



Clinton Power Station
8401 Power Road
Clinton, IL 61727

U-604304
August 22, 2016

10CFR50.73
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 2016-009-00

Enclosed is Licensee Event Report (LER) 2016-009-00: Trip of the Fuel Building Fans Due to Damper Failure Results in Loss of Secondary Containment. 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,

A handwritten signature in black ink, appearing to read "T. Stoner", written over a horizontal line.

Theodore R. Stoner
Site Vice President
Clinton Power Station

KP/cac

Attachment: Licensee Event Report 2016-009-00

cc:

Regional Administrator— NRC 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)

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 and Information Collections Branch (T-5 F53), 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
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4. TITLE
Trip of Fuel Building Fans Due to Damper Failure Results in Loss of Secondary Containment

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
06	24	2016	2016	- 009 00-		08	22	2016		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 099	<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 Dale A. 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	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	VG	SOL	A499	Y					

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 June 24, 2016 at 1511 (CST) Clinton Power Station (CPS) was operating at 99 percent reactor power when the MCR received two Fuel Building (VF) trouble alarms. An unexpected damper closure resulted in Secondary Containment (SC) vacuum degrading, eventually exceeding the Technical Specification (TS) limit of 0.25 inch vacuum water gauge. TS Limiting Condition for Operation (LCO) 3.6.4.1, Secondary Containment, Required Action A.1 and Emergency Operating Procedure (EOP) – 08, Secondary Containment Control were entered. At 1512, SC vacuum was restored within TS limits with the auto start of VF supply fan 1VF03CB and exhaust fan 1VF04CB. An initial investigation determined that the 'A' Exhaust Fan Isolation Damper 1VF11YA had failed to the closed position on loss of air due to failure of the associated air supply solenoid, 1FSVVF005. The apparent cause of this event is the failure of the ASCO solenoid valve, 1FSVVF005, due to a slightly deformed and worn core which resulted in sticking. The failed solenoid valve 1FSVVF005 was replaced and the VF system ventilation was restored. In addition, parts quality testing, and preventative maintenance programs are being established to replace VF solenoid operated valves on a periodic basis. The temporary loss of SC is reportable under 10CFR 50.73(a)(2)(v)(C) as an event or condition that could have prevented fulfillment of a safety function needed to control the release of radioactive material.



**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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Clinton Power Station, Unit 1	05000461	2016	- 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 the text as [XX]

EVENT IDENTIFICATION

Trip of Fuel Building Fans Due to Damper Failure Results in Loss of Secondary Containment

A. Plant Operating Conditions before the Event

Unit: 1	Event Date: 06/24/16	Event Time: 1511
Mode: 1	Mode Name: Power Operation	Reactor Power: 99 percent

B. DESCRIPTION OF EVENT

On June 24, 2016 at 1511-(CST) Clinton Power Station (CPS) was operating at 99 percent reactor power when the MCR received two unexpected annunciators associated with the Fuel Building ventilation system (VF), 5042-4D (Trouble VF system local panel 1PL44J) and 5042-5D (Hi Diff Press Fuel Bldg). Subsequent investigation determined that VF exhaust fan isolation damper 1VF11YA had failed closed as a result of a failure of solenoid 1FSVVF005. As a result, Secondary Containment (SC) vacuum degraded, eventually exceeding the Technical Specification (TS) limit of 0.25 inch vacuum water gauge (WG). Both the Fuel Building (FB) 'B' supply and exhaust fans auto started as designed, to restore SC vacuum, however, the sequence was not timely enough to prevent the FB differential pressure from exceeding the TS requirement. TS Limiting Condition for Operation (LCO) 3.6.4.1, Secondary Containment, Required Action A.1 and Emergency Operating Procedure (EOP) – 08, Secondary Containment Control were entered. The momentary loss of the VF fans also resulted in no flow through the VF exhaust ductwork and; therefore, duct monitors 1RIX-PR006A-D were declared inoperable. The lack of monitored VF exhaust flow associated with LCO 3.3.6.2, Secondary Containment Isolation Instrumentation, Fuel Building exhaust radiation resulted in a momentary loss of SC isolation capability and Standby Gas Treatment System (SGTS) initiation capability on VF exhaust high radiation. As a result of this condition, LCO 3.3.6.2 Required Actions A.1 and Action B.1 were entered. At 1512, SC vacuum was restored within TS limits following the auto start of supply fan 1VF03CB and exhaust fan 1VF04CB. TS LCO 3.6.4.1 Required Action A.1 and TS LCO 3.3.6.2 Required Actions A.1 and B.1 were subsequently exited. At 1602, EOP-08 was exited.

CPS replaced failed solenoid valve 1FSVVF005. In addition, Exelon PowerLabs evaluated a similar failed ASCO solenoid valve in determining a cause of component failure. The failure conditions of this valve were similar based on observations by field technicians. CPS concluded the apparent cause of ASCO solenoid valve 1FSVVF005 failure was due to sticking as a result of a slightly deformed and worn core. The Powerlabs evaluation further attributed the most likely cause of the initiating event to a manufacturing defect in the solenoid valve due to its low inservice time (11 months).



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C. CAUSE OF EVENT

The apparent cause of this event is the failure of the ASCO solenoid valve, 1FSVVF005, due to sticking as a result of a slightly deformed and worn core. Due to its low inservice time (11 months), the most likely cause of the initiating event is a subtle manufacturing defect.

D. SAFETY ANALYSIS

There were no safety consequences associated with this event described in this report. The event is reportable in accordance with 10CFR50.73(a)(2)(v)(C) as a condition that could have prevented fulfillment of a safety function to control the release of radioactive material because SC was declared inoperable.

The SGTS system was fully operable at the time of the event and capable of performing the required safety function. Operations entered EOP-08 for SC vacuum less than minus 0.25 inch WG and entered TS LCO 3.6.4.1 Required Action A.1. SC vacuum was restored to within TS limits within the completion time requirement. The SC vacuum is kept slightly negative relative to the 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 SGTS system is the safety-related system which is relied upon to perform this function following an accident. During the event both VF 'B' supply and exhaust fans auto started as designed and restored SC to operability consistent with its design function. In addition, the SGTS system remained available to respond to an accident condition throughout this event. Therefore, the ability of the station to maintain secondary containment in an accident scenario was never jeopardized or challenged by the VF system fan trip.

Because the SGTS remained available to restore SC vacuum in event of an accident, this event report does not constitute a safety system functional failure.

E. CORRECTIVE ACTIONS

The failed component, 1FSV-VF005, was replaced and the VF system was restored to normal operation. Additional maintenance activities are planned for the VF system including establishing preventative maintenance tasks for the replacement of solenoid operated valves and rebuilding a damper actuator on a periodic basis. Additional parts quality testing is being established for VF damper solenoids to identify manufacturing defects prior to placing them in service.



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NARRATIVE

F. PREVIOUS SIMILAR OCCURENCES

LER 2014-001-00 Premature Failure of Air Supply Solenoid Results in Isolation Of Fuel Building Ventilation System And Loss Of Secondary Containment Differential Pressure

The cause of this event was the VF system inboard exhaust isolation damper 1VF07Y air supply solenoid was prematurely degraded and caused the damper to isolate the VF system flow-path during the Main Control Room Ventilation (VC) Train B startup, resulting in a VF system trip and a subsequent loss of SC. The troubleshooting team concluded that during the VC Train B startup, the air supply solenoid on the VF system inboard exhaust isolation damper 1VF07Y responded to a minor perturbation of the supply voltage or a surge of current on the bus by repositioning (dropping out) because the solenoid was weak or degraded, resulting in isolation of the VF system inboard exhaust isolation damper. The VF system inboard exhaust isolation damper failed closed, thus fulfilling its safety function.

G. COMPONENT FAILURE DATA

Component Description: Solenoid Valve (ASCO Red Hat II)
Model Number HB8320G001