



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

August 14, 2014

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

**SUBJECT: RE-ISSUED INSPECTION REPORT: DUANE ARNOLD ENERGY CENTER  
NRC INTEGRATED INSPECTION REPORT 05000331/2014003**

Dear Mr. Vehec:

On August 11, 2014, the U.S. Nuclear Regulatory Commission (NRC) issued Inspection Report 05000331/2014003 and this report is publicly available under Agencywide Documents Access and Management System (ADAMS) Accession Number ML14224A150. After the inspection report was issued, the NRC identified that the cross-cutting aspect information for one of the findings (non-cited violation (NCV) 05000331/2014003-03) was incorrect. The cover letter and the enclosed inspection report are being re-issued to correct the inspection record.

On June 30, 2014, the U.S. NRC completed an integrated inspection at your Duane Arnold Energy Center. The enclosed report documents the results of this inspection, which were discussed on July 21, 2014, with you and other members of your staff.

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

Sincerely,

**/RA/**

Christine Lipa, Chief  
Branch 1  
Division of Reactor Projects

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

Enclosure:  
Inspection Report 05000331/2014003  
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: 05000331/2014003

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: April 1 through June 30, 2014

Inspectors: L. Haeg, Senior Resident Inspector  
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Branch 1  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

Inspection Report 05000331/2014003; 04/01/2014 – 06/30/2014, Duane Arnold Energy Center; Maintenance Effectiveness, Operability Determinations and Functionality Assessments, and Identification and Resolution of Problems.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Three Green findings were identified by the inspectors. The findings were considered non-cited violations (NCVs) of Nuclear Regulatory Commission (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 (SDP)," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas" effective date January 1, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated July 9, 2013. 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.

### **NRC-Identified and Self-Revealed Findings**

#### **Cornerstone: Initiating Events**

- **Green.** The inspectors identified a finding of very low safety significance (Green) and associated non-cited violation of Duane Arnold Energy Center (DAEC) Renewed Operating License Condition 2.C.(3), for the failure to implement compensatory measures for non-functional fire suppression deluge systems. Specifically, the licensee did not establish hourly fire patrols within 1 hour of discovering the non-functional status of deluges 3 and 4 in accordance with Technical Requirements Manual (TRM) Limiting Condition for Operation (TLCO) 3.11.4, "Fire Suppression Deluge and Sprinkler Systems," Condition A.2. The licensee documented the issue in the corrective action program (CAP) as condition reports (CRs) 01959153, 01964875, 01964878, 01968702, 01968720 and 01971501; and implemented fire patrols until the deluge systems were satisfactorily tested per TRM requirements.

The performance deficiency was determined to be more than minor and a finding in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because it impacted the Reactor Safety - Initiating Events Cornerstone of Protection Against External Factors to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors also determined that if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. The inspectors applied IMC 0609, Attachment 4, "Initial Characterization of Findings," to this finding. The inspectors answered "Yes" to question E.2(2), "Does the finding involve fixed fire protection systems or the ability to contain a fire within Table 3 – SDP Appendix Router," and transitioned to IMC 0609, Appendix F, "Fire Protection Significance Determination Process." The inspectors processed the finding in accordance with Fire Protection SDP Phase 1 Screening in IMC 0609, Appendix F, Attachment 1 and answered "Yes" to Step 1.3, Task 1.3.1 question, "Is the reactor able to reach and maintain safe shutdown (either hot or cold) condition?" Therefore, the finding screened as very low safety significance (Green).

The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Consistent Process in the Human Performance area and involving individuals using a consistent, systematic approach to make decisions. [H.13] (Section 1R15.1)

#### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a finding of very low safety significance (Green) and associated non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to prescribe a procedure appropriate to the circumstances for work order planning as related to the failure of under-voltage relay 127-SB2. Specifically, procedure MA-AA-203-1001, "Work Order Planning," Section 4.2, Step 2, inappropriately allowed the selection of model work orders without verification of the acceptance criteria, requirements for as-found/as-left data, set points, and other related information. The issue was entered into the licensee's CAP for resolution as CRs 01972812 and 01972807; and the licensee took actions to add a verification step to procedure MA-AA-203-1001, Section 4.2, Step 2, to verify the procedure being referenced contained the relevant information to the work task being accomplished.

The inspectors determined that the issue of concern represented a performance deficiency because it was the result of the licensee's failure to prescribe a procedure appropriate for the circumstances. The performance deficiency was determined to be more than minor and a finding in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. The inspectors applied IMC 0609, Attachment 4, "Initial Characterization of Findings," to this finding. The inspectors answered "No" to all questions within Table 3 – SDP Appendix Router, and transitioned to IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power." Per Exhibit 2 – Mitigating Systems Screening Questions, the inspectors determined that because the finding did not represent an actual loss of function (redundant loss of power instrumentation remained operable during the period of the 127-SB2 inoperability), the finding screened as very low safety significance (Green).

The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Evaluation in the Problem Identification and Resolution area and involved the organization thoroughly evaluating issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. [P.2] (Section 4OA2.5)

#### **Cornerstone: Barrier Integrity**

- Green. A finding of very low safety significance and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the licensee's failure to accomplish procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments." Specifically, on multiple occasions but as recently as March 20, 2014, the licensee failed to properly evaluate operability following intermittent downward spikes of the 'A' refueling floor exhaust duct – high radiation monitor (RIS-4131A). The improper operability evaluations

resulted in not declaring RIS-4131A inoperable when appropriate, improper prioritization of investigation of the cause, and untimely resolution of the degraded conditions. The licensee entered the inspectors' concerns into the CAP as CR 01954560. The licensee invoked a policy to properly assess operability in the interim, completed a prompt operability determination (POD) to evaluate intermittent downward spikes, completed a past operability review (POR), and ultimately identified the cause and implemented repairs to RIS-4131A.

The inspectors determined that the issue of concern represented a performance deficiency because it was the result of the licensee's failure to meet a procedural requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because it impacted the Barrier Integrity Cornerstone Attribute of structure, system, and component (SSC) and Barrier Performance, and adversely affected the Cornerstone objective of maintaining containment and radiological barrier functionality. The inspectors applied IMC 0609, Attachment 4, "Initial Characterization of Findings," to this finding. The inspectors answered "No" to all questions within Table 3 – SDP Appendix Router, and transitioned to IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power." Per Exhibit 3 – Barrier Integrity Screening Questions, the inspectors answered "No" to questions B.1 and B.2, and "Yes" to question C.1, therefore, the finding screened as very low safety significance (Green).

The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Human Performance, Consistent Process, and involving individuals using a consistent, systematic approach to make decisions. [H.13] (Section 1R12.1)

### **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) operated at full power for the entire inspection period except for brief down-power maneuvers to accomplish rod pattern adjustments or to conduct planned surveillance testing activities.

#### **1. REACTOR SAFETY**

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

##### **1R01 Adverse Weather Protection (71111.01)**

###### **.1 External Flooding**

###### **a. Inspection Scope**

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Updated Final Safety Analysis Report (UFSAR) for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also walked down underground bunkers/manholes subject to flooding that contained multiple train or multiple function risk-significant cables. The inspectors also reviewed the abnormal operating procedure (AOP) for mitigating the design basis flood to ensure it could be implemented as written. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one external flooding sample as defined in Inspection Procedure (IP) 71111.01–05.

###### **b. Findings**

No findings were identified.

###### **.2 Readiness For Impending Adverse Weather Condition – Extreme Heat/Drought Conditions**

###### **a. Inspection Scope**

The inspectors performed a detailed review of the licensee's procedures and preparations for operating the facility during an extended period of time when ambient outside temperature was high and the ultimate heat sink was experiencing elevated temperatures. The inspectors focused on plant specific design features and implementation of the procedures for responding to or mitigating the effects of these conditions on the operation of the facility's River Water Supply, Emergency Service



Water, Residual Heat Removal Service Water, and electrical substation systems. Inspection activities included a review of the licensee's adverse weather procedures, daily monitoring of the off-normal environmental conditions, and that operator actions specified by plant specific procedures were appropriate to ensure operability of the facility's normal and emergency cooling systems. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one readiness for impending adverse weather condition sample as defined in 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:

- 'B' Control Building Chiller (CBC) subsystem with the 'A' CBC subsystem out of service for planned maintenance (PM);
- Intake Structure Ventilation System; and
- SCRAM Discharge Volume 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, the UFSAR, Technical Specification (TS) requirements, outstanding work orders (WOs), 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 corrective action program (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These inspections constituted three quarterly partial system walkdown samples 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:

- Pre-Fire Plan (PFP) -RB-757; "Pre-Fire Plan Reactor Building El. 757," Revision 0;
- PFP-RB-812; "Pre-Fire Plan Reactor Building El. 812," Revision 0;
- PFP-TB-780; "Pre-Fire Plan Turbine Building El. 780," Revision 0;
- PFP-RB-828; "Pre-Fire Plan Reactor Building El. 828," Revision 0; and
- PFP-RB-855; "Pre-Fire Plan Reactor Building El. 855," Revision 0.

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 five routine resident inspector tour samples as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Underground Vaults

a. Inspection Scope

The inspectors selected underground bunkers/manholes subject to flooding that contained cables whose failure could disable risk-significant equipment. The inspectors determined whether any cables were submerged, that splices were intact, and that appropriate cable support structures were in place. In those areas where dewatering

devices were used, such as a sump pump, the inspectors determined whether the device was functional and level alarm circuits were set appropriately to ensure that the cables would not be submerged. In those areas without dewatering devices, the inspectors verified that drainage of the area was available, or that the cables were qualified for submergence conditions. The inspectors also reviewed the licensee's corrective action documents with respect to past submerged cable issues identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following underground bunkers/manholes subject to flooding:

- Manholes 1MH104, 105, 106, and 107.

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

This inspection constituted one underground vaults sample as defined in IP 71111.06–05.

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 June 2, 2014, 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 crew's 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.

b. Findings

No findings were identified.

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

a. Inspection Scope

On May 20, 2014, the inspectors observed a crew of licensed operators during the performance of a downpower evolution to perform a rod pattern adjustment. 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 during periods 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:

- Intake Structure Ventilation system;
- Area and Process Radiation Monitors; and
- Safety-Related Electrical Relays for the Standby and Start-Up Transformers.

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

(1) Failure to Accomplish Procedure for Repetitive Malfunctions of Refuel Floor Radiation Monitor

Introduction: A finding of very low safety significance and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the licensee's failure to accomplish procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments." Specifically, on multiple occasions but as recently as March 20, 2014, the licensee failed to properly evaluate operability of intermittent downward spikes of the 'A' refueling floor exhaust duct – high radiation monitor (RIS-4131A). The improper operability evaluations resulted in not declaring RIS-4131A inoperable when appropriate, improper prioritization of investigation of the cause, and untimely resolution of the degraded conditions.

Description: On February 21, 2014, operators in the main control room received an unexpected alarm associated with the 'A' refueling floor exhaust duct – high radiation monitor (RIS-4131A). Upon further investigation, the licensee determined that a downscale condition had occurred on the radiation monitor and the condition was spurious, in that following a reset of the alarm, the downscale condition cleared. The licensee documented the downscale condition in the CAP as CR 01942767, documented that "there is reasonable assurance that RIS-4131A remains able to perform its safety function, therefore, RIS-4131A is operable," and the CR was closed to trending.

During the week of March 3, 2014, the inspectors reviewed the extent of the downscale conditions for RIS-4131A over the prior year. The inspectors noted five prior CRs dating back to April of 2013 that documented similar spurious downscale alarms for RIS-4131A. For each occurrence, the downscale alarm was reset, the radiation monitor was verified to be indicating normally after the alarm reset and during the daily "channel check", and the CRs were closed to trend. However, following a downscale occurrence in October of 2013, the licensee generated a trend CR that documented the ongoing issues with

downscale alarms from RIS-4131A, and generated a condition evaluation to determine why prior work orders performed to correct the downscale conditions had not been effective. In November of 2013, DAEC Nuclear Oversight generated a CR also recognizing the station's inability to correct the unknown condition with the radiation monitor that was resulting in the repetitive downscale alarms.

Following additional downscale conditions on March 20 and April 1, 2014; and the inspector's recollection that Revision 16 was made to licensee procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," on February 11, 2014, the inspectors questioned the licensee's closing to trend downscale conditions of RIS-4131A. In particular, the inspectors noted that EN-AA-203-1001 was revised to require more rigorous, systematic, and consistent operability/functionality/reportability (OFR) screenings and immediate operability determinations (IODs) for all CRs involving TS SSCs. The inspectors were concerned that the licensee was not: 1) ensuring that the periodic inoperable conditions of the radiation monitor were being properly evaluated under EN-AA-203-1001, 2) recognizing that a degraded condition existed with RIS-4131A, and 3) establishing the appropriate timeliness of resolution.

Specifically, EN-AA-203-1001, Section 4.1.2 required in part, that "if the shift manager receives notice that a SSC described in the current licensing basis is affected by a degraded condition, the shift manager shall: perform the OFR screening using instructions in Section 4.2." Section 4.2.1.1 of EN-AA-203-1001 required, in part, that "the shift manager shall perform the OFR screening of CRs that identify a degraded condition." Attachment 1 of EN-AA-203-1001, "OFR Screening," required in part, that the required action for degraded conditions of TS SSCs is to perform an IOD. The inspectors determined that the March 20 and April 1, 2014, downscale conditions of RIS-4131A represented a degraded condition for RIS-4131A, and OFR and IOD screenings had not been performed. In particular, EN-AA-203-1001, Section 4.3.1 required in part, that "if the condition affects a TS SSC, the shift manager shall complete the IOD without delay and in a controlled manner using the best available information," and Section 4.3.6 required in part, that "the shift manager prepares the IOD using the guidance in EN-AA-203-1001-F04, "AR Operability Notes Worksheet," to determine the IOD content." Additionally, Section 4.3.9 required in part, that "if the IOD raises a question of past operability, then the shift manager shall request a prompt operability determination (POR)."

Based on the inspector's questions/concerns above, the licensee generated CR 001954560 on April 3, 2014. Corrective actions included invoking a policy to properly assess operability until final corrective actions were taken (logging of TS LCO 3.3.6.1, "Primary Containment Isolation Instrumentation," and 3.3.6.2, "Secondary Containment Isolation Instrumentation," entries during momentary inoperable conditions), completing a prompt operability determination (POD) to evaluate operability of the instrument and to evaluate for compensatory measures (RIS-4131A was determined to be operable but degraded), and completing a past operability review. Based on determining that RIS-4131A was operable but degraded, the station elevated and prioritized investigation into the cause of the downward spikes, and ultimately identified the cause and implemented repairs to RIS-4131A.

Analysis: The inspectors determined that the issue of concern represented a performance deficiency because it was the result of the licensee's failure to meet procedural requirements, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented.

The performance deficiency was determined to be more than minor and a finding because it impacted the Barrier Integrity Cornerstone Attribute of SSC and Barrier Performance, and adversely affected the Cornerstone objective of maintaining containment and radiological barrier functionality. Specifically, the degraded condition of RIS-4131A adversely impacted defense-in-depth provided by the primary and secondary containment isolation refueling floor exhaust duct – high radiation function.

The inspectors applied Inspection Manual Chapter (IMC) 0609, Attachment 4, "Initial Characterization of Findings," to this finding. The inspectors answered "No" to all questions within Table 3 – 'Significance Determination Process (SDP) Appendix Router, and transitioned to IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power." Per Exhibit 3 – Barrier Integrity Screening Questions, the inspectors answered "No" to questions B.1 and B.2, and "Yes" to question C.1, therefore, the finding screened as very low safety significance (Green).

The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Human Performance, Consistent Process, and involving individuals using a consistent, systematic approach to make decisions. Specifically, on numerous occasions, improper operability decisions were made with respect to intermittent downward spiking of RIS-4131A. By not using the systematic operability process to evaluate the intermittent downward spikes, ongoing malfunctions of RIS-4131A were accepted for an extended period of time. [H.13]

Enforcement: 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 and shall be accomplished in accordance with these instructions.

Contrary to the above, on multiple occasions but as recently as March 20, 2014, the licensee failed to properly accomplish procedure EN-AA-302-1001, "Operability Determinations/Functionality Assessments," Revision 16, following intermittent downward spiking of the 'A' refueling floor exhaust duct – high radiation monitor (RIS-4131A).

Because this violation was of very low safety significance and because the issue was entered into the licensee's CAP as CR 01954560, consistent with Section 2.3.2 of the Enforcement Policy it is being treated as a NCV. **(NCV 05000331/2014003-01, Failure to Accomplish Procedure for Repetitive Malfunctions of Refuel Floor Radiation Monitor).**

#### 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:

- 'B' Standby Diesel Generator (SBDG) unavailability during gasket replacements;
- Cable Spreading Room Suppression system failed surveillance test;
- Technical Requirements Manual (TRM) and TS missed surveillances;
- Work Week 1424 plant risk; and
- Plant risk during Core Spray surveillance testing and Emergency Core Cooling System Instrument PMs.

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 are listed in the Attachment to this report.

These inspections constituted five maintenance risk assessment 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)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Standby Liquid Control tank foreign material issue;
- SCRAM Discharge Volume High Water Level Calibration (Float Switches), LS1861D (Reactor Protection System (RPS) Channel B2) found to be high out of the TS-required calibration value;
- Fire Protection System Deluge 3 & 4 lack of TRM surveillance test; and
- Alternate Depressurization System accumulator sizing issue.

The inspectors selected these potential operability/functionality 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 or functionality was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability, functionality and design criteria in the appropriate sections of the TS, TRM, and UFSAR to the licensee's evaluations to determine whether the components or systems were



operable or functional. Where compensatory measures were required to maintain operability or functionality, 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 and functionality evaluations.

Documents reviewed are listed in the Attachment to this report.

These inspections constituted four operability evaluation samples as defined in IP 71111.15–05.

b. Findings

(1) Failure to Establish Fire Patrols as Compensatory Actions in Accordance with the Fire Protection Program

Introduction: The inspectors identified a finding of very low safety significance (Green) and associated NCV of DAEC Renewed Operating License Condition 2.C.(3), for the failure to implement compensatory measures for non-functional fire suppression deluge systems. Specifically, the licensee did not establish hourly fire patrols within 1 hour of discovering the non-functional status of deluges 3 and 4 in accordance with TRM TLCO 3.11.4, “Fire Suppression Deluge and Sprinkler Systems,” Condition A.2.

Description: On March 6, 2014 the licensee transitioned their fire protection program to National Fire Protection Association (NFPA) 805, “Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants,” 2001 Edition. As part of the transition analysis, the licensee documented in FHA-200, “Fire Protection Design Documentation,” Appendix F, “Fire Safety Analysis,” that deluge systems 3 and 4, associated with Reactor Feedwater Pumps 1P-1B and 1P-1A, respectively, had been determined to be of high safety significance in the event of a fire. Being of high safety significance, controls and testing requirements for deluge systems 3 and 4 were incorporated into TRM Section 3.11.4, “Fire Suppression Deluge and Sprinkler Systems,” for periodic testing to ensure functionality. In accordance with Technical Surveillance Requirement (TSR) 3.11.4.4, these deluges were required to be air flow tested on 36 month basis.

On April 17, 2014 while reviewing License Renewal Interim Staff Guidance LR-ISG-2012-02, “Aging Management of Internal Surfaces, Fire Water Systems, Atmospheric Storage Tanks, and Corrosion Under Insulation,” the licensee discovered that procedures did not exist for air flow testing of deluges 3 and 4. Prior to transition to NFPA 805, under 10 CFR 50, Appendix R, these deluges were not required to be air flow tested at any point. Therefore, prior to April 17, 2014, fire suppression deluges 3 and 4 had never been air flow tested. The licensee determined that because no physical impairment was apparent for the deluges, there existed a reasonable expectation of functionality. The licensee declared the TSR 3.11.4.4 missed and invoked TSR 3.0.3 to perform a risk assessment for the missed surveillance and manage the risk impact until the next available window to air flow test the deluges.

In part, TSR 3.0.3 stated that, “if it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the TLCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever was greater. This delay period is permitted to allow performance of the Surveillance. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed.” On May 9, 2014, the resident inspectors challenged the licensee’s use of TSR 3.0.3 to delay the performance of air flow testing based on IMC 0326, Appendix A, Section A.03 that stated, in part, “Surveillance Requirement 3.0.3 may not be applied when a licensee discovers that a Technical Specification’s surveillance has never been performed. In cases where a specified safety function or a necessary and related support function required for operability has never been performed, then a reasonable expectation of operability does not exist.” Although the statement referred to the Technical Specifications, the inspectors determined that the IMC 0326 statement also applied to the TRM TSRs after discussions with the NRC Technical Specification Branch.

On May 29, 2014, the licensee directed that a Condition Evaluation be performed to determine the use of TSR 3.0.3 and its appropriateness to the circumstances and further directed that a functionality assessment be performed. On June 10, 2014, the licensee’s Condition Evaluation confirmed that use of TSR 3.0.3 was not appropriate given TSR 3.11.4.4 air flow testing for deluge systems 3 and 4 had never been performed (i.e. not “missed”). The inspectors noted that TSR 3.0.1 stated, in part, that “TSRs shall be met during the MODES or other specified conditions in the Applicability for individual TLCOs, unless otherwise stated in the TSR. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the TLCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the TLCO except as provided in TSR 3.0.3.” On June 10, 2014, the licensee declared fire suppression deluge systems 3 and 4 non-functional, entered TLCO 3.11.4, Condition A and established hourly fire watches in the Reactor Feedwater Pump area. See Section 4OA7 of this report that provides additional background information for a Licensee-Identified Violation associated with this issue.

The issues were documented in CRs 01959153, 01964875, 01964878, 01968702, 01968720 and 01971501. Corrective actions included establishing procedures to air flow test the systems and prompted changes to EN-AA-203-1001, “Operability Determinations/Functionality Assessments,” to add clarification that a missed surveillance is not the same as a surveillance that has never been performed. On July 4, 2014, the licensee successfully tested, in accordance with the approved procedures, and restored functionality of the automatic fire suppression deluge systems 3 and 4.

Analysis: The inspectors determined that the issue of concern represented a performance deficiency because it was the result of the licensee’s failure to establish an hourly fire patrol in accordance with TLCO 3.11.4 required action Condition A.2. Specifically, on May 9, 2014, the inspectors raised the question about the licensee invoking TSR 3.0.3 and performing a risk assessment associated with a system which had never been tested before, where a reasonable expectation of functionality did not exist. The performance deficiency was within the licensee’s ability to foresee and correct and should have been prevented because the licensee had a process in place to

address the status of the deluge system 3 and 4 functionality through the Operability Determination/Functionality Assessment procedure.

The performance deficiency was determined to be more than minor and a finding in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because it impacted the Reactor Safety - Initiating Events Cornerstone of Protection Against External Factors to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors also determined that if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern.

The inspectors applied IMC 0609, Attachment 4, "Initial Characterization of Findings," to this finding. The inspectors answered "Yes" to question E.2(2), "Does the finding involve fixed fire protection systems or the ability to contain a fire within Table 3 – SDP Appendix Router," and transitioned to IMC 0609, Appendix F, "Fire Protection Significance Determination Process." The inspectors processed the finding in accordance with Fire Protection SDP Phase 1 Screening in IMC 0609, Appendix F, Attachment 1 and answered "Yes" to Step 1.3, Task 1.3.1 question, "Is the reactor able to reach and maintain safe shutdown (either hot or cold) condition?" Therefore, the finding screened as very low safety significance (Green).

The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Consistent Process in the Human Performance area and involving individuals using a consistent systematic approach to make decisions. Specifically, the licensee did not systematically consider and apply the aforementioned TRM statements and EN-AA-203-1001 procedure (which establishes a process consistent with IMC 0326) in order to correctly assess the non-functional status of deluges 3 and 4 upon discovery that TSR 3.11.4.4 was never performed. [H.13]

Enforcement: Duane Arnold Energy Center Renewed Operating License Condition 2.C.(3), "Fire Protection Program," stated, in part that "Duane Arnold shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c)." Fire protection program procedure FP-AB-100, "DAEC Fire Protection Program", section 3.4.4(3), stated in part, that for NFPA 805 credited Fire Protection System and Features, TLCOs and compensatory measures were prescribed by the TRM.

Contrary to the above, on April 17, 2014, the licensee failed to institute compensatory measures for non-functional fire suppression deluge systems as required by Duane Arnold Energy Center Renewed Operating License Condition 2.C.(3). Specifically, the licensee did not establish an hourly fire patrol within 1 hour of discovering the non-functional status of deluges 3 and 4 in accordance with TRM TLCO 3.11.4, "Fire Suppression Deluge and Sprinkler Systems," Condition A.2.

Because this violation was of very low safety significance and because the issue was entered into the licensee's CAP as CRs 01959153, 01964875, 01964878, 01968702, 01968720 and 01971501, consistent with Section 2.3.2 of the Enforcement Policy it is being treated as a NCV. **(NCV 05000331/2014003-02, Failure to Establish Fire Patrols as Compensatory Actions in Accordance with the Fire Protection Program).**

## 1R18 Plant Modifications (71111.18)

### a. Inspection Scope

The inspectors reviewed the following modification:

- 'A' Control Building Chiller (CBC) condenser head replacement following discovery of internal surface pitting during PM.

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screening against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system. The inspectors, as applicable, observed ongoing and completed work activities to ensure that the modification was installed as directed and consistent with the design control documents; the modification operated as expected; post-modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modification did not impact the operability of any interfacing systems. As applicable, the inspectors verified that relevant procedure, design, and licensing documents were properly updated. Lastly, the inspectors discussed the plant modification with operations, engineering, and training personnel to ensure that the individuals were aware of how the operation with the plant modification in place could impact overall plant performance.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted one modification sample as defined in IP 71111.18–05.

### 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:

- 'A' CBC testing following PM;
- Low Pressure Coolant Injection (LPCI) system testing following PM;
- 'B' SBDG testing following ventilation system PM; and
- Reactor Core Isolation Cooling (RCIC) testing following PM.

These activities were selected based upon the structure, system, or component's 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.

These inspections constituted four 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:

- Surveillance Test Procedure (STP) 3.0.0-01, "Instrument Checks," Revision 142 reactor coolant system (RCS);
- STP 3.3.6.1-32; "RCIC Exhaust Diaphragm Channel Functional Test," Revision 4 (Routine);
- STP 3.5.3-02; "RCIC System Operability Test," Revision 46 (Routine);
- STP 3.5.1-01B; "B Core Spray System Operability Test," Revision 15 (in-service test (IST));
- STP 3.3.1.1-13; "Turbine Control Valve EOC RPT Logic & RPS Instrumentation Functional Test," Revision 15 (Routine);
- STP 3.5.1-02A; "A LPCI System Operability Tests," Revision 14 (Routine); and
- STP 3.5.1-03A; "A Core Spray System Simulated Automatic Actuation," Revision 9 (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.

These inspections constituted five routine samples, one in-service test sample, and one reactor coolant system leak detection surveillance testing inspection sample, as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstones: Occupational and Public Radiation Safety**

2RS5 Radiation Monitoring Instrumentation (71124.05)

This inspection constituted a partial sample as defined in IP 71124.05–05.

.1 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down effluent radiation monitoring systems, including at least one liquid and one airborne system. Focus was placed on flow measurement devices and all

accessible point-of-discharge liquid and gaseous effluent monitors of the selected systems. The inspectors assessed whether the effluent/process monitor configurations aligned with Offsite Dose Calculation Manual (ODCM) descriptions and observed monitors for degradation and out-of-service tags.

b. Findings

No findings were identified.

.2 Calibration and Testing Program (02.03)

Process and Effluent Monitors

a. Inspection Scope

The inspectors selected effluent monitor instruments (such as gaseous and liquid) and evaluated whether channel calibration and functional tests were performed consistent with radiological effluent TSs/ODCM. The inspectors assessed whether: (a) the licensee calibrated its monitors with National Institute of Standards and Technology traceable sources; (b) the primary calibrations adequately represented the plant nuclide mix; (c) when secondary calibration sources were used, the sources were verified by the primary calibration; and (d) the licensee's channel calibrations encompassed the instrument's alarm set-points.

The inspectors assessed whether the effluent monitor alarm setpoints were established as provided in the ODCM and station procedures.

For changes to effluent monitor setpoints, the inspectors evaluated the basis for changes to ensure that an adequate justification existed.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

This inspection constituted one complete sample as defined in IP 71124.06–05.

.1 Inspection Planning and Program Reviews (02.01)

Event Report and Effluent Report Reviews

a. Inspection Scope

The inspectors reviewed the radiological effluent release reports issued since the last inspection to determine if the reports were submitted as required by the ODCM/TSs. The inspectors reviewed anomalous results, unexpected trends, or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, were entered in the CAP, and were adequately resolved.

The inspectors selected radioactive effluent monitor operability issues reported by the licensee as provided in effluent release reports, to review these issues during the onsite

inspection, as warranted, given their relative significance and determine if the issues were entered into the CAP and adequately resolved.

b. Findings

No findings were identified.

Offsite Dose Calculation Manual and Final Safety Analysis Report Review

a. Inspection Scope

The inspectors reviewed UFSAR descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths so they could be evaluated during inspection walkdowns.

The inspectors reviewed changes to the ODCM made by the licensee since the last inspection against the guidance in NUREG-1302 and 0133, and Regulatory Guides 1.109, 1.21, and 4.1. When differences were identified, the inspectors reviewed the technical basis or evaluations of the change during the onsite inspection to determine whether they were technically justified and maintain effluent releases as-low-as-reasonably-achievable.

The inspectors reviewed licensee documentation to determine if the licensee has identified any non-radioactive systems that have become contaminated as disclosed either through an event report or the ODCM since the last inspection. This review provided an intelligent sample list for the onsite inspection of any 10 CFR 50.59 evaluations and allowed a determination if any newly contaminated systems have an unmonitored effluent discharge path to the environment, whether any required ODCM revisions were made to incorporate these new pathways, and whether the associated effluents were reported in accordance with Regulatory Guide 1.21.

b. Findings

No findings were identified.

Groundwater Protection Initiative Program

a. Inspection Scope

The inspectors reviewed reported groundwater monitoring results and changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater.

b. Findings

No findings were identified.

Procedures, Special Reports, and Other Documents

a. Inspection Scope

The inspectors reviewed Licensee Event Reports, event reports and/or special reports related to the Effluent Program issued since the previous inspection to identify any



additional focus areas for the inspection based on the scope/breadth of problems described in these reports.

The inspectors reviewed Effluent Program implementing procedures, particularly those associated with effluent sampling, effluent monitor set-point determinations, and dose calculations.

The inspectors reviewed copies of licensee and third party (independent) evaluation reports of the Effluent Monitoring Program since the last inspection to gather insights into the licensee's program and aid in selecting areas for inspection review (smart sampling).

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down selected components of the gaseous and liquid discharge systems to evaluate whether equipment configuration and flow paths align with the documents reviewed in Section 02.01 above and to assess equipment material condition. Special attention was made to identify potential unmonitored release points (such as open roof vents in boiling water reactor turbine decks, temporary structures butted against turbine, auxiliary or containment buildings), building alterations which could impact airborne, or liquid effluent controls, and ventilation system leakage that communicates directly with the environment.

For equipment or areas associated with the systems selected for review that were not readily accessible due to radiological conditions, the inspectors reviewed the licensee's material condition surveillance records, as applicable.

The inspectors walked down filtered ventilation systems to assess for conditions such as degraded high-efficiency particulate air/charcoal banks, improper alignment, or system installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

As available, the inspectors observed selected portions of the routine processing and discharge of radioactive gaseous effluent (including sample collection and analysis) to evaluate whether appropriate treatment equipment was used and the processing activities align with discharge permits.

The inspectors determined if the licensee has made significant changes to their effluent release points (e.g., changes subject to a 10 CFR 50.59 review or require NRC approval of alternate discharge points).

As available, the inspectors observed selected portions of the routine processing and discharging of liquid waste (including sample collection and analysis) to determine if appropriate effluent treatment equipment is being used and that radioactive liquid waste is being processed and discharged in accordance with procedure requirements and aligns with discharge permits.

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.03)

a. Inspection Scope

The inspectors selected effluent sampling activities, consistent with smart sampling, and assessed whether adequate controls have been implemented to ensure representative samples were obtained (e.g. provisions for sample line flushing, vessel recirculation, composite samplers, etc.).

The inspectors selected effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to assess whether controls were in place to ensure compensatory sampling was performed consistent with the radiological effluent TSs/ODCM and that those controls were adequate to prevent the release of unmonitored liquid and gaseous effluents.

The inspectors determined whether the facility was routinely relying on the use of compensatory sampling in lieu of adequate system maintenance, based on the frequency of compensatory sampling since the last inspection.

The inspectors reviewed the results of the Inter-Laboratory Comparison Program to evaluate the quality of the radioactive effluent sample analyses and assessed whether the Inter-Laboratory Comparison Program includes hard-to-detect isotopes, as appropriate.

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.04)

Effluent Flow Measuring Instruments

a. Inspection Scope

The inspectors reviewed the methodology the licensee uses to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with radiological effluent TS/ODCM UFSAR values, and that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

b. Findings

No findings were identified.

Air Cleaning Systems

a. Inspection Scope

The inspectors assessed whether surveillance test results since the previous inspection for TS required ventilation effluent discharge systems (high-efficiency particulate air and

charcoal filtration), such as the standby gas treatment system and the containment/auxiliary building ventilation system, met TS acceptance criteria.

b. Findings

No findings were identified.

.5 Dose Calculations (02.05)

a. Inspection Scope

The inspectors reviewed all significant changes in reported dose values compared to the previous radiological effluent release report (e.g., a factor of 5, or increases that approach Appendix I criteria) to evaluate the factors which may have resulted in the change.

The inspectors reviewed radioactive liquid and gaseous waste discharge permits to assess whether the projected doses to members of the public were accurate and based on representative samples of the discharge path.

The inspectors evaluated the methods used to determine the isotopes that are included in the source term to ensure all applicable radionuclides are included within detectability standards. The review included the current Part 61 analyses to ensure hard-to-detect radionuclides are included in the source term.

The inspectors reviewed changes in the licensee's offsite dose calculations since the last inspection to evaluate whether changes were consistent with the ODCM and Regulatory Guide 1.109. The inspectors reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to evaluate whether appropriate factors were being used for public dose calculations.

The inspectors reviewed the latest Land Use Census to assess whether changes (e.g., significant increases or decreases to population in the plant environs, changes in critical exposure pathways, the location of nearest member of the public or critical receptor, etc.) have been factored into the dose calculations.

For the releases reviewed above, the inspectors evaluated whether the calculated doses (monthly, quarterly, and annual dose) are within the 10 CFR Part 50, Appendix I, and TS dose criteria.

The inspectors reviewed, as available, records of any abnormal gaseous or liquid tank discharges (e.g., discharges resulting from misaligned valves, valve leak-by, etc.) to ensure the abnormal discharge was monitored by the discharge point effluent monitor. Discharges made with inoperable effluent radiation monitors, or unmonitored leakages, were reviewed to ensure that an evaluation was made of the discharge to satisfy 10 CFR 20.1501 so as to account for the source term and projected doses to the public.

b. Findings

No findings were identified.

.6 Groundwater Protection Initiative Implementation (02.06)

a. Inspection Scope

The inspectors reviewed monitoring results of the Groundwater Protection Initiative to determine if the licensee implemented its program as intended and to identify any anomalous results. For anomalous results or missed samples, the inspectors assessed whether the licensee identified and addressed deficiencies through its CAP.

The inspectors reviewed identified leakage or spill events and entries made into 10 CFR 50.75 (g) records. The inspectors reviewed evaluations of leaks or spills and reviewed any remediation actions taken for effectiveness. The inspectors reviewed onsite contamination events involving contamination of ground water and assessed whether the source of the leak or spill was identified and mitigated.

- On October 11, 2012, approximately 200 to 700 gallons of radioactively contaminated water leaked to the ground from the Condensate Storage Tank pit through a failed seal. The inspectors reviewed the licensee's notification to the NRC (Event No. 48403), the licensee's ground water monitoring program, completed remediation, as well as the licensee's plan to install additional sample wells for better characterization of the spill.

For unmonitored spills, leaks, or unexpected liquid or gaseous discharges, the inspectors assessed whether an evaluation was performed to determine the type and amount of radioactive material that was discharged by:

- Assessing whether sufficient radiological surveys were performed to evaluate the extent of the contamination and the radiological source term and assessing whether a survey/evaluation had been performed to include consideration of hard-to-detect radionuclides.
- Determining whether the licensee completed offsite notifications, as provided in its Groundwater Protection Initiative implementing procedures.

The inspectors reviewed the evaluation of discharges from onsite surface water bodies that contain or potentially contain radioactivity and the potential for ground water leakage from these onsite surface water bodies. The inspectors assessed whether the licensee was properly accounting for discharges from these surface water bodies as part of their effluent release reports.

The inspectors assessed whether on-site ground water sample results and a description of any significant on-site leaks/spills into ground water for each calendar year were documented in the Annual Radiological Environmental Operating Report for the Radiological Environmental Monitoring Program or the Annual Radiological Effluent Release Report for the Radiological Effluent TSs.

For significant, new effluent discharge points (such as significant or continuing leakage to ground water that continues to impact the environment, if not remediated), the inspectors evaluated whether the ODCM was updated to include the new release points.

b. Findings

No findings were identified.

.7 Problem Identification and Resolution (02.07)

a. Inspection Scope

The inspectors assessed whether problems associated with the Effluent Monitoring and Control Program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. In addition, they evaluated the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving radiation monitoring and exposure controls.

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES**

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

4OA1 Performance Indicator (PI) Verification (71151)

.1 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Leakage performance indicator for the period from the second quarter 2013 through the first quarter 2014. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator logs, RCS leakage tracking data, issue reports, event reports and NRC Integrated Inspection Reports for the period of April, 2013 through March, 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 reactor coolant system leakage sample as defined in IP 71151-05.

b. Findings

No findings were identified.

## .2 Occupational Exposure Control Effectiveness

### a. Inspection Scope

The inspectors reviewed licensee submittals for the Occupational Exposure Control Effectiveness Performance Indicator for the fourth quarter 2013. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 2013, to determine the accuracy of the Performance Indicator data reported during those periods. The inspectors reviewed the licensee's assessment of the Performance Indicator for occupational radiation safety to determine if the indicator-related data was adequately assessed and reported. To assess the adequacy of the licensee's Performance Indicator data collection and analyses, the inspectors discussed with radiation protection staff the scope and breadth of its data review and the results of those reviews. Documents reviewed are listed in the Attachment to this report.

The inspectors reviewed a licensee-identified issue that occurred on October 8, 2013, and was documented as a licensee-identified NCV of TS 5.7.2 in NRC Inspection Report 05000331/2013005. The licensee previously did not report this as a PI occurrence. Upon discussion with the licensee, the licensee has determined that the issue was an occurrence of the Occupational Exposure Control Effectiveness PI in accordance with Nuclear Energy Institute Document 99-02. This licensee has entered this issue into their CAP as CR 01971250. This will result in the change for this PI from zero to one occurrence. This change will not result in a change in regulatory significance to this PI.

This inspection constituted a partial occupational exposure control effectiveness sample as defined in IP 71151-05.

### b. Findings

No findings were identified.

However, the inspectors identified a minor violation of 10 CFR 50.9 "Completeness and Accuracy of information" for one occurrence that was not reported. Specifically, the Occupational Exposure Controls Effectiveness PI occurrence on October 8, 2013 was not initially reported and then not corrected when NRC issued IR 2013-005 as discussed above. Because this results in the change for this PI from zero to one occurrence, and does not result in a change in regulatory significance of this PI, this is considered a minor violation.

## 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. Documents reviewed are listed 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.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6-month period of January 2014 through June 2014, although some examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's

CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This inspection constituted one semi-annual trend inspection sample as defined in IP 71152-05.

b. Findings

No findings were identified.

.4 Annual Sample: Review of Operator Workarounds

a. Inspection Scope

The inspectors evaluated the licensee's implementation of their process used to identify, document, track, and resolve operational challenges. Inspection activities included, but were not limited to, a review of the cumulative effects of the operator workarounds on system availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents.

The inspectors performed a review of the cumulative effects of operator workarounds. The documents listed in the Attachment to this report were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into their CAP and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an Initiating Event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate compensatory actions. Additionally, all temporary modifications were reviewed to identify any potential effect on the functionality of Mitigating Systems, impaired access to equipment, or required equipment uses for which the equipment was not designed. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified operator workarounds.

These inspections constituted one operator workaround annual inspection sample as defined in IP 71152-05.

b. Findings

.5 Selected Issue Follow-Up Inspection: Standby Transformer Relay Root Cause Evaluation

a. Inspection Scope

The inspectors reviewed Root Cause Evaluation (RCE) 01934040, "Under-voltage Relay Failed," associated with the January 17, 2014, surveillance test failure of Standby Transformer under-voltage relay 127-SB2. The inspectors assessed whether the licensee's determination of the root and contributing causes, corrective actions, and



effectiveness measures were appropriate. The finding below describes a finding and violation identified by the inspectors during their review.

This inspection constituted one in-depth problem identification and resolution sample as defined in IP 71152-05.

b. Findings

(1) Failure to Prescribe Work Order Planning Procedure Appropriate to the Circumstances

Introduction: The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to prescribe a procedure appropriate to the circumstances for work order planning as related to the failure of under-voltage relay 127-SB2. Specifically, procedure MA-AA-203-1001, "Work Order Planning," Section 4.2, Step 2, inappropriately allowed the selection of model work orders without verification of the acceptance criteria, requirements for as-found/as-left data, set points, and other related information.

Description: On January 17, 2014, the licensee performed STP 3.3.8.1-05B, "1A4 4KV Emergency Transformer Supply Under-Voltage Calibration." During performance of the STP, two trip circuit contacts on Standby Transformer supply under-voltage relay 127-SB2 did not open as expected. Upon further investigation, the licensee discovered that the 11-12 and 13-14 127-SB2 contacts had been configured incorrectly. The contacts were arranged in series with a third contact 19-20, such that upon a reduction of supply voltage, two contacts would open, but one contact remained closed and would have prevented the relay trip signal from tripping the Standby Transformer supply breaker when voltage reduced to less than 2450 Volts. The function of the 127-SB2 relay was to sense a loss of offsite power, open the Standby Transformer supply breaker, and provide a permissive signal to the 1A4 4KV essential bus to allow the bus to be reenergized by the 'B' SBDG. The contact configuration was such that this function would have been inhibited had it been called upon.

Technical Specification 3.3.8.1, "Loss of Power Instrumentation," required in part, relay 127-SB2 to be operable in Modes 1, 2 and 3. The failed STP on January 17, 2014, demonstrated that the 127-SB2 relay was inoperable and the required action to satisfy the TS was to place the channel in trip within 1 hour of discovery (Condition A.1) and if that was not achieved, declare the associated SBDG inoperable immediately (Condition C.1). Upon the discovery of the inoperable relay, the licensee declared the 'B' SBDG inoperable to comply with LCO 3.3.8.1, Condition C.1. The licensee documented the issue in CR 01934040 and performed a POR. The prompt operability review (POR) noted that relay 127-SB2 had been replaced on September 16, 2013, as part of WO 40126852. Further review noted that no in-field, post-installation functional testing had been performed or identified as part of the WO instructions. Therefore, relay 127-SB2 had been inoperable from September 16, 2013, to January 17, 2014, or 120 days. During this timeframe, the relay miss-configuration had gone unrecognized and the TS required actions unfulfilled, resulting in the licensee operating in a condition prohibited by Technical Specifications. The event was reported by the licensee as Licensee Event Report (LER) 2014-001-00 and 2014-001-01 in accordance with 10 CFR 50.73(a)(2)(i)(B). See Section 4OA3.1 in reference to the above mentioned LERs and Section 4OA7 for an associated licensee-identified violation.

As part of the event analysis called out by CR 01934040, the licensee performed an RCE in accordance with procedure PI-AA-100-1005, "Root Cause Analysis," Revision 9. The RCE identified two root causes and two contributing causes. The first root cause was that existing procedural guidance was inadequate to correctly setup the relay per procedure RELAY-080-08, "General Electric Under-Voltage Relay Type NGV," Revision 10, which WO 40126852 referenced for calibration of relay 127-SB2. The licensee determined that RELAY-080-08 did not define set-point criteria and relay configuration. The corrective action to prevent recurrence was to make changes to RELAY-080-08 to state that when a relay or contact is replaced, the configuration of the relay or contact shall match the installed relay and applicable drawings. Furthermore, the procedure was changed to record allowable dropout voltage as specified in applicable drawings and that a maintenance supervisor or engineer shall verify the correct set-point information.

The second root cause was that existing procedural guidance was inadequate to correctly test the relay per procedure MD-024, "Post Maintenance Testing Program," Revision 23, that stated calibration alone was an adequate post maintenance test for protective relays. The corrective action to prevent recurrence was to modify procedure MD-024 to require at a minimum, return to service testing of TS-required equipment to ensure that functionality and operability requirements are met.

The resident inspectors reviewed the RCE and found the licensee's root and contributing causes, as well as the corrective actions, appropriate to the circumstances with one exception. A contributing cause was identified by the licensee associated with WO planning being inadequate to identify relay configuration and acceptance criteria. The licensee's corrective action to address this contributing cause was to provide a briefing to WO planners that procedure MA-AA-203-1001, Section 4.2 stated, in part that "acceptance criteria, requirements for as-found/as-left data, set points, and other related information must be copied verbatim from the controlled procedure," and that if that requirement was not going to be conducted, the expectation was that the requirements were verified to ensure that the information was in fact contained in the procedure being referenced. Procedure PI-AA-100-1005, Section 4.10, Step 2 stated in part, that "corrective actions should be specific and address each root and contributing cause." Further, Section 4.10, Step 3 stated, in part that "all corrective actions shall be consistent with the "SMART" approach – (Specific, Measurable, Achievable, Relevant, and Timely) (refer to PI-AA-205)." Per procedure PI-AA-205, "Condition Evaluation and Corrective Action," Revision 25, a Relevant corrective action is one in which "the action is aligned with the issue that it is intended to resolve and will correct the problem."

The inspectors questioned the licensee's corrective action to provide a briefing of expectations to WO planners given the apparent procedural weakness in MA-AA-203-1001. Specifically, Section 4.2 of MA-AA-203-1001 provided WO planners with several options/steps that could be used to create work task instructions. The corrective action to address the contributing cause only addressed Option/Step 3 in Section 4.2 but made no reference to Option/Step 2 which stated that "Controlled procedures may be referenced in the work task instructions and included in the work order package." The inspectors were concerned that using Option 2, as it existed, did not ensure that WO planners verify the controlled document referenced contained the appropriate acceptance criteria, as-found/as-left data, set points, and other related information relevant to the circumstances.

The existing procedural error-trap that was not addressed as part of the RCE contributing cause corrective action was documented in CRs 01972812 and 01972807. Condition Report 01972807 specifically added a verification step as part of procedure MA-AA-203-1001, Section 4.2, Step 2, to verify the procedure being referenced contained the relevant information to the work task being accomplished.

Analysis: The inspectors determined that the issue of concern represented a performance deficiency because it was the result of the licensee's failure to prescribe a procedure appropriate for the circumstances. Specifically, on June 18, 2014, procedure MA-AA-203-1001, "Work Order Planning," Section 4.2, Step 2, inappropriately allowed the selection of model work orders without verification of the acceptance criteria, requirements for as-found/as-left data, set points, and other related information. The performance deficiency was within the licensee's ability to foresee and correct and should have been prevented because the licensee had a process in place to appropriately identify, evaluate and correct issues noted as part of the Root Cause Evaluation process.

The performance deficiency was determined to be more than minor and a finding in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, MA-AA-203-1001 was deficient, in that a WO planner could select a model work order without a required verification of the work objectives to ensure correct equipment configuration and functional testing was performed.

The inspectors applied IMC 0609, Attachment 4, "Initial Characterization of Findings," to this finding. The inspectors answered "No" to all questions within Table 3 – SDP Appendix Router, and transitioned to IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power." Per Exhibit 2 – Mitigating Systems Screening Questions, the inspectors determined that because the finding did not represent an actual loss of function (redundant loss of power instrumentation remained operable during the period of the 127-SB2 inoperability), the finding screened as very low safety significance (Green).

The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Evaluation in the Problem Identification and Resolution area and involved the organization thoroughly evaluating issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, the licensee correctly identified the need to ensure work orders either contained appropriate acceptance criteria, as-found/as-left data, set points, and other related information relevant to the circumstances, but failed to fully evaluate the adequacy of the contributing cause corrective action and its applicability to the work order planning procedure as a whole. [P.2]

Enforcement: 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 procedures of a type appropriate to the circumstances.

Contrary to the above, on June 18, 2014, the licensee failed to prescribe a work order planning procedure appropriate for the circumstances. Specifically, procedure MA-AA-203-1001, "Work Order Planning," Revision 1, was not appropriate in that it did

not ensure that appropriate configuration and testing criteria were verified prior to developing work orders.

Because this violation was of very low safety significance and because the issue was entered into the licensee's CAP as CRs 01972812 and 01972807, consistent with Section 2.3.2 of the Enforcement Policy it is being treated as a NCV.

**(NCV 05000331/2014003-03, Failure to Prescribe Work Order Planning Procedure Appropriate to the Circumstances).**

#### 4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

##### .1 (Closed) Licensee Event Report 05000331/2014-001-00 and 05000331/2014-001-01: Condition Prohibited by Technical Specifications – Past Inoperability of Standby Transformer Under-Voltage Relay

This event, which occurred on January 17, 2014, involved the Standby Transformer under-voltage relay 127-SB2 which was found inoperable during surveillance testing and was inoperable since it was replaced on September 16, 2013. See Section 4OA2.5 above for a detailed description of the event and an associated NRC-identified NCV. The inspectors reviewed LERs 05000331/2014001-00 and 05000331/2014001-01 against reporting requirements and found no issues. A licensee-identified violation associated with this event and the enforcement aspects are discussed in Section 4OA7 below. Documents reviewed are listed in the Attachment to this report. These LERs are closed.

This inspection constituted one event follow-up sample as defined in IP 71153–05.

#### 4OA6 Management Meetings

##### .1 Exit Meeting Summary

On July 21, 2014, the inspectors presented the inspection results to Mr. G. Pry, Plant General Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

##### .2 Interim Exit Meetings

An interim exit was conducted for the inspection results for the areas of radiation monitoring instrumentation, radioactive gaseous and liquid effluent treatment, and occupational exposure control effectiveness performance indicator verification with Mr. R. Anderson, Site Vice President, on June 13, 2014. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

#### 4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as NCVs.

- Duane Arnold Energy Center Renewed Operating License Condition 2.C.(3), "Fire Protection Program," stated, in part that "Duane Arnold shall implement and

maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c)."

Contrary to the above, on March 6, 2014, the licensee transitioned their fire protection program to NFPA 805 without having tested or having procedures to test fire suppression deluge systems 3 and 4. Specifically, procedure FP-AB-100, "DAEC Fire Protection Program", Section 3.4.4, stated in part that, "NFPA 805, Section 3.2.3(1) provides the requirements for establishing procedures that address inspection, testing and maintenance for fire protection systems and features credited by NFPA 805." Section 3.4.4(2), stated in part that, "fire protection systems are periodically inspected and tested in accordance with established procedures recommended by equipment manufacturers or by nationally recognized organizations such as the NFPA." Procedure FP-AA-04-1000, "Fire Protection Maintenance, Testing, Impairment and Compensatory Actions," Section 4.2.1.1, stated in part that, "procedures shall be established for any testing on fire protection systems, equipment and features." Section 1R15.1 above provides additional background description for this licensee-identified violation. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," Table 3 – SDP Appendix Router and IMC 0609, Appendix F, Attachment 1, "Fire Protection Significance Determination Process Phase 1 Worksheet." Because the inspectors answered "Yes" to the Step 1.3, Task 1.3.1 question "Is the reactor able to reach and maintain safe shutdown (either hot or cold) condition?" the finding screened as very low safety significance (Green). The licensee documented the issue in CR 01959153; created appropriate testing procedures to demonstrate deluge 3 and 4 functionality, and satisfactorily air flow tested the deluge systems in accordance with approved procedures.

- Technical Specification 3.3.8.1, "Loss of Power Instrumentation," required in part, that if any 4.16 kV emergency bus under-voltage (degraded voltage) channel was inoperable, that the associated Diesel Generator (DG) be declared inoperable within one hour from discovery of loss of initiation capability for feature(s) in one or both divisions as well as placing the channel in trip within 24 hours.

Contrary to the above on September 19, 2013, the licensee failed to declare the 'B' DG inoperable and entered a condition prohibited by TSs. Specifically, WO 40126852 was completed to replace relay 127-SB2, 1A4 4KV Emergency Transformer Supply Under-voltage, due to dirty contacts. However, 127-SB2 was returned to service without post maintenance testing appropriate to the circumstances. This resulted in 127-SB2 being in an inoperable status when the required action to declare the 'B' DG inoperable within one hour was not accomplished. Section 4OA2.5 above provides additional background description for this licensee-identified violation. The licensee documented the conditions prohibited by TSs for relay 127-SB2 in CRs 01934167 and 01934040. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, Initial Characterization of Findings," Table 3 – Appendix Router and IMC 0609 Appendix A, "The Significance Determination Process for Findings At Power," Exhibit 2 – Mitigating Systems Screening Questions. Because the

inspectors answered “No” to all questions in Section A, the finding screened as very low safety significance (Green). Section 4OA2.5 describes the corrective actions taken by the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

R. Anderson, Site Vice President  
G. Pry, Plant General Manager  
K. Kleinheinz, Site Engineering Director  
W. Bentley, Maintenance Director  
M. Davis, Emergency Preparedness and Licensing Manager  
K. Peveler, 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  
C. Casey, Chemistry Supervisor

#### Nuclear Regulatory Commission

C. Lipa, Chief, Reactor Projects Branch 1  
M. Chawla, Project Manager, NRR

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Opened

05000331/2014003-01	NCV	Failure to Accomplish Procedure for Repetitive Malfunctions of Refuel Floor Radiation Monitor (Section 1R12.1)
05000331/2014003-02	NCV	Failure to Establish Fire Patrols as Compensatory Actions in Accordance with the Fire Protection Program (Section 1R15.1)
05000331/2014003-03	NCV	Failure to Prescribe Work Order Planning Procedure Appropriate to the Circumstances (Section 4OA2.5)

### Closed

05000331/2014003-01	NCV	Failure to Accomplish Procedure for Repetitive Malfunctions of Refuel Floor Radiation Monitor (Section 1R12.1)
05000331/2014003-02	NCV	Failure to Establish Fire Patrols as Compensatory Actions in Accordance with the Fire Protection Program (Section 1R15.1)
05000331/2014003-03	NCV	Failure to Prescribe Work Order Planning Procedure Appropriate to the Circumstances (Section 4OA2.5)
05000331/2014-001-00;-01	LER	Condition Prohibited by Technical Specifications – Past Inoperability of Standby Transformer Under-Voltage Relay (Section 4OA3.1)

### 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

AOP 903; Severe Weather; Revision 39  
OP-AA-102-1002; Seasonal Readiness; Revision 4  
AOP 410; Loss of River Water Supply/High River Bed Elevation/Low River Water Depth; Revision 27  
AOP 902; Flood; Revision 51  
Condition Evaluation (CE) 01942883-01; Inventory of Flood Materials per WO 40249718-01 and AOP 902  
CE 01957698-01; Conduct a Rework Evaluation for Rainwater Leaking into the RCIC Room Through Hatch  
CR 01942883; Inventory of Flood Material per WO 40249718-01 and AOP 902  
CR 01949252; Frequency Based PM Needed for Flooding Preps  
CR 01957698; Rainwater Leaking into RCIC Room Through Hatch  
CR 01963290; Storm Drain Entrance Almost Completely Blocked by Gravel  
CR 01969659; Doors, Bottom Seal Improvements Mitigate Potential Water Intrusion  
CR 01969674; Flood/Conduit Seals Capability for Flood Protection  
CR 01969689; Conduit Internal Seal Inspections/Flood Inspections  
CR 01972529; Water Found in MH107 Following Storm/Heavy Rain  
CR 01972989; Water Intrusion into Various Reactor Building and Essential Switchgear Room  
CR 01973136; Initiate Work Order to Seal Penetration – AOP 902  
CR 01973155; Initiate Work Order to Relocate Gasoline/Diesel Storage Tanks – AOP 902  
CR 01973261; Rain Water Entering CSC Building during Severe Weather  
CR 01973305; AOP 902 'Flood' Entry Due to Cedar River Water Level  
CR 01973311; Safety CR Rain Water Intrusion at Cable Spreading Room Door  
CR 01973646; Water Intrusion into Refuel Floor and RCIC Room  
POD 01957698-01; Rainwater Leaking into RCIC Room through Hatch; Revision 0

### 1R04 Equipment Alignment

Operating Instruction (OI) 710, Intake Structure HVAC System, Revision 14  
DCR985A; Intake Structure Air Compressors  
DCR985B; Power Separation for Instrument Air Compressors  
OI 255A2; Control Rod Drive System Valve Lineup and Checklist; Revision 5  
OP-AA-102-1003; Guarded Equipment; Revision 5  
OI 255A2; Control Rod Drive System Valve Lineup and Checklist; Revision 5  
OI 710; Intake Structure HVAC System; Revision 14  
OI 730A1; Control Building HVAC System Electrical Lineup; Revision 3  
OI 730A4; Plant Chilled Water System Valve Lineup; Revision 17  
OI 730A6; Control Building HVAC System Control Panel Lineup; Revision 9  
BECH-M161; P&ID Air Conditioning System Control Building; Revision 53  
BECH-M169<2>; P&ID Control Building Cooling System; Revision 22  
BECH-M169<3>; P&ID Control Building Chillers 1VCH001A and 1VCH001B; Revision 13

DCR985A; Intake Structure Air Compressors  
DCR985B; Power Separation for Instrument Air Compressors

#### 1R05 Fire Protection

STP NS13B005; WK3-Portable Fire Extinguishing Equipment Inspection  
STP NS13B005; Portable Fire Extinguishing Equipment  
CR 01974458; Violation of Fire Hazards Analysis for Fire Zone OAG  
CR 01974441; Violation of Administrative Control Procedure (ACP) 1412.2, Control of Combustibles  
CR 01974230; Poor Housekeeping in the Turbine Building Exhaust Fan Penthouse  
FHA-200; NFPA 805 Fire Protection Design Document; Revision 16  
FHA-400; Duane Arnold Energy Center Fire Protection Program; Revision 14  
FP-AB-100; Fire Protection Program; Revision 0  
ACP 1412.2; Control of Combustibles; Revision 41  
ACP 1412.4; Impairments to Fire Protection Systems; Revision 69  
PFP-RB-757; Pre-Fire Plan Reactor Building El. 757; Revision 0  
PFP-RB-812; Pre-Fire Plan Reactor Building El. 812; Revision 0  
PFP-RB-828; Pre-Fire Plan Reactor Building El. 828; Revision 1  
PFP-RB-855; Pre-Fire Plan Reactor Building El. 855; Revision 1  
PFP-TB-780; Pre-Fire Plan Turbine Building El. 780; Revision 0  
STP NS13F006; Structural Steel Fireproofing Inspection; Revision 17  
STP NS13B005; WK3-Portable Fire Extinguishing Equipment Inspection  
STP NS13B005; Portable Fire Extinguishing Equipment  
CR 01964471; Deluge #2 Leak Getting Worse  
CR 01966499; Missing Items During Fire Brigade Inventory  
CR 01966736; Leakage on Primary Line Upstream of Isolation  
CR 01966799; HPCI Deluge #2 FPR-14-7114

#### 1R06 Flooding

ECPM SECT 4.4; Electrical Manhole Inspection Frequency; Revision 1  
WO 40308721; SUS99.09 Inspect Manholes MH104, MH105, MH106 and MH107  
BECH-E350<1>; Underground Duct Bank Layout; Revision 7  
BECH-E351<1>; Manhole Details; Revision 2  
CR 01965875; Manhole MH104, MH105; MH106, MH107 Inspect Results May 14, 2014  
CR 01966371; DNA – CAS Operator Observed Water Flowing From Manhole  
CR 01972529; Water Found in MH107 Following Storm/Heavy Rain  
CR 01974836; Run Boroscope through Conduit Y156A to Check for Obstruction

#### 1R11 Licensed Operator Regualification Program

OP-020; Area Inspections; Revision 26  
Reactivity Management Plan; Downpower for Control Rod Sequence Exchange; May 2014  
CE 01967067; Tar-Like Substance Found on Floor of the Condenser Bay; Revision 1  
CR 01967056; CV1097A Has a 5-10 DPM Packing Leak  
CR 01967057; V03-0245 LS-1070A Lower Isolation Packing Leak  
CR 01967058; CV1064 in Steam Tunnel Has 10-15 DPM Leak from Packing  
CR 01967067; Identified Abnormal Leakage on Condenser Bay Floor

### 1R12 Maintenance Effectiveness

CR 01943118; 1K016A Intake Air Compressor Tripped Again  
CR 01944636; TC7715A Leaking Air  
CR 01944627; 1VT050A Excessive Leakage  
CR 01944750; 1K016A Failed Once Again  
CR 01952071; Air Leak Past Fitting Upstream of Check Valve V77-0019  
CR 01960690; 1K016A Intake Air Compressor is Short Cycling  
CR 01960301; 1K016A Intake Air Compressor Found Not Cycling  
CR 01961140; 1K016A Found Tripped  
CR 01961192; V77-0022 Has an Air Leak  
CR 01962708; 1K016A Not Carrying Load at Intake Structure  
CR 01966760; Air Dryer was Found in Service but not Purging  
CR 01967005; DO7713A Positioner Inlet Supply Line Leaking Air  
CR 01969340; DNA-River Water Supply HVAC Controllers Not Installed per Specifications  
CR 01970330; 1K-16A Exhaust Line Air Fryer Not Functioning  
CR 01942767; Unexpected Alarm on RIS-4131A  
CR 01949942; Unexpected Alarm on A Fuel Pool Rad Monitor Downscale  
CR 01953813; Annunciator 1C03A (C-1) Fuel Pool Exhaust RIS-4131A/B Rad Monitor  
CR 01954560; Momentary Alarms Associated with RIS-4131A  
CR 01867785; Unexpected Alarm from RIS-4131A  
CR 01867929; Momentary Spike Down on RR4131  
CR 01877344; Fuel Pool Exhaust RIS-4131A/B Downscale/Inoperable Alarm Activated & Reset  
CR 01909908; RIS-4131A Spiked Downscale  
CR 01911385; Fuel Pool Exhaust RIS-4131A/B Downscale/Inoperable Alarm Activated & Reset  
CR 01912005; CRs and WRs are not Automatically Crossed Referenced to WOs  
CR 01912041; Trend – RIS-4131A/B Downscale/Inoperable Alarms not Fixed  
CR 01920482; No Equipment Reliability Issues for the Refuel Floor Radiation Monitor  
CR 01935047; Trend – Increased Trend in Relay Issues

### 1R13 Maintenance Risk Assessments and Emergent Work Control

WPG-2; On-Line Risk Management Guideline; Revision 65  
WMA-AA-100; Risk Management Program; Revision 0  
EN-AA-105; Probabilistic Risk Assessment (PRA) Program; Revision 0  
Operators Risk Report; June 26, 2014  
Operators Logs; May 30-31, 2014, and June 9, 16, 17, 2014  
WO 40239697-01; E/S4599B: Replace Electrolytic Capacitors  
STP 3.5.1-03A; A Core Spray System Simulated Automatic Actuation; Revision 9  
WPG-1; Work Process Guideline; Revision 61  
OP-AA-104-1007; Online Aggregate Risk; Revision 2  
WM-AA-100-1000; Work Activity Risk Management; Revision 1  
OP-AA-102-1003; Guarded Equipment; Revision 5  
Work Week 1424 Work Activity Risk Management Summary and Weekly Probabilistic Risk Analysis  
AOP 410; Loss of River Water Supply/High River Bed Elevation/Low River Water Depth; Revision 27  
EP-AA-105 (DAEC); Maintaining Equipment Important to Emergency Preparedness (DAEC Specific Information); Revision 3  
EP-AA-105; Maintaining Equipment Important to Emergency Response; Revision 4  
Operators Risk Report; June 26, 2014

Operators Logs; May 30-31, 2014, and June 9, 16, 17, 2014  
WO 40239697-01; E/S4599B: Replace Electrolytic Capacitors  
WO 40293372-01; 94-K7333B Replace Relay  
WO 40249563-01; AV7318B-O: Calibrate Positioner  
WO 40267914-01; 1VEF036B: MA-Inspect Unit  
WO 40310673-01; 1G-31 Lube Oil Cooler Heat Exchanger  
STP 3.3.8.1-04B; 1A4 4KV Emergency Bus Under-voltage Relay Calibration; Revision 2  
M063-033; 'B' Control Building Chiller Mechanical Drawing (1VCH001B); Revision 6  
M063-036; Control Building Chiller Condenser 1E235A Fabricated Head; Revision 0  
CE 01965912; Kaman 2 High Alarms  
CR 01973110; Kaman 2 Auto Check Source Needs Repositioning  
CR 01972939; Emergency Service Water System Unavailability in Maintenance Rule Yellow Status  
CR 01948954; Unplanned TS and TRM Entries Due to Door Timeout  
CR 01949651; Unplanned Standby Filter Unit/Control Building Boundary LCO Entry on Door 402  
CR 01945507; Possible Missed Surveillance; ½ of 3.4.5-03 Not Completed

#### 1R15 Operability Determinations and Functionally Assessments

CR 01946048; Apparent Cause Evaluation Report, LS1861D Calibration Found out of Tolerance  
EN-AA-203-1001; Operability Determinations/Functionality Assessments; Revision 16  
FP-AA-104-1000; Fire Protection Maintenance, Testing, Impairment and Compensatory Action; Revision 0  
FP-AB-100; DAEC Fire Protection Program; Revision 0  
ACP 107.0; Surveillance Tests  
ACP 111.0; Inspection, Test Control and Testing; Revision 6  
ACP 1412.4; Impairments to Fire Protection Systems, Revision 70  
ACE 1966869; Standby Liquid Control Foreign Material; Revision 2  
POR 1966869; Standby Liquid Control Foreign Material Past Operability Review  
CE 01964875-01; NRC Question on Use of TSR 3.0.3 and the TRM  
CR 01946048; Apparent Cause Evaluation Report, LS1861D Calibration Found Out of Tolerance  
CR 01959153; No Air Flow Testing Procedures Exist for TRM Deluge Systems  
CR 01963691; TRM Surveillance Requirements Not Performed  
CR 01963696; Missed TRM Surveillance for Hose Stations  
CR 01964875; NRC Question on Use of TSR 3.0.3 and the TRM  
CR 01964878; NFPA Requirements for Air Flow Testing  
CR 01971501; TLCO Times for Fire Detection and Suppressions Challenged  
CR 01966869; Standby Liquid Control Foreign Material  
Procedure Change Request (PCR) 01968702; EN-AA-203-1001 – Operability Determinations/Functionality Assessments  
PCR 01968720; ACP 107.0 – Surveillance Tests  
TWR 01976300; Provide Training on the Proper Use of SR 3.0.3 and TSR 3.0.3  
CR 01956085; CAL-M98-058 (Alternate Depressurization System Accumulator Size Verification) Inputs Error  
CR 01956930; Investigate Potential Non-Conservative TS SR 3.5.1.3

### 1R18 Plant Modifications

CR 01961603; Errors on Original Code Data Reports for Condenser  
CR 01961294; S&L Draft Evaluation Not Favorable for 1E235A Return to Service  
CR 01960576; 'A' Control Building Chiller Condenser 1E235A Return Head Has Corrosion

### 1R19 Post-Maintenance Testing

STP 3.5.1-05; HPCI System Operability Test; Revision 58  
WO 40170771; MO2247-O, Lube and Inspect Gearbox and Limit Switch  
WO 40176867; MO2318-O; Inspect Lube Gearbox and Limit Switch  
WO 40175686; 1P218-M, Inspect & Perform PI Test  
STP 3.8.1-06B; 'B' Standby Diesel Generator Operability Test (Fast Start); Revision 15  
WO 40184541; 1P229C-M, Change Out Upper Motor Bearing (RHR)  
CR 01844913; C RHR Motor Oil Reservoir Found Metal Shavings  
WO 40107646; Replace Electrolytic Capacitors  
WO 40168715; MO 2515-O, Lube & Inspect  
WO 40173426; Calibrate TE 2406 (Maintenance Run)  
WO 40172163; FI 2509: Calibrate  
WO 40172161; FIC2509: Replace MPU Board  
WO 40172164; FT2509: Calibrate  
STP 3.5.3-02; RCIC System Operability Test; Revision 37  
MD-062; Work Order Task(s); Revision 7  
MD-024; Post Maintenance Testing Program; Revision 78  
STP 3.5.1-02A; A LPCI System Operability Tests; Revision 14  
STP 3.5.3-02; RCIC System Operability Test; Revision 44  
CAL-E90-008; In-Service Testing Program Instrument Accuracy; Revision 17  
POD 1971819; Instrument Accuracy Accounted for in RCIC Flow Rate in STP 3.5.3-02  
CR 01964910; NRC Question Regarding PI 2302, HPCI Booster Pump Suction PI  
CR 01967624; FI2509 Indicated 395 GPM During RCIC Operability Test  
CR 01967794; DNA – Margin to RCIC Tech Spec Flow Requirement is Low  
CR 01971819; Instrument Accuracy Accounted for in RCIC Flow Rate STP

### 1R22 Surveillance Testing

STP 3.3.6.1-32; RCIC Exhaust Diaphragm Channel Functional Test; Revision 4  
ACP 107; Surveillance Tests; Revision 17  
STP 3.0.0-01; Surveillance Test Procedure Instrument Checks; Revision 142  
STP 3.3.6.1-32; RCIC Exhaust Diaphragm Channel Functional Test; Revision 4  
STP 3.5.1-01B; B Core Spray System Operability Test; Revision 15  
STP 3.3.1.1-13; Turbine Control Valve EOC RPT Logic and RPS Instrument Function Test; Revision 15  
STP 3.5.1-03A; A Core Spray System Simulated Automatic Actuation; Revision 9  
STP NS930002; Main Turbine Stop and Combined Intermediate Valves Test; Revision 5  
APED-E41-002; Process Diagram High Pressure Coolant Injection System  
CAL-M91-010; Recommended Discharge Pressure for HPCI Main Pump Test; Revision 1  
CAL-M91-011; Recommended Discharge Pressure for RCIC Main Pump Test; Revision 0  
CE 1961465-01; Evaluate Minimum HPCI Pump Discharge Pressure During Operability STPs  
CE 1961479-01; Evaluate Minimum RCIC Pump Discharge Pressure During Operability STPs  
CR 01961465; DNA AR: HPCI STPs May Contain an Incorrect Pump Discharge Pressure

CR 01961479; DNA AR: RCIC STPs Minimum Pump Discharge Pressure Less Than CAL M91011  
CR 01967068; SV and ISV Position Indication Problems for STP NS930002  
CR 01968205; ODMI for MSR Drain Tank Dump Valve Leak By  
PCR 1961750; Change STPs 3.5.1-05, 3.5.1-09, 3.5.1-10 Minimum HPCI Pump Discharge Pressure

#### 2RS5 Radiation Monitoring Instrumentation

STP 3.0.0-01; Surveillance Test Procedure Instrument Checks; Revision 142  
STP NS790301; GSW Radiation Monitor Calibration  
STP NS791011; K8 Calibration  
STP NS791013; K10 Calibration  
OI 920; Drywell Sump Systems; Revision 46

#### 2RS6 Radioactive Gaseous and Liquid Effluent Treatment

PCP 8.7; Alarm Setpoints for Liquid Rad Monitors; Revision 17  
PCP 8.4; Alarm Setpoints and Efficiency for GE Offgas Stack Rad Monitor; Revision 10  
EV-AA-100; Fleet Ground Water Protection Program; Revision 2  
ACP 1411.35; The DAEC Groundwater Protection Program; Revision 8  
STP 3.6.4.3-03-A; SBGT Sys HEPA/CHAR Filter Efficiency Test  
STP 3.6.4.3-03-B; SBGT Sys HEPA/CHAR Filter Efficiency Test  
NS790505; Effluent Noble Gas Sampling & Analysis; Revision 3  
NS790601; Effluent P & I Sampling & Analysis; Revision 24  
EV-AA-100-1001-F01; 10 CFR 50.75(g) Documentation; Various Dates  
Duane Arnold Energy Center Operations and Maintenance Activity Assessment of Unplanned Releases; July 12, 2013  
EN 48403; Offsite Notification Due to Leak From Condensate Storage Tank Containment Pit Sump; October 12, 2012  
Five Year Review of the DAEC GWPP Monitoring Plan; August 13, 2013  
Ground Water Protection Initiative Site Conceptual Model; May 29, 2013  
CR 01812156; CST Pit Sump Seal Leaking  
CR 01827363; Structural Monitoring, CST Foundation Floor Surface Cracks  
CR 01820689; Degraded Drain Piping Found in Turbine Building Basement  
CE 01905073; Tritium and Cesium 137 Identified in Conduit Water – 2013

#### 4OA1 Performance Indicator Verification

CR 01910625; Walkdown Scope Increase  
CR 01971250; TS Hi-Rad Violation Not Characterized Correctly: NRC PI Q413  
MSPI Basis Document; Revision 16  
NRC PI Data Calculation, Review and Approvals; RCS Leakage; 2nd Quarter 2013 through 1st Quarter 2014  
OI 920; Drywell Sump System; Revision 46  
CR 01866940; Very Slight Increasing Trend in Drywell Unidentified Leakage  
CR 01867793; Drywell Equipment Sump Did Not Auto Pump  
CR 01871786; Equipment Sump Inconsistent Pump Volumes Today  
CR 01872165; DWEDS Totalizer FQ3708 Drift Due to 1P-037A Control Circuit De-energized  
CR 01872166; Abnormal DW Identified Leakage Calculation Due to FQ3708 Drift  
CR 01879703; Drywell Equipment Drain Pump, 1P-37B, Did Not Auto Pump

CR 01886976; DWEDS Has Not Pumped for Greater Than 8 Hours  
CR 01887568; Level Switch is Sticking  
CR 01887570; Drywell Floor Drain Leakage Calculated High  
CR 01951939; Potential Adverse Trend – Sump Pump Issues  
CR 01965584; Equipment Sump Failed to Pump at 1200  
CR 01910625; Walkdown Scope Increase  
CR 01971250; TS Hi-Rad Violation not Characterized Correctly: NRC PI Q413

#### 4OA2 Identification and Resolution of Problems

RCE 01934040; Under-voltage Relay Failed Root Cause Evaluation  
MA-AA-203-1001; Work Order Planning; Revision 1  
Relay-G080-08; General Electric Under-voltage Relay Type NGV; Revision 11  
STP 3.3.8.1-05B; 1A4 4KV Emergency Transformer Supply Under-voltage Calibration;  
Revision 2  
WO 40136277-01; STP 3.3.8.1-05-B 4KV Transformer Supply Under-voltage  
MD-024; Post Maintenance Testing Program; Revision 78  
MA-AA-202; Work Order Execution Process; Revision 8  
MD-062; Work Order Task(s); Revision 6  
MA-AA-201; Work Order Identification, Screening and Validation Process  
WM-AA-200; Work Management Process Overview; Revision 8  
AD-AA-103; Nuclear Safety Culture Program; Revision 5  
PI-AA-100-1002; Procedure for Failure Investigation Process; Revision 9  
OP-AA-100-1002; Plant Status Control Management; Revision 2  
PI-AA-101-1000; Focused Self-Assessment Planning, Conduct and Reporting; Revision 10  
ACP 1410.2; LCO Tracking and Safety Function Determination Program; Revision 32  
AD-AA-100-1006; Procedure and Work Instruction Use and Adherence; Revision 3  
PI-AA-204; Condition Identification and Screening; Revision 24  
PI-AA-205; Condition Evaluation and Corrective Action; Revision 25  
PI-AA-100-1005; Root Cause Analysis; Revision 9  
PI-AA-100-1007; Apparent Cause Evaluation; Revision 8  
CR 01934040; STP 3.3.8.1-05-B, 4KV Emergency Transformer Under-voltage Failed  
CR 01934167; 127/SB2 Standby Transformer 1X4 Under-voltage Relay Wrong Configuration  
CR 01941895; Reportability Review Due Date Set Past LER 60 Day Due Date  
CR 01972812; Contributing Cause Actions for Under-voltage Relay RCE #1934040  
PCR 01972807; MA-AA-203-1001 – Work Order Planning

## **LIST OF ACRONYMS USED**

ACP	Administrative Control Procedure
ADAMS	Agencywide Document Access Management System
AOP	Abnormal Operating Procedure
CAP	Corrective Action Program
CBC	Control Building Chiller
CE	Condition Evaluation
CFR	Code of Federal Regulations
CR	Condition Report
DAEC	Duane Arnold Energy Center
DG	Diesel Generator
IOD	Immediate Operability Determination
IMC	Inspection Manual Chapter
IP	Inspection Procedure
kV	Kilovolt
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LPCI	Low Pressure Coolant Injection
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OFR	Operability/Functionality/Reportability
OI	Operating Instruction
PARS	Publicly Available Records System
PCR	Procedure Change Request
PFP	Pre-Fire Plan
PI	Performance Indicator
PM	Planned Maintenance
POD	Prompt Operability Determination
POR	Prompt Operability Review
RCE	Root Cause Evaluation
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RPS	Reactor Protection System
SBDG	Standby Diesel Generator
SDP	Significance Determination Process
SSC	Structure, System, and Component
STP	Surveillance Test Procedure
TLCO	Technical Requirements Manual Limiting Condition for Operation
TRM	Technical Requirements Manual
TSR	Technical Surveillance Requirement
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WO	Work Order



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Sincerely,

**/RA/**

Christine Lipa, Chief  
Branch 1  
Division of Reactor Projects

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