NEXTera ENERGY
DUANE ARNOLD

April 4, 2018

NG-18-0040
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 2018-001

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.

Dean Curtland
Site Director, Duane Arnold Energy Center
NextEra Energy Duane Arnold, LLC

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

IE22
NRR

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 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)

(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/)

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4. TITLE

Loss of RPS Function During MSIV and TSV Channel Functional Testing due to Use of a Test Box

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
2	6	2018	2018	- 001	- 00	4	04	2018	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)*
Bob Murrell, Licensing Engineer	(319) 851-7900

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				

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

On February 6, 2018, at 1312 CST, while operating at 100% power, a Maintenance Supervisor determined that the use of the Reactor Protection System (RPS) test box described in site procedures would result in the loss of two RPS reactor scram functions. Technical Specifications (TS) 3.3.1.1 requires that RPS instrumentation for Table 3.3.1.1-1, Function 5, for Main Steam isolation Valves (MSIVs) and Table 3.3.1.1-1, Function 8, for Turbine Stop Valves (TSVs) remain OPERABLE. Surveillance Test Procedure (STP) 3.3.1.1-17, Main Steam Isolation Valve Functional Test, used the RPS test box from June 2015 through July 2016. STP 3.3.1.1-19, Functional test of TSV Closure Input to RPS and RPT, had used the RPS test box from May 2006 through December 2017. The cause of this event was determined to be inadequate plant effect evaluations for revising the STPs to incorporate use of the RPS test box. This event was of low safety significance and had no impact on public health or safety. This event is reportable pursuant to 10CFR50.73(a)(2)(v) as an Event or Condition that Could Have Prevented Fulfillment of a Safety Function.

STP 3.3.1.1-19 was revised on February 28, 2018 to eliminate the use of the RPS test box.

NARRATIVE

I. Description of Event:

On February 6, 2018, at 1312 CST, while operating at 100% power, a Maintenance Supervisor determined that the use of the Reactor Protection System (RPS) test box described in site procedures would result in the loss of two RPS reactor scram functions. Technical Specifications (TS) 3.3.1.1 requires that RPS instrumentation for Table 3.3.1.1-1, Function 5, for Main Steam isolation Valves (MSIVs) and Table 3.3.1.1-1, Function 8, for Turbine Stop Valves (TSVs) remain OPERABLE.

Surveillance Test Procedure (STP) 3.3.1.1-17, Main Steam Isolation Valve Functional Test, used the RPS test box from June 2015 through July 2016. STP 3.3.1.1-19, Functional test of TSV Closure Input to RPS and RPT, had used the RPS test box from May 2006 through December 2017.

Both STP 3.3.1.1-17 and 3.3.1.1-19 were revised to incorporate the use of a test box to reduce unnecessary RPS actuations by eliminating the half scram created during previous STP performances. Between June 2015 and July 2016, STP 3.3.1.1-17 was performed 6 times. Between February 2014 and December 2017, STP 3.3.1.1-19 was performed 18 times. The performance of these STPs using the test box caused a loss of the RPS trip functions by bypassing more than the TS minimum allowed inputs per trip channel to maintain trip function operability.

The unintended loss of RPS trip functions during these tests resulted in a NRC reportable condition under 10CFR50.73(a)(2)(v) as "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shutdown the reactor and maintain it in a safe shutdown condition," and (D) "Mitigate the consequences of an accident."

II. Assessment of Safety Consequences:

The RPS initiates a reactor scram when at least one MSIV in 3 of the 4 Main Steam Lines close or when 3 of 4 TSVs close. The automatic MSIV and TSV closure reactor scrams preserve the integrity of the fuel cladding and the Reactor Coolant System in anticipation of the transients caused by closure of these valves. With the use of the RPS test box a half scram for the trip system under test would still have occurred for an MSIV or TSV isolation as designed (all 4 steam lines isolated) because each trip logic channel individually produces a half scram.

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Thus, based on no other failures found in the logic during testing, the entire logic would have remained capable of initiating a full reactor scram. However, the TS 3.3.1.1 Bases requirement of 3 valve position signals per trip system was not met during each test with the test box installed.

The applicable previously performed surveillance tests were reviewed to determine if any TS Limiting Condition for Operability (LCO) action completion time was exceeded. The TS LCO action completion time is one hour for one or more Functions with RPS trip capability not maintained. The elapsed time with the RPS Test Box installed was always less than one hour (while in the mode of applicability). The bounding duration with the test box installed on the TSV RPS system was 27 minutes on December 10, 2017 and 36 minutes on the MSIV RPS system on May 2, 2016 during Mode 1. Therefore, no condition prohibited by TS was identified.

III. Cause of Event:

The cause of this event was determined to be inadequate plant effect evaluations/technical reviews for revising the STPs to incorporate use of the RPS test box.

IV. Corrective Actions:

Immediate Corrective Actions

STP 3.3.1.1-19 was quarantined.

Corrective Actions for Cause of Event

STP 3.3.1.1-19 was revised on February 28, 2018 to eliminate the use of the RPS test box.

V. Additional Information:

Previous Similar Occurrences:

A review of NextEra Energy Duane Arnold LERs from the previous 10 years found no other instance of events related to safety system functional failures of RPS.

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NARRATIVE

EIIS System and Component Codes:

JD - Reactor Power Control System

Reporting Requirements:

This event is reportable pursuant to 10CFR50.73(a)(2)(v) as an Event or Condition that Could Have Prevented Fulfillment of a Safety Function.