



10CFR50.73

LR-N15-0142

JUN 30 2015

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 2015-001-01

Reference: PSEG Letter LR-N15-0120 dated May 29, 2015
Licensee Event Report 2015-001-00

The Reference, Hope Creek Generating Station (HCGS) Licensee Event Report (LER), reported conditions prohibited by Technical Specifications due to a Core Spray pump breaker failure. The Reference stated that HCGS would supply a supplement to the LER with the results of an evaluation to determine the cause of breaker 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. Thomas MacEwen at (856) 339-1097.

There are no regulatory commitments contained in this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric S. Carr", with a long horizontal flourish extending to the right.

Eric S. Carr
Plant Manager
Hope Creek Generating Station

ttm

Attachment: Licensee Event Report 2015-001-01

cc: Mr. Daniel Dorman, Regional Administrator – Region I, NRC


Ms. Carleen Parker, Project Manager - US NRC

Justin Hawkins, NRC Senior Resident Inspector – Hope Creek (X24)

Mr. Patrick Mulligan, Manager IV
Bureau of Nuclear Engineering
New Jersey Department of Environmental Protection
PO Box 420
Trenton, NJ 08625

Mr. Thomas MacEwen, Hope Creek Commitment Tracking Coordinator (H02)

Mr. Lee Marabella - Corporate Commitment Tracking Coordinator (N21)

NRC FORM 366 (02-2014)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104		EXPIRES: 01/31/2017			
		LICENSEE EVENT REPORT (LER) (See Page 2 for required number of digits/characters for each block)								
1. FACILITY NAME Hope Creek Generating Station					2. DOCKET NUMBER 05000354		3. PAGE 1 OF 4			
4. TITLE Conditions Prohibited by Technical Specifications Due to Core Spray Inoperabilities										
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
03	31	2015	2015	- 001	- 01	06	30	2015	FACILITY NAME	DOCKET NUMBER 05000
9. OPERATING MODE			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check all that apply)							
10. POWER LEVEL 100			<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)	
			<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 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 checked="" type="checkbox"/> 50.73(a)(2)(i)(B)		<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)		Specify in Abstract below or in NRC Form 366A				
12. LICENSEE CONTACT FOR THIS LER										
LICENSEE CONTACT Thomas MacEwen, Lead Compliance Engineer								TELEPHONE NUMBER (Include Area Code) 856-339-1097		
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	BM	BKR	B455	Y						
14. SUPPLEMENTAL REPORT EXPECTED						15. EXPECTED SUBMISSION DATE				
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)						<input checked="" type="checkbox"/> NO				
						MONTH		DAY	YEAR	
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)										
<p>On 03/31/2015 at 1342, the breaker for 'A' Core Spray Pump failed to close during normal surveillance testing. No alarms were received in the Main Control Room when the start pushbutton was depressed. A second start attempt had the same results. Technical Specification (TS) 3.5.1.a was entered for one inoperable Core Spray Subsystem. The breaker was replaced and the surveillance was satisfactorily performed. 'A' Core Spray Subsystem was declared OPERABLE on 03/31/2015 at 2000 and the TS was exited.</p> <p>Initial troubleshooting indicated that the failure in the breaker most likely existed since the last breaker operation in January 2015. Failure analysis concluded that the spring in the breaker control device failed due to cyclic fatigue, preventing the breaker from closing. Consequently, 'A' Core Spray Subsystem was inoperable for longer than the TS allowed outage time. Therefore, the condition was determined to be reportable per 10 CFR 50.73(a)(2)(i)(B) as any operation or condition prohibited by TS. During the review of this event, it was determined that 'B' Core Spray Subsystem was inoperable from 02/09/2015 at 0300 until 02/10/2015 at 1532 (36 hours and 32 minutes) when planned maintenance was performed on the 'B' Emergency Diesel Generator (EDG). This condition is reportable per 10 CFR 50.73(a)(2)(v) as an event or condition that could have prevented the fulfillment of a safety function.</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 Infocollections.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. LER NUMBER			3. PAGE
Hope Creek Generating Station	05000354	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
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NARRATIVE**PLANT AND SYSTEM IDENTIFICATION**

General Electric – Boiling Water Reactor (BWR/4)

Core Spray System {BM/BKR}*
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*Energy Industry Identification System {EIS} codes and component function identifier codes appear as {SS/CCC}

IDENTIFICATION OF OCCURRENCE

Event Date: 03/31/15

Discovery Date: 03/31/15

CONDITIONS PRIOR TO OCCURRENCE

Hope Creek was in Operational Condition 1 at 100 percent rated thermal power (RTP). There was no other equipment out of service that would have impacted this event.

DESCRIPTION OF OCCURRENCE

On 03/31/2015 at 1342, the breaker {BM/BKR} for 'A' Core Spray Pump failed to close during normal surveillance testing. No alarms were received in the Main Control Room when the start pushbutton was depressed. A second start attempt had the same results. Technical Specification (TS) 3.5.1.a was entered for one inoperable Core Spray Subsystem {BM}. The breaker was replaced and the surveillance was satisfactorily performed. 'A' Core Spray Subsystem was declared OPERABLE on 03/31/2015 at 2000 and the TS was exited.

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Initial troubleshooting indicated that the failure in the breaker most likely existed since the last breaker operation in January 2015. Consequently, 'A' Core Spray Subsystem was inoperable for longer than the TS allowed outage time. Therefore, the condition was determined to be reportable per 10 CFR 50.73(a)(2)(i)(B) as any operation or condition prohibited by TS. During the review of this event, it was determined that 'B' Core Spray Subsystem was inoperable from 02/09/2015 at 0300 until 02/10/2015 at 1532 (36 hours and 32 minutes) when planned maintenance was performed on the 'B' Emergency Diesel Generator (EDG). This condition is reportable per 10 CFR 50.73(a)(2)(v) as an event or condition that could have prevented the fulfillment of a safety function.

Plant TS require two Core Spray Subsystems, each comprised of two OPERABLE Core Spray pumps and an OPERABLE flow path. Provided that at least two Low Pressure Coolant Injection (LPCI) subsystems are OPERABLE, with one Core Spray Subsystem inoperable, the inoperable Core Spray Subsystem must be restored to OPERABLE within seven days, or the plant shall be in HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours. With both Core Spray Subsystems inoperable, the plant shall be in HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the next 24 hours. Contrary to these requirements, the 'A' Core Spray Subsystem was inoperable from 01/08/2015 at 1000 when the 'A' Core Spray Pump breaker was opened, until 03/31/2015 at 2000, a period of 82 days, 10 hours. Both Core Spray Subsystems were inoperable from 02/09/2015 at 0300 until 02/10/2015 at 1532 (36 hours and 32 minutes) when planned maintenance was performed on the 'B' EDG.

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LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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NARRATIVE

CAUSE OF EVENT

A broken spring was found inside the breaker 125 VDC control device. The control device operates when the breaker closes to recharge the closing springs and other breaker control functions. The closing springs were found charged on 03/31/15 when the Core Spray breaker failed to close. This indicates that the control device operated properly to recharge the closing springs when the breaker was closed on 01/08/15 during the quarterly surveillance test. Once the closing springs are charged, the control device does not operate again until the next closing cycle. Failure analysis indicated fatigue where the spring coil begins to bend to form the hook that attaches to the pin on the contact carrier. The fracture exhibited multiple initiation sites where an apparent shallow kink was present on the spring. The bend for the hook is a high stress location and the kink likely introduced an additional stress riser that promoted fatigue crack initiation. Fatigue is a progressive failure mechanism that occurs over several stress cycles, suggesting that the spring failed due to an accumulation of operations of the control device. Based on a review of corrective action program data, this failure has not been seen on any other breakers and is considered to be an isolated event.

SAFETY CONSEQUENCES AND IMPLICATIONS

The Core Spray System consists of two independent subsystems or loops. Each subsystem consists of two centrifugal pumps that can be powered by normal or emergency AC power; a spray sparger in the reactor vessel; piping and valves to convey water from the suppression pool to the sparger; and associated controls and instrumentation. If there is low water level in the reactor vessel or high pressure in the drywell, the core spray system automatically sprays water onto the top of the fuel assemblies in time and at a sufficient flow rate to cool the core and prevent excessive fuel temperature. The Low Pressure Coolant Injection (LPCI) system starts from the same signals that initiate the core spray system and operates independently to achieve the same objective by flooding the reactor vessel.

The Emergency Core Cooling System (ECCS) network has built-in redundancy so that adequate reactor core cooling can be provided, even with other failures. The primary purpose of Core Spray is to provide reactor vessel inventory makeup and spray cooling during large breaks in which the reactor core is calculated to uncover. LPCI is an operating mode of the RHR system. Four pumps deliver water from the suppression chamber to four separate reactor vessel nozzles and inject directly into the core shroud region. The primary purpose of LPCI is to provide reactor vessel coolant inventory makeup following large break loss of coolant accidents. The Core Spray System and LPCI also both provide reactor vessel inventory makeup and core cooling following small break loss of coolant accidents after automatic depressurization.

The accident analyses require various combinations of ECCS components. To meet these combinations, at least one Core Spray Subsystem must remain available. The 'B' Emergency Diesel Generator (EDG) was inoperable for planned maintenance from 02/09/2015 at 0300 until 02/10/2015 at 1532 (36 hours and 32 minutes). Consequently, one Core Spray Pump in each subsystem was unavailable, resulting in two inoperable Core Spray Subsystems and a non-compliance with TS 3.5.1 Action a.2.

There were no actual consequences due to the failure of the 'A' Core Spray Pump breaker and the potential impact on nuclear safety was minimal. There were no actual consequences due to the inoperability of both Core Spray Subsystems and there was no significant impact on nuclear safety.

SAFETY SYSTEM FUNCTIONAL FAILURE

During the period when the 'A' Core Spray Subsystem was inoperable, planned maintenance was performed on 'B' EDG, resulting in two inoperable Core Spray Subsystems. This condition existed for 36 hours and 32 minutes. This condition is a safety system functional failure as defined in NEI 99-02, Revision 7, Regulatory Assessment Performance Indicator Guideline.

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NARRATIVE**PREVIOUS EVENTS**

A review of events at Hope Creek for the past three years was performed to determine if any similar events had occurred. No similar events were identified.

CORRECTIVE ACTIONS

The 'A' Core Spray Pump breaker was replaced. 'A' Core Spray Pump was declared operable after completion of the surveillance test on 03/31/2015 at 2000.

The preventative maintenance template for the ABB HK breakers used in safety-related applications will be reviewed and revised as necessary to include periodic replacement of the breaker control device.

Other corrective actions are being tracked in the licensee's Corrective Action Program.

COMMITMENTS

This LER contains no regulatory commitments.