condition D, was entered for both reactor building to suppression chamber vacuum breaker lines with one or more vacuum breakers inoperable for opening. The Condition D action was to restore vacuum breakers in one line to an operable status within one hour. After it was determined replacement switches were available, one Reactor Building to Torus Vacuum Breaker Isolation Valve was failed to the open position, restoring operability of that line and exiting Condition D. With one vacuum breaker failed

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open, TS 3.6.1.7 Condition A required closing the vacuum breaker within 72 hours. At 2115 hours on March 15, 2008 replacement differential pressure switches were installed and tested and TS 3.6.1.7 limiting condition for operation was exited.

Significant Safety Consequences and Implications

There were no nuclear safety consequences as a result of this event since the reactor building to suppression chamber vacuum breaker isolation valves were not called upon to perform their safety function.

The reactor building to suppression chamber vacuum breaker isolation valves are in series with the reactor building to suppression chamber vacuum breakers and automatically open to establish a flowpath to the vacuum breakers for equalizing the pressure between the suppression chamber and the reactor building during postulated accident events involving failure to secure drywell spray following a steam leak in the drywell and following a design basis accident (DBA). Termination of containment spray is a procedure action, directed during execution of the Emergency Operating Procedures (EOPs).

The primary containment component with the lowest allowable external pressure is the torus shell above the suppression chamber pool water level. Failure will not result in loss of suppression pool water inventory. This failure would not prevent the Emergency Core Cooling Systems (ECCS) from performing their function of mitigating core damage; rather primary containment release mitigating capability would be compromised.

There is a small probability the reactor building to suppression chamber vacuum breakers will be required to operate. Should they be required to operate, failure of the reactor building to suppression chamber vacuum breakers would impact only the containment integrity risk metric, Large Early Release Frequency (LERF). The calculated value for the change in LERF is very small, 8.4E-8/yr, which is less than the limit of 1.0E-7/yr. This demonstrates that the nuclear safety significance is very low.

This event is being reported under 10 CFR 50.73(a)(2)(v)(D), as a condition that could have prevented the fulfillment of the safety function of a system needed to mitigate the consequences of an accident. An 8-hour non-emergency notification was made to the NRC at 18:24 EST on March 13, 2008 (EN 44062).

Cause of the Event

The condition that could have prevented fulfillment of the safety function of the reactor building to suppression chamber vacuum breakers was caused by differential pressure switch operation outside the qualified range. The differential pressure switch range was 0 to 10 inches of water column with normal suppression chamber pressure approximately 15 inches of water column on the low side of the switch. This caused an under-range condition during normal operation resulting in a hydraulic lockup preventing the differential pressure switch from responding to a change in pressure.

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Deficiencies in the equivalent replacement process resulted in differential pressure switches being installed in the plant that could not perform their intended function during normal and accident conditions. Problems were noted in the design evaluation and testing process.

Corrective Actions

The differential pressure switches were replaced with a model having a range that encompasses the normal suppression chamber pressure.

This event is documented and evaluated in the Fermi 2 corrective action program. A root cause evaluation was performed to address this event. Reviews of internal corrective action documents and operating experience did not identify any additional cases where an equivalent replacement part was installed in the plant in an application outside of its design. This event is unique to differential pressure switches that have been installed where normal plant conditions would place the instrument in an over-range protection mode. By design, the switch operating range should bound normal plant conditions. The deficiencies noted in the equivalent replacement process were reviewed for similar deficiencies in the engineering design change process. Similar deficiencies were not present. Additional actions are being taken to strengthen the equivalent replacement process to include a more thorough review of Operating Experience and improving the post modification testing process to prevent recurrence of this event. Corrective actions will be tracked and implemented as necessary in accordance with the Fermi 2 Corrective Action Program.

Additional Information

A. Failed Components: ITT Barton 581A-2/199

B. Previous LERs on Similar Problems:

None