

Peter Dietrich  
Senior Vice President and Chief Nuclear Officer

DTE Electric Company  
6400 N. Dixie Highway, Newport, MI 48166  
Tel: 734.586.4153 Fax: 734.586.1431  
Email: peter.dietrich@dteenergy.com



December 29, 2021  
NRC-21-0056

10 CFR 50.73

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

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

Subject: Licensee Event Report (LER) No. 2021-003

Pursuant to 10 CFR 50.73(a)(2)(v)(D), DTE Electric Company (DTE) is submitting LER No. 2021-003, High Pressure Coolant Injection Inoperable due to Contact Oxidation.

No new commitments are being made in this submittal.

Should you have any questions or require additional information, please contact Mr. Ertman L Bennett III, Manager – Nuclear Licensing, at (734) 586-4273.

Sincerely,

A handwritten signature in black ink, appearing to read "P. Dietrich".

Peter Dietrich  
Senior Vice President and Chief Nuclear Officer

Enclosure: Licensee Event Report No. 2021-003, High Pressure Coolant Injection Inoperable due to Contact Oxidation

cc: NRC Project Manager  
NRC Resident Office  
Regional Administrator, Region III

**Enclosure to  
NRC-21-0056**

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

**Licensee Event Report No. 2021-003  
High Pressure Coolant Injection Inoperable due to Contact Oxidation**



**LICENSEE EVENT REPORT (LER)**

(See Page 3 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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk ail: [oir\\_submission@omb.eop.gov](mailto:oir_submission@omb.eop.gov). The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

<b>1. Facility Name</b> Fermi 2	<b>2. Docket Number</b> 05000	<b>3. Page</b> 1 OF 3
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**4. Title**  
High Pressure Coolant Injection Inoperable due to Contact Oxidation

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
6	3	2021	2021	003	0	12	29	2021	N/A	05000
									Facility Name	Docket Number
									N/A	05000

<b>9. Operating Mode</b> 1	<b>10. Power Level</b> 100
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**11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)**

<b>10 CFR Part 20</b>	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<b>10 CFR Part 73</b>
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	<b>10 CFR Part 21</b>	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<b>10 CFR Part 50</b>	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<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)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	

**OTHER** (Specify here, in abstract, or NRC 366A).

**12. Licensee Contact for this LER**

Licensee Contact Ertman L Bennett III – Manager, Nuclear Licensing	Phone Number (Include area code) 734-586-4273
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**13. Complete One Line for each Component Failure Described in this Report**

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

14. Supplemental Report Expected				15. Expected Submission Date		
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)			Month	Day	Year

**16. Abstract** (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)  
 On 6/3/2021 at 0313 a condition was encountered during performance of the HPCI Condensate Storage Tank Level Channel Functional Test when the HPCI Pump Suction Isolation Valve from the Suppression Pool was slow to open. The Channel Functional Test was successfully completed; however, the valve took approximately 5 minutes to open on the simulated low Condensate Storage Tank (CST) level signal. Technical Specification (TS) 3.3.5.1 Action D.2.1 and D.2.2 were entered on 6/3/2021 at 0241 (surveillance start) which allows 24 hours to place the channel in trip or to align HPCI pump suction to the suppression pool. Troubleshooting of the condition identified an oxidated relay contact was the cause of the slow opening of the suction isolation valve. After relay repair and a repeat performance of the HPCI CST Level Channel Functional Test the Limiting Condition of Operation was exited on 6/4/2021 at 1451. It was later determined that the condition impacted both channels of the CST low level suction transfer logic, and during the condition TS 3.3.5.1 Action D.1 should have been entered resulting in declaring the HPCI system inoperable. HPCI suction was transferred to the suppression pool on 6/3/2021 at 1817 completing required actions for D.2.2 also making condition D.1 not applicable.



**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		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Fermi 2	05000- 341	2021	003	0

**NARRATIVE**

**INITIAL PLANT CONDITIONS**

Mode – 1  
Reactor Power – 100%

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

**DESCRIPTION OF THE EVENT**

On 6/3/2021 at 0313 while performing the HPCI [BJ] Condensate Storage Tank Level Channel Functional Test, the E4150-F042, HPCI Pump Suction Isolation Valve [ISV] from the Suppression Pool [BT], was slow to open. The isolation valve took approximately 5 minutes to open on the simulated signal low CST level. Technical Specification (TS) 3.3.5.1 Action D.2.1 and D.2.2 were entered which allows 24 hours to place the channel in trip or to align HPCI pump suction to the suppression pool. During the LCO period of time it was believed HPCI remained operable and available as there are two channels within this logic and the subsequent channel was verified to be working satisfactorily following the slow response time of the first channel. The first channel tested operates the logic and transfers the suction from the CST to the suppression pool. The valves are not repositioned to test the second channel, only the logic is tested. Further investigation identified that an oxidated contact on a common relay [RLY] was the cause of the delayed opening of the E4150-F042 isolation valve. This condition impacted both channels of the CST low level suction transfer logic. Technical Specification 3.3.5.1 Action D.1 should have been entered declaring the HPCI system inoperable or HPCI suction transferred to the Suppression Pool within 1 hour upon the discovery of the impact to both channels. During the event HPCI was available and functional.

During the HPCI condition between 0313 on 6/3/2021 and 1451 on 6/4/2021 Reactor Core Isolation Cooling (RCIC) was declared inoperable twice for performance of surveillances. The first instance was from 0944 to 1236 on 6/3/2021. At 1236 the Division 1 Emergency Equipment Cooling Water (EECW) Pump and Valve Operability Test was satisfactorily completed restoring RCIC operability. The second instance was from 1515 to 1750 on 6/3/2021. At 1750 the Division 1 EECW Check Valve Operability Test was completed satisfactorily restoring RCIC operability. During performance of these surveillances entry into TS 3.5.1 Condition I with a completion time of 12 hours to be in Mode 3 was required due to the HPCI condition but was not recognized or entered. When RCIC is restored to Operable status TS 3.5.1 Condition I is exited. During performance of the EECW pump and valve operability tests HPCI was verified operable by administrative means; however, it was not recognized that HPCI was inoperable due to the common relay.

HPCI suction was transferred to the suppression pool on 6/3/2021 at 1817 completing required actions for TS 3.3.5.1 D.2.2 also making Action D.1 not applicable. After relay repair and a repeat performance of the HPCI CST Level Channel Functional Test the LCO was exited on 6/4/2021 at 1451.

After CST level logic was repaired and restored to operable it was discovered that HPCI should have been declared inoperable and an eight-hour NRC report was required per 10CFR50.72 and an LER per 10CFR50.73(a)(2)(v)(D) Mitigate the consequences of an accident. The 8 Hour NRC Event Notification for Unplanned HPCI Inoperability for the relay E41A-K17 condition was identified on 11/3/2021 at 0900 and completed on 11/3/2021 at 1345. A Technical Evaluation was completed that determined HPCI was available to perform its function during this event.



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CONTINUATION SHEET**

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Fermi 2	05000- 341	2021	003	0

**NARRATIVE**

**SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS**

The HPCI system normally takes suction from the condensate storage tank. This tank is designed such that the last 150,000 gal is reserved for use by the HPCI or RCIC systems by the tank's standpipe design. HPCI suction automatically switches to the suppression pool upon low condensate storage tank (CST) level (equivalent to about 45,000 gallons of water in the CST). However, while the plant is operating, the CST is maintained at a normal level in excess of 400,000 gallons.

A Technical Evaluation determined if HPCI operation were required with the CST inventory at the low CST level suction transfer setpoint that HPCI would operate as designed for most of the approximate 5 minutes of the slow suction transfer condition. However, before suction transfer would have been completed the CST level would have lowered below the level where vortexing, or air entrainment would have occurred. Without operator action, HPCI would trip on a low suction pressure signal. Then upon completion of the suction transfer, suction pressure would be restored, and HPCI would automatically restart if demanded and continue to inject.

However, if HPCI operation were required with CST inventory at the low CST level suction transfer setpoint operators would receive a control room annunciator, HPCI/RCIC Suction Transfer CST Level Low. The associated alarm procedure directs the operator to verify the automatic transfer occurs as expected. If automatic suction transfer does not occur, operators are trained per station procedures to complete automatic actions manually. Therefore, the operator would have established the proper line-up. The relay contact associated with manual operation of the HPCI Pump Suction Isolation Valve [ISV] was unaffected.

During the event Division 2 Low Pressure Coolant Injection (LPCI) [BO], Core Spray (CS) [BM] and Automatic Depressurization System (ADS) were operable. Division 1 LPCI and CS were operable except during the Division 1 EECW pump and valve testing.

**CAUSE OF THE EVENT**

The direct cause is Electrical Contact Degradation due to the oxidation of the E41A-K17 relay contact.

**CORRECTIVE ACTIONS**

The initial performance of the channel test was completed successfully though the transfer was slow.

The E41A-K17 contact was burnished during initial troubleshooting. The valve was returned to operable after the contact burnishing and was successfully tested.

The Inspection and Testing of Multi-Contact Auxiliary Relays HFA, HMA and HGA procedure was revised to require contact burnishing.

This condition was entered into the corrective action program and lessons learned were determined and communicated.

**PREVIOUS OCCURRENCES**

There are no previous similar occurrences.