Bentley K. Jones
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DEC 07 2016

10 CFR 50.73

Serial: HNP-16-117

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 2016-005-00

Ladies and Gentlemen:

Duke Energy Progress, LLC, submits the enclosed Licensee Event Report 2016-005-00 in accordance with 10 CFR 50.73 for Shearon Harris Nuclear Power Plant, Unit 1 (HNP). This report details an offsite power undervoltage that occurred on October 8, 2016. The multiple causes of the undervoltage were outside the authority of HNP.

This document contains no regulatory commitments. Please refer any questions regarding this submittal to Jeff Robertson, Manager – Regulatory Affairs, at (919) 362-3137.

Sincerely,

Bentley K. Jones

Enclosure: Licensee Event Report 2016-005-00

cc: C. D. Jones, NRC Sr. Resident Inspector, HNP
M. Barillas, NRC Project Manager, HNP
NRC Regional Administrator, Region II

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

Subject: Licensee Event Report 2016-005-00

Ladies and Gentlemen:

Duke Energy Progress, LLC, submits the enclosed Licensee Event Report 2016-005-00 in accordance with 10 CFR 50.73 for Shearon Harris Nuclear Power Plant, Unit 1 (HNP). This report details an offsite power undervoltage that occurred on October 8, 2016. The multiple causes of the undervoltage were outside the authority of HNP.

This document contains no regulatory commitments. Please refer any questions regarding this submittal to Jeff Robertson, Manager – Regulatory Affairs, at (919) 362-3137.

Sincerely,

Bentley K. Jones

Enclosure: Licensee Event Report 2016-005-00

cc: C. D. Jones, NRC Sr. Resident Inspector, HNP
M. Barillas, NRC Project Manager, HNP
NRC Regional Administrator, Region II

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

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

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 e-mail to 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.

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
Shearon Harris Nuclear Power Plant, Unit 1	05000 400	1 OF 3

4. TITLE

Offsite Power Undervoltage Caused Actuation of Several Systems

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
									None	05000 N/A
10	08	2016	2016	- 005	- 00	12	07	2016	FACILITY NAME: None	DOCKET NUMBER: 05000 N/A

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
4	☐ 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)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
000	☐ 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)*
Jeffrey Robertson, Regulatory Affairs Manager	(919) 362-3137

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
C	EA	N/A	N/A	N					

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 October 8, 2016, at approximately 1310 EDT, while in Mode 4 for a planned refueling outage, Shearon Harris Nuclear Power Plant experienced an undervoltage (UV) condition in the switchyard for about 1.5 seconds. This triggered the UV relays for both emergency 6.9 kV buses and for several of the non-nuclear safety 6.9kV auxiliary buses, resulting in the respective supply breakers opening. At the time of the UV, the site was experiencing high winds and rain from the effects of Hurricane Matthew. Both Emergency Diesel Generators started and loaded as designed. Operations restored offsite power at 2154 EDT after verifying stable grid behavior for an extended period. Additionally, the Containment Ventilation Isolation system and the Auxiliary Feedwater system actuated and performed as designed.

The site declared an Unusual Event at 1328 EDT for loss of offsite power to emergency buses for greater than 15 minutes. At 2049 EDT, the Unusual Event was terminated.

The causes of the UV were determined to be a line fault on the Cape Fear - West End 230 kV line and equipment deficiencies associated with the Cape Fear 230 kV Substation protection relays which prevented immediate clearing of the fault.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(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. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Shearon Harris Nuclear Power Plant - Unit 1	05000- 400	2016	- 005	- 00

NARRATIVE

Energy Industry Identification System (EIIS) and component codes are identified in the text as [XX].

A. Background

On October 8, 2016, Shearon Harris Nuclear Power Plant (HNP), was preparing for a planned refueling outage. At the time of the event, the unit was in Mode 4 and experiencing high winds and rain due to the effects of Hurricane Matthew.

HNP is connected to the transmission grid via a switchyard and 8 transmission lines. The transmission line initiating this event was the Cape Fear 230 kV line.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in valid manual or automatic actuation of any of the following systems: reactor protection system, general containment isolation signals, emergency core cooling systems, auxiliary or emergency feedwater system, containment heat removal and depressurization systems, emergency AC electrical systems, emergency service water systems.

B. Event Description

On October 8, 2016, at approximately 1310 EDT, while in Mode 4 in preparation for a planned refueling outage, HNP experienced an undervoltage (UV) condition for approximately 1.5 seconds. The duration exceeded the UV relay time delay due to failure of transmission system relays to clear the faulted line within design parameters. This condition triggered the UV relays for both emergency 6.9 kV buses and for several of the non-safety related 6.9kV auxiliary buses, resulting in the respective supply breakers opening. The interruption in power caused the actuation of several safety systems.

Both Emergency Diesel Generators (EDGs) [EK] started and loaded as designed. The EDGs were allowed to run until 2154 EDT, after the grid had been declared stable by the Energy Control Center at 2033 EDT and grid performance had been verified by operations personnel. Additionally, the Containment Ventilation Isolation system [JM] and the Auxiliary Feedwater system [BA] actuated and performed as designed.

An Unusual Event was declared for the loss of offsite power to emergency buses for greater than 15 minutes.

C. Causal Factors

Several causes were found to contribute to the UV condition. One cause was determined to be a line fault along the Cape Fear - West End 230kV line. A fallen tree was discovered near the location of the fault. Additionally, contact resistance was discovered at the protective relay within the Cape Fear 230 kV Substation which caused the delay in clearing the line fault. Further, a substation timing relay tripped at 88 cycles, which was beyond the 24 cycle design time. All causal factors, not within the authority of HNP, combined to decrease grid voltage to about 68% nominal, which is below the HNP UV relay setpoints.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(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. LER NUMBER		
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Shearon Harris Nuclear Power Plant, Unit 1	05000- 400	2016	- 005	- 00

NARRATIVE

D. Corrective Actions

Completed: The Cape Fear – West End 230kV line was restored to its normal configuration on 10/8/2016. An additional feeder relay check was performed on 10/9/2016. The affected relays were calibrated or replaced as necessary.

Planned: An end-to-end test of the feeder/relay scheme is planned.

E. Safety Analysis

The safety significance of these events is low per Probabilistic Risk Assessment analysis. The station was in Mode 4 during a planned refueling outage. Station equipment operated as designed. Throughout the events, there were no significant adverse impacts to the health and safety of the public.

F. Additional Information

There is no prior operational experience at HNP involving the loss of offsite power to both emergency buses over the past three years.