Clinton Power Station
8401 Power Road
Clinton, IL 61727

Exelon Generation®

U-604402
February 5, 2018

10 CFR 50.73
SRRS 5A.108

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Licensee Event Report 2017-010-00

Enclosed is Licensee Event Report (LER) 2017-007-00: Division 1 Transformer Failure Leads to Instrument Air Isolation to Containment Requiring a Manual Reactor Scram. This report is being submitted in accordance with the requirements of 10 CFR 50.73.

There are no regulatory commitments contained in this report.

Should you have any questions concerning this report, please contact Mr. Dale Shelton, Regulatory Assurance Manager, at (217) 937-2800.

Respectfully,

Theodore R. Stoner
Site Vice President
Clinton Power Station

KP/cac

Attachment: License Event Report 2017-010-00

cc: Regional Administrator – Region III
NRC Senior Resident Inspector — Clinton Power Station
Office of Nuclear Facility Safety — Illinois Emergency Management Agency

IE22
NRR

NRC FORM 366 (04-2017) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

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	2. DOCKET NUMBER	3. PAGE
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4. TITLE

Division 1 Transformer Failure Leads to Instrument Air Isolation to Containment Requiring a Manual Reactor Scram

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	09	2017	2017	- 010	- 00	02	05	2018		05000
									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)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☒ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☒ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
097	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Mr. Dale Shelton, Regulatory Assurance Manager	(217)937-2800

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
X	ED	XFMR	G184	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO		7	20	18

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

On December 9, 2017 at 1347 CDT the Main Control Room received annunciators that indicated a trip of a 4160V 1A1 Breaker, the 480V transformer 1A and A1 feed breaker. The loss of Division 1 480V power caused the instrument air (IA) containment isolation valves to fail close as designed. The loss of IA affected various containment loads, including the scram pilot air header and containment isolation valves. Another consequence of this event was that secondary containment differential pressure became positive due to fuel building ventilation dampers failing closed by design due to the loss of power. Operations entered Emergency Operating Procedure (EOP) -08, Secondary Containment Control, and Technical Specification (TS) Limiting Condition for Operation (LCO), 3.6.4.1 Action A.1. Division 2 Standby Gas Treatment System was activated at 1350 and restored secondary containment differential pressure within allowable TS values at 1351. The TS LCO and EOP were exited when allowable TS values were restored. Due to the loss of IA, a manual reactor scram was inserted at 1353 when two control rods began drifting in as expected. A phase to ground fault was identified on 480V transformer 1A (1AP11E). On December 14, the 480V transformer was replaced and the plant returned to Mode 1 operations on December 15. The condition described in this report was determined to be reportable under 10 CFR50.73(a)(2)(iv)(A), 10 CFR 50.73(a)(2)(v)(C) and 10 CFR 50.73 (a)(2)(ii)(B). The cause of the transformer failure is currently under investigation and will be provided in a supplemental report. This event is classified as an unplanned scram with complications due to the loss of the Division 1 480V power.

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/)

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Clinton Power Station, Unit 1	05000461	2017	- 010	- 00

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

General Electric -- Boiling Water Reactor, 3473 Megawatts Thermal Rated Core Power
Energy Industry Identification System (EIIS) codes are identified in text as [XX].

EVENT IDENTIFICATION

Division 1 Transformer Failure Leads to Instrument Air Isolation to Containment Requiring a Manual Reactor Scram

A. Plant Operating Conditions Before the Event

Unit: 1 Event Date: 12/09/17 Event Time: 1347
Mode: 1 Mode Name: Power Operation Reactor Power: 97 percent

B. Description of Event

At 1347 CDT on December 9, 2017, the Main Control Room received annunciators that indicated a trip of the 4160 V [EB] 1A1 breaker [BKR]1AP07EJ and the loss of the 480V transformer 1A [ED] and A1. Numerous Division 1 components lost 480V power (powered from unit substations 1A and A1). The Division 1 containment Instrument Air isolation valves had failed closed by design due to the loss of power. Due to the loss of containment instrument air, several control rods began to drift into the core as expected and, by procedure, the reactor mode switch was placed in the shutdown position at 1353 and a manual reactor scram was performed.

Due to the loss of power, the Fuel Building ventilation dampers failed closed by design. With the normal ventilation system secured, secondary containment differential pressure rose to slightly greater than 0 inches water gauge which exceeded the Technical Specification Surveillance Requirement 3.6.4.1.1 limit of greater than or equal to 0.25 inches vacuum water gauge at 1348. The Control Room entered Emergency Operating Procedure-8, Secondary Containment Control. Secondary Containment differential pressure was restored within Technical Specification requirements at 1351 by starting the Division 2 Standby Gas Treatment System (SGTS).

Inspection of 480V transformer 1A (1AP11E) found an area on the upper end of the B phase coil that was consistent with a phase to ground fault.

On December 14, the transformer was replaced and the plant returned to Mode 1 operations on December 15.

This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) as a manual actuation of the Reactor Protection System (RPS), 10 CFR 50.73(a)(2)(v)(C) as a Condition that Could Have Prevented Fulfillment of a Safety Function and 10 CFR 50.73 (a)(2)(ii)(B) as the plant being in an unanalyzed condition. The event described in this report is considered an unplanned scram with complications due to the loss of the Division 1 480V power.

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NARRATIVE

C. Cause of the Event

A phase to ground fault was identified on the B Phase of the 480V transformer 1A (1AP11E). The cause of the transformer failure is currently under investigation and will be provided in a supplemental Licensee Event Report.

D. Safety Consequences

The trip of 4160V circuit breaker and the failure of the 480V transformer placed the station in a potential scram condition due to loss of instrument air to the containment and scram pilot air header. Manual operator actions were taken to shut down the reactor prior to an automatic scram and place the plant in a safe and stable condition. The loss of 480 volt power caused the Fuel Building Ventilation System to isolate resulting in positive secondary containment pressure. Operators placed the Division 2 SGTS in service to restore secondary containment negative pressure. All Division 2 and Division 3 Emergency Core Cooling Systems remained operable and available throughout this event for accident mitigation if required. No plant safety limits were exceeded and no Emergency Core Cooling System actuations occurred.

E. Corrective Actions

On December 14, the faulted transformer was replaced and the plant returned to Mode 1 operations on December 15. Additional corrective actions will be determined following completion of the causal evaluation.

F. Previous Similar Occurrences

LER 2013-008-01 Failure of Division 1 Transformer Leads to Isolation of Instrument Air Supply to Containment, Lowering Scram Pilot Air Header Pressure, and Manual Reactor Scram

On December 8, 2013 at 2026 hours with the plant in Mode 1 at 97.3 percent reactor power, operators received multiple alarms due to the trip of 4160 volt 1A1 breaker which resulted in a loss of power to two Division 1 480 volt unit substations. Operators were immediately dispatched and found a 4160/480 volt stepdown transformer A1 (0AP05E) failed. Many Division I components lost power. The loss of power caused an instrument air (IA) containment isolation. The loss of IA affected various containment loads, including the scram pilot air header, the main steam isolation valves and the reactor water cleanup system. At 2036 hours, the scram pilot air header low pressure alarm was received and in response to an anticipated automatic reactor scram, operators immediately initiated a manual reactor scram. All control rods fully inserted into the core.

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NARRATIVE

The cause of the transformer failure was a turn to turn failure of the high side windings due to insulation breakdown over time, prior to its expected end of life. An installed spare was connected to replace the failed Division 1 transformer.

G. Component Failure Data

Component Description: I-T-E Dry Type Transformer; 4160V/480V; 750KVA
Manufacturer: GOULD-BROWN-BOVERI