Southern Nuclear

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Docket Nos.: 50-321

NL-17-0585

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant Unit 1
Licensee Event Report 2017-002-00
High Pressure Coolant Injection System Declared Inoperable Due to Degraded Inverter

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(v)(D), Southern Nuclear Operating Company (SNC) hereby submits the enclosed Licensee Event Report.

This letter contains no NRC commitments. If you have any questions, please contact Greg Johnson at (912) 537-5874.

Respectfully submitted,

Justin T. Wheat
Regulatory Affairs Manager

JTW/jcb/lac

Enclosure: LER 2017-002-00

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. D. R. Vineyard, Vice President – Hatch
Mr. M. D. Meier, Vice President – Regulatory Affairs
Mr. R. D. Gayheart, Fleet Operations General Manager
Mr. B. J. Adams, Vice President – Engineering
Mr. G. L. Johnson, Regulatory Affairs Manager - Hatch
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Ms. C. Haney, Regional Administrator
Mr. R. Hall, NRR Project Manager – Hatch
Mr. D. H. Hardage, Senior Resident Inspector – Hatch

Edwin I. Hatch Nuclear Plant Unit 1

LER 2017-002-00

High Pressure Coolant Injection System Declared Inoperable Due to Degraded Inverter

NRC FORM 366 (06-2016) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2018

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/)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Edwin I. Hatch Nuclear Plant Unit 1	05000321	1 OF 3

4. TITLE

High Pressure Coolant Injection System Declared Inoperable Due to Degraded Inverter

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
02	08	2017	2017	- 002	- 00	4	7	2017	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Carl J. Collins – Licensing Supervisor	912-366-2342

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	BJ	INVT	0000	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On February 8, 2017, at 1151 EST with Unit 1 at approximately 100 percent rated thermal power, the High Pressure Coolant Injection (HPCI) suction and discharge pressure indicators were noted to be downscale during a main control room panel walk down. Upon further investigation, it was discovered that the output voltage of the DC to AC inverter was degraded. The HPCI DC to AC inverter supplies power to the HPCI flow controller and power supply. HPCI was therefore declared inoperable due to the degraded voltage condition.

The inoperable as found condition of the HPCI pressure indicators was due to degraded output voltage from the DC to AC HPCI inverter. The degraded inverter was removed and replaced and HPCI was returned to operable status. As part of an extent of condition review, the internals of the degraded inverter were inspected to determine what caused premature failure of the inverter. Based on the findings of this inspection, the preventative maintenance frequency for inverter replacement and calibration will be adjusted as necessary.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Edwin I. Hatch Nuclear Plant Unit 1	05000-321	2017	- 002	- 00

NARRATIVE

Event Description

On February 8, 2017, at 1151 EST with Unit 1 at approximately 100 percent rated thermal power, the High Pressure Coolant Injection (HPCI) suction and discharge pressure indicators were noted to be downscale during a main control room panel walk down. Upon further investigation, it was discovered that the output voltage of the DC to AC inverter (EIIS Code INVT) was degraded. This inverter provides power to multiple HPCI control room indications as well as to the HPCI flow controller and power supply. HPCI was therefore declared inoperable.

Failed Components Information:

Master Parts List Number: 1E41K603
Manufacturer: Abacus Controls Inc.
Model Number: 452-4-120M9
Type: Inverter

Event Cause Analysis

The cause of the event is due to degradation of the output voltage of the DC to AC inverter. The HPCI DC to AC inverter supplies power to the HPCI flow controller and power supply. The flow controller maintains constant flow over the pressure range of HPCI system operation and automatically starts if HPCI system initiation is required. The power supply provides DC control power to the HPCI Turbine Speed Control logic. Without the flow controller and the power supply, the HPCI Turbine would not be able to run if called upon, causing HPCI to be declared inoperable.

Safety Assessment

This event is reportable per 10 CFR 50.73(a)(2)(v)(D) due to an event or condition that could have prevented fulfillment of a safety function needed to mitigate the consequences of an accident.

The HPCI system is a single train system designed to permit the unit to be shut down while maintaining sufficient reactor pressure vessel (RPV) water inventory. The system continues to operate until the RPV is below the pressure at which either operation of the Low Pressure Coolant Injection (LPCI) mode of the Residual Heat Removal or the Core Spray (CS) system will maintain core cooling. The HPCI system consists of a steam turbine that drives a constant flow pump, system piping, valves, controls, and instrumentation. Upon receipt of an initiation signal, the HPCI turbine stop valve and turbine control valve open simultaneously. The HPCI turbine then accelerates to a specified speed to provide necessary pump flow.

Upon a "small" or "intermediate" break resulting in a loss of coolant accident (LOCA), HPCI provides sufficient inventory to prevent the core from being uncovered. It performs a dual function by providing makeup water to the reactor pressure vessel (RPV) as well as supplementing the break in depressurizing the RPV. If HPCI is unavailable, the Automatic Depressurization System (ADS) is credited to depressurize

the RPV to enable operation of the low pressure Emergency Core Cooling Systems (ECCS) (i.e., CS and LPCI). The Reactor Core Isolation Cooling (RCIC) system is also available to restore and maintain water level in the event HPCI is inoperable.

Although HPCI was declared inoperable, ADS, CS, LPCI, and RCIC were operable to provide core cooling in the event of a small or immediate break LOCA or a design basis accident (DBA) LOCA. Therefore, based on the ability of the station to mitigate the consequences of a potential loss of the HPCI system combined with a LOCA, this event is considered to have very low safety significance.

Corrective Actions

The degraded inverter was removed and replaced to return HPCI to operable status. As part of an extent of condition review, the internals of the degraded inverter were inspected to determine what caused premature failure of the inverter. Based on the findings of this inspection, the preventative maintenance frequency for inverter replacement and calibration will be adjusted as necessary.

Previous Similar Events

None.