



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

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

October 24, 2018

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

**SUBJECT: DUANE ARNOLD ENERGY CENTER—NRC INTEGRATED INSPECTION  
REPORT 05000331/2018003**

Dear Mr. Curtland:

On September 30, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Duane Arnold Energy Center. On October 11, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

Based on the results of this inspection, the NRC has identified no issues that were evaluated under the risk significance determination process as more than minor safety significance. Further, the inspectors documented a licensee-identified violation which was determined to be of very low safety significance. The NRC is treating this violation as a non-cited violation (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC Resident Inspector at the Duane Arnold Energy Center.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

Karla Stoedter, Chief  
Branch 1  
Division of Reactor Projects

Docket No. 50-331  
License No. DPR-49

Enclosure:  
Inspection Report 05000331/2018003

cc: Distribution via LISTSERV®

Letter to Dean Curtland from Karla Stoedter dated October 24, 2018

SUBJECT: DUANE ARNOLD ENERGY CENTER—NRC INTEGRATED INSPECTION  
REPORT 05000331/2018003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Number: 50-331

License Number: DPR-49

Report Numbers: 05000331/2018003

Enterprise Identifier: I-2018-003-0017

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: July 1 through September 30, 2018

Inspectors: C. Norton, Senior Resident Inspector  
J. Beavers, Resident Inspector  
V. Myers, Senior Health Physicist  
M. Holmberg, Reactor Inspector

Approved by: K. Stoedter, Chief  
Branch 1  
Division of Reactor Projects

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee's performance by conducting an integrated quarterly 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. Findings and violations being considered in the NRC's assessment are summarized in the table below. Licensee-identified non-cited violations are documented in report section: 71153.

### List of Findings and Violations

No findings or violations were identified.

### Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000331/2018001-01	Failure to Perform Nondestructive Examination of MSIV 4415 Following Machining of Valve Bore	71111.15	Closed
LER	05000331/2018-002	Secondary Containment Inoperable	71153	Closed

## PLANT STATUS

Duane Arnold Energy Center began the inspection period at rated thermal power. On July 2, 2018, the unit began coast down. On September 3, 2018, the licensee shut the unit down from 90 percent rated thermal power to begin refuel outage (RFO) 26. On September 21, 2018, the licensee commenced reactor startup and synchronized to the grid on September 22, 2018. The unit achieved rated thermal power on September 27, 2018, 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/reading-rm/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." 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.

## REACTOR SAFETY

### 71111.01—Adverse Weather Protection

#### Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for tornado watches on July 18, 2018.

### 71111.04—Equipment Alignment

#### Partial Walkdown (1 Sample)

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

Low-Pressure Coolant Injection (LPCI) 'A' on July 31, 2018.

### 71111.05AQ—Fire Protection Annual/Quarterly

#### Quarterly Inspection (2 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Control Building Elevation 786' and 800'; on August 15, 2018; and
- (2) Reactor Building Elevation 833' on September 11, 2018.

### 71111.07—Heat Sink Performance

#### Heat Sink (1 Sample)

The inspectors evaluated the river water supply stilling basin inspection and cleaning on July 18, 2018.

### 71111.08—Inservice Inspection Activities (1 Sample)

The inspectors assessed the effectiveness of the licensee's programs for monitoring degradation of the reactor coolant system boundary, risk-significant piping system boundaries, and the containment boundary by reviewing the following activities from September 4, 2018 to September 11, 2018:

- (1) Manual Ultrasonic (UT) examination of reactor water cleanup system welds CUA-J001, CUA-J006, CUA-J012 and CUA-J013;
- (2) Encoded Automated UT examination of Core Spray nozzle (N5B)—to safe-end and safe end-to-pipe welds CSB-F002 and CSB-F002a;
- (3) Enhanced Visual (EVT-1) examination of internal core spray pipe assembly welds CSP-P-2-270, CSP-BP4d, and CSP-AP5;
- (4) Welds W1, W2, and W3, Residual Heat Removal System—Minimum flow valve replacement (Work Order 40201185-02);
- (5) Welds W1, W2, and W3, Residual Heat Removal System—Minimum flow valve replacement (Work Order 40201185-02); and
- (6) Welds W1, Residual Heat Removal System—Injection Line Installation (Work Order 40376987-02).

### 71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

#### Operator Requalification (2 Samples)

- (1) The inspectors observed and evaluated a requalification scenario on July 10; and
- (2) The inspectors observed and evaluated a requalification scenario on July 31, 2018.

#### Operator Performance (1 Sample)

The inspectors observed and evaluated the reactor plant startup following a refueling outage on September 21, 2018.

### 71111.12—Maintenance Effectiveness

#### Routine Maintenance Effectiveness (1 Sample)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

Torus to Reactor Building Vacuum Breaker rework on July 5, 2018.

#### 71111.13—Maintenance Risk Assessments and Emergent Work Control (5 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Standby Transformer new feed planned and emergent work activities on July 25, 2018;
- (2) 125 Volts Direct Current ground fault troubleshooting emergent work activity on August 23, 2018;
- (3) 'B' Core Spray wetted cable replacement planned work activity on August 23, 2018;
- (4) High Pressure Coolant Injection (HPCI) test return valve erratic operation emergent work activity on August 6, 2018; and
- (5) Reactor Water Cleanup differential flow indication high emergent work activity on August 17, 2018.

#### 71111.15—Operability Determinations and Functionality Assessments (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Condition Report (CR) 02270970; TT7000A, 'A' Standby Diesel Generator Room Temp, Indicating Low on July 4, 2018;
- (2) CR 02271001; Drywell Temperature Indicating High on July 5, 2018;
- (3) CR 02270892; Torus to Reactor Building Vacuum Breaker Indication Light Burned Out During Surveillance on July 5, 2018;
- (4) CR 02272273; Fire Door 231 Does Not Latch On Its Own on July 17, 2018;
- (5) CR 02277607; CR 02277607; Reactor Core Isolation Coolant (RCIC) Tripped During RCIC Operability—Test Pot and CR 02277650; RCIC Valve Stroke Time Delay on August 29, 2018; and
- (6) CR 02251009; Missed NDE [non-destructive examination] During Rebuild of Main Steam Isolation Valve (MSIV), CV4415 on September 16, 2018.

The inspectors also reviewed the status of unresolved item (URI) 05000331/2018001-01, Failure to Perform Nondestructive Examination of MSIV 4415 Following Machining of Valve Bore. This URI is closed.

#### 71111.18—Plant Modifications (1 Sample)

The inspectors evaluated the following permanent modification:

Engineering Change (EC) 288326; Installation of new 1X005 transformer on July 13, 2018.

#### 71111.19—Post Maintenance Testing (7 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Torus to Reactor Building Vacuum Breaker after valve repair on July 3, 2018;
- (2) 'A' Residual Heat Removal Service Water after pipe replacement on August 2, 2018;
- (3) High Pressure Coolant Injection after valve positioner replacement on August 7, 2018;



- (4) 'A' Reactor Protection System after electrical protection assemblies replacement on August 7, 2018;
- (5) Reactor Water Cleanup System after flow converter replacement on August 13, 2018;
- (6) Torus Hard Pipe Vent following valve repairs on September 16, 2018; and
- (7) Main Steam Isolation Valves following valve repairs on September 17, 2018.

71111.20—Refueling and Other Outage Activities (1 Sample)

The inspectors evaluated refueling outage 26 activities from September 3–22, 2018.

71111.22—Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (2 Samples)

- (1) 'B' River Water Supply and Screen Wash System Vibration Measurement and Operability Test on July 26, 2018; and
- (2) Reactor Water Cleanup High Differential Flow Channel Calibration on July 31, 2018.

71114.06—Drill Evaluation

Emergency Planning Drill (1 Sample)

The inspectors evaluated the full scale emergency response organization drill on July 18, 2018.

**RADIATION SAFETY**

71124.01—Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

Instructions to Workers (1 Sample)

The inspectors evaluated worker instructions.

Contamination and Radioactive Material Control (1 Sample)

The inspectors evaluated contamination and radioactive material controls.

Radiological Hazards Control and Work Coverage (1 Sample)

The inspectors evaluated radiological hazards control and work coverage.

High Radiation Area and Very High Radiation Area Controls (1 Sample)

The inspectors evaluated risk-significant high radiation area and very high radiation area controls.

Radiation Worker Performance and Radiation Protection Technician Proficiency (1 Sample)

The inspectors evaluated radiation worker performance and radiation protection technician proficiency.

71124.02—Occupational As Low As Reasonably Achievable Planning and Controls

Implementation of As Low As Reasonably Achievable and Radiological Work Controls (1 Sample)

The inspectors reviewed As Low As Reasonably Achievable (ALARA) practices and radiological work controls by reviewing the following activities:

- (1) Drywell pipe replacement; Radiation Work Permit (RWP) 18–4280;
- (2) Drywell in-service inspection activities; RWP 18–4212; and
- (3) Drywell Main Steam Isolation Valve work; RWP 18–4080.

Radiation Worker Performance (1 Sample)

The inspectors evaluated radiation worker and radiation protection technician performance.

71124.03—In-Plant Airborne Radioactivity Control and Mitigation

Engineering Controls (1 Sample)

The inspectors evaluated airborne controls and monitoring.

Use of Respiratory Protection Devices (1 Sample)

The inspectors evaluated respiratory protection.

**OTHER ACTIVITIES – BASELINE**

71151—Performance Indicator Verification (3 Samples)

The inspectors verified licensee performance indicators submittals listed below:

- (1) MS06: Emergency AC Power Systems—1 Sample (July 1, 2017 – June 30, 2018);
- (2) MS07: High Pressure Injection Systems—1 Sample (July 1, 2017 – June 30, 2018); and
- (3) MS08: Heat Removal Systems—1 Sample (July 1, 2017 – June 30, 2018).

71153—Follow-Up of Events and Notices of Enforcement Discretion

Events (1 Sample)

- (1) The inspectors evaluated the reactor water level transient (CR 2272128; Master Feed Regulating Valve Controller Taken To Manual) and the licensee response on July 14, 2018.

Licensee Event Reports (1 Sample)

The inspectors evaluated the following licensee event reports (LER) which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) Licensee Event Report 05000331/2018–002, “Secondary Containment Inoperable,” issued on August 16, 2018.

**INSPECTION RESULTS**

71111.15 — Operability Determinations

Licensee Identified Non-Cited Violation	71111.15 – Operability Determinations and Functionality Assessments
A violation of very low safety significance (Green) was identified by the licensee and has been entered into the corrective action program. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.	
Violation: Title 10 of the <i>Code of Federal Regulations</i> (CFR) 50, Appendix B, Criterion III, states, in part, “Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions.” System Design Specification APED–A61–019, Pressure Integrity of Piping and Equipment Pressure Parts – Data Sheet, required in the applicable castings section T1.3.3.b, “all accessible surfaces including machine surfaces shall be examined by either the magnetic particle or liquid penetrant method in either the furnished or finished condition.”  Contrary to the above, in October 2016, measures were not established to assure that applicable design basis requirements as defined in 10 CFR 50.2 were translated into work instructions repairing the ‘B’ inboard main steam isolation valve, CV 4415, during RFO 25. Specifically, instructions to perform a NDE of machined surfaces following the valve repair were not included in the work package. As a result, the non-destructive examination was not performed prior to placing the valve into service.	
Upon identification of the issue, the licensee initiated CR 02251009 and determined the valve was operable but nonconforming because no leakage from the valve was observed during the hydrostatic test at the end of RFO 25, and there was no evidence of increased unidentified drywell leakage. The licensee scheduled disassembly and NDE of the CV 4415 valve bore surface for RFO 26 conducted in September 2018.	
During RFO 26, CV 4415 passed its as found local leak rate test. Subsequently, CV 4415 was disassembled and a liquid dye penetrant test was performed on the machined surface.	

Five indications were revealed of which three required repair. The excavation for each of the three repairs was less than the calculated maximum excavation depth. Each repair was successfully feathered to the required taper and passed its respective liquid dye penetrant test.

Significance/Severity Level: The inspectors determined the performance deficiency was more than minor because it adversely affected the Design Control attribute of the Barrier Integrity Cornerstone and its objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, not performing the required NDE following machining of the CV 4415 valve bore failed to provide reasonable assurance that the valve would not fail during an accident or event and expose the public to radionuclide releases. The inspectors assessed the significance of the finding using IMC 0609, Appendix A, Exhibit 1, Section A and determined the finding was of very low safety significance (Green) because all the questions were answered “No.”

Corrective Action Reference: The licensee entered this issue into their corrective action program as CR 02251009, Missed NDE During Rebuild of MSIV CV4415.

The disposition of this finding and associated violation closes Unresolved Item (URI) 05000331/2018001-01.

71153—Follow-Up of Events and Notices of Enforcement Discretion

Minor Violation	71153 Follow-Up of Events and Notices of Enforcement Discretion
<p>Minor Violation: During Mode 1 power operations on July 9, 2018, the licensee had both doors of a secondary containment airlock open simultaneously, and a minor violation of Technical Specification (TS) 3.6.4.1 Secondary Containment was self-revealed. During the time both doors were open, approximately 3 seconds, the allowable penetration opening area was exceeded and rendered the secondary containment inoperable.</p> <p>Technical Specification 3.6.4.1 requires secondary containment to be operable in Modes 1, 2 and 3. Technical Specification Surveillance Requirement 3.6.4.1.2 supports secondary containment operability by verifying that either the outer door(s) or the inner door(s) in each secondary containment access opening are closed. The posted instructions at each secondary containment airlock door stated, “ATTENTION Push Button To Be Held In For 2 Seconds Prior To Opening Door,” to be of a type appropriate for traversing the containment airlock.</p> <p>Contrary to the above, at approximately 1:34 p.m. on July 9, 2018, while operating in Mode 1 at 97 percent power, two individuals simultaneously traversing through opposite doors of a secondary containment airlock each failed to hold the airlock interlock push button for two seconds prior to opening their respective doors resulting in a momentarily inoperability of secondary containment.</p> <p>Operability was restored upon the immediate closure of one of the two doors. Subsequently, maintenance was unable to recreate the condition and satisfactorily performed Surveillance Test Procedure (STP) 3.6.4.1-02, “Secondary Containment Airlock Verification,” and GMP-ELEC-44, Section A-5.1, “Airlock Door Interlock Checks.” The licensee entered this</p>	

issue into the corrective action program as CR 02271412, "Door 256 and 257 Open Simultaneously."

Screening: The inspectors determined the failure to maintain secondary containment operable while operating in Modes 1, 2 or 3 as required by Technical Specifications was a performance deficiency. However, this performance deficiency was determined to be minor because each of the more than minor questions contained in IMC 0612, Appendix B, were answered "No." In addition, the inspectors considered the failure was less than a Severity Level IV violation in accordance with the NRC's Enforcement Policy.

Violation: This failure to comply with TS 3.6.4.1 Secondary Containment, constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

Disposition of this minor violation closes LER 05000331/2018-002.

## **EXIT MEETINGS AND DEBRIEFS**

The inspectors confirmed that proprietary information was controlled to protect from public disclosure. No proprietary information was documented in this report.

- On September 11, 2018, the inspector presented the inservice inspection activities and post-approval site inspection for license renewal results to Mr. D. Curtland, Site Director, and other members of the licensee staff.
- On September 13, 2018, the inspector presented the radiation protection program inspection results to Mr. D. Morgan, Radiation Protection Manager, and other members of the licensee staff.
- On October 11, 2018, the inspectors presented the quarterly integrated inspection results to Mr. J. Davis, and other members of the licensee staff.

## **DOCUMENTS REVIEWED**

### 71111.01—Adverse Weather Protection

- Abnormal Operating Procedure (AOP) 903; Severe Weather; Revision 59

### 71111.04—Equipment Alignment

- STP NS490003A; 'A' Residual Heat Removal (RHR) System Leakage Inspection Walkdown; Revision 6
- STP 3.5.1-02A; 'A' LPCI System Operability Tests, Revision 19

#### 71111.05AQ—Fire Protection Annual/Quarterly

- Pre Fire Plan (PFP)-CB-800; Pre-Fire Plan Control Building Elevation 800'; Revision 2
- PFP-CB-786; Pre-Fire Plan Control Building Elevation 786'; Revision 3
- PFP-RB-833; Reactor Building; Pre-Fire Plan Reactor Building Elevation 833'; Revision 3

#### 71111.07—Heat Sink Performance

- Work Order (WO) 40559751; River Water Pump House Stilling Basin Inspect and Clean
- MA-AA-100-1005; Conduct of Diving Operations, Revision 7

#### 71111.08—Inservice Inspection Activities

- CR 02165296; Required VT-1 Preservice Examination Not Performed; October 25, 2016
- CR 02184101; GBC-002-E20 – Pits in Fabrication Weld Area Below Min Wall Thickness; February 6, 2017
- CR 02251009; Missed NDE During Rebuild of MSIV - CV4415; February 22, 2018
- CR 02263853; ASME Defects Found on LPRMs Received at Site; May 11, 2018
- CR 02277254; Use of Administrative Control Procedures (ACP) to Control NDE Process; August 23, 2018
- CR 02279744; Dual Pitch Catch Phased Array Wedge Separated During UT Exam; September 11, 2018
- Performance Demonstration Qualification Sheet; T Blechinger; August 23, 2018
- Performance Demonstration Qualification Sheet; D Block; August 23, 2018
- Performance Demonstration Qualification Sheet; R Davies; August 23, 2018
- Personnel Certification; M. Smith; August 23, 2018
- Procedure ACP 1211.36; Reactor Pressure Vessel Inspection Procedure; Revision 12
- Procedure ACP 1211.20; Ultrasonic Examination of Austenitic Piping Welds; Revision 12
- Procedure ACP 1211.44; Ultrasonic Detection and Sizing of Reactor Pressure Vessel Nozzle to Shell Welds and Nozzle Inner Radius; Revision 4
- Procedure LMT-10-PAUT-007 Fully Encoded Phased Array Ultrasonic Examination of Dissimilar Metal Piping Welds; Revision 3
- Procedure LMT-14-PAUT-024; Encoded Phased Array Ultrasonic Examination of Ferritic Welds; Revision 1
- Procedure LI-AA-102-1002; Part 21 Reporting; Revision 14
- Procedure Qualification Record GMP 102-311-GS-PWHT; July 21, 1987
- Procedure Qualification Record WPS SM-1-1(1); January 2, 1978
- Procedure Qualification Record WP-6; January 8, 1991
- Report BOP-RT-16-005; Radiographic Examination; October 10, 2016
- Report BOP-RT-16-006; Radiographic Examination; October 10, 2016
- Report UT-PDA1-18-015; CUA-J013; September 6, 2018
- Report UT-PDA1-18-014; CUA-J012; September 6, 2018
- Report UT-PDA1-18-011; CUA-J006; September 6, 2018
- Report UT-PDA1-18-010; CUA-J001; September 6, 2018
- Report CV-4415-Bore-PT; CV-4415 Valve Body Bore, Guide Ribs, Seat; September 11, 2018
- STP N549003A; 'A' RHR System Leakage Inspection Walkdown; October 13, 2016
- WO 40376987-02; Residual Heat Removal System –Injection Line Installation; October 5, 2016.
- WO 40201185-02; Residual Heat Removal System –Minimum flow valve replacement; October 10, 2016.
- WPS FP-PE-B31-P1P1-GTSM-001; Welding Procedure Specification; Revision 3

### 71003 — Post-Approval Site Inspection for License Renewal

- Procedure ACP 1211.36; Reactor Pressure Vessel Inspection Procedure; Revision 12

### 71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

- First Requalification Scenario; July 10, 2018
- Reactivity Management Plan Plant Startup RFO 26; Revision 0
- IPOI-1; Startup Checklist; Revision 155
- IPOI-2; Startup; Revision 164

### 71111.12—Maintenance Effectiveness

- CR 02270923; CV 43121 Required Re-Orientation

### 71111.13—Maintenance Risk Assessments and Emergent Work Control

- WO 405119923; EC 288326 New Feed for the 1X004 Standby Transformer
- CR 02270923; CV 43121 Required Re-Orientation
- CR 02272315; Unexpected Phase Angle Shift Discovered in 1X5 Post Maintenance Testing
- CR 02273366; 1X005 Reserve Auxiliary Transformer Neutral Current Transformer Circuit Low Resistance
- WO 40381659; HPCI Test Return CV2315 Exhibiting Sticky Behavior
- MA-AA100-F01; Troubleshooting; Revision 4
- CR 02274909; HPCI Speed Logic Capacitors Could not be Replaced
- CR 02274998; HPCI Surveillance Delayed
- CR 02275014; HPCI Test Return Valve Position Changes
- CR 02275019; HPCI Gland Seal Leak
- S001-023-18; 161 KV CB 4290; Revision 17
- GMP-TEST-59; Ground Fault Troubleshooting; Revision 3
- WO 40616048-03; 1D120 Ground Isolated to H/I Breaker Control Power
- CR 02276247; Reactor Water Cleanup (RWCU) High Differential Flow
- WO 40617536-04; RWCU High Differential Flow Isolation Summer
- GEMAC 565; Flow Square Root Basic Diagram
- CR 02262655; RWCU Inlet Flow Low
- WO 40617272; RWCU Inlet Flow Indication Lowering
- STP 3.3.6.1-12; RWCU; High Differential Flow Channel Functional Test; Revision 9
- WO 40476465; 'B' Core Spray Wetted Cables
- CR 02276753; QA Identified Cable Checklist Error
- CR 02276891; Cut Found on 1BP211B M Motor Lead
- CR 02276901; Motor Lead Lug Bolts Over Torqued on 1BP211B
- STP 3.5.1-01-B; Core Spray System Operability Test; Revision 23
- CR 02281753; CV-1579; 'B' Feedwater Regulating Valve Controller
- CR 02282184; ZC1621; Position Controller for CV1621
- CR 02282159; ODMI 'B' Feedwater Regulating Valve Control
- Operating Instruction (OI) 644; Condensate and Feedwater Systems; Revision 182
- AOP 644; Feedwater/Condensate Malfunction; Revision 22

### 71111.15—Operability Determinations and Functionality Assessments

- CR 02270892; Burned Out Light Bulb and Leads to Retesting
- CR 02277607; RCIC Tripped during RCIC Operability-Test Pot
- CR 02277650; RCIC Valve Stroke Time Delay
- WO 40501456; RCIC Turbine Calibration
- STP 3.5.3-02; RCIC System Operability Test, Revision 55
- ER-AA-113-1000; Inservice Testing Procedure; Revision 4
- CR 02251009; Missed NDE During Rebuild of MSIV CV 4415
- WO 40598471-10 NDE of 'B' Main Steam Line Inboard Isolation
- USAS B31.1.0-1967; Power Piping
- Main Steam Isolation Valves; General Electric Spec. No. 21A9230; Revision 2
- System Design Specification APED-A61-019; Pressure Integrity of Piping and Equipment Pressure Parts – Data Sheet; Revision 3

### 71111.18—Plant Modifications

- EC 288326; New Feed to 1X4 Standby Transformer

### 71111.19—Post Maintenance Testing

- STP 3.6.1.6-01; Suppression Pressure Chamber to Reactor Building Vacuum Breaker Operational Test; Revision 11
- WO 40558930-01; Realign Plunger to the Cap Screw of CV 43121
- WO 40568577; Residual Heat Removal Service Water (RHRSW) 'A' Buried Piping UT Exam on GBC-001-E09
- BECH-M1113; RHRSW and Emergency Service Water Systems; Revision 77
- ACP 1211.3 NDE Procedure for Liquid Penetrant; Revision 14
- ACP 1211.4 NDE Procedure for Visible Dye Penetrant – Expanded Temperature Applications
- CR 02262655; RHRSW Pipe Exam Results
- NS160003A; 'A' RHRSW System Leakage Inspection, Revision 4
- WO 40561179; HPCI System Operability Test
- STP 3.5.1-05; HPCI System Operability Test
- WO 40559476; RPS 'A' MG Set [Electronic Protection Assembly] EPA Channel Calibration
- STP 3.3.8.2-01A; RPS 'A' MG Set EPA Channel Calibration
- WO 40617272; RWCU Inlet Flow Indication Lowering
- STP 3.3.6.1-12; Reactor Water Cleanup; High Differential Flow Channel Functional Test; Revision 9
- STP 3.6.1.1-04; Containment Isolation Valve Leak Tightness Test – Type C Penetrations – Main Steam System; Revision 39
- WO 40497894; MO-4423 Main Steam Line Drain Inboard Isolation Valve
- WO 40490830; MO-4424 Main Steam Line Drain Outboard Isolation Valve
- WO 40598471; CV-4415B Main Steam Line Inboard Isolation Valve
- WO 40598471-10; 'B' Main Steam Line Inboard Isolation
- ACP 1211.3; Liquid Penetrant Examination; Revision 14
- BOP-PT-18-008; CV-4415-Bore-PT
- Purchase Order 21A9230; Main Steam Isolation Valve Purchase Specification; Revision 2

### 71111.20—Refueling and Other Outage Activities

- Duane Arnold Energy Center (DAEC) RFP–26 Shutdown Risk Map; June 16, 2018



- RFP-403; Performance of Fuel Handling Activities; Revision 63
- WO 40500952-01; Reconfigure Fuel Pool Prior to RFO 26
- Spent Fuel Pool Plan 18-009
- CR 02276813; QA Identifier Vendor Fuel Handler Qualifications not Activated per Procedure
- NextEra Energy Resources Duane Arnold Energy Center (DAEC)
- D12R267 Shutdown Safety Management Plan; Revision 1
- Reactivity Management Plan RFO 26 Plant Shutdown; August, 2018
- SA-AA-100-F02; Confined Space Entry Permit, Supplemental Log Sheet; Revision 1
- SA-AA-100-F09; Confined Space Entry Permit, Supplemental Log Sheet; Revision 2
- ISO GBD-070-01; Isometric Severe Accident Water Addition; Revision 2
- Duane Arnold Technical Specification 3.3.1.2 and Bases
- Duane Arnold Technical Specification Table 3.3.1.2-1
- Clearance 5500-1S220; HCU 22-15
- WO 40620641; V 04-0038 Reinstall Insulation
- IPOI 4; Shutdown; Revision 141
- IPOI 8; Outage and Refueling Operations; Revision 93c
- STP NS930003; Main Turbine Overspeed Trip System Tests; Revision 17
- STP NS810001; Refueling Platform Inspection; Revision 31
- STP 3.9.1-01; Refueling Interlock Channel Functional Test; Revision 12
- STP 3.4.9-01; Reactor Heatup and Cooldown Rate Log; Revision 20
- STP 3.8.4-08; Performance Discharge Test of 1D4 Battery; Revision 19
- STP 3.8.1-07B; 'B' LOOP-LOCA Test; Revision 23
- CR 02279683; CV-4360, Torus Hard Pipe Vent Inboard Isolation, Failed ASME Opening and Closing Time
- CR 02279684; CV-4361, Torus Hard Pipe Vent Outboard Isolation, Failed ASME Opening and Closing Time
- STP NS240507; FLEX Vehicle Inspection and ERB Inspection South Building; Revision 4
- STP NS240508; FLEX Vehicle Inspection and ERB Inspection North Building; Revision 4
- STP 3.1.7-02; Standby Liquid Control (SBLC) System Initiation and Explosive Valve Test; Revision 22
- WO 40402074; STP 3.1.7-02 SBLC System Initiation and Explosive Valve Test
- CR 02280245; PSV-2607 Leaking from Component Internal to Valve
- IOPI 7 Attachment 3; Torus Close Out; Revision 136
- SY-AA-100-1011; Fatigue Management; Revision 9
- SY-AA-1011-FO1; Fatigue Assessment; Revision 6
- RFP 210; Reactor Pressure Vessel Reassembly; Revision 47
- STP 3.10.1-01; Non-Nuclear Heat Class 1 System Leakage Pressure Test; Revision 51
- Reactivity Management Plan; Plant Startup Following RFO 26; Revision 1
- IPOI 2; Startup; Revision 164
- OI 563; Hydrogen Water Chemistry; Revision 164
- OI 149; Residual Heat Removal System; Revision 169
- OI 416; RHR Service Water System; Revision 67
- IPOI-1; Startup Checklist; Revision 155

#### 71111.22—Surveillance Testing

- WO 40551950-01; Perform STP 3.3.6.1-13
- STP 3.3.6.1-13; Reactor Water Cleanup High Differential Flow Channel Calibration; Revision 19
- STP NS100102B; 'B' River Water Supply and Screen Wash System Vibration Measurement and Operability Test; Revision 26

#### 71114.06—Drill Evaluation

- 18TD1; July 18, 2018 Emergency Response Organization Drill
- DAEC Emergency Plan; Revision 34
- EAL-01; Emergency Action Level Matrix; Revision 11
- Emergency Action Level Basis Document; Revision 21
- EPIP 1.1; Determination of Emergency Action Levels; Revision 29
- EPIP 1.2; Notification; Revision 50
- EPIP 2.2; Activation and Operation of TSC; Revision 37
- Copies of Notifications
- CR 02272664; 18TD1SIMCR EP Drill - Assessment to Down Grade Emergency Action Levels; July 18, 2018
- CR 02272668; 18TD1SIMCR EP Drill – Risk Significant Planning Standard Failure; July 18, 2018

#### 71124.01—Radiological Hazard Assessment and Exposure Controls

- RP-AA-107; Radioactive Material Control Program; Revision 1
- HPP 3111.09; Providing Radiological Briefing; Revision 32
- NS-999901; Sealed Source Leak Test Listing Verification Report; July 16, 2018
- GEL Laboratories LLC: Ni-63 Smear Analysis; August 10, 2018
- Duane Arnold Energy Center; Smear Leak Test; July 5, 2017
- Radiological Survey Report NextEra Energy DAEC; Dry Well Elevations; Various Dates
- Radiological Survey Report NextEra Energy DAEC; N5B Nozzle Drywell Survey; Various Dates
- Radiological Survey Report NextEra Energy DAEC; N1B; Various Dates
- HP-48; Air Sample Record; Various Dates

#### 71124.02—Occupational As Low As Reasonably Achievable Planning and Controls

- RWP 18-4080 and Related ALARA Documents; LHRA-DW MSIV; Various Revisions
- RWP 18-4280 and Related ALARA Documents; DW Pipe Replacement; Various Revisions
- RWP 18-4212 and Related ALARA Documents; DW ISI & FAC; Various Revisions
- RP-AA-104; ALARA Program; Revision 6
- RP-AA-104-1000; ALARA Implementing Procedure; Revision 14

#### 71124.03—In-Plant Airborne Radioactivity Control and Mitigation

- HPP 3106.03; Description and Issuance of Respiratory Protection Equipment; Revision 20
- RP-AA-106; Respiratory Protection Program; Revision 1
- Laboratory Report Compressed Air/Gas Quality Testing; July 17, 2018

#### 71151—Performance Indicator Verification

- MSPI Basis Document; Revision 16

#### 71153—Follow-Up of Events and Notices of Enforcement Discretion

- Event Notification 53496
- LER 05000331/2018-002, “Secondary Containment Inoperable,” Issued on August 16, 2018