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10 CFR 50.73

February 4, 2019
NRC-19-0007

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

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

Subject: Licensee Event Report (LER) No. 2018-007

Pursuant to 10 CFR 50.73(a)(2)(i)(B), DTE Electric Company (DTE) is submitting LER No. 2018-007, Reactor Building to Suppression Chamber Vacuum Breaker Condition Prohibited by Technical Specifications.

No new commitments are being made in this LER.

Should you have any questions or require additional information, please contact Mr. Scott A. Maglio, Manager – Nuclear Licensing, at (734) 586-5076.

Sincerely,

Keith J. Polson
Senior Vice President and CNO

Enclosure: Licensee Event Report No. 2018-007, Reactor Building to Suppression Chamber Vacuum Breaker Condition Prohibited by Technical Specifications

cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 5, Region III
Regional Administrator, Region III
Michigan Public Service Commission
Regulated Energy Division (kindschl@michigan.gov)

**Enclosure to
NRC-19-0007**

**Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43**

**Licensee Event Report (LER) No. 2018-007
Reactor Building to Suppression Chamber Vacuum Breaker Condition Prohibited by
Technical Specifications**

**LICENSEE EVENT REPORT (LER)**

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-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.

1. Facility Name

Fermi 2

2. Docket Number

05000

341

3. Page

1 OF

3

4. Title

Reactor Building to Suppression Chamber Vacuum Breaker Condition Prohibited by Technical Specifications

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
12	08	2018	2018	007	00	02	04	2019	N/A	05000

9. Operating Mode**11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)**

4	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
10. Power Level	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
0	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<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)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER**Licensee Contact**

Fermi 2 / Scott A. Maglio – Manager, Nuclear Licensing

Telephone Number (Include Area Code)

(734) 586-5076

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No**15. Expected Submission Date**

Month Day Year

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On 12/8/2018, an inconsistency was identified between the Updated Final Safety Analysis Report (UFSAR) and the original station design of the Reactor Building to Suppression Chamber vacuum breakers. The Reactor Building to Suppression Chamber vacuum breaker design includes two vacuum breakers, a check valve and a butterfly valve, in series in each of two lines from the Reactor Building to the Suppression Chamber. The UFSAR states that power is applied to automatically keep the butterfly valve vacuum breakers closed except when air is required to relieve a vacuum inside the primary containment and that a loss of power will cause the butterfly valve to open to prevent a negative differential pressure condition. Contrary to the UFSAR requirement, after losing power the original control circuit design prevented the butterfly valve vacuum breakers from re-closing once power was restored without manual Operator action. This original station design issue rendered the butterfly valve vacuum breakers inoperable and resulted in a condition prohibited by Technical Specifications. The butterfly valve vacuum breaker control circuits have been modified so that the valve operation meets the UFSAR requirements to open when power is lost and to automatically close when power is restored.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME		2. DOCKET NUMBER		3. LER NUMBER		
Fermi 2		05000-	341	YEAR	SEQUENTIAL NUMBER	REV NO.
				2018	007	00

NARRATIVE**INITIAL PLANT CONDITIONS**

Mode – 4

Reactor Power – 0 percent

There were no structures, systems, or components (SSCs) that were inoperable at the start of this event that contributed to this event.

DESCRIPTION OF THE EVENT

On 12/8/2018, an inconsistency was identified between the Fermi 2 Updated Final Safety Analysis Report (UFSAR) (Section 6.2.4.2.2.3 and Table 6.2-2) and the station design of the Reactor Building to Suppression Chamber Vacuum Breakers [[VACB]]. Each of the two associated containment penetrations [[PEN]] for the Reactor Building to Suppression Chamber Vacuum Breakers contain a check valve [[V]] in series with a butterfly valve. UFSAR section 6.2.4.2.2.3.1 states, "Power from divisional electrical buses [[BU]] is applied to the butterfly valves at all times to keep the valves closed, except when air is required to relieve a vacuum inside the primary containment." UFSAR Table 6.2-2 states that the butterfly valves fail open on a loss of power but the valves' post Loss of Coolant Accident (LOCA) position is closed. The UFSAR table further states (in Note 24 to UFSAR Table 6.2-2) that, "This butterfly valve is normally closed and opens automatically to prevent formation of a negative pressure in the torus. This butterfly valve closes automatically upon increasing torus pressure and remains closed during all containment high-pressure conditions." The terms Torus and Suppression Chamber are synonymous as are Reactor Building and Secondary Containment.

On a loss of power (including a loss of offsite power) the butterfly valves open consistent with UFSAR Table 6.2-2. However, after a loss of power the seal in relays [[RLY]] associated with the butterfly valve control circuit would open and require manual operator action to reset the circuit and close the butterfly valves. The required manual operator action to reset the circuit is contrary to UFSAR section 6.2.4.2.2.3.1 and Note 24 to UFSAR in that: 1) once power is restored to the valves, including during a Loss of Offsite Power – Loss of Coolant Accident (LOP/LOCA), the butterfly valves will not be automatically closed and 2) a postulated LOP/LOCA will create a containment high-pressure condition, and the butterfly valves will not automatically remain closed. The identified condition does not impact the ability of the check valve vacuum breaker to perform its required functions.

The function of the Reactor Building to Suppression Chamber vacuum breakers is to limit the differential pressure between Reactor Building and the Suppression Chamber and to relieve vacuum when the Suppression Chamber pressure drops below Reactor Building pressure. In addition, the two vacuum breakers (check valve and butterfly valve) in each of the two lines from the Reactor Building to the Suppression Chamber airspace are to remain closed (except during testing or when performing their intended function to relieve vacuum) to maintain a leak tight primary containment boundary.

The opening of the butterfly valves on a loss of power ensures the vacuum relief safety function is met during a loss of power event where the check valve will function as required to prevent a negative differential pressure condition. However, once power is restored, the original station design prevented the butterfly valve from closing, as required post LOCA by the UFSAR, without manual Operator action. This original design issue rendered the butterfly valve vacuum breakers inoperable, which fails to meet the Limiting Condition for Operation (LCO) requirement of TS 3.6.1.7 for each Reactor Building to Suppression Chamber vacuum breaker to be operable. Specifically, since original plant design and operation the butterfly valves did not meet the requirement TS 3.6.1.7 to remain closed, except during testing or performing their intended function.

This issue is reported under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications.



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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Fermi 2	05000- 341	YEAR 2018	SEQUENTIAL NUMBER 007	REV NO. 00

NARRATIVE

SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

There were no safety consequences or radiological releases associated with this event. At no time during this event was there a potential for endangering the public health and safety. The condition described does not impact the ability of the check valve vacuum breaker to perform its required function in each vacuum breaker line. In addition, existing station procedures directed operators to manually close the butterfly valve from the Main Control Room following a loss of power to the valve.

CAUSE OF THE EVENT

The cause was determined to be a legacy design issue in the control circuits of the suppression chamber to secondary containment butterfly valve vacuum breakers.

CORRECTIVE ACTIONS

The butterfly valve vacuum breaker control circuits have been modified so that the valve operation meets the UFSAR requirements to open when power is lost and to automatically close when power is restored.

PREVIOUS OCCURRENCES

No related previous site occurrences were identified related to deficiencies in vacuum breaker design or operation.