

Clinton Power Station  
8401 Power Road  
Clinton, IL 61727



Exelon Generation®

U-604398

10 CFR 50.73  
SRRS 5A.108

January 4, 2018

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 2017-009-00

Enclosed is Licensee Event Report (LER) 2017-009-00: Trip of Emergency Reserve Auxiliary Transformer Static VAR Compensator Causes Positive Secondary Containment Pressure Following Voltage Transient on 138 kV Offsite Source. 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 2017-009-00

cc:

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

IEZZ  
NRR



**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**

Clinton Power Station, Unit 1

**2. DOCKET NUMBER**

05000461

**3. PAGE**

1 OF 4

**4. TITLE**

Trip of Emergency Reserve Auxiliary Transformer Static VAR Compensator Causes Positive Secondary Containment Pressure Following Voltage Transient on 138 kV Offsite Source.

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
11	05	2017	2017	009	00	01	04	2018	FACILITY NAME	DOCKET NUMBER 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	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
10. POWER LEVEL  098	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER	Specify in Abstract below or in NRC Form 366A	

**12. LICENSEE CONTACT FOR THIS LER**

LICENSEE CONTACT Mr. Dale Shelton, Regulatory Assurance Manager	TELEPHONE NUMBER (Include Area Code) (217)-937-2800
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EIPX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EIPX

**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)

On November 5, 2017, at approximately 1240 CDT, the Main Control Room (MCR) received numerous annunciators that indicated a trip of the Emergency Reserve Auxiliary Transformer (ERAT) Static VAR Compensator (SVC) caused by a voltage transient on the 138 kV offsite supply. Technical Specification (TS) Limiting Condition for Operation (LCO) 3.8.1, AC Sources-Operating, Required Action A.1 and A.2 were entered. As a result of the voltage transient, the Division 1 Fuel Building ventilation (VF) system isolation dampers closed causing a trip of VF supply and exhaust fans. With no operating VF fans, Secondary Containment (SC) vacuum rose to slightly greater than 0 inches water gauge (WG) at 1241 CDT which exceeded the TS requirement of greater than 0.25 inches vacuum WG. The MCR entered Emergency Operating Procedure (EOP)-8, Secondary Containment Control and TS LCO 3.6.4.1, Secondary Containment, Required Action A.1. The cause of the SC differential pressure becoming positive is that the circuit design of VF is not adequately robust to withstand loss of the 138 kV feed. At the time, the Division 1 safety bus was being fed from the ERAT. Secondary Containment vacuum was restored within TS requirements at 1242 CDT by starting the Standby Gas Treatment System. A modification will be installed to prevent tripping VF during a momentary loss of power. Installation of a 138 kV Ring Bus is scheduled that is intended to improve the reliability of the radial feed of the 138 kV line. This event is being reported as a condition that could have prevented fulfillment of a safety function under 10 CFR 50.73(a)(2)(v)(C).



**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.
Clinton Power Station, Unit 1	05000461	2017	- 009	- 00

**NARRATIVE**

**PLANT AND SYSTEM IDENTIFICATION**

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

**EVENT IDENTIFICATION**

Trip of Emergency Reserve Auxiliary Transformer Static VAR Compensator Causes Positive Secondary Containment Pressure Following Voltage Transient on 138 kV Offsite Source.

**A. Plant Operating Conditions before the Event**

Unit: 1                                      Event Date: 11/05/17                                      Event Time: 1240 CDT  
 Mode: 1                                      Mode Name: Power Operation                                      Reactor Power: 98 percent

**B. Description of Event**

On November 5, 2017, at approximately 1240 hours CDT the Emergency Reserve Auxiliary Transformer (ERAT)[XFMR] Static VAR Compensator (SVC)[COMP] tripped due to a voltage transient on the 138 kV line owned and maintained by Ameren Illinois. The Main Control Room (MCR) entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.8.1, AC Sources-Operating, Required Actions A.1 and A.2. As a result of the voltage transient, the Division 1 Fuel Building Ventilation (VF) system isolation dampers closed causing a trip of the VF supply and exhaust fans. Ameren stated that the voltage transient was possibly due to weather. The effect of this condition was that Secondary Containment (SC) vacuum rose to slightly greater than 0 inches water gauge (WG) and exceeded the TS limit of -0.25 inch WG. Operations personnel entered Emergency Operating Procedure (EOP) -8, Secondary Containment Control, and TS LCO 3.6.4.1, Secondary Containment, Required Action A.1. As a result of the momentary loss of power, the following additional system actuations occurred:

- Division 1 MCR Ventilation Chiller tripped,
- Division 1 Diesel Generator Room Exhaust Fan 1VD02CA tripped,
- Division 1 Shutdown Service Water Pump auto started,
- Fission Product Monitoring (FPM) skid isolation valves shut,
- Division 1 Hydrogen Monitoring system isolation valves shut,
- Containment Service Air System Outboard Isolation valve 1SA029 shut,
- Nuclear Systems Protection System (NSPS) Inverter Trouble alarms (due to loss of synchronization)



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**NARRATIVE**

The Standby Gas Treatment System (VG) was manually started and SC vacuum was restored within TS limits at approximately 1242 hours. The system actuations were addressed and plant equipment was restored to service in accordance with plant procedures. The momentary loss of power did not adversely affect the safe operation of the plant or the restoration of SC. During the investigation, Ameren reported that the Clinton feeder breaker that supplied the 138 kV line had tripped and reclosed probably due to weather. In addition, during inspection of the offsite power lines, two disconnects were found not fully seated. These disconnects were resealed and the ERAT SVC was returned to service and declared OPERABLE at 1702 hours.

**C. Cause of the Event**

The cause of the SC differential pressure becoming positive is that the circuit design of VF is not adequately robust to withstand the loss of the 138 kV feed.

**D. Safety Consequences**

This event is reportable in accordance with 10CFR50 50.73(a)(2)(v)(C) as a condition that could have prevented fulfillment of a safety function to control the release of radioactive material because the SC was declared inoperable.

The VG system was fully operable at the time of the event and capable of performing its required safety function. Operations entered EOP-8 for SC vacuum less than -0.25 inch WG and entered TS LCO 3.6.4.1 Required Action A.1. The SC vacuum was restored to within TS limits within the completion time requirement. The SC vacuum normally is kept slightly negative relative to atmospheric pressure to prevent leakage to the atmosphere. The VF system is a non-safety ventilation system which is normally in service to maintain SC vacuum. The VG system is the safety-related system which is relied upon to perform this function following an accident. During the event, the VG system was placed in service and restored SC to operability consistent with its safety function. Therefore, the ability of the station to maintain SC vacuum in the event of an accident was never jeopardized or challenged by the VF system trip. Engineering analysis has determined that this event is not considered a safety system functional failure.

**E. Corrective Actions**

A modification will be installed to prevent tripping VF during a momentary loss of power. Installation of a 138 kV Ring Bus is scheduled that is intended to improve the reliability of the radial feed of the 138 kV line.



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**NARRATIVE**

In addition, a License Amendment Request (LAR) was submitted to the NRC on November 8, 2017 to adopt Technical Specifications Task Force (TSTF)-551, Revise Secondary Containment Surveillance Requirements, to adopt a change to the CPS TS that would eliminate the requirement to declare SC inoperable under similar transient conditions. Adoption of this LAR would have prevented this event from being reportable.

**F. Previous Similar Occurrences**

Licensee Event Report 2015-004-00: Trip of Emergency Reserve Auxiliary Transformer Static VAR Compensator Causes Positive Secondary Containment Pressure Following Lightning Strike on 138 kV Offsite Source.

On June 25, 2015 at 0301 CDT, the Main Control Room received numerous annunciators that indicated a trip of the ERAT Static VAR Compensator caused by a voltage transient on the 138 kV offsite source due to thunderstorms in the area. The Division 1 safety bus was manually aligned from the reserve source to its normal source. As a result of the voltage transient, the Division 1 VF system isolation dampers closed causing a trip of VF supply and exhaust fans. Secondary Containment vacuum increased to greater than 0 inch WG which exceeded the TS requirement. Secondary Containment vacuum was restored within TS requirements by reopening the VF isolation dampers and restarting the VF supply and exhaust fans. The ERAT SVC was returned to service at 0457 CDT.

Licensee Event Report 2016-004-00: Trip of Emergency Reserve Auxiliary Transformer Static VAR Compensator Causes Positive Secondary Containment Pressure Following Lightning Strike on 138 kV Offsite Source

On March 30, 2016, at approximately 1545 CDT, the Main Control Room received numerous annunciators that indicated a trip of the Emergency Reserve Auxiliary Transformer Static VAR Compensator caused by a voltage transient on the 138 kV supply. Technical Specification Limiting Condition for Operation 3.8.1, AC Sources-Operating, Required Action A.1 and A.2 were entered. As a result of the voltage transient, the Division 1 Fuel Building ventilation system isolation dampers closed causing a trip of VF supply and exhaust fans. With no operating VF fans, Secondary Containment vacuum rose to slightly greater than 0 inches water gauge which exceeded the TS requirement of greater than 0.25 inches vacuum WG. Secondary Containment vacuum was restored within TS requirements at 1550 CDT by starting the Standby Gas Treatment System.

**G. Component Failure Data**

There were no component failures associated with this event.