



APR 04 2014

10CFR50.73

LR-N14-096

United States Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-001

Hope Creek Generating Station Unit 1  
Renewed Facility Operating License No. NPF-57  
Docket No. 50-354

Subject: Licensee Event Report 2013-009-01

Reference: PSEG Letter LR-N14-011 dated January 28, 2014  
Licensee Event Report 2013-009-00

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv)(A), PSEG Nuclear LLC is submitting the enclosed Licensee Event Report (LER) Number 2013-009-01, "Automatic Actuation of the Reactor Protection System due to a Main Turbine Trip." The Reference LER stated that Hope Creek Generating Station would supply a supplement to the LER with the results of an evaluation to determine the cause of the Moisture Separator dump valve failure. The results of the causal evaluation are being communicated in the LER supplement attached to this letter.

If you have any questions or require additional information, please contact Mr. Philip Duca at (856) 339-1640.

There are no regulatory commitments contained in this letter.


Sincerely,

A handwritten signature in black ink, appearing to read "Eric S. Carr", written over a horizontal line.

Eric S. Carr  
Plant Manager  
Hope Creek Generating Station

Attachment: Licensee Event Report 2013-009-01

cc: W. Dean, Regional Administrator – Region I, NRC  
J. Hughey, Project Manager - US NRC  
NRC Senior Resident Inspector – Hope Creek (X24)  
P. Mulligan, Manager, NJBNE  
LER uploaded to ICES  
Hope Creek Commitment Tracking Coordinator (H02)  
L. Marabella - Corporate Commitment Tracking Coordinator (N21)

<b>NRC FORM 366</b> (01-2014)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		<b>APPROVED BY OMB: NO. 3150-0104</b>		<b>EXPIRES: 01/31/2017</b>		
		<b>LICENSEE EVENT REPORT (LER)</b> (See Page 2 for required number of digits/characters for each block)						
<b>1. FACILITY NAME</b> Hope Creek Generating Station				<b>2. DOCKET NUMBER</b> 05000354		<b>3. PAGE</b> 1 OF 3		
<b>4. TITLE</b> Automatic Actuation of the Reactor Protection System Due to a Main Turbine Trip								
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>		<b>7. REPORT DATE</b>		<b>8. OTHER FACILITIES INVOLVED</b>	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR
12	05	2013	2013	- 009	- 01	04	04	2014
						FACILITY NAME N/A		DOCKET NUMBER 05000
						FACILITY NAME N/A		DOCKET NUMBER 05000
<b>9. OPERATING MODE</b>		<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>						
<b>1</b>		<input type="checkbox"/> 20.2201(b)		<input type="checkbox"/> 20.2203(a)(3)(i)		<input type="checkbox"/> 50.73(a)(2)(i)(C)		<input type="checkbox"/> 50.73(a)(2)(vii)
		<input type="checkbox"/> 20.2201(d)		<input type="checkbox"/> 20.2203(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)
<b>10. POWER LEVEL</b>  75		<input type="checkbox"/> 20.2203(a)(1)		<input type="checkbox"/> 20.2203(a)(4)		<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)
		<input type="checkbox"/> 20.2203(a)(2)(i)		<input type="checkbox"/> 50.36(c)(1)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)
		<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)
		<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.36(c)(2)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)
		<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.46(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(5)
		<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)(C)		<input type="checkbox"/> OTHER
		<input type="checkbox"/> 20.2203(a)(2)(vi)		<input type="checkbox"/> 50.73(a)(2)(i)(B)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		Specify in Abstract below or in NRC Form 366A
<b>12. LICENSEE CONTACT FOR THIS LER</b>								
FACILITY NAME Philip Duca, Senior Compliance Engineer						TELEPHONE NUMBER (Include Area Code) (856) 339-1640		
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>								
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER
X	SB	LCV	F130	Y				
<b>14. SUPPLEMENTAL REPORT EXPECTED</b>						<b>15. EXPECTED SUBMISSION DATE</b>		MONTH
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)						<input checked="" type="checkbox"/> NO		DAY
								YEAR
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)								
<p>On December 5, 2013, at 03:25 EST, Hope Creek Unit 1 automatically scrammed from approximately 75 percent rated thermal power due to a main turbine trip that was caused by a high level in the 'A' moisture separator (MS). The MS high level control loop was in the process of being tuned when the dump valve cycled repeatedly and subsequently failed closed. The main turbine trip automatic reactor scram resulted in a trip of both reactor recirculation pumps. The plant was stabilized in hot shutdown Operational Condition 3. During the recovery of the recirculation pumps, the digital electro-hydraulic control system was mis-operated which caused the turbine bypass valves to cycle. This caused reactor level to swell above Level 8 then shrink below Level 3 resulting in a second actuation of the reactor protection system.</p> <p>A root cause evaluation determined the cause of the MS dump valve failure was thermal binding.</p> <p>MS dump valve control has been modified from a modulating function to a full open function on high level to prevent valve cycling. The root cause determined that the MS dump valve clearances need to be modified to prevent thermal binding.</p> <p>This is an event reportable under 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in an automatic actuation of the reactor protection system.</p>								

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

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 Internet e-mail to [Infocollects.Resource@nrc.gov](mailto: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	6. LERNUMBER			3. PAGE
Hope Creek Generating Station	05000354	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 3
		2013	- 009	- 01	

**NARRATIVE****PLANT AND SYSTEM IDENTIFICATION**

General Electric – Boiling Water Reactor {BWR/4}  
Main Turbine – EISS Identifier {TA/TRB}\*  
Moisture Separator – EISS Identifier {SB/MSR}\*  
Moisture Separator Dump Valve {SB/LCV}  
Reactor Protection System – EISS Identifier {JC}\*  
Reactor Recirculation Pumps – EISS Identifier {AD/P}  
Safety Relief Valves – EISS Identifier {SB/RV}

\* Energy Industry Identification System {EISS} codes and component function identifier codes appear as {SS/CCC}

**IDENTIFICATION OF EVENT**

Event Date: December 5, 2013  
Discovery Date: December 5, 2013

**CONDITIONS PRIOR TO EVENT**

Hope Creek was in Operational Condition (OPCON) 1 operating at approximately 75 percent rated thermal power. No other structures, systems or components were inoperable at the time of the event.

**DESCRIPTION OF EVENT**

On December 5, 2013, at 03:25 EST Hope Creek Unit 1 was operating at approximately 75 percent rated thermal power with the 'A' moisture separator (MS) {SB/MSR} high level control loop in the process of being tuned. The high level control loop consists of the MS dump valve {SB/LCV}, the valve controller, and the level transmitter.

During tuning, the MS drain valves were closed so that the MS level could be controlled by the MS dump valve. The dump valve cycled open and closed. Technicians were unable to open the MS drain or dump valves for approximately two minutes. With the dump and drain valves closed, the MS level increased to the setpoint for a turbine trip signal.

The main turbine {TA/TRB} trip caused an actuation of the reactor protection system {JC} resulting in an automatic reactor scram. The recirculation pumps {AD/P} tripped as expected. All control rods inserted as required and no automatic emergency core cooling system (ECCS) or reactor core isolation cooling (RCIC) system initiations occurred. The plant was stabilized in hot shutdown (OPCON 3).

During the recovery of the recirculation pumps, the digital electro-hydraulic control (DEHC) system was mis-operated which caused the turbine bypass valves to cycle. This caused reactor level to swell above Level 8 then shrink below Level 3 resulting in a second actuation of the reactor protection system.

A four-hour NRC Emergency Notification System (ENS) notification was required by 10 CFR 50.72(b)(2)(iv)(B) for an actuation of RPS when the reactor was critical. The ENS notification (#49608) was completed on December 5, 2013, at 05:40. An eight-hour NRC ENS notification was required by 10 CFR 50.72 (b)(3)(iv)(A) for an event that results in a valid actuation of RPS. This event involved two automatic actuations of RPS; the second RPS actuation was reported at 10:00 via an update to ENS # 49608. This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv)(A).

(01-2014)

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

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**NARRATIVE****CAUSE OF EVENT**

A causal evaluation determined the failure of the MS dump valve was due to thermal binding. The valve dimensional clearances were based on analysis performed at thermal equilibrium; however, the assumption of thermal equilibrium is not valid for all thermal events when temperature rise is not uniform throughout the valve.

Organizational and programmatic issues associated with risk recognition contributed to the scram during power ascension activities. Existing station procedures lacked sufficient detail to ensure startup exceptions or constraints were tracked to completion. In addition, all unrefuted or non-conclusive causes identified during troubleshooting were not adequately dispositioned.

The second actuation of the reactor protection system was caused by mis-operation of the digital electro-hydraulic control (DEHC) system, due to crew knowledge deficiencies, poor communication, and failure to adhere to procedures.

**SAFETY CONSEQUENCES AND IMPLICATIONS**

There were no safety consequences associated with this event. The high moisture level in the 'A' MS resulted in a main turbine trip and subsequent automatic reactor scram. All control rods inserted. All reactor protection systems functioned as designed. All systems responded as expected. There were no consequences from the second RPS actuation since the reactor was already in hot shutdown (OPCON 3). No ECCS or RCIC initiation setpoints were reached in either the first scram or the second RPS actuation. The plant was stabilized in hot shutdown after the reactor was depressurized to allow the start of a reactor recirculation pump.

**SAFETY SYSTEM FUNCTIONAL FAILURE**

A review of this event determined that a Safety System Functional Failure (SSFF) did not occur as defined in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline." This event did not prevent the ability of a system to fulfill its safety function to either shutdown the reactor, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident.

**PREVIOUS EVENTS**

A review of events for the past three years at Hope Creek was performed to determine if a similar event had occurred. A similar event occurred on December 1, 2013, and is documented in LER 2013-008-00.

**CORRECTIVE ACTIONS**

1. A design change was implemented modifying control of the MS dump valve from a modulating function to a full open function on high level.
2. During the next refueling outage, the MS dump valves will be modified to prevent thermal binding.
3. The integrated operating procedures for plant startup will be revised to incorporate requirements for complete documentation of operational constraints and full disposition of each constraint by Operations or Senior Station management.
4. The troubleshooting procedure will be revised to require entering the operational decision making process for any unrefuted or non-conclusive causes identified.
5. Other corrective actions are tracked in the corrective action program.

**COMMITMENTS**

This LER contains no commitments.