



David S. Hoffman
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Shearon Harris Nuclear Power Plant
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10 CFR 50.73

January 26, 2023
Serial: RA-23-0013

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

Shearon Harris Nuclear Power Plant, Unit 1
Docket No. 50-400/Renewed License No. NPF-63

Subject: Licensee Event Report 2022-007-01

Ladies and Gentlemen:

Duke Energy Progress, LLC, submits the enclosed Licensee Event Report 2022-007-01 in accordance with 10 CFR 50.73 for Shearon Harris Nuclear Power Plant, Unit 1 (HNP). This report is a planned supplement to LER 2022-007-00 submitted on December 20, 2022. On October 30, 2022, with HNP in Mode 1, an automatic reactor trip occurred due to an under-voltage condition on the 'A' reactor coolant pump (RCP) and the 'C' RCP that resulted from a loss of power from the 'A' auxiliary bus. This event had no significance with respect to the health and safety of the public.

There are no regulatory commitments contained within this report.

Please refer any questions regarding this submittal to Sarah McDaniel at (984) 229-2002.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. Hoffman", written over a light blue circular stamp.

David S. Hoffman

Enclosure: Licensee Event Report 2022-007-01

cc: P. Boguszewski, NRC Senior Resident Inspector, HNP
M. Mahoney, NRC Project Manager, HNP
NRC Regional Administrator, Region II



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/>)

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, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name Shearon Harris Nuclear Power Plant, Unit 1	<input checked="" type="checkbox"/> 050 <input type="checkbox"/> 052	2. Docket Number 00400	3. Page 1 OF 3
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4. Title
Automatic Reactor Trip due to Loss of Power from the 'A' Auxiliary Bus

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved		
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	<input type="checkbox"/> 050	Docket Number
10	30	2022	2022	- 007	- 01	01	26	2023	Facility Name	<input type="checkbox"/> 052	Docket Number

9. Operating Mode 1	10. Power Level 016
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

<input type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.1200(a)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 73.1200(b)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 73.1200(c)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.1200(d)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 10 CFR Part 21	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 10 CFR Part 73	<input type="checkbox"/> 73.1200(e)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.77(a)(1)	<input type="checkbox"/> 73.1200(f)
<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(2)(i)	<input type="checkbox"/> 73.1200(g)
<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)	<input type="checkbox"/> 73.1200(h)
<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)		
<input type="checkbox"/> OTHER (Specify here, in abstract, or NRC 366A).					

12. Licensee Contact for this LER

Licensee Contact Sarah McDaniel, Regulatory Affairs Engineer	Phone Number (Include area code) (984) 229-2002
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13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS
A	EA	XCT	S188	Y					

14. Supplemental Report Expected

<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)
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15. Expected Submission Date

Month	Day	Year

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

At 06:53 Eastern Daylight Time, with Shearon Harris Nuclear Power Plant, Unit 1, in Mode 1, at sixteen percent power following the completion of a refueling outage, an automatic reactor trip occurred due to an under-voltage condition on the 'A' reactor coolant pump (RCP) and the 'C' RCP that resulted from a loss of power from the 'A' auxiliary bus. Power was lost from the 'A' auxiliary bus while operators were performing a procedure to transfer power from the 'A' start-up transformer to the 'A' unit auxiliary transformer (UAT). With the loss of power from the 'A' auxiliary bus, the 'A' main feedwater pump (MFP) tripped. The 'B' MFP was not in service and with the loss of the last running MFP, the auxiliary feedwater system actuated as designed. Safety systems functioned as required. This event did not impact public health and safety. An investigation determined that the current transformers (CTs) in the '1A-3' cubicle were mis-wired, resulting in a differential current protective relay sensing the equivalent of a differential current in the 'C' phase on the 'A' auxiliary bus. When current was applied through the 'A' UAT to the '1A-3' cubicle, the differential current protective relay actuated, which actuated the lockout of the 'A' auxiliary bus. The wiring error occurred during maintenance activities on the CTs that were reinstalled during the refueling outage. Corrective actions involved rewiring of the CTs in accordance with design.

**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 Shearon Harris Nuclear Power Plant, Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER 00400	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR 2022	SEQUENTIAL NUMBER 007	REV NO. 01

NARRATIVE

Note: Energy Industry Identification System (EIS) codes are identified in the text within brackets [].

A. Background

Prior to the event, Shearon Harris Nuclear Power Plant, Unit 1 (HNP), was operating in Mode 1 at approximately sixteen percent power. There were no structures, systems, or components that were inoperable at the time of this event that contributed to the event. This event is reportable per 10 CFR 50.73(a)(2)(iv)(A) as "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of [10 CFR 50.73]..." due to actuation of the reactor protection system (RPS) [JC] and auxiliary feedwater system (AFWS) [BA]. All actuated safety systems functioned as designed.

The onsite non-emergency electrical distribution system [EA] provides auxiliary power to buses [BUs] that are divided into trains 'A' and 'B'. Under normal operating conditions, the 'A' train receives power through the 'A' unit auxiliary transformer (UAT) [XFMR] and the 'B' train receives power through the 'B' UAT. During start-up and shutdown conditions, offsite power is supplied to the 'A' and 'B' trains through the 'A' start-up transformer (SUT) and 'B' SUT. At the time of the event, the 'A' auxiliary bus was supplying non-safety equipment loads that included the 'A' reactor coolant pump (RCP) motor [AB P MO], 'C' RCP motor, 'A' condensate pump motor [SD P MO], 'A' condensate booster pump motor, and 'A' main feedwater pump (MFP) motor [SJ P MO].

B. Event Description

At 06:53 Eastern Daylight Time, with HNP in Mode 1, at approximately sixteen percent power following completion of a refueling outage, an automatic reactor trip occurred due to an under-voltage condition on the 'A' RCP and the 'C' RCP that resulted from a loss of power from the 'A' auxiliary bus. Power was lost from the 'A' auxiliary bus while operators were performing a procedure to transfer power from the 'A' SUT to the 'A' UAT. With the loss of power from the 'A' auxiliary bus, the 'A' MFP tripped. The 'B' MFP was not in service and with the loss of the last running MFP, the AFWS actuated as designed. Safety systems functioned as required. An investigation determined that the current transformers (CTs) [XCTs] in the '1A-3' cubicle were mis-wired, resulting in a differential current protective relay [87] sensing the equivalent of a differential current in the 'C' phase on the 'A' auxiliary bus. When current was applied through the 'A' UAT to the '1A-3' cubicle, the differential current protective relay actuated, which actuated the lockout of the 'A' auxiliary bus. The wiring error occurred during maintenance activities on the CTs that were reinstalled during the refueling outage.

C. Causal Factors

The root cause of the CT wiring error was that the lift/land of leads for the CT maintenance was not performed in accordance with procedural guidance that requires unique cable identifiers for each lead lifted to ensure the as-found configuration would be replicated during the lead terminations. A contributing cause was that the lift/lead process lacked sufficient rigor to ensure configuration control. It was determined that the post-maintenance testing (PMT) following the maintenance activity was inadequate since it only included wire land verification. The development and approval of the PMT did not adequately address the potential consequences of bus de-energization for an incorrectly wired CT. This resulted in not identifying the need to perform additional checks or testing, which consequently led to not validating proper CT configuration.



LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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Shearon Harris Nuclear Power Plant, Unit 1		00400	2022	- SEQUENTIAL NUMBER 007	- 01

NARRATIVE

D. Corrective Actions

Corrective actions involved rewiring of the differential CTs in accordance with design. An extent of condition review was completed on CT connections on other auxiliary buses that had maintenance completed in the refueling outage and no additional wiring errors were identified.

Accountability actions for individuals involved in the development of the lift/land sheets that lacked unique cable identifiers required by procedure will be completed. Maintenance personnel will receive training on lift/land sheet usage. Additionally, procedural guidance to improve the lift/land process will be implemented. A standing order has already been implemented to prescribe supervisor reviews of configuration control sheets prior to implementation, which will remain in effect until the improved procedural guidance is implemented. Procedural guidance that clarifies the conditions for utilizing wire land verification as a post-maintenance test to ensure risk has been evaluated will also be implemented.

E. Safety Analysis

Following the reactor trip, the 'A' auxiliary bus was able to be reenergized from the 'A' SUT. The reactor trip was not complex, with all safety systems functioning as designed during and following the reactor trip. The automatic reactor trip had no impact on public health and safety. The plant is designed for a loss of main feedwater and plant systems responded as expected for this condition.

F. Additional Information

There have been no events at HNP similar to the event documented in this LER in the past three years.