Clinton Power Station
8401 Power Road
Clinton, IL 61727

U-604100
October 26, 2012

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 2012-001-00

Enclosed is Licensee Event Report (LER) No. 2012-001-00: Loss of Secondary Containment Differential Pressure Due to Transformer Trip. 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 Ms. Kathy Ann Baker, Regulatory Assurance Manager, at (217)-937-2800.

Respectfully,

William G. Noll
Site Vice President
Clinton Power Station

JLP/blf

Enclosures: Licensee Event Report 2012-001-00

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Clinton Power Station
Office of Nuclear Facility Safety – IEMA Division of Nuclear Safety

IE22
NRR

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

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 Section (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 reverse for required number of digits/characters for each block)

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4. TITLE

Loss of Secondary Containment Differential Pressure Due to Transformer Trip

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
09	02	2012	2012	- 001 -	00	10	26	2012	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

097

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☒ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Kathy Ann Baker, 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
B	EB	RLY	Q011	YES					

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)*

At 2204 on September 2, 2012, the Emergency Reserve Auxiliary Transformer (ERAT) transferred unexpectedly to the Reserve Auxiliary Transformer, causing a trip of the Fuel Pool Cooling and Cleanup system pump 'A' and trip of the Fuel Building Ventilation system. Secondary Containment differential pressure increased above the Technical Specification 0.25 inches vacuum and was restored at 2219 on September 2, 2012, when the Standby Gas Treatment System was manually started. This event is being reported as a condition that could have prevented the fulfillment of a safety function per 10 CFR 50.73(a)(2)(v)(C). The trip of the ERAT was caused by a spurious station ground on one of the ERAT sudden pressure seal-in relay cards (63SPX) caused by a latent design error. The ground revealed itself when Electrical Maintenance technicians were performing circuit checks to determine the source of a ground indicated on the 125 Volts Direct Current motor control center 1F. A temporary modification was implemented to disable the seal-in trip feature of the 63SPX relay card.

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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 test as [XX].

EVENT IDENTIFICATION

Emergency Reserve Auxiliary Transformer Trip and Subsequent Loss of Secondary Containment Differential Pressure

A. Plant Operating Conditions Before the Event

Unit: 1 Event Date: 9/2/2012 Event Time: 2204 hours CDT
Mode: 1 Mode Name: Power Operation Reactor Power: 97 percent

B. DESCRIPTION OF EVENT

On September 1 and 2, 2012, Clinton Power Station (CPS) experienced significant precipitation (rain). Partly due to the rain, a hard ground alarm [ALM] was received on Direct Current (DC) Motor Control Center [MCC] 1F. To determine the location of the ground, station Electrical Maintenance technicians conducted ground fault tracing using a DC Scout ground test device.

At 2204 on September 2, 2012, when the DC Scout device was connected between the Balance of Plant (BOP) 125 Volts DC (VDC) battery [BTRY] 1F and station ground, the Emergency Reserve Auxiliary Transformer (ERAT) [XFMR] sudden pressure seal-in relay [RLY] (63SPX) sealed in causing both the ERAT and ERAT Static Var Compensator (SVC) to trip.

Immediately following the trip, the ERAT deluge system actuated and fire pumps [P] 'A' and 'B' started. Safety related 4160 kV Bus [BU] 1A1, which had been powered from the ERAT, momentarily lost power and transferred to the Reserve Auxiliary Transformer (RAT). Due to the momentary loss of power to Bus 1A1, Fuel Building Ventilation [VG] lost power and its dampers [DMP] closed causing a loss of Secondary Containment differential pressure. Secondary Containment differential pressure increased above the 0.25 inches vacuum required by Technical Specification (TS) 3.6.4.1, Secondary Containment. Due to high secondary containment differential pressure, operators entered Emergency Operating Procedure (EOP) - 8, Secondary Containment Control. Fuel Pool Cooling and Cleanup [DA] system pump 'A' tripped, causing the upper containment pool level to drop. However, upper containment pool level did not drop below the minimum level required by plant TS 3.6.2.4, Suppression Pool Makeup System. The Drywell fission product monitor [MON] required by TS 3.4.7, Reactor Coolant System Leakage Detection Instrumentation, isolated. Main Control Room Ventilation [VI] 'A' chiller [CHU] shut down. Diesel Generator [DG] Vent Oil Room 1A Exhaust Fan [FAN] lost power. Several radiation monitors momentarily lost power and were declared inoperable.

Secondary Containment differential pressure was restored at 2219 on September 2, 2012, when the Standby Gas Treatment System SGTS [BH] was manually started and operators exited EOP - 8 at 2238 on September 2, 2012. The fission product monitor was restored by 2309 on September 2,

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2012, within the 30 day TS completion time. The Main Control Room Ventilation 'A' Chiller was restarted at 2237. The DG Vent Oil Room 1A Fan was restarted at 0104 on September 3, 2012.

Since the secondary containment differential pressure was greater than the TS required pressure, this event was reported (Event Number: 48269) on September 3, 2012, at 0417 as a condition that could have prevented the fulfillment of a safety function per 10 CFR 50.72(b)(3)(v)(C).

Corrective action program Issue Report 1408282 was initiated to evaluate this event.

A review of the ERAT trip and of the 1A1 Bus fed breaker logic indicates that the DC Scout signal used during ground fault tracing actuated the sudden pressure relay logic which then actuated the lockout relays. One lockout relay specifically blocks the synchro-verifier relay logic, thus blocking a fast transfer. This resulted in an automatic slow 1A1 bus transfer from the ERAT to the RAT. The slow transfer resulted in the momentary loss of power on the 1A1 bus and all downstream loads.

During troubleshooting activities for this event, a latent design error was identified on seal-in relays 63SPX and 63FPX. Both relays are Qualitrol Model 909-200-01 AC/DC Seal-In Relays with 125 VDC supply power. The latent design error is a ground wire installed on terminal 13 of the relay. The current vendor manual information states that terminal 13 should not be connected to earth ground when a DC power supply is used. The vendor has acknowledged that spurious operation can occur when this device is used with DC supply power and a ground on terminal 13. All indications show that the latent error has existed since original transformer construction at the factory in 1998. The current ERAT was received and installed in 1998.

C. CAUSE OF EVENT

The cause of this event was due to a latent design error that involved the wiring of terminal 13 to ground for the sudden pressure seal-in relay cards (63SPX). Updated vendor manual information states that terminal 13 should not be connected to earth ground when a DC power supply is used. The relay manufacturer has acknowledged that spurious operation can occur when this device is used with DC supply power and a ground on terminal 13. The latent error has existed since original transformer construction at the factory.

D. SAFETY CONSEQUENCES

There were no actual nuclear safety consequences related to this event. This event resulted in the loss of secondary containment for approximately 15 minutes, from 2204 to 2219 on September 2, 2012 due to loss of power to the Fuel Building ventilation system and dampers closing. Secondary Containment differential pressure was greater than the 0.25 inches vacuum required by TS 3.6.4.1. The SGTS was manually started during this period and differential pressure was restored to within limits. The SGTS initiates automatically when conditions indicate a release of radioactive material or a loss of coolant accident to ensure that any radioactive materials that leak from the Primary Containment into the Secondary Containment following an accident are filtered by SGTS prior to release to the environment.

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This event is considered to be reportable as a loss of safety function under 50.72(b)(3)(v)(C) and 50.73(a)(2)(v)(C) as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material.

E. CORRECTIVE ACTIONS

A Temporary Modification under Engineering Change (EC) 390386 was implemented to disable the 63SPX (Qualitrol Model No. 909-200-01) trip function and remove the ground connection from terminal 13 on the seal-in relays (63SPX and 63FPX). The trip function of the 63SPX relay can be restored during the next ERAT maintenance outage. Based on these actions the risk of an invalid ERAT trip has been mitigated.

F. PREVIOUS OCCURRENCES

12/18/2001 - ERAT TRIP - The ERAT and ERAT SVC tripped (with deluge). A Root Cause investigation was performed. The cause of the trip was an internal fault. The cause for the internal fault on the ERAT was a gradual localized breakdown of the insulating oil due to corona discharge from the spliced HV lead. The controller cards, seal-in relays, etc., were not mentioned as contributing factors and no specific issues with the seal-in relays were documented.

3/02/2002 - ERAT TRIP - The ERAT and ERAT SVC tripped (with deluge). The cause of the trip was determined to be a wet seal-in relay card. The control cabinet contained gaps that allowed rain and subsequent deluge water to enter the cabinet. A Work Request was issued to seal the ERAT control cabinet.

G. COMPONENT FAILURE DATA

Manufacturer	Nomenclature	Manufacturer Model Number
Qualitrol Corporation	Sudden pressure Seal-in relay (63SPX)	909-200-01