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DTE Energy

10 CFR 50.73

June 15, 2015
NRC-15-0069

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: Revision to Licensee Event Report (LER) No. 2015-001

Pursuant to 10 CFR 50.73 (a)(2)(v)(C), DTE Electric Company (DTE) is submitting LER No. 2015-001-01, Secondary Containment Declared Inoperable after Loss of Reactor Building Ventilation from Freeze Protection Actuation. DTE performed material identification testing of the "H" heating coil after the event. Testing revealed the coil material to be aluminum; not copper-nickel. This new fact did not change the cause or corrective actions related to the event.

No commitments are being made in this LER.

Should you have any questions or require additional information, please contact Mr. Christopher R. Robinson of my staff at (734) 586-5076.

Sincerely,

Vito A. Kaminskas

Enclosure

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-15-0069

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

Revision to LER 2015-001, Secondary Containment Declared Inoperable after Loss of Reactor Building Ventilation from Freeze Protection Actuation

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

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 internet 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.

LICENSEE EVENT REPORT (LER)

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

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4. TITLE

Secondary Containment Declared Inoperable after Loss of Reactor Building Ventilation from Freeze Protection Actuation

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
										05000
02	19	2015	2015	- 001 -	01	06	15	2015	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☑ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
David G. Coseo - Supervisor, Nuclear Compliance	(734) 586-4273

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
B	VA	HCL	N/A	N					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☑ NO				

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

At 0303 EST on February 19, 2015, Fermi 2 experienced a trip of the non-safety related Reactor Building Ventilation (RBHVAC) during normal steady-state operations due to valid actuation of a freeze protection device. At the time of the trip, site area air temperature was -1 degree Fahrenheit. The plant Technical Specifications (TS) require that Secondary Containment vacuum be maintained greater than or equal to -0.125 inches of water gauge. As a result of the RBHVAC trip, this specification was not maintained for approximately 4 seconds until the safety-related Standby Gas Treatment (SGT) system restored Secondary Containment vacuum to an acceptable value.

At 0450 EST, during restoration activities, Secondary Containment vacuum again degraded to less than -0.125 inches of water gauge for 38 seconds until restored by the SGT system. RBHVAC was restored by resetting the freeze protection feature and the SGT system was returned to a standby condition.

In both instances, the lowest observed vacuum was -0.11 inches of water gauge. There were no radiological releases associated with this event.

The cause of the freeze protection actuation was insufficient heat transfer from the heating coil associated with 1 of the 14 freeze protection actuators. An investigation revealed this particular heating coil, installed in 2011, has material properties that differ from the original design specification. This results in a reduced heat transfer rate. The heating coil is scheduled to be replaced before the next winter season.

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NARRATIVE

Initial Plant Conditions:

Mode 1
Reactor Power 100 percent

Description of the Event:

At 0303 EST on February 19, 2015, Fermi 2 experienced a trip of the non-safety related Reactor Building Ventilation (RBHVAC) [[VA]] during normal steady-state operations due to valid actuation of a freeze protection device. At the time of the trip, site area air temperature was -1 degree Fahrenheit. The plant Technical Specifications (TS) require that Secondary Containment [[NG]] vacuum be maintained greater than or equal to -0.125 inches of water gauge. As a result of the RBHVAC trip, this specification was not maintained for approximately 4 seconds until the safety-related Standby Gas Treatment (SGT) system [[VA]] restored Secondary Containment vacuum to an acceptable value.

At 0324 EST, the tripped "H" Freeze-Stat was reset.

At 0335 EST, the West RBHVAC supply and exhaust fans were restored to operation.

At 0450 EST, the Division 1 SGTS was secured. As a result, Secondary Containment vacuum again degraded to less than -0.125 inches of water gauge for approximately 38 seconds until the SGTS was promptly re-actuated.

At 0458 EST, the East RBHVAC supply and exhaust fans were restored to operation.

At 0502 EST, the Division I SGTS was secured.
In both instances, the lowest observed vacuum was -0.11 inches of water gauge. There were no radiological releases associated with this event.

Safety Consequences and Implications:

There were none. At no time during this event was there a potential for endangering the public health and safety.

The specified safety function of the Secondary Containment 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 Standby Gas Treatment System (SGTS) and closure of certain valves whose lines penetrate the secondary containment, the secondary containment 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 and motor heat load additions.). To prevent ground level exfiltration while allowing the secondary containment to be designed as a conventional structure, the secondary containment requires support systems to maintain the control volume pressure at less than the external pressure. For the secondary containment 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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NARRATIVE

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During this particular event, the Secondary Containment vacuum degraded to a lowest value of -0.11 inches of water gauge for a maximum of 38 seconds. In Chapter 15 of the Fermi 2 UFSAR, RBHVAC is assumed lost at the onset of a LOCA concurrent with a Loss of Offsite Power. As a result, calculations show that the Secondary Containment would be pressurized until the SGTS restores vacuum. For this particular event, the Secondary Containment vacuum degraded when the non-safety related RBHIVAC system tripped due to freeze protection. The structural integrity (i.e., leak tightness) of the Secondary Containment was re-confirmed when the safety related Division 1 SGTS restored vacuum to greater than -0.125 inches of water gauge.

If the DBA LOCA for Secondary Containment concurrent with a Loss of Offsite Power had occurred during the time when Secondary Containment vacuum was between -0.11 and -0.125 inches of water gauge, the Secondary Containment 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 Secondary Containment contained in Chapter 15 of the Fermi 2 UFSAR result in doses that are below 10CFR50.67. The Secondary Containment is assumed to be at a vacuum of -0.125 inches at the onset of the LOCA. For this particular event, had the DBA LOCA for Secondary Containment actually occurred, the increase in magnitude of radiological dose as a result of increased draw-down time from starting at -0.11 vice -0.125 inches of water gauge, would be minimal and negated by several very conservative assumptions in the existing analysis (e.g., 100% exfiltration from Secondary Containment during the first 15 minutes of drawdown with SGT in operation, 10% exfiltration from Secondary Containment with SGT in operation throughout the remaining 30 day duration of the accident, no holdup time in Secondary Containment throughout the 30 day duration of the accident, and all exfiltration and filtered releases are at ground level). These conservative assumptions are not reflective of actual plant conditions and configuration. This qualitative evaluation performed by the Fermi 2 Licensing and Engineering staff concludes that no actual loss of safety function occurred. This LER is required because the reporting threshold is "could have" prevented fulfillment of a safety function, which was valid at the time that Secondary Containment was declared INOPERABLE.

Cause of the Event:

The RBHVAC system has 14 steam-supplied heating coils [[HCL]] and 14 corresponding low temperature switches (Freeze-Stat) [[TS]]. The switches monitor the temperature of the air downstream of the heating coils to ensure the RBHVAC system does not freeze. If any single switch trips on low temperature, the RBHVAC system automatically trips. In this event, the "H" Freeze-Stat tripped on low temperature (35°F decreasing) and caused a trip of the RBHVAC system. A subsequent investigation concluded that the material properties of the "H" heating coil deviated from the original design and resulted in a lower rate of heat transfer. This particular "H" heating coil was installed in November 2011 and is made of aluminum. The original "H" heating coil was pure copper, as are the other 13 heating coils currently installed. The reduced thermal conductivity of the aluminum resulted in a reduced RBHVAC air temperature downstream of the "H" coil and actuated the "H" Freeze-State as designed. The Fermi 2 staff have documented the investigation and corrective actions in CARD 15-21350.

Corrective Actions:
A work order has been generated to replace the "H" heating coil with original design specification material. The work order is scheduled to be completed before the next winter season.

Previous Occurrences:
There have been 5 occurrences of Freeze-Stat actuations in the RBHVAC system between November 2014 and March 2015. This event is the only one that resulted in declaring the Secondary Containment INOPERABLE.

LER 2013-003: Secondary Containment was declared INOPERABLE after RBHVAC tripped due to Freeze-Stat actuation resulting from a failed steam trap.

LER 2013-001: Secondary Containment was declared INOPERABLE after RBHVAC dampers malfunctioned.