

Keith J. Polson
Site Vice President

DTE Energy Company
6400 N. Dixie Highway, Newport, MI 48166
Tel: 734.586.4849 Fax: 734.586.4172
Email: polsonk@dteenergy.com



10 CFR 50.73

September 30, 2016
NRC-16-0063

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 (LER) No. 2016-005

Pursuant to 10 CFR 50.73(a)(2)(v)(C), DTE Electric Company (DTE) is submitting LER No. 2016-005, Secondary Containment Pressure Exceeded Technical Specification Due to Reactor Building HVAC Restart During High Winds.

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
Site Vice President

Enclosure: Licensee Event Report No. 2016-005, Secondary Containment Pressure Exceeded Technical Specification Due to Reactor Building HVAC Restart During High Winds

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-16-0063**

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

**Licensee Event Report (LER) No. 2016-005, Secondary Containment Pressure
Exceeded Technical Specification Due to Reactor Building HVAC Restart
During High Winds**



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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.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 5

4. TITLE

Secondary Containment Pressure Exceeded Technical Specification Due to Reactor Building HVAC Restart During High Winds

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
08	02	2016	2016	- 005	- 00	09	30	2016	N/A	05000
									FACILITY NAME	DOCKET NUMBER
									N/A	05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
1	<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)
100	<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)
	<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 checked="" 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 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	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
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 15 single-spaced typewritten lines)

On August 2, 2016, at 1015 EDT, while restoring the east train of Reactor Building Heating Ventilation and Air Conditioning (RBHVAC) after a surveillance test on Division 2 Standby Gas Treatment System (SGTS), the Technical Specification (TS) for the Secondary Containment (SC) pressure boundary was not met for approximately 1 second. The maximum SC pressure observed was approximately 0.120 inches of vacuum water column. The TS requirement is to maintain SC vacuum greater than or equal to 0.125 inches of vacuum water column for SC operability. All plant equipment responded as required to the changing conditions and RBHVAC and SGTS already in operation returned the SC pressure to within the TS limits; therefore, the Limiting Condition for Operation was met. There were no safety consequences or radiological releases associated with this event.

The cause of this momentary loss of SC was determined to be the combined effect of the RBHVAC startup sequence with high winds outside the Reactor Building (RB). For corrective actions, Fermi 2 has implemented a plant modification to the RBHVAC system to improve its ability to maintain RB pressure negative during the RBHVAC startup sequence. In addition, Fermi 2 will adopt Technical Specification Task Force Traveler (TSTF) 551, "Revise Secondary Containment Surveillance Requirements," when it is approved, to eliminate the need to declare SC inoperable due to momentarily exceeding the TS vacuum limit.

**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 2016	SEQUENTIAL NUMBER 005	REV NO. 00

NARRATIVE**INITIAL PLANT CONDITIONS:**

Mode – 1
Reactor Power – 100 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 August 2, 2016, at 1015 EDT, while restoring the east train of Reactor Building Heating Ventilation and Air Conditioning (RBHVAC) [[VA]] after a surveillance test on Division 2 Standby Gas Treatment System (SGTS) [[BH]], the Technical Specification (TS) for the Secondary Containment (SC) [[NH]] pressure boundary was not met for a duration of approximately 1 second. The maximum SC pressure observed during the event was approximately 0.120 inches of vacuum water column. In addition to the restart of RBHVAC, high winds were noted at the time that SC was lost.

There are two recorder [[PR]] divisions to monitor SC pressure. The Division 2 recorder indicated 0.120 inches of vacuum water column. The Division 1 recorder indication was within TS limits throughout this event, with a maximum SC pressure of 0.150 inches of vacuum water column. SC pressure was immediately returned to within the TS limit by RBHVAC and SGTS already in operation. There were no equipment failures or abnormal equipment indications observed during the RBHVAC startup sequence. There were no radiological releases associated with this event.

The TS requirement is to maintain secondary containment vacuum greater than or equal to 0.125 inches of vacuum water column (TS Surveillance Requirement 3.6.4.1.1) for SC operability.

An 8-hour event notification (EN 52146) was made to the NRC based on meeting the reporting criteria of Title 10 Code of Federal Regulations (10 CFR) 50.72(b)(3)(v)(C) as an event or condition that could have prevented the fulfillment of a safety function needed to control the release of radioactive material. This Licensee Event Report (LER) is being made under the corresponding requirement in 10 CFR 50.73(a)(2)(v)(C).

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 specified safety function of the SC is to contain, dilute, and hold up fission products that may leak from primary containment following a Design Basis Accident (DBA). In conjunction with operation of the SGTS and closure of certain valves [[V]] whose lines penetrate the SC, the SC is designed to reduce the activity level of the fission products prior to release to the environment and to isolate and contain fission products that are released during certain operations that take place inside primary containment, when primary containment is not required to be OPERABLE, or that take place outside primary containment. It is possible for the pressure in the control volume to rise relative to the environmental pressure (e.g., due to pump [[P]] and motor [[MO]] heat load additions). To prevent ground level exfiltration while allowing the SC to be designed as a conventional structure, the SC requires support systems to maintain the control volume pressure at less than the external pressure. For the SC to be considered OPERABLE, it must have adequate leak tightness to ensure that the required vacuum can be established and maintained.

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Fermi 2		05000-	341	YEAR 2016	SEQUENTIAL NUMBER 005	REV NO. 00

NARRATIVE

During this particular event, a higher indicated SC pressure was recorded for a total of approximately 1 second. In Chapter 15 of the Updated Final Safety Analysis Report (UFSAR), RBHVAC is assumed lost at the onset of a Loss of Coolant Accident (LOCA) concurrent with a Loss of Offsite Power. As a result, calculations show that the SC would be pressurized until the SGTS restores vacuum. For this event, the structural integrity (i.e., leak tightness) of the SC was re-confirmed when RBHVAC and SGTS restored pressure to less than -0.125 inches water column.

If the DBA LOCA for SC concurrent with a Loss of Offsite Power had occurred during the time when the SC pressure TS limit was exceeded, the SC was sufficiently leak tight such that the SGTS would still have established and maintained vacuum greater than the TS required value.

The radiological consequences of the DBA LOCA for SC contained in Chapter 15 of the Fermi 2 UFSAR result in doses that are below 10 CFR 50.67. The SC is assumed to be at a pressure of -0.125 inches water column at the onset of the LOCA. For this particular event, had the DBA LOCA for SC actually occurred, the increase in magnitude of radiological dose as a result of increased draw-down time from the highest recorded pressure of -0.120 vice -0.125 inches water column for 1 second, would be minimal and negated by several very conservative assumptions in the existing analysis (e.g., 100% exfiltration from SC during the first 15 minutes of drawdown with SGTS in operation, 10% exfiltration from SC with SGTS in operation throughout the remaining 30 day duration of the accident, no holdup time in SC throughout the 30 day duration of the accident, and all exfiltration and filtered releases are at ground level).

CAUSE OF THE EVENT:

The combined effect of the RBHVAC startup sequence with high winds caused the momentary loss of SC.

Depending on the exact exhaust fan and supply fan start relay timing, SC pressure can increase during RBHVAC startup, which reduces the margin to the TS limit. During RBHVAC startup, the exhaust fan starts prior to the intake fan. Then the respective dampers open in the same order to maintain a negative pressure in the Reactor Building (RB) [[NG]]. The modulating vane dampers modulate to control building air pressure through the start process. There is a timer delay of 2 seconds between the start of the exhaust fan and intake fan. The time delay relays [[62]] functioned as intended during this event. However, it has been previously identified that a longer timer delay would improve the system's ability to maintain RB pressure and preserve margin to the TS limit.

In addition, high winds outside the RB are known to cause large and rapid changes in RB differential pressure (i.e. between inside and outside the RB). There are two divisions to monitor SC pressure. Each division has four pressure transmitters [[PT]] located on the RB fifth floor, one on each of the four RB walls, with a pressure probe that penetrates the wall to the outside, and a recorder. The recorder indicates the highest pressure of the four inputs from the transmitters. Using the equation provided in Section 6.2 of the Fermi 2 UFSAR, wind speeds of 30 to 60 miles per hour (mph) on the RB result in an external pressure change of -0.27 to 1.07 inches water column on the leeward side of the building. The negative change on the leeward side of the building results in a lower RB differential pressure. As a result, high wind gusts are sufficient to cause momentary loss of SC even with no other contributing causes. Data from the time of the event indicates an average wind speed of approximately 9 mph. Although no specific data on the magnitude of wind gusts is available at the time of the event (i.e. showing instantaneous wind speeds greater than 9 mph), it is expected that the wind speed at the time of the event affected the indicated RB differential pressure.

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NARRATIVE**CORRECTIVE ACTIONS:**

No corrective actions were required to restore compliance with the TS requirement.

A plant modification was previously planned to increase the time delay between the start of the exhaust fan and the intake fan. This modification will improve the system's ability to maintain RB pressure negative during the RBHVAC startup sequence and will thus preserve margin to the TS limit. This modification was completed on September 14, 2016. This modification addresses the first contributing cause discussed above.

In addition, Fermi 2 will adopt Technical Specification Task Force Traveler (TSTF) 551, "Revise Secondary Containment Surveillance Requirements," when it is approved by the U.S. Nuclear Regulatory Commission. This TSTF would eliminate the need to declare SC inoperable due to momentarily exceeding the TS vacuum limit, such as may be caused by wind gusts and maintenance, testing, or swapping the normal ventilation subsystems.

Additional corrective actions will be evaluated and tracked in the Corrective Action Program (CAP).

PREVIOUS OCCURRENCES:

As described above, the SC pressure increase during the RBHVAC system startup sequence contributed to the cause of this event. Similar events involving loss of SC due to the RBHVAC system have been reported in the following LERs:

LER 2013-001 involved a loss of SC function due to an RBHVAC system equipment malfunction. The cause of that event was related to improper damper sequencing.

LER 2013-003 involved a loss of SC function due to an RBHVAC system equipment malfunction. The cause of that event was related to a RBHVAC system trip caused by the lack of steam flow through a heating coil due to inadequate draining of the downstream steam trap.

LER 2015-001 involved the loss of SC function due to an RBHVAC system trip caused by a valid actuation of a freeze protection device.

LER 2015-004 involved the loss of SC function due to reverse rotation of the RBHVAC center exhaust fan during post-maintenance testing caused by reversed electrical leads.

LER 2015-005-01 involved the loss of SC function due to setpoint drift of the RBHVAC supply damper time delay relay resulting in the dampers moving out of sequence.

Although the events above are similar, they do not involve the same underlying concern or reason as this event, such as the same cause, failure, or sequence of events. In particular, the August 2, 2016 event reported in this LER did not involve a trip of RBHVAC and did not identify any equipment failures or abnormal equipment indications in the RBHVAC system. However, corrective actions in response to LER 2013-001 included the plant modification to increase the time delay between the start of the exhaust fan and the intake fan for the RBHVAC system, which is expected to improve the performance of the system during startup. This plant modification, although complete now, had not yet been implemented at the time that this event occurred and was therefore not able to prevent occurrence of this event.



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NARRATIVE

As described above, high winds also contributed to the cause to this event. Similar events involving loss of SC due to high winds have been reported in the following LERs:

LER 2016-003 involved the loss of SC due to high winds on July 8, 2016.

LER 2016-004 involved the loss of SC due to high winds on July 13, 2016.

Loss of SC due to high winds on August 27, 2016, will be documented in a future LER and has been entered into the CAP.

The events above were caused by high winds only and therefore do not have the same underlying concern or reason as this event, such as the same cause, failure, or sequence of events. In addition, corrective actions for the above events were not complete prior to the August 2, 2016 event reported in this LER due to the short timeframe between the events and therefore were not able to prevent occurrence of this event.