Exelon Generation®

Dresden Nuclear Power Station
6500 North Dresden Road
Morris, IL 60450

December 15, 2021

10 CFR 50.73

SVPLTR # 21-0065

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

Dresden Nuclear Power Station, Unit 3
Renewed Facility Operating License No. DPR-25
NRC Docket No. 50-249

Subject: Licensee Event Report 249/2021-001-00, Reactor Scram due to Main Power Transformer Failure

Enclosed is Licensee Event Report 249/2021-001-00, Reactor Scram due to Main Power Transformer Failure.

There are no regulatory commitments contained in this submittal.

Should you have any questions concerning this letter, please contact Mr. Duane Avery, acting Regulatory Assurance Manager, at (815) 416-2804.

Respectfully,

Patrick J Boyle for

Peter J. Karaba
Site Vice President
Dresden Nuclear Power Station

Enclosure: Licensee Event Report 249/2021-001-00

CC: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station

IE22
NRR

NRC FORM 366 (08-2020) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED BY OMB: NO. 3150-0104 | EXPIRES: 08/31/2023

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/)

1. Facility Name	2. Docket Number	3. Page
Dresden Nuclear Power Station, Unit 3	05000249	1 OF 3

4. Title

Unit 3 Reactor Scram due to Main Power Transformer Failure

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
10	16	2021	2021	001 -	00	12	15	2021	N/A	N/A
									Facility Name: N/A	Docket Number: N/A

9. Operating Mode	10. Power Level
1	100

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

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(1)(i)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

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

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Duane Avery – Acting Regulatory Assurance Manager	815-416-2804

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
X	EL	XFMR	S125	Y						

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☐ No	☒ Yes (If yes, complete 15. Expected Submission Date)		06	30	2022

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On October 16, 2021 at 0428 CDT, an automatic reactor protection system actuation occurred due to failure of the main power transformer. The safety significance of this event was minimal. All control rods inserted to their full-in position. Following the reactor scram, all systems operated as expected.

The cause of this event was due to a sudden, unanticipated, catastrophic failure of the main power transformer high voltage oil impregnated paper bushing. The cause of the bushing failure has not yet been determined. A root cause investigation and failure analyses are ongoing. Results of the root cause report and failure analyses will be provided in a supplemental report.

Corrective actions included replacement of the failed main power transformer. Other corrective actions will be provided in a supplemental report.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A), an event that resulted in automatic actuation of a system listed in paragraph 10 CFR 50.73(a)(2)(iv)(B), specifically the reactor protection system including reactor scram.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(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/)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Dresden Nuclear Power Station, Unit 3	05000- 249	2021	- 001	- 00

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

General Electric – Boiling Water Reactor, 2957 megawatts thermal rated core power

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

A. CONDITIONS PRIOR TO EVENT

Unit: 3 Event Date: October 16, 2021 Event Time: 0428 CDT

Reactor Mode: 1 Mode Name: Power Operation Power Level: 100%

B. DESCRIPTION OF EVENT

On October 16, 2021, at 0428 CDT, an automatic reactor protection system [JC] actuation occurred due to failure of the main power transformer (MPT) [EL]. All control rods [AA] inserted to their full-in position. Following the reactor scram, all systems operated as expected.

The MPT experienced a phase-to-ground fault. There is no evidence of a plant event or grid event as the initiator. There were no alarms indicative of a transformer failure as a precursor to the failure. Additionally, a dissolved gas analysis of the transformer oil sample performed two hours prior to the event revealed no alert nor degrading trend.

The MPT "A" phase high voltage bushing, lightning arrester, and control cabinet suffered catastrophic damage. Ancillary components and equipment of the transformer suffered various degrees of damage.

As a result of a fire associated with the MPT failure, an Unusual Event was declared due to a fire in the protected area not extinguished in less than 60 minutes. The Unusual Event was terminated at 0709 CDT.

The transformer was replaced with a transformer of a different design and a different manufacturer.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A), an event that resulted in automatic actuation of a system listed in paragraph 10 CFR 50.73(a)(2)(iv)(B), specifically the reactor protection system including reactor scram.

C. CAUSE OF EVENT

The cause of the event was due to a sudden, unanticipated, catastrophic failure of the MPT high voltage oil impregnated paper bushing.

Additional cause(s) of the transformer and bushing failure is under investigation and will be reported in a supplemental report.

D. SAFETY ANALYSIS

The safety significance of this event was determined to be minimal based upon the availability of the required systems to

1) Shutdown the reactor and maintain it in a safe shutdown condition,
2) Remove residual heat,
3) Control the release of radioactive material, or
4) Mitigate the consequences of an accident.

There were no safety consequences impacting plant or public safety as a result of this event. There was no loss of safety function for this event.

E. CORRECTIVE ACTIONS

Corrective actions included replacement of the failed MPT with a transformer of a different design and from a different manufacturer.

Additional corrective action(s) will be developed during the ongoing root cause investigation.

F. PREVIOUS OCCURRENCES

The most recent transformer failure at Dresden was in April 2014 (LER 05000237/2014-002-02). During that event the Unit 2 MPT failed due to an internal fault with the most probable cause determined to be a combination of insulation issues. The event resulted in the main turbine tripping and a reactor scram. The transformer was replaced with a transformer of a different design and a different manufacturer.

G. COMPONENT FAILURE DATA

Device	Manufacturer	Model	S/N	Type
Main Power Transformer	Siemens	ELIN	1731659	TDQ-A27D9K-99