NEXTera ENERGY
DUANE ARNOLD

March 18, 2014

NG-14-0085
10 CFR 50.73

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

Duane Arnold Energy Center
Docket 50-331
Renewed Op. License No. DPR-49

Licensee Event Report #2014-001

Please find attached the subject report submitted in accordance with 10 CFR 50.73. This letter makes no new commitments or changes to any existing commitments.

(For)

Richard L. Anderson
Vice President, Duane Arnold Energy Center
NextEra Energy Duane Arnold, LLC

cc: Administrator, Region III, USNRC
Project Manager, DAEC, USNRC
Resident Inspector, DAEC, USNRC

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NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

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, 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)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Duane Arnold Energy Center	05000331	1 OF 4

4. TITLE

Condition Prohibited by Technical Specifications – Past Inoperability of Standby Transformer Undervoltage Relay

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
									N/A	N/A
01	17	2014	2014	- 001 -	00	03	18	2014	FACILITY NAME N/A	DOCKET NUMBER N/A

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)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
C. Rushworth, DAEC Licensing	(319) 851-7545

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

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO		05	05	2014

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

On January 17, 2014, while operating at 100% power, Standby Transformer 1X4 Undervoltage Relay 127/SB2 failed to meet requirements of Surveillance Test Procedure (STP) 3.3.8.1-05B, 1A4 4KV Emergency Transformer Supply Undervoltage Calibration. Two relay trip circuit contacts were found to be incorrectly configured such that the relay could not perform the intended function to actuate on loss-of-voltage to trip the Standby Transformer supply breaker. A past operability review determined that the relay had been inoperable for 120 days, 8 hours and 5 minutes. The relay is required to be operable in Modes 1, 2, and 3, and when the associated "B" Emergency Diesel Generator is required to be operable by Limiting Condition for Operation (LCO) 3.8.2, AC Sources-Shutdown. The event resulted in a condition prohibited by Technical Specifications and is reportable pursuant to 10CFR50.73(a)(2)(i)(B). The safety significance is minimized due to the fact that degraded voltage relays perform a similar function and would trip the Standby Transformer supply breaker to allow the "B" Emergency Diesel Generator to carry essential loads during a Loss-of-Offsite-Power.

A Root Cause Evaluation is currently being conducted and when completed, a Supplemental Report will be submitted detailing the cause(s) and corrective action(s) for this event.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Duane Arnold Energy Center	05000331	2014	- 001	- 00	2 OF 4

NARRATIVE

I. Description of Event:

On January 17, 2014 at 0914, while operating at 100% power, Standby Transformer 1X4 Undervoltage Relay 127/SB2 failed to meet requirements of Surveillance Test Procedure (STP) 3.3.8.1-05B, 1A4 4KV Emergency Transformer Supply Undervoltage Calibration. Relay 127/SB2 has an intended function to actuate on loss-of-voltage to trip the Standby Transformer supply breaker (breaker 1A401) to ensure that essential bus 1A4 is de-energized to allow the "B" Emergency Diesel Generator (EDG) to carry essential loads. The relay is required to be Operable in Modes 1, 2, and 3, and when the associated "B" EDG is required to be Operable by Limiting Condition for Operation (LCO) 3.8.2, AC Sources-Shutdown to ensure that no single instrument failure can preclude the "B" EDG function.

Upon investigation, it was determined that two contacts were incorrectly configured and out of tolerance. Specifically, two contacts were configured as "Normally Open" and not as "Normally Closed" as required per the design drawing. The configuration was such that on a loss-of-voltage, one contact would close and two would open. Since the contacts are in series, the breaker trip signal would not trip breaker 1A401, and the relay could not perform its intended function. The incorrect contact configuration was corrected, and STP 3.3.8.1-05B was completed satisfactorily at 1807 on January 17, 2014.

A past operability review was performed. Relay 127/SB2 had been replaced on September 16, 2013 during pre-planned maintenance on the Standby Transformer. The transformer was placed back in service on September 19, 2013 at 0109. The relay was determined to have been inoperable for 120 days, 8 hours and 5 minutes. Therefore, this condition is reportable to the NRC in accordance with 10CFR50.73(a)(2)(i)(B) as a condition prohibited by TS.

There were no other structures, systems or components inoperable at the start of this event that contributed to the event.

A Root Cause Evaluation is currently being conducted and when completed, a Supplemental Report will be submitted detailing the cause(s) and corrective action(s) for this event.

II. Assessment of Safety Consequences:

A past operability review determined that Relay 127/SB2 was inoperable for approximately 120.4 days. During that time, the Standby Transformer was supplying essential bus 1A4 for about 17 hours; during the remaining time (about 119.7 days), the Startup Transformer was supplying the bus.

Relay 127/SB2 senses Standby Transformer output voltage directly on the output of the transformer with three coils. There are six contacts associated with the relay. Three normally open contacts (one from each of the three relay coils) are in parallel in the closing circuit; the function of these contacts is to close when adequate transformer output voltage is available providing a permissive to close the Standby Transformer supply breaker to the essential bus (breaker 1A401). Three normally closed contacts (one from each of the three relay coils) are in series in the breaker trip circuit ; the function of these contacts

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Duane Arnold Energy Center	05000331	2014	- 001	- 00	3 OF 4

NARRATIVE

is to close when voltage is below the trip set point (less than adequate voltage) providing a trip signal to breaker 1A401.

Breaker 1A411 ("B" EDG Supply breaker) auto transfer function requires a permissive that 1A401 Standby Transformer breaker is open. Due to the fact that two of the trip circuit contacts were configured incorrectly, breaker 1A401 would not receive a trip signal from relay 127/SB2 immediately upon loss of power on the Standby Transformer secondary winding. However, a second set of relays, the Degraded Voltage Relays 127-A1BUS1A4, 127-A2BUS1A4, 127-B1BUS1A4, and 127-B2BUS1A4, are available to trip the Standby Transformer breaker. These relays sense actual essential bus power directly from the bus. There is a time delay associated with these relays; the relays are set to trip at between 90 to 92% bus voltage with a time delay of between 7.92 to 8.5 seconds.

On a complete loss of power to the bus when the Standby transformer is supplying the bus, the degraded voltage relays would trip breaker 1A401 after 7.92 to 8.5 seconds. This delays the permissive signal to the "B" EDG auto transfer circuit, and therefore the 1A411 "B" EDG supply breaker could not close in on the emergency bus until 7.92 to 8.5 seconds from the loss of power. Technical Specifications 3.8.1.7 and 3.8.1.13 require that the "B" EDG come up to rated voltage and frequency and be able to connect to the essential bus in less than or equal to 10 seconds upon a Loss-of-Offsite-Power (LOOP) and Loss-of-Coolant-Accident (LOCA) signal. Since the Emergency Diesel Generator start circuit was not affected by the incorrect configuration, the requirements of TS 3.8.1.7 and TS 3.8.1.13 would be met.

While the Startup Transformer was supplying the bus, there was no exposure to the 127/SB2 relay. Upon a Loss-of-Offsite-Power (LOOP) signal, the 1A402 Startup Transformer breaker would trip. The 1A401 Standby Transformer breaker would not have closed in because the parallel 127/SB2 contacts that provide a close permissive to 1A401, which were correctly configured, would have opened upon the LOOP, thus blocking the closure of 1A401. With 1A401 and 1A402 open, the permissives would be met to allow the "B" EDG to connect to the 1A4 bus within the Technical Specification time requirements.

Based on the above, the safety significance of the event is low.

III. Cause of Event:

A Root Cause Evaluation is currently being conducted and when completed, a Supplemental Report will be submitted detailing the cause(s) for this event.

IV. Corrective Actions:

On January 17, 2014, the incorrect contact configuration was corrected, and STP 3.3.8.1-05B completed satisfactorily.

A Root Cause Evaluation is currently being conducted and when completed, a Supplemental Report will be submitted detailing corrective action(s) for this event.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Duane Arnold Energy Center	05000331	2014	- 001	- 00	4 OF 4

NARRATIVE

V. Additional Information:

Previous Similar Occurrences:

A review of Licensee Event Reports from the past five years did not identify a similar occurrence.

EIIS System and Component Codes:

EK - Emergency Onsite Power Supply System

Reporting Requirements:

This event is being reported as a condition prohibited by TS, in accordance with 10CFR50.73(a)(2)(i)(B).