



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

May 11, 2020

Mr. Dean Curtland
Director of Site Operations
NextEra Energy Duane Arnold, LLC
3277 DAEC Road
Palo, IA 52324-9785

SUBJECT: DUANE ARNOLD ENERGY CENTER – INTEGRATED INSPECTION REPORT
05000331/2020001

Dear Mr. Curtland:

On March 31, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Duane Arnold Energy Center. On April 16, 2020, the NRC inspectors discussed the results of this inspection with Mr. M. Davis, Licensing Manager, and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Billy C. Dickson, Jr., Chief
Branch 2
Division of Reactor Projects

Docket No. 05000331
License No. DPR-49

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

Letter to Dean Curtland from Billy C. Dickson, Jr., dated May 11, 2020.

SUBJECT: DUANE ARNOLD ENERGY CENTER – INTEGRATED INSPECTION REPORT
05000331/2020001

DISTRIBUTION:

Jessie Quichocho
Omar Lopez-Santiago
RidsNrrDorlLpl3
RidsNrrPMDuaneArnold Resource
RidsNrrDrolrib Resource
John Giessner
Kenneth O'Brien
Jamnes Cameron
Allan Barker
DRPIII
DRSIII
ROPreports.Resource@nrc.gov

ADAMS ACCESSION NUMBER: ML20132A266

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RIII				
NAME	BDickson:wc via email				
DATE	5/11/2020				

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number: 05000331

License Number: DPR-49

Report Number: 05000331/2020001

Enterprise Identifier: I-2020-001-0046

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, Iowa

Inspection Dates: January 01, 2020 to March 31, 2020

Inspectors: R. Edwards, Senior Health Physicist
V. Myers, Senior Health Physicist
C. Norton, Senior Resident Inspector
T. Ospino, Reactor Engineer
J. Rutkowski, Project Engineer

Approved By: Billy C. Dickson, Jr., Chief
Branch 2
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Duane Arnold Energy Center, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

None.

PLANT STATUS

The Unit began the inspection period at rated thermal power. On February 15, 2020, the unit was down powered to 60 percent power for a control rod sequence exchange. The unit was returned to full power on February 16, 2020, and remained at or near rated thermal power for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at

<http://www.nrc.gov/readingrm/doc-collections/insp-manual/inspection-procedure/index.html>.

Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." From January 1 – March 19, 2020, the inspectors performed plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), resident inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time the resident inspectors performed periodic site visits each week and during that time conducted plant status activities as described in IMC 2515, Appendix D; and observed risk significant activities when warranted. In addition, resident and regional baseline inspections were evaluated to determine if all or portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In the cases where it was determined the objectives and requirements could not be performed remotely, management elected to postpone and reschedule the inspection to a later date.

REACTOR SAFETY

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (1 Sample)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Standby liquid control system on March 10, 2020

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Low Level Radioactive Waste Processing and Storage Facility Elevation 757 South Fire Zones 21-G and 21-N on March 6, 2020
- (2) Reactor Building Elevation 786 Fire Zones 3-A and 3-B on March 10, 2020
- (3) Radwaste Building Fire Zones 13-A, 13-B, and 13-C on March 11, 2020
- (4) Turbine Building Elevation 757 Fire Zones 8-A, 8-B, 8-D, 8-F and 8-H on March 16, 2020

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated a reactor plant power evolution and rod sequence exchange on February 15, 2020

Licensed Operator Regualification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator regualification training and activities on March 10, 2020

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Emergent work on torus spray and cooling supply header isolation valve on January 7, 2020
- (2) Planned work on the 'A' control rod drive pump speed increaser on February 4, 2020
- (3) Planned work on the Reactor Core Isolation Cooling (RCIC) system on February 24, 2020

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (3 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) Condition Report (CR) 02343529, Kaman equipment not operable on February 5, 2020

- (2) CR 02343787, Part 21 drywell accident range radiation monitor on February 7, 2020
- (3) CR 02347414, High Pressure Coolant Injection (HPCI) system room exhaust fan outboard belt beginning to fail on March 6, 2020

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) 'A' and 'B' fuel pool demineralizers flow recording controllers replaced with low indicating recorders on February 19, 2020

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the following post maintenance test activities to verify system operability and functionality:

- (1) Following inboard and outboard torus vent valve seal pressure indicators reconfiguration on January 30, 2020
- (2) Following 'A' control rod drive pump speed changer maintenance on February 4, 2020
- (3) Following replacement of reactor building door 280 on February 26, 2020
- (4) Following oil change on the 'B' fuel pool pump on January 22, 2020
- (5) Following modification to replace 'B' fuel pool demineralizer flow indicating recorder with a flow indicating controller on January 22, 2020

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (8 Samples)

- (1) In field activities associated with the pressure suppression chamber to reactor building vacuum breaker operability test on January 7, 2020
- (2) In field activities associated with the HPCI system operability test on January 14, 2020
- (3) In field activities associated with the Low Pressure Coolant Injection (LPCI) system operability test on January 27, 2020
- (4) In field activities associated with the fuel pool liner monitoring test on January 27, 2020
- (5) In field activities associated with repositioning torus to reactor building vacuum breaker T-seal pressure indicators on January 29, 2020
- (6) Functional test of turbine stop valve closure input to the reactor protection system and recirculation pump trip logic on February 15, 2020
- (7) In field activities associated with the Standby Liquid Control (SBLC) pump operability test on March 10, 2020
- (8) In field activities associated with the 'B' standby diesel generator operability test (fast start) on March 11, 2020

71114.06 - Drill Evaluation

Select Emergency Preparedness Drills and/or Training for Observation (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated the emergency response organization training drill on March 4, 2020

RADIATION SAFETY

71124.05 - Radiation Monitoring Instrumentation

Walk Downs and Observations (IP Section 02.01) (1 Sample)

The inspectors evaluated the following radiation detection instrumentation during plant walkdowns:

- (1) Portable Survey Instruments
 - Ludlum 177, serial number 342940
 - Mirion Telepole II, serial number 228316-027
 - Ludlum 26, serial number HP3508
 - Ludlum 12-4, serial number 326388
 - Ludlum 9-3, serial number 343228

Source Check Demonstration

- Ludlum 177, serial number 342940
- Mirion Telepole II, serial number 228316-027
- Ludlum 26, serial number HP3508

Area Radiation Monitors and Continuous Air Monitors

- RE-9167, reactor building railroad access area
- RE-9177, clean up phase separator area
- RE-9156, reactor water clean up pump rooms
- AMS-4, low level radioactive waste storage and processing facility
- AMS-4, refuel floor

Personnel Contamination Monitors, Portal Monitors and Small Article Monitors

- Argos-5AB, serial number 308
- Cronos-1, serial number 215
- Gem 5, serial number 366

Calibration and Testing Program (IP Section 02.02) (1 Partial)

The inspectors evaluated the calibration and testing of the following radiation detection instruments:

- (1) (Partial)
 - Whole body counter calibration on May 8, 2019
 - AMP 100, serial number 5012-014, calibration on September 13, 2019
 - Argos-5AB, serial number 308, calibration on July 9, 2019

- RE-9156, reactor water clean up pump rooms area monitor, calibration on June 12, 2016

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (1 Sample)

- (1) Unit 1 (January 1, 2019 to December 31, 2019)

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (1 Sample)

- (1) Unit 1 (January 1, 2019 to December 31, 2019)

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (1 Sample)

- (1) Unit 1 (January 1, 2019 to December 31, 2019)

71153 - Followup of Events and Notices of Enforcement Discretion

Reporting (IP Section 03.05) (1 Sample)

- (1) The inspectors reviewed the circumstances surrounding Event Notification 54528, transport of a potentially contaminated person to a medical facility on February 18, 2020

INSPECTION RESULTS

Observation: Licensee Documentation Observation	71152
<p>During the 2019 fourth quarter, while performing reviews associated with baseline inspection activities, the inspectors identified several documentation issues. These issues included operational logging errors, missing signatures in surveillance test procedures and work orders, and inaccurate date and time notations. Although individual performance deficiencies associated with these documentation issues were minor, they were numerous, demonstrated a lack of attention-to-detail, and made it difficult to track the work performed. During the 2019 fourth quarter exit, the inspectors informed the licensee that the inspectors would conduct a Problem Identification and Resolution (PIR), inspection during the first quarter of 2020 and assess Duane Arnold's corrective actions to improve the quality of documentation.</p> <p>During the week of January 19, 2020, the inspectors conducted a PIR inspection of the documentation associated with the maintenance window on the 'B' control building chiller. This work activity was chosen because it was complex and included coordination among multiple work groups. The inspectors noted a profound improvement in documentation quality over the 2019 fourth quarter that included:</p> <ol style="list-style-type: none"> 1. reduced logging errors, 2. appropriate work and review signatures, and 	

3. improved time and date notations when work was repeated or handed off between workers.

The inspectors concluded the licensee changed behaviors to sustain document quality improvements that includes:

1. call outs at plan-of-the-day meetings,
2. emphasis on documentation quality during shop briefings, and
3. nuclear assurance review of documentation quality.

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

- On April 16, 2020, the inspectors presented the integrated inspection results to Mr. M. Davis, Licensing Manager, and other members of the licensee staff.
- On March 19, 2020, the inspectors presented the radiation protection program inspection results to Mr. D. Curtland, Director of Site Operations, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.05	Fire Plans	PFP-LL-757	Pre-Fire Plan LLRPSF	4
		PFP-RB-786	Pre-Fire Plan Reactor Building Elevation 786	8
		PFP-RW-757	Pre-Fire Plan Radwaste Building	2
		PFP-TB-757	Pre-Fire Plan Turbine Building Elevation 757	6
71111.11Q	Miscellaneous		Reactivity Management Plan Down Power for February 2020 Control Rod Sequence Exchange	01/22/2020
		SEG 2020B-01E	Evaluated Scenario	0
	Procedures	Operating Instruction 264	Reactor Recirculation System	143
		Operating Instruction 856.1	Reactor Manual Control System	52
71111.13	Corrective Action Documents	Condition Report (CR) 02340151	Handswitch has Intermittent Contact for MO2005	01/06/2020
	Miscellaneous		Operations Logs	02/24/2020
			Operations Logs	01/06/2020
			Duane Arnold Station Daily Status Report	02/24/2020
		VALOP-L200-08	Limiter Valve Operator Inspection and Lubrication	44
	Procedures	MA-AA-100-1011-FO1	Troubleshooting, MO2005 did not Open as Expected HS was Taken to Open	01/06/2020
	Work Orders	40659928-01	IP209 A-G, Inspect and Oil Change	0
		WO 40662001	MO, 2405-0, Elect Lube and Inspect	0
71111.15	Corrective Action Documents	CR 02343529	Kaman Equipment not Operable	0
		CR 02343787	Part 21 Drywell Accident Range Radiation Monitor	0
		CR 02347414	HPCI System Room Exhaust Fan Outboard Belt Beginning to Fail	0
71111.18	Engineering Changes	EC-287976, Replace FRC-3511A(B)	Replace FRC-3511A(B), Fuel Pool F/D IT-206A(B) Effluent Flow Controllers	3
	Miscellaneous		2nd Assistant Logs	32

71111.18	Miscellaneous	APED-G41-2929-047, Fuel Pool Demineralizers Control Panel	Fuel Pool Demineralizers Control Panel	6
		APED-G41-2929-049 Sheet 1	Fuel Pool Demineralizers Electric Schematic, Filter 'A'	9
		APED-G41-2929-049 Sheet 2	Fuel Pool Demineralizers Electric Schematic, Filter 'B'	11
		APED-G41-2929-056	Fuel Pool Demineralizers Control Panel Wiring	10
		APED-G41-2929-058	Fuel Pool F/D System, Withdraw Drawing	2
		Bech-M135	P&ID Fuel Pool Demineralizer System	24
	Procedures	Operating Instruction 435	Fuel Pool Cooling System	78
Work Orders	WO 40580523	Replace FRC 3511 by EC 287976	0	
71111.19	Miscellaneous	GMP-Test-54	des Mid/High Range Leak Rate Monitor (LRM) Sec C	1
	Procedures	STP 3.6.1.3-02CAC	CAC, PCIS, and ASME Valve Functional Test	4
		STP NS700002A	Secondary Containment Test Using SGBT 'A'	7
	Work Orders	40658036-01	STP 3.6.1.3-02CAC, PCIS, and ASME Valve Functional Test	0
		40659928-01	IP209 A-G, Inspect and Oil Change	0
		40695659-01	PI4300: Reconfigure Orientation	0
71111.20	Procedures	PCP 2.41	Fuel Pool Liner Monitoring	3
71111.22	Corrective Action Documents	Condition Report (CR) 02342593	Torus Water Temperature Difference Between Recorders at Maximum Difference	01/27/2020
		CR 02344750	Z19011 Indication During STP 3.3.1.1-19	0
		CR 02348061	PSV3252B Leaking from Valve Cap	03/11/2020
	Miscellaneous		Pictures of PI-4300	0
	Procedures	NS490003A	'A' RHR System Leakage Inspection Walkdown	7
		STP 3.3.1.1-19	Functional Test of TSV Closure Input to RPS and RPT	23
		STP 3.5.1-02A	'A' LPCI System Operability Test	19
		STP 3.5.1-05	HPCI System Operability Test	83
		STP 3.6.1.3-02CAC	CAC PCIS and ASME Valve Functional Test	4

	Work Orders	STP 3.6.1.6-01	Pressure Suppression Chamber to Reactor Building Vacuum Breaker Operability Test	11
		STP NS520001	HPCI System Leakage Inspection Walkdown	24
		WM-AA-1000-F01	Work Activity Risk Evaluation Form	5
		40654043	Pressure Suppression Chamber Reactor Building Vacuum Breaker Operability Test	11
		40655944-01	STP 3.5.1-05 HPCI System Operability Test	0
		40658036-01	STP 3.6.1.3-02CAC PCIS and ASME Valve Functional Test	0
		40658042-01	STP 3.5.1-02 LCPI System Operability Test	0
		40661313	Standby Liquid Control Pump Operability Test	03/10/2020
		40664416-01	STP 3.8.1-06B 'B' SBDG Operability Test (Fast Start)	03/11/2020
71114.06	Corrective Action Documents	40695659-01	P14300: Reconfigure Orientation	0
		02347183	2020 Drill Observations Not Covered by Drill Critique	03/04/2020
		02347187	2020 Drill Note 5 Information Communication	03/04/2020
	Miscellaneous Procedures	02347205	2020 Drill Question on Issuing Potassium Iodide	03/04/2020
		NOTE-5	Duane Arnold Energy Center Emergency Notification	21
		EPIP 3.3	Dose Assessment and Protective Actions	37
71124.05	Calibration Records	EPIP 4.5	Administration of Potassium Iodide	11
			Ortec Whole Body Counter	05/08/2019
			AMP-100 Serial Number 5012-014	09/13/2019
	Procedures		Argos-5AB Serial Number 308	07/09/2019
		HPP 3109.87	Operation of the Argos 5AB Personnel Contamination Monitor	4
	Work Orders	40381701	RE9156: Reactor Water Clean Up Pump Rooms A and B	06/12/2016
71151	Miscellaneous	NG-001L	NRC PI Data Calculation, Review and Approval	07/08/2019
		NG-001L	NRC PI Data Calculation, Review and Approval	04/16/2019
		NG-001L	NRC PI Data Calculation, Review and Approval	10/14/2019
	NDE Reports	NG-001L	NRC PI Data Calculation, Review and Approval	01/17/2020
71152	Miscellaneous		January 12-17, 2020 DAEC Operational Logs	0
	Procedures	Clearance - 3002, I/16924B	AC to DC converter	0
		Clearance 3000 - 1VAC308B-02	Control Building Air Conditioning Unit, CB Heating, Ventilation, and Air Conditioning (HVAC) Room	0
		Clearance 3000 - 1VCP030B	Control Building HVAC Chilled Water Pump, North Open Area	0

		Clearance 3000 - 1VRF030B	Control Building HVAC Return Air Fan, CB HVAC Room	0
	Work Orders	40603853-01	1VCP030B: Rebuild Pump	0
		40603853-02	1VCP030B: OPS PMT	0
		40634094-01	I/16924B: Calibrate	0
		40655395-01	1VAC030B: Inspect and Lube Unit	0
		40656453-01	1VRF030B: MA, Inspect Unit and Lube BRG	0
		406566918-01	PS6933B: Inspect and Calibrate	0
		40656919-01	PS6930B: Inspect and Calibrate, High Pressure Safety Switch	0
		40671140-01	STP 3.7.5-01-B, 'B' Control Building Chiller Operability	7
		40671140-02	B2: Swap to 'B' Chiller	0
		40688611-01	1VCH001B: Inspection with ESW Secured	0
71153	Corrective Action Documents	CR 02344843	Medical Emergency	02/17/2020
		CR 02344897	Security Medical Response SEL 20-11	02/17/2020
	Miscellaneous	Event Notification (EN) 54528	Transport of Potentially Contaminated Person to a Medical Facility	0