



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION III
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LISLE, IL 60532-4352

May 4, 2015

Mr. Thomas A. Vehec
Vice President
NextEra Energy Duane Arnold, LLC
3277 DAEC Road
Palo, IA 52324-9785

SUBJECT: DUANE ARNOLD ENERGY CENTER–NRC INTEGRATED INSPECTION
REPORT 05000331/2015001

Dear Mr. Vehec:

On March 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Duane Arnold Energy Center. The enclosed report documents the results of this inspection, which were discussed on April 16, 2015, with you and other members of your staff.

Based on the results of this inspection, two NRC-identified findings of very low safety significance were identified. The findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy. Additionally, two licensee-identified violations are listed in Section 4OA7 of this report.

If you contest the subject or severity of any NCV in this report, 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 a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission–Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532–4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001; and the Resident Inspector Office at the Duane Arnold Energy Center. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Duane Arnold Energy Center.

T. Vehec

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In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

J. McGhee, Acting Chief
Branch 1
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000331/2015001
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000331/2015001

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: January 1 through March 31, 2015

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Branch 1
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Enclosure

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SUMMARY OF FINDINGS

Inspection Report 05000331/2015001; 01/01/2015–03/31/2015; Duane Arnold Energy Center; Maintenance of Emergency Preparedness and Occupational Dose Assessment.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were identified by the inspectors. These findings were considered NCVs of NRC regulations. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310; "Aspects Within the Cross-Cutting Areas" dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG–1649, "Reactor Oversight Process" Revision 5, dated February 2014.

Cornerstone: Emergency Preparedness

Green. The inspectors identified a finding of very-low safety significance (Green) and an associated NCV of Title 10 of the *Code of Federal Regulations* (CFR) 50.54(q)(2), and 10 CFR 50.47(b)(4) for the failure of the licensee to classify and declare a Notification of Unusual Event. Specifically, on June 30, 2014, the licensee failed to classify and declare a Notification of Unusual Event after a control room instrument peaked at a wind speed that exceeded the Unusual Event Emergency Classification Level threshold for 4 seconds. The licensee entered the issue into the corrective action program (CAP) as condition report (CR) 01975495. Corrective actions included procedure changes to ensure available indications for wind speed are monitored during high wind events.

The failure to classify and declare a Notice of Unusual Event when conditions warranted was a performance deficiency. The finding was more than minor because it adversely affected the emergency response organization (ERO) performance attribute of the Emergency Preparedness (EP) cornerstone objective to ensure that licensees are capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Because the finding only involved a failure to declare a Notification of Unusual Event, the finding screened as being of very low safety significance (Green). This finding was associated with the cross-cutting aspect of avoid complacency in the area of Human Performance, because control room operators did not walk-down instrumentation that was available to them in the control room. [H.12] (Section 1EP5)

Cornerstone: Occupational Radiation Safety

Severity Level IV. The inspectors identified a Severity Level (SL) IV NCV of 10 CFR 20.2206 for the licensee's failure to report results of individual radiation exposure monitoring for individuals required to be monitored by 10 CFR 20.1502. Specifically, on or before April 30, 2014, the licensee failed to report results for all individuals requiring monitoring for the calendar year 2013 to the NRC's Radiation Exposure Information and Reporting System (REIRS) database. The issue was entered into the licensee's CAP as CR 02028468. Immediate corrective actions

included the resubmittal of radiation exposure data to the REIRS database, which included radiation exposure for all individuals that were required to be monitored.

The violation of 10 CFR 20.2206 was assessed in accordance with the traditional enforcement path in IMC 0612, Appendix B, "Issue Screening." The inspectors determined that traditional enforcement did apply because reporting failures impact the regulatory process. In accordance with the NRC Enforcement Policy, Section 6.9(d)(2), failures to make a timely written report as required by 10 CFR 20.2206 are categorized as SL IV violations. Cross-cutting aspects are not assigned to traditional enforcement violations. (Section 2RS4)

Licensee-Identified Violations

Violations of very low safety or security significance or Severity Level IV that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's CAP. These violations and CAP tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Duane Arnold Energy Center (DAEC) was operating at 54 percent reactor power at the beginning of the inspection period due to ongoing troubleshooting of elevated vibrations associated with the “B” reactor feedwater pump and motor. Following repairs to the “B” reactor feedwater pump, DAEC ascended in power and achieved 100 percent reactor power on January 8, 2015. The plant remained at 100 percent reactor power for the remainder of the inspection period with the exception of brief down-power maneuvers to accomplish rod pattern adjustments, troubleshooting activities or planned surveillance testing activities.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Impending Adverse Weather Condition–Extreme Cold Conditions

a. Inspection Scope

Since extreme cold conditions were forecast in the vicinity of the facility for February 18-19, 2015, the inspectors reviewed the licensee’s overall preparations/protection for the expected weather conditions. On February 17, 2015, the inspectors walked down portions of the emergency service water (ESW), residual heat removal service water (RHRSW), standby transformer, and startup transformer systems because their safety-related functions could be affected or required as a result of the extreme cold conditions forecast for the facility. The inspectors observed insulation, heat trace circuits, space heater operation, and weatherized enclosures to ensure operability of affected systems. The inspectors reviewed licensee procedures and discussed potential compensatory measures with control room personnel. The inspectors focused on plant management’s actions for implementing the station’s procedures for ensuring adequate personnel for safe plant operation and emergency response would be available. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one readiness for impending adverse weather condition sample as defined in Inspection Procedure (IP) 71111.01–05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Startup transformer and standby diesel generators (SBDGs) with the standby transformer out-of-service for planned maintenance; and
- High pressure coolant injection (HPCI) system during surveillance testing of the reactor core isolation cooling (RCIC) system.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report (UFSAR), Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These inspections constituted two quarterly partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On February 23–26, 2015, the inspectors performed a complete system alignment inspection of the HPCI system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and

outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These inspections constituted one semi-annual complete system walkdown sample as defined in IP 71111.04–05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Turbine Building Elevation 734’;
- Reactor Building Elevation 786’;
- Radwaste and Machine Shop Buildings; and
- Reactor Building Elevation 716’ Fire Zones 1AN, 1AC, 1C and 1G.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee’s fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant’s Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant’s ability to respond to a security event. Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee’s CAP. Documents reviewed are listed in the Attachment to this report.

These inspections constituted four routine resident inspector tour samples as defined in IP 71111.05–05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant area to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- torus room.

Documents reviewed during this inspection are listed in the Attachment to this report.

This inspection constituted one internal flooding sample as defined in IP 71111.06–05.

b. Findings

No findings were identified.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's testing of torus cooling and residual heat removal (RHR) system heat exchangers to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions. Documents reviewed for this inspection are listed in the Attachment to this document.

This inspection constituted one annual heat sink performance sample as defined in IP 71111.07–05.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification (71111.11Q)

a. Inspection Scope

On February 23, 2015, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas of the crew:

- licensed operator performance;
- clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one resident inspector quarterly review of licensed operator regualification sample as defined in IP 71111.11.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation During Periods of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On the evening of March 24, 2015, the inspectors observed activities in the control room during a downpower evolution to perform a rod pattern adjustment and surveillance testing activities. This was an activity that required heightened awareness or was related to increased risk. The inspectors evaluated the following areas of the crew:

- licensed operator performance;
- clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;

- correct use and implementation of procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The performance in these areas was compared to pre-established operator action expectations, procedural compliance and task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one resident inspector quarterly observation of heightened activity or risk sample as defined in IP 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- RHR heat exchanger outlet valve issues;
- RCIC; and
- Drywell vacuum breaker post maintenance testing issues.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted three routine quarterly evaluation samples as defined in IP 71111.12–05.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- RCIC system maintenance window during cold weather conditions;
- Work Week 1509 plant risk; and
- Work Week 1511 plant risk.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Documents reviewed during this inspection are listed in the Attachment to this report.

These inspections constituted three maintenance risk assessments and emergent work control samples as defined in IP 71111.13–05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- HPCI operability determination for flow oscillations observed during quarterly surveillance testing;
- SBDG cable support prompt operability determination;
- RHRSW cable shielding issue; and
- "A" control building chiller (CBC) condenser corrosion issue.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS, Technical Requirements Manual, and UFSAR to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This inspection constituted four operability evaluation samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- HCPI system test return valve;
- RCIC system following valve replacements;
- "A" standby gas treatment system following switch replacement;
- Low pressure coolant injection (LPCI) loop select relay replacement; and
- "B" CBC system operability test following planned maintenance activities.

These activities were selected based upon the structures, systems, and components (SSCs) ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being

corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

This inspection constituted five post-maintenance testing samples as defined in IP 71111.19–05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- “A” ESW operability test (Inservice Test);
- HPCI system operability test (Routine);
- HPCI steam line high differential pressure “A” instrument channel calibration (Routine);
- Scram discharge volume high water level calibration (Routine); and
- “A” SBDG fast start operability test (Routine).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;

- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted four routine surveillance testing samples and one inservice testing sample as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

1EP2 Alert and Notification System Evaluation (71114.02)

a. Inspection Scope

The inspectors held discussions with emergency preparedness (EP) staff regarding the operation, maintenance, and periodic testing of the primary and backup Alert and Notification System (ANS) in the plume pathway Emergency Planning Zone. The inspectors reviewed monthly trend reports and siren test failure records from June of 2013 through January of 2015. Information gathered during document reviews and interviews were used to determine whether the ANS equipment was maintained and tested in accordance with Emergency Plan Commitments and Procedures. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one alert and notification system evaluation sample as defined in IP 71114.02–06.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03)

a. Inspection Scope

The inspectors reviewed and discussed with plant EP staff the Emergency Plan Commitments and Procedures for Emergency Response Organization (ERO) on-shift, and augmentation staffing levels. A sample of ERO training records for personnel assigned to key and support positions were reviewed to determine the status of their training as it related to their assigned ERO positions. The inspectors reviewed the ERO

Augmentation System and activation process, the primary and alternate methods of initiating ERO activation, unannounced off-hour augmentation tests from June of 2013 through January of 2015, and the provisions for maintaining the plant's ERO roster.

The inspectors reviewed a sample of corrective actions related to the facility's ERO staffing, Augmentation System Program, and activities from June of 2013 through January of 2015, to determine whether corrective actions were completed in accordance with the site's CAP. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one emergency response organization staffing and augmentation system sample as defined in IP 71114.03–06.

b. Findings

No findings were identified.

1EP5 Maintenance of Emergency Preparedness (71114.05)

a. Inspection Scope

The inspectors reviewed a sample of nuclear oversight staff's audits of the EP Program to determine whether these independent assessments met the requirements of 10 CFR 50.54(t). The inspectors also reviewed critique reports and samples of CAP records associated with the 2014 Biennial Exercise, as well as various EP drills conducted, in order to determine that the licensee fulfilled its drill commitments and to evaluate the licensee's efforts to identify, track, and resolve concerns identified during these activities. The inspectors reviewed a sample of EP items and corrective actions related to the facility's EP Program and activities from June of 2013 through January of 2015, to determine whether corrective actions were completed in accordance with the site's CAP. Documents reviewed are listed in the Attachment to this report.

This correction of emergency preparedness weaknesses and deficiencies inspection constituted one sample as defined in IP 71114.05–06.

b. Findings

Introduction: The inspectors identified a finding of very-low safety significance (Green) and an associated NCV of 10 CFR 50.54(q)(2), and 10 CFR 50.47(b)(4) for the failure of the licensee to classify and declare a Notification of Unusual Event (NOUE). The event took place on June 30, 2014, when a control room instrument peaked at a wind speed that exceeded the NOUE Emergency Classification Level threshold for 4 seconds.

Description: On June 30, 2014, the local area, which included Duane Arnold Energy Center, experienced a severe storm that resulted in high winds. During the storm, primary wind speed indication found in the front panel area of the Control Room and on the plant process computer remained below the Emergency Action Level HU1.3 threshold of 95 miles per hour for a NOUE. However, after the storm, the licensee performed a review of the conditions that existed during the thunderstorm under CR 01975495. This review determined that the backup 50 meter wind speed indicator reached 95.5 mph for approximately 4 seconds. The backup wind speed indicator is in the main control room on a back panel and available to the control room operators but

was not recognized during the storm. The licensee made an event report to the NRC about the conditions being met for the NOUE but determined that it did not warrant a declaration of an emergency classification. The licensee conducted a re-evaluation of the event in January 2015. As a result of this evaluation, it was determined that there was a missed classification for the June 30, 2014, event and was considered a missed Drill and Exercise Performance (DEP) Indicator opportunity only.

The inspectors evaluated the licensee's assessment and identified aspects of the issue that were not fully evaluated by the licensee. The inspectors concluded that the event was a missed classification and failure to follow the emergency plan. The inspectors also identified that the licensee did not classify the event and did not complete an actual event review specified in its program (EPDM 1020, "Actual Event Investigation").

Based on the inspector's concerns, the licensee re-opened CR 01975495 and initiated a corrective action to revise Abnormal Operating Procedure (AOP) 903, "Severe Weather," to ensure that backup indications are monitored during high wind events.

Analysis: The inspectors determined that the failure to classify and declare a Notification of Unusual Event when conditions warranted was a performance deficiency. The inspectors reviewed IMC 0612, Appendix B, dated September 7, 2012, and determined that the finding was more than minor because it adversely affected the ERO Performance attribute of the EP cornerstone objective to ensure that licensees are capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Since the finding involved a failure to implement the licensee's Emergency Plan during an actual event, the inspectors reviewed IMC 0609, Appendix B, Attachment 1, dated September 23, 2014, and determined that this was a finding of very-low safety significance (Green) because it involved the failure to declare a Notification of Unusual Event. The finding was associated with the cross-cutting aspect of avoid complacency in the area of Human Performance, because the control room operators relied on front panel indications and their plant process computer but did not take the action to walk-down and verify the back panel indications for wind speed during the storm. [H.12]

Enforcement: Title 10 CFR 50.54(q)(2), requires, in part, that a holder of a license under this part, shall follow and maintain the effectiveness of an emergency plan that meets the requirements of Appendix E, Part 50, and for nuclear power reactor licensees, the planning standards of 10 CFR 50.47(b). Title 10 CFR 50.47(b)(4) requires, in part, that emergency plans must have a standard emergency classification, and action level scheme in use by the nuclear facility licensee.

Contrary to the above, on June 30, 2014, the licensee failed to follow its scheme of emergency action levels for classifying an emergency. Specifically, the licensee failed to classify and declare a Notification of Unusual Event after conditions was met for Emergency Action Level HU 1.3. Because the finding was of very-low safety significance (Green) and it was entered into the licensee's CAP as CR 01975495, this violation is being treated as a NCV, consistent with Section 2.3.2, of the NRC Enforcement Policy. **(NCV 05000331/2015001-01, Failure to Classify and Declare a Notification of Unusual Event)**

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on March 25, 2015, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

This inspection constituted one emergency preparedness drill observation sample as defined in IP 71114.06–06.

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

Cornerstone: Occupational Radiation Safety

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls (71124.02)

This inspection constituted a partial sample as defined in IP 71124.02–05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed pertinent information regarding plant collective exposure history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspectors reviewed the plant's 3-year rolling average collective exposure.

The inspectors reviewed the site-specific trends in collective exposures and source term measurements.

The inspectors reviewed site-specific procedures associated with maintaining occupational exposures as-low-as-reasonably-achievable (ALARA), which included a review of processes used to estimate and track exposures from specific work activities.

b. Findings

No findings were identified.

.2 Radiological Work Planning (02.02)

a. Inspection Scope

The inspectors selected the following work activities of the highest exposure significance:

- Scaffolds in drywell and balance of plant;
- Motor Operated Valves/Air Operated Valves;
- Torus Proper/Condensate Storage Tank work; and
- Inservice Inspection and Flow Accelerated Corrosion exams and support.

The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements. The inspectors determined whether the licensee reasonably grouped the radiological work into work activities based on historical precedence, industry norms, and/or special circumstances.

The inspectors assessed whether the licensee's planning identified appropriate dose mitigation features, considered alternate mitigation features, and defined reasonable dose goals. The inspectors evaluated whether the licensee's ALARA assessment had taken into account decreased worker efficiency from use of respiratory protective devices and/or heat stress mitigation equipment (e.g., ice vests). The inspectors determined whether the licensee's work planning considered the use of remote technologies (e.g., teledosimetry, remote visual monitoring, and robotics) as a means to reduce dose and the use of dose reduction insights from industry operating experience and plant-specific lessons learned. The inspectors assessed the integration of ALARA requirements into work procedure and radiation work permit documents.

The inspectors compared the results achieved (dose rate reductions and person-rem used) with the intended dose established in the licensee's ALARA planning for these work activities. The inspectors compared the person-hour estimates provided by maintenance planning and other groups to the radiation protection group with the actual work activity time requirements, and evaluated the accuracy of these time estimates. The inspectors assessed the reasons (e.g., failure to adequately plan the activity and failure to provide sufficient work controls) for any inconsistencies between intended and actual work activity doses.

The inspectors determined whether post-job reviews were conducted and if identified problems were entered into the licensee's CAP.

b. Findings

No findings were identified.

.3 Verification of Dose Estimates and Exposure Tracking Systems (02.03)

a. Inspection Scope

The inspectors reviewed the assumptions and bases (including dose rate and man-hour estimates) for the Current Annual Collective Exposure Estimate for reasonable accuracy for select ALARA work packages. The inspectors reviewed applicable procedures to

determine the methodology for estimating exposures from specific work activities and the intended dose outcome.

The inspectors evaluated whether the licensee established measures to track, trend, and, if necessary, to reduce occupational doses for ongoing work activities. The inspectors assessed whether trigger points or criteria were established to prompt additional reviews and/or additional ALARA planning and controls.

The inspectors evaluated the licensee's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors assessed whether adjustments to exposure estimates (intended dose) were based on sound radiation protection and ALARA principles or if they were just adjusted to account for failures to control the work. The inspectors evaluated whether the frequency of these adjustments called into question the adequacy of the original ALARA planning process.

b. Findings

No findings were identified.

.4 Radiation Worker Performance (02.05)

a. Inspection Scope

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or high radiation areas. The inspectors evaluated whether workers demonstrated the ALARA philosophy in practice (e.g., workers are familiar with the work activity scope and tools to be used; workers used ALARA low-dose waiting areas) and whether there were any procedure compliance issues (e.g., workers are not complying with work activity controls). The inspectors observed radiation worker performance to assess whether the training and skill level was sufficient with respect to the radiological hazards and the work involved.

b. Findings

No findings were identified.

.5 Problem Identification and Resolution (02.06)

a. Inspection Scope

The inspectors evaluated whether problems associated with ALARA planning and controls are being identified by the licensee at an appropriate threshold, and were properly addressed for resolution in the licensee's CAP.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

The inspection activities supplement those documented in Inspection Report 05000331/2014005, and constitute one complete sample as defined in IP 71124.04–05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the REIRS database to determine if dose had been appropriately reported to the NRC.

b. Findings

Introduction: The inspectors identified a SL IV NCV of 10 CFR 20.2206 for the licensee's failure to report results of individual radiation exposure monitoring for individuals required to be monitored by 10 CFR 20.1502.

Description: Title 10 CFR 20.1502 requires licensees to monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits of 10 CFR Part 20. The licensee's procedure RP-AA-101, "Personnel Monitoring Program," implemented this requirement by requiring that all radiation workers be monitored for radiation exposure. In order to track radiation exposure, the licensee maintained exposure data in the Sentinel database. Title 10 CFR 20.2206 requires the licensee to submit an annual report to the NRC of the results of individual monitoring for those who were required to be monitored. These reports are maintained in the REIRS database maintained by the NRC.

In February of 2015, the inspectors noted that for the calendar year 2013, the licensee had reported monitoring results for 53 individuals to the NRC's REIRS database. This number was much lower than those reported by this licensee in the past, and other similar licensed facilities (typically in excess of 1,000 individuals). Upon investigation by the licensee, it was determined that the electronic file submitted to the NRC had not included all monitored individuals from the Sentinel database, but was instead filtered to only contain individuals who had received 100 mrem or more.

Analysis: The violation of 10 CFR 20.2206 was assessed in accordance with the traditional enforcement path in IMC 0612, Appendix B, "Issue Screening." The inspectors determined that traditional enforcement did apply because reporting failures impact the regulatory process. In accordance with the Enforcement Policy, Section 6.9(d)(2), failures to make a timely written report as required by 10 CFR 20.2206 are categorized as SL IV violations. Cross-cutting aspects are not assigned to traditional enforcement violations.

Enforcement: Title 10 CFR 20.2206 requires, in part, that the licensee submit an annual report of the results of individual monitoring carried out by the licensee for each individual for whom monitoring was required by 10 CFR 20.1502 during that year. The licensee must file the report, covering the preceding year, on or before April 30 of each year.

Contrary to the above, the licensee did not report results for all required monitoring for the calendar year 2013, on or before April 30, 2014. For immediate corrective actions,

on February 25, 2015, the licensee resubmitted radiation exposure data to REIRS which included radiation exposure for all individuals that were required to be monitored. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. The violation was entered into the licensee's CAP as CR 02028468.

(NCV 05000331/2015001-02, Failure to Report Required Monitoring Results to the NRC)

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety and Occupational Radiation Safety, and Security

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours performance indicator (PI) for the period from the first quarter of 2014 through the fourth quarter of 2014. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of January 1, 2014, through December 31, 2014, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one unplanned scrams per 7000 critical hours sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams with Complications performance indicator for the period from the first quarter of 2014 through the fourth quarter of 2014. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of January 1, 2014, through December 31, 2014, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to

determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one unplanned scrams with complications sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Unplanned Power Changes per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Power Changes per 7000 Critical Hours performance indicator for the period from the first quarter of 2014 through the fourth quarter of 2014. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports and NRC Integrated Inspection Reports for the period of January 1, 2014, through December 31, 2014, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one unplanned power changes per 7000 critical hours sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.4 Drill/Exercise Performance

a. Inspection Scope

The inspectors sampled licensee submittals for the DEP PI for the period from the first quarter 2014 through the fourth quarter 2014. The inspectors used PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment PI Guideline," Revision 7, dated August 31, 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's records and processes, including procedural guidance on assessing opportunities for the PI, assessments of PI opportunities during pre-designated control room simulator training sessions, performance during the 2014 Biennial Exercise, and performance during other drills associated with the PI to validate the accuracy of the submittals. The inspectors also reviewed the licensee's Issue Report Database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constitutes one drill/exercise performance sample as defined in IP 71151–05.

b. Findings

No findings were identified.

.5 Emergency Response Organization Readiness

a. Inspection Scope

The inspectors sampled licensee submittals for the ERO Readiness PI for the period from the first quarter 2014 through the fourth quarter 2014. The inspectors used PI definitions and guidance contained in NEI Document 99–02, “Regulatory Assessment PI Guideline,” Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee’s records and processes, including procedural guidance on assessing opportunities for the PI, performance during the 2014 Biennial Exercise and other drills, and revisions of the roster of personnel assigned to key ERO positions to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s Issue Report Database to determine if any problems were identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one emergency response organization readiness sample as defined in IP 71151–05.

b. Findings

No findings were identified.

.6 Alert and Notification System

a. Inspection Scope

The inspectors sampled licensee submittals for the ANS Reliability PI for the period from the first quarter 2014 through the fourth quarter 2014. The inspectors used PI definitions and guidance contained in NEI Document 99–02, “Regulatory Assessment PI Guideline,” Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee’s records and processes including procedural guidance on assessing opportunities for the PI and results of periodic ANS operability tests to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s Issue Report Database to determine whether any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one alert and notification system reliability sample as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: identification of the problem was complete and accurate; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment to this report.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 (Closed) Violation 05000331/2014010-01, Failure to Remove Water From Conduits Containing Safety-Related Cables

On September 19, 2014, Violation 05000331/2014010-01 was issued regarding the failure to take corrective action to remove water from nine safety-related conduits. The licensee subsequently committed to install replacement cables and high density polyethylene (HDPE) inner conduits in the nine conduits cited in the violation. The HDPE conduits were designed to prevent water from entering the conduit to ensure the new cables remained free of water intrusion. The licensee has implemented this corrective action for conduits containing cables for the "A" SBDG and "B" SBDG, as well as some of the conduits containing cables for the standby transformers. The remaining cables and conduits are scheduled to be installed prior to startup from RFO 25, currently scheduled to be completed in the fall of 2016. The inspectors concluded the licensee implemented appropriate corrective actions and prioritized the work commensurate with the safety significance of the issues. The inspectors concluded the licensee's response, and corrective actions are acceptable. This violation is closed.

4OA6 Management Meetings

.1 Exit Meeting Summary

On April 16, 2014, the inspectors presented the inspection results to Mr. T. Vehec, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report inputs discussed were considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The inspection results for the Biennial Emergency Preparedness Program was discussed with Mr. G. Pry, Plant General Manager, on February 20, 2015; and
- The inspection results for the areas of occupational ALARA planning and controls; and occupational dose assessment with Mr. G. Pry, Plant General Manager, on March 6, 2015.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) or Severity Level IV were identified by the licensee and were violations of NRC requirements that met the criteria of the NRC Enforcement Policy for being dispositioned as NCVs.

- Duane Arnold TS 5.4, "Procedures," Section 5.4.1.a requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2,

Appendix A, February 1978. Regulatory Guide 1.33, Revision 2, Appendix A, contains, in part under Section 8.b(2)(t), surveillance test procedures for inspection of the reactor coolant system pressure boundary.

Contrary to the above, on November 8, 2014, the licensee failed to properly implement surveillance test procedure (STP) 3.10.1-02, "Non Nuclear Heat Class 1 Ten Year System Leakage Pressure Test," Revision 32. Specifically, during the Fall 2014 refueling outage, licensee personnel identified leakage during visual under-vessel inspections per STP 3.10.1-02. Although several CRs were generated to capture the identified leakage locations and approximate leakage rates from control rod drive mechanism (CRDM) flanges, the personnel failed to fully implement STP 3.10.1-02, Attachment 3 requirements to perform a detailed inspection of the associated CRDM flanges to "identify the leakage source and to verify pressure boundary integrity." Had this identification/verification been performed, STP 3.10.1-02, Attachment 3, further required implementation of GMP-TEST-66, "CRD (**-**) Troubleshooting Procedure," Revision 8, for CRDM flange leakage. Because CRs were written, the licensee personnel considered the under-vessel inspection results satisfactory and moved forward in the STP. Upon further review of the completed STP, the licensee identified that required detailed inspections were not performed for the CRDM flange leaks. The licensee entered the issue into the CAP and successfully re-performed STP 3.10.1-02 after resolving the leakage issues.

Because the inspectors answered "No" to all questions under Exhibit 4 of IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings," the finding screened as very low safety significance (Green). The above issue was documented in the licensee's CAP as CR 02006364. Corrective actions included a revision to STP 3.10.1-02 to more clearly define under-vessel visual inspection requirements.

- Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances.

Contrary to the above, on September 27 and 29, 2014, the licensee failed to prescribe an instruction appropriate to the circumstances associated with the replacement of shielded cables between the "A" and "C" RHRSW pump motors and the associated 4kV supply breakers. Specifically, SPEC-E512, "Cable and Wire Installation," Revision 14, did not ensure that shielded cables be grounded only at the switchgear end, and that the cables be routed back through ground fault (ring) current transformers in the cabinet before being grounded. This resulted in the improper development of work instructions used in the installation of replacement cables for the "A" and "C" RHRSW pumps and a resultant non-conforming condition which was discovered by the licensee during an extent of condition review in March of 2015.

Because the SSCs maintained operability based on the deficiency affecting the design of the SSCs, the finding screened as very low safety significance (Green).

The above issue was documented in the licensee's CAP as CR 02023605. Immediate corrective actions included a determination of operability (the ground fault protection had no required safety supporting function for the RHRSW pumps and switchgear), equipment configuration control until resolution was taken, re-routing of the affected cables to restore full design, and a revision to SPEC-E512 to clearly describe shielded cable installation requirements.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Vehec, Site Vice President
G. Pry, Plant General Manager
K. Kleinheinz, Site Engineering Director
M. Davis, EP and Licensing Manager
B. Simmons, Nuclear Oversight Manager
R. Wheaton, Operations Director
R. Porter, Radiation Protection Manager
D. Olsen, Chemistry Manager
J. Schwertfeger, Security Manager
C. Hill, Training Manager
B. Murrell, Licensing Engineer Analyst
L. Swenzinski, Licensing Engineer
M. Casey, Environmental Coordinator
L. Helms, Emergency Preparedness Coordinator
D. Church, Engineering Programs Manager
F. Dohmen, Site Level III
B. Castiglia, Fleet Performance Improvement Manager
M. Fritz, EP Coordinator
P. Polflec, EP Corporate Functional Area Manager
J. Probst, Licensing Engineer
M. Salyer, Senior Communications Specialist

Nuclear Regulatory Commission

J. McGhee, Acting Chief, Reactor Projects Branch 1
M. Chawla, Project Manager, NRR

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000331/2015001-01	NCV	Failure to Classify and Declare a Notification of Unusual Event (Section 1EP5)
05000331/2015001-02	NCV	Failure to Report Required Monitoring Results to the NRC (Section 2RS4)

Closed

05000331/2015001-01	NCV	Failure to Classify and Declare a Notification of Unusual Event (Section 1EP5)
05000331/2015001-02	NCV	Failure to Report Required Monitoring Results to the NRC (Section 2RS4)
05000331/2014010-01	VIO	Failure to Remove Water From Conduits Containing Safety-Related Cables (Section 4OA5)

Discussed

None.

LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

1R01 Adverse Weather Protection (71111.01)

- AOP 903; Severe Weather; Revision 49
- CR 02027123; Deluge 12 Initiation

1R04 Equipment Alignment (71111.04)

- Operating Instruction (OI) 152; HPCI; Revision 112
- OI 152A1; HPCI System Electrical Lineup; Revision 4
- OI 152A2; HPCI System Valve Lineup and Checklist; Revision 17
- OI 152A2; HPCI System Valve Lineup and Checklist; Revision 18
- BECH-M122; HPCI Steam Side; Revision 64
- BECH-M123; HPCI Water Side Sheet 2; Revision 46
- CR 02018806; HPCI Pressure/Flow Changes Occurred with No Operator Action
- CR 02021796; Test Results from CV2315 Under Work Order 4063196
- CR 02025548; HPCI Test Return Valve Air Regulator Pressure Setpoint
- OI 152A10; SBDG Standby/Readiness Condition Checklist; Revision 24

1R05 Fire Protection (71111.05Q)

- ACP 1412.4; Impairments to Fire Protection Systems; Revision 73
- FP-AB-100; DAEC Fire Protection Program; Revision 2
- PFP-RB-786; Pre-Fire Plan Reactor Building El. 786; Revision 1
- PFP-RB-716; Pre-Fire Plan Reactor Building El. 716; Revision 1
- PFP-TB-734; Pre-Fire Plan Turbine Building El. 734; Revision 3
- PFP-RW-757; Pre-Fire Plan Radwaste Building; Revision 0
- PFP-MS-757; Pre-Fire Plan Machine Shop Building; Revision 0
- Drawing FHA-M-03; FHA Plans at Elev 780, 786, 773-6, Sheet 1; Revision 26
- Drawing FHA-M-03; FHA Plans at Elev 780, 786, 773-6, Sheet 2; Revision 26
- STP NS13F006; Structural Steel Fireproofing Inspection; Revision 19

1R06 Flooding (71111.06)

- AOP 902; Flood; Revision 52

1R07 Annual Heat Sink Performance (71111.07)

- WO 1140682; Perform RHR Heat Exchanger 1E201A Heat Transfer Test In Accordance with EMP-1E201-HT
- WO 40116232; 1E201A: Perform RHR Heat Exchanger 1E201A Heat Transfer Test in Accordance with EMP-1E201-HT
- WO 40249611; 1E201B: Perform RHR Heat Exchanger 1E201B Heat Transfer Test in Accordance with EMP-1E201-HT

- STP 3.6.2.1-01; Suppression Pool Water Temperature Surveillance; Revision 8
- EMP-1E201-HT; RHR Heat Exchangers 1E-201A and B Heat Transfer Test; Revision 5
- CR 01655677; Entry Into EOP-2 During HPCI STP 3.5.1-10
- CR 01770302; EOP-2 Entered During HPCI STP
- CR 01785957; Momentary Entry Into EOP-2 On Torus Temperature
- CR 02019784; NRC Resident Concern on HPCI STP and EOP-2 Entry

1R11 Licensed Operator Regualification Program (71111.11)

- Simulator Exercise Guide PDA OPS 2015A-02S; Revision 0

1R12 Maintenance Effectiveness (71111.12)

- Drawing M129-020; Replacement Parts for GPE Model LD240-208 Vacuum Breakers; Revision A
- Drawing M129-002; Vacuum Breakers; Revision 10
- CR 02004238; 2 of 7 Torus Vacuum Breakers Failed During STP 3.6.7-02
- CR 02004239; 2 of 7 Torus Vacuum Breakers Failed During STP 3.6.7-02
- CR 0200812; Issues Pressurizing the Drywell During STP 3.6.1.1-05
- CE 02008124-01; Drywell Vacuum Breakers Failed PMT after Pallet Seal Replacement; January 9, 2015
- Maintenance Rule Criteria Calculation Report – Primary Containment
- Vendor Manual LA-240-265; Instruction Manual for Vacuum Breakers, LD-240-207/208; December 19, 1973
- Equipment Specific Maintenance Procedure; Valve-G202-01, GPE Controls Vacuum Breaker Model LD-240-208; Revision 7
- WO 40198715-01; CV4327B: Remove/Replace Vacuum Breaker Pallet Seal; November 6, 2014
- CR 02021455; Results from Inspection of MO2046 Dual Indication

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

- AOP 903; Severe Weather; Revision 49
- FHA-400; Fire Protection Program; Revision 16
- Administrative Control Procedure 1412.2; Control of Combustibles; Revision 42
- Work Week 1509 Work Activity Risk Management (WARM) Summary and Weekly Probabilistic Risk Analysis (PRA)
- Work Week 1511 WARM Summary and Weekly PRA
- CR 02027600; Wood Found by NRC Inspector Behind 1D41

1R15 Operability Determinations and Functionality Assessments (71111.15)

- EN-AA-203-1001; Operability Determinations/Functionality Assessments; Revision 17
- CR 02021063; 1E237A West End Cover Corrosion
- CR 01960576; “A” Control Building Chiller Condenser Return Head Corrosion
- POD 02021063-01; 1E237A As-Found Corrosion Extent of Condition
- OBD 01960320-06; “A” Chiller Lube Oil Cooler Tube Sheet Corrosion
- USAS B31.1.0; Power Piping; 1967
- ASME Section VIII; UCI-23, Maximum Allowable Stress Values; 1968
- ASME Section VIII; UCI-32, Head with Pressure on Concave Side; 1968

- ASME Section VIII; UG-32, Formed Heads, Pressure on Concave Side; 1968
- BECH-M190<HBD>; Piping Class Summary for Carbon Steel
- CR 02018763; EOP-2 Entry During HPCI STP
- CR 02018806; HPCI Pressure/Flow Changes with no Operator Action
- CR 02018812; V60-0461 Valve Sitting on HPCI Mezzanine
- CR 2021796; Test Results from CV-2315 Under Work Order 40363196
- WO 40363196; SUS 52.00 HPCI Control Non-intrusive Troubleshooting
- GMP-Test-58; Air Operated Valve Diagnostic Testing; Revision 7
- CE 02018806-04; HPCI Pressure and Flow Changes Occurred with No Operator Action
- CR 02023605; 5kV Shielding Issue
- POR 02023605; No Ground Fault Protection with Shielded 5kV Cable for "A" and "C" RHRSW Pumps

1R19 Post-Maintenance Testing (71111.19)

- WO 40287676; 1VAC030B: MA, Inspect and Lubricate Valve
- WO 40337628; PS6931B: Replace Chiller Hi Freon Pressure Safety Switch
- STP 3.7.5-01B; "B" Control Building Chiller Operability; Revision 2
- CR 02028695; 1P227 RCIC Turbine Gland Seal Vacuum Pump Brushes
- CR 02027849; Weld Fails Fit-up Verification NOS/QC Identified
- CR 02027860; 1P227-M Insulation Resistance Readings
- CR 02027871; MO 2516-O Problem Found Under WO 40302501
- CR 02027877; FME Barrier Fell Off During Grinding Work on V24-0062
- CR 02028467; Defect Not Detected During Penetrant Exam Ref CR# 02028331
- CR 02028493; Maintenance Cognitive Trend for Welding During WW1508 Work
- CR 02028597; RCIC Vacuum Pump 1P227 Did Not Run During Maintenance Run
- CR 02028648; Null Voltage Found Low Out of Spec
- OI 150; Reactor Core Isolation Cooling System; Revision 79
- CR 02021796; Test Results from CV2315 Under Work Order 40363196
- CR 02025548; HPCI Test Return Valve Air Regulator Pressure Setpoint
- CR 02022508; Unable to Start "A" SBDG in Manual

1R22 Surveillance Testing (71111.22)

- STP 3.3.1.1-11; Discharge Volume High Water Level Calibration (RTDS); Revision 12
- STP 3.3.6.1-44; HPCI Steam Line High Differential Pressure Instrument Channel Calibration; Revision 10
- STP 3.5.1-05; HPCI System Operability Test; Revision 68
- NS540003; "A" Emergency Service Water Operability Test and Comprehensive Pump Test; Revision 23
- STP 3.8.1-06A; "A" Standby Diesel Generator Operability Test (Fast Start); Revision 19

1EP2 Alert and Notification System Evaluation (71114.02)

- FEMA-43/REP-10; An Offsite Emergency Plan Prompt Alert and Notification System Addendum for Duane Arnold; November 1985
- EPDM 1013; Emergency Siren (ANS) and Siren Sign Program; Revision 14
- GMP-ELEC-34; Annual Siren Inspection and Testing; Revision 2
- 2013-2014 Siren Replacement Tracker
- CR 01916547; Siren Inspection Frequency Reduction

- CR 01970051; Siren 10C (2018) Did Not Respond Correctly
- CR 01975599; Siren 20C (1019) Did Not Respond

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03)

- EPDM 1016; ERO Augmentation Drill and Testing Program; Revision 20
- Augmentation Drill Report Form; First Quarter 2014
- Augmentation Drill Report Form; Second Quarter 2014
- Augmentation Drill Report Form; Third Quarter 2014
- Augmentation Drill Report Form; Fourth Quarter 2014
- ERO Drill Key Participation Indicator Report; December 31, 2014
- EP Duty Schedule; February 18, 2015
- DAEC Emergency Response Organization Contact List
- CR 01931708; 1 ER&RD Missed 2-Year Requirement For EMG Refresher
- CR 01931852; Sunday Night ERO Call In Is Missing the Mark

1EP5 Maintenance of Emergency Preparedness (71114.05)

- DAEC Emergency Plan; Revision 37
- EPIP 6.1; Drill and Exercise Program; Revision 5
- EPIP 6.2; Maintenance of Emergency Response Facilities and Equipment; Revision 5
- PDA 13-005; DAEC Nuclear Oversight Report; July 26, 2013
- PDA 14-008; DAEC Nuclear Oversight Report; July 25, 2014
- CR 02012236; QHSA for NRC Program Inspection
- NEP 2013-0022; 2013-10-02 Drill Report
- NEP 2014-0015; 2013-10-30 Drill Report
- NEP 2014-0006; 2014-03-05 Drill Report
- NEP 2014-0007; 2014-04-09 Exercise Report
- NEP 2014-0014; 2014-05-15 Drill Report
- NEP 2014-0023; 2014-07-30 Drill Report
- EPDM 1020; Actual Event Investigation; Revision 3
- CR 01916551; EP Drill, Missed DEP Opportunity
- CR 01916733; EP Drill, DEP Trend
- CR 01945816; Beyond Design Bases Portable EDG Unavailable
- CR 01945982; EAL HG1.2 Bases Confusion
- CR 01956576; Two Person Rule Confusion
- CR 01966085; EP Drill, Accountability Issue
- CR 01979124; Inconsistent EP Work Activities
- CR 01979130; Hospital Training Request
- CR 01979132; Offsite Interface Concerns
- CR 01981287; EP Drill, NRC Late Notification
- CR 01981325; EP Drill, Release Status and Action Issue
- CR 01981398; EP Drill, NRC Late Notification
- CR 02019572; 06/30/2014 Wind Speed Event

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls (71124.02)

- ALARA Package for C1; Scaffolds In Drywell And Balance Of Plant
- ALARA Package for E1/I1; MOVs/AOVs – Motor Operated Valves/Air Operated Valves; Inspect, Repair, Overhaul, Lube & Inspect, Dynamic Testing

- ALARA Package for MH; Torus Proper/CST Work In Including Diving For Cleaning and Coating Inspections. Transport of Vacuum Filters.
- ALARA Package for S1S2; ISI and FAC Exams and Support
- DAEC 5-Year ALARA Plan 2014-2018; Revision 1
- RP-AA-104; ALARA Program; Revision 3
- RP-AA-104-1000; ALARA Implementing Procedure; Revision 5
- RP-AA-104-1000-F02; Pre-Job ALARA Review; Various Dates
- RP-AA-104-1000-F04; Post-Job ALARA Review; Various Dates
- RP-AA-104-1000-F03; Job In Progress ALARA Review; Various Dates
- ACE 02019872; RF024 Scaffold Dose Variance; February 16, 2015
- CR 02005076; Lessons Learned 2012/2014 RFO LPCI Flow Test Good
- CR 02000093; RFO24 ALARA: E1 Project Exceeded 125% of Dose Estimate
-

2RS4 Occupational Dose Assessment (71124.04)

RP-AA-101; Personnel Monitoring Program; Revision 0

4OA1 Performance Indicator Verification (71151)

- EPIP 1.1; Determination of Emergency Action Levels; Revision 29
- EPIP 1.2; Notifications; Revision 46
- EPIP 3.3; Dose Assessment and Protective Action; Revision 32
- EPDM 1010; EP Department Performance Indicators; Revision 23
- NRC Performance Indicator Data; Unplanned Scrams per 7000 Critical Hours; 1st Quarter 2014 through 4th Quarter 2014
- NRC Performance Indicator Data; Unplanned Scrams with Complications; 1st Quarter 2014 through 4th Quarter 2014
- NRC Performance Indicator Data; Unplanned Power Changes per 7000 Critical Hours; 1st Quarter 2014 through 4th Quarter 2014
- NRC Performance Indicator Data; Emergency Preparedness – Drill/Exercise Performance; 1st Quarter 2014 through 4th Quarter 2014
- NRC Performance Indicator Data; Emergency Preparedness – ERO Readiness; 1st Quarter 2014 through 4th Quarter 2014
- NRC Performance Indicator Data; Emergency Preparedness – Alert and Notification System Reliability; 1st Quarter 2014 through 4th Quarter 2014
-

4OA2 Identification and Resolution of Problems (71152)

- PI-AA-204; Condition Identification and Screening Process; Revision 24

4OA5 Other Activities

- WO 40325719-01; EC282081 Determ Cables Associated with Conduit 2K235
- WO 40325719-02; EC282081 Remove Cables Associated with Conduit 2K235
- WO 40325719-03; EC282081 Pull Innerduct/Cables/Test Associated with Conduit 2K235
- WO 40325719-04; EC282081 Term Cables Associated with Conduit 2K235
- WO 40325715-03; EC282081 Pull Innerduct/Cables/Test Associated with Conduit 2K231
- WO 40325716-03; EC282081 Pull Innerduct/Cables/Test Associated with Conduit 2K232
- WO 40325717-03; EC282081 Pull Innerduct/Cables/Test Associated with Conduit 2K233
- WO 40325718-03; EC282081 Pull Innerduct/Cables/Test Associated with Conduit 2K234

- WO 40325715-04; EC282081 Terminate Multi Cables Associated with 2K231
- WO 40325716-04; EC282081 Terminate Multi Cables Associated with 2K232
- WO 40325717-04; EC282081 Terminate Multi Cables Associated with 2K233
- WO 40325718-04; EC282081 Re-Term Cable 2A0411-C at 4KV SWGR 1A411 and Panel 1C94
- WO 40325719-04; EC282081 Re-Term Cable 2A0411-D at 4KV SWGR 1A411 and Panel 1C94
- SL-012470; Revision 0; Engineering Evaluation For Use of Innerduct As a Sleeve For Conduit
- SL-012481; Revision 0, Cable Sizing Evaluation for Standby Transformer and Diesel Generators Power Cables
- EC 282080; Revision 0; Design Change Package Form Standby Transformer Conduits
- EC 282081; Revision 1; Design Change Package Form Stand-By Diesel Generators Conduits
- CR 01988838; Reevaluate Cable Testing for Cables in Innerduct
- CR 01998033; Need Better Communication Devices for EDG Cable Work
- CR 01998068; Revise EC 282081
- CR 01998257; WO Tasks Set to Ready with Information Missing
- CR 01998301; Wetted Cable Conduit 2K232 Cleaning Results
- CR 01998319; Conduit 1A111 Inspection Results
- CR 01998329; Leads Lifted with No Verification
- CR 01998493; Quality of Work Instruction Steps – Innerduct WOs
- CR 01998575; Wetted Cable Project – 2K231 Inner Duct Stuck
- CR 01998596; Wetted Cable Project – WO Steps NA’ed Without Proper Approval
- CR 01998600; Four Innerducts Stuck in Conduit 231
- CR 01998601; Steps NA’ed in Innerduct Installation Work Order
- CR 01998609; Wetted Cable Project – Instantaneous Spikes in Pull Tension
- CR 01998817; Workers on Wetted are not being Allowed to Prepare
- CR 01999104; Innerduct Installation Issues
- CR 01999120; Steps Added to Work Orders Not per the Work Process – QC Identified
- CR 01999389; Not All Cable Data Pull Sheets in WO

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
ALARA	As-Low-As-Is-Reasonably-Achievable
ANS	Alert and Notification System
CAP	Corrective Action Program
CBC	Control Building Chiller
CFR	Code of Federal Regulations
CR	Condition Report
CRDM	Control Rod Drive Mechanism
DAEC	Duane Arnold Energy Center
DEP	Drill and Exercise Performance
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ERO	Emergency Response Organization
HDPE	High Density Polyethylene
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
LPCI	Low Pressure Coolant Injection
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NOUE	Notification of Unusual Event
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
REIRS	Radiation Exposure Information and Reporting System
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SBDG	Standby Diesel Generator
SL	Severity Level
SSC	Systems, Structures, and Components
STP	Surveillance Test Procedure
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WO	Work Order

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Sincerely,

/RA/

J. McGhee, Acting Chief
Branch 1
Division of Reactor Projects

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