

Clinton Power Station
8401 Power Road
Clinton, IL 61727



U-604439

10 CFR 50.73
SRRS5A.108

August 17, 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 2018-003-00

Enclosed is Licensee Event Report (LER) 2018-003-00: Load Driver Card Failure Resulting in High Pressure Core Spray Inoperability. 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 "Bradley T. Kapellas", written over the word "Respectfully,".

Bradley T. Kapellas
Plant Manager
Clinton Power Station

KP/lam

Attachment: License Event Report 2018-003-00

cc:

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

IELZ
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-m/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 Infocollcts.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 3

4. Title

Load Driver Card Failure Resulting in High Pressure Core Spray Inoperability

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	20	2018	2018	- 003	- 00	08	17	2018	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	<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)
099	<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 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 checked="" 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 ICES	Cause	System	Component	Manufacturer	Reportable to ICES
Unknown	BG	RLY	GE	Y					

14. Supplemental Report Expected

<input checked="" type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input type="checkbox"/> No	15. Expected Submission Date	Month	Day	Year
		10	17	18

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On June 20, 2018, at 1145 CDT, during panel walkdown, a reactor operator identified that High Pressure Core Spray (HPCS) injection valve 1E22-F004 was in the open position. Valve 1E22-F004 is normally closed and receives an open signal upon HPCS initiation. Operations personnel verified that the valve was open locally and that the plant computer indicated the valve was in the 'not closed' position. No alarms or status lamps indicated why the valve would be open and there was no valid demand signal. Reactor power, pressure, level, and feedwater parameters remained steady and unchanged, with no indication of HPCS injection having occurred or required. With valve 1E22-F004 in the open position without a demand signal, closure on a high reactor water level condition was not assured. HPCS was, therefore, declared inoperable. Technical Specifications (TS) 3.5.1, "Emergency Core Cooling Systems (ECCS)-Operating" and 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," were entered. The HPCS injection valve 1E22-F004 was subsequently observed cycling without operator action. To assure the containment isolation function and closure on a high reactor water level condition, 1E22-F004 was deactivated in the closed position. Event troubleshooting established the apparent cause as the load driver card energizing which opened the HPCS pump injection valve. As a corrective measure, the original load driver circuit card was replaced. The completed causal evaluation results and a discussion of corrective actions will be provided in a followup report. This event was reported as an 8-hour non-emergency notification per 10 CFR 50.73(a)(2)(v)(D) as any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

**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	2018	- 003	- 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

Load Driver Card Failure Resulting in High Pressure Core Spray Inoperability

A. Plant Operating Conditions Before the Event

Unit: 1	Event Date: June 20, 2018	Event Time: 1145
Mode: 1	Mode Name: Power Operation	Reactor Power: 099 percent

B. Description of Event

On June 20, 2018, at 1145 CDT, the High Pressure Core Spray (HPCS) injection valve 1E22-F004 was observed in the "OPEN" instead of the required "CLOSED" position. A review of computer point HP-BC801, "HPCS Pump Discharge 1E22-F004," and Transient Test (TT) Channel 50, "HPCS Injection Valve Position," showed the valve opened at approximately 0847 CDT. Operations entered Technical Specification (TS) 3.5.1, "ECCS-Operating," and TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," Required Actions in response to the event. The HPCS injection valve remained in the OPEN position as additional assessment and troubleshooting activities were conducted.

At approximately 1324 CDT, the HPCS injection valve began cycling "OPEN" and "CLOSED." It was established that this condition occurred for approximately 13 minutes and 45 seconds at which time the 1E22-F004 valve was de-energized and the valve manually isolated.

C. Cause of the Event

Troubleshooting was initiated to determine the cause for the pump discharge valve OPEN/CLOSE circuit operations. The initiating event for the as-found position of valve 1E22-F004 was that the 1H13-P663-B-A16-A123 (A123) load driver circuit card [RLY] failed in a manner that caused it to send a spurious signal which opened the valve. Troubleshooting also identified unexpected voltages at the output of the 1H13-P663-B-A16-A121 (A121) load driver circuit card. This load driver provided the signal to close the valve. When both the A123 and A121 load driver cards were replaced, the voltages in the circuit returned to expected values. The cause of this event, including investigation conclusions, will be documented in a supplemental report following completion of the failure analysis.

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

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Clinton Power Station, Unit 1	05000461	2018	- 003	- 00

NARRATIVE**D. Safety Consequences**

There were no actual safety consequences associated with the condition described in this report. The HPCS system provides and maintains an adequate coolant inventory inside the reactor vessel to limit fuel cladding temperatures in the event of breaks in the reactor coolant pressure boundary. The system is initiated by either high pressure in the drywell or low water level in the reactor vessel. Though the as-found HPCS injection valve position rendered the system inoperable, the Reactor Core Isolation Cooling (RCIC) system was operable throughout this event. Although no credit is taken in the safety analysis for the RCIC system, it performs a similar function as HPCS but has reduced makeup capability. HPCS is also backed up by the Automatic Depressurization System in combination with the Low Pressure Coolant Injection [BO] and Low Pressure Core Spray [BM] systems. These systems also remained operable throughout this event.

This event is reportable under the provisions of 10 CFR 50.73(a)(2)(v)(D) as a condition that could have prevented fulfillment of the HPCS system (a single train safety system) to mitigate the consequences of an accident.

E. Corrective Actions

The original load driver circuit cards were replaced. Additional corrective actions will be discussed in a supplemental report following completion of the failure analysis.

F. Previous Similar Occurrences

There were no previous similar occurrences involving load driver card failure that resulted in HPCS inoperability.

G. Component Failure Data

Manufacturer: General Electric Hitachi
Part Number 147D8455 Load Driver Card