



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

April 25, 2016

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

SUBJECT: DUANE ARNOLD ENERGY CENTER—NRC INTEGRATED INSPECTION
REPORT 05000331/2016001

Dear Mr. Vehec:

On March 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Duane Arnold Energy Center. The enclosed report documents the results of this inspection, which were discussed on April 15, 2016, with you and other members of your staff.

Based on the results of this inspection, the NRC inspectors did not identify any findings or violations of more than minor significance.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS)

T. Vehec

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Sincerely,

/RA/

Karla Stoedter, Chief
Branch 1
Division of Reactor Projects

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

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IR 05000331/2016001

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000331/2016001

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: January 1 through March 31, 2016

Inspectors: C. Norton, Senior Resident Inspector
J. Steffes, Resident Inspector

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

Enclosure

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SUMMARY

Inspection Report 05000331/2016001; 01/01/2016—03/31/2016; Duane Arnold Energy Center; Integrated inspection report.

This report covers a 3-month period of inspection by resident inspectors. No findings or violations were identified by the inspectors. The U.S. Nuclear Regulatory Commission's (NRCs) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," dated February 2014.

NRC-Identified and Self-Revealed Findings

No findings were identified during this inspection.

Licensee-Identified Violations

No findings were identified during this inspection.

REPORT DETAILS

Summary of Plant Status

Duane Arnold Energy Center (DAEC) operated at full power at the beginning of the inspection period. On January 19, 2016, the licensee lowered power to approximately 60 percent to perform a control rod sequence exchange. Following the control rod sequence exchange, power was gradually increased with full power operations re-established on January 21, 2016. The plant remained at full power for the rest of the inspection period with the exception of brief small down-power maneuvers to accomplish load line adjustments or planned surveillance testing activities.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

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

a. Inspection Scope

Since extreme cold conditions were forecast in the vicinity of the facility for January 11, 2016, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. On January 11, 2016, the inspectors walked down the river water supply system because this system's safety-related functions could be affected or required as a result of the extreme cold conditions forecast for the facility. The inspectors observed insulation, heat trace circuits, space heater operation, and weatherized enclosures to ensure operability of affected systems. The inspectors reviewed licensee procedures and discussed potential compensatory measures with control room personnel. The inspectors focused on plant management's actions for implementing the station's procedures for ensuring adequate personnel for safe plant operation and emergency response would be available. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- “B” control building chiller (CBC) system while the “A” CBC was unavailable during emergent repair;

- “A” emergency service water (ESW) while the “B” ESW and “B” standby diesel generator (SBDG) were out-of-service during system maintenance outage;
- “B” core spray system while the residual heat removal system low pressure core injection function was inoperable during suppression pool cooling mode for high pressure core injection (HPCI) system testing;
- “B” River Water Supply while the “A” River Water Supply out for maintenance; and
- HPCI while the Reactor Core Isolation Cooling (RCIC) system was inoperable.

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

These activities constituted five partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On March 2–11, 2016, the inspectors performed a complete system alignment inspection of the normal alternating current (AC) distribution system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee’s probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were

being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These activities constituted one complete system walkdown sample as defined in IP 71111.04–05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Reactor building elevation 786 (all fire zones);
- Control building elevation 757 (all fire zones);
- Turbine building elevation 734 (all fire zones);
- Reactor building elevation 716 (fire zones 1–AN, 1–AS, 1–C and 1–G); and
- Low level radwaste processing storage facility (fire zones 21–A through 21–E, 21–N, 21–P through 21–R, 21–T and 21–U) and radioactive release (fire zone 21–E).

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; fire detectors and sprinklers were unobstructed; 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 activities 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 that the cables were not submerged, splices were intact, and appropriate cable support structures were in place. In those areas where dewatering devices were used, such as a sump pump, the device was operable 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 corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following underground bunkers/manholes (MH) subject to flooding:

- MH 104, MH 105, MH 106, MH 107, MH 116 and MH 215.

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 February 9, 2016, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas of the crew:

- Licensed operator performance;
- Clarity and formality of communications;
- Ability to take timely actions in the conservative direction;
- Prioritization, interpretation, and verification of annunciator alarms;
- Correct use and implementation of abnormal and emergency procedures;
- Control board manipulations;
- Oversight and direction from supervisors; and
- Ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

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

This inspection constituted one resident inspector quarterly review of licensed operator requalification program simulator sample as defined in IP 71111.11–05.

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

a. Inspection Scope

On January 19, 2016, the inspectors observed reactivity manipulation for a control rod sequence exchange. The inspectors evaluated the following areas of the crew:

- Licensed operator performance;
- Clarity and formality of communications;
- Ability to take timely actions in the conservative direction;
- Prioritization, interpretation, and verification of annunciator alarms;
- Correct use and implementation of procedures;
- Control board manipulations;
- Oversight and direction from supervisors; and
- Ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

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

This inspection constituted one resident inspector quarterly observation of heightened activity or risk sample as defined in IP 71111.11–05.

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:

- “A” CBC; and
- RCIC Critical Maintenance Management (CMM).

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/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 two quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- "A" CBC emergent maintenance for unplanned inoperability—oil pressure low out of specification;
- "B" SBDG CMM;
- Work week 1602 plant risk with extreme cold weather in the area;
- Risk assessment and emergent work management for the loss of low level radwaste transformer, construction transformer while performing HPCI surveillance;
- Valve disassembly for Residual Heat Removal (RHR) keep fill stop check American Society Mechanical Engineers (ASME) inspection V19-0124; and
- 2nd Occurrence; "A" CBC emergent maintenance for unplanned inoperability.

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

walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

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

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

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Functionality review for temporary diesel air compressor found unavailable;
- “B” fuel pool cooling pump discharge check valve hinge pin found not engaged;
- RCIC barometric condenser water in leakage; and
- SBDG operability during sync relay calibration.

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

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

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the following modifications:

- Torus Swell following Design-Basis Accident, Loss-of-Coolant Accident, Extended Power Uprate modification;
- "B" isolated phase duct cooling temporary modification due to damper failure; and
- Hardened containment vent system installation.

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 modifications were installed as directed and consistent with the design control documents; the modifications operated as expected; post-modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications 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 the completion of one temporary modification sample and one permanent plant modification sample as defined in IP 71111.18–05. The inspection of the hardened containment vent system was considered a partial sample since the modification was scheduled for installation over several inspection periods.

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;
- "D" RHR Service Water Pump repack;
- "D" RHR pump following wetted cable replacement;
- "A" SBDG slow start following sychroscope check relay calibration;
- Adjust packing on MO 2202, HPCI Steam Inlet Valve;
- RCIC CMM; and
- Unplanned "A" CBC inoperability.

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.

This inspection constituted seven 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:

- Activities associated with ASME/In-Service Testing inspection of V19–0124 “A” RHR Loop Keep Fill Supply Line Stop Check (Routine);
- Main Steam Isolation Valve and Turbine Valve Testing (Routine);
- “A” LPCI System Operability Test (In-service Testing);
- “A” Primary Containment Isolation System Group Three Isolation Logic System Functional Test (Routine);
- HPCI System Operability Test (Routine);
- Standby Liquid Control System Operability Test (Routine); and
- RCIC Surveillance Test (Routine).

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

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;

- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted six routine surveillance testing samples and one in-service test sample as defined in IP 71111.22, Sections–02 and–05.

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 Security

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours performance indicator (PI) for the period from the first quarter of 2015 through the fourth quarter of 2015. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI)

Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of January 1, 2015, through December 31, 2015, to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams with Complications performance indicator for the period from the first quarter of 2015 through the fourth quarter of 2015. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period January 1, 2015, through December 31, 2015, to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.3 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Transients per 7000 Critical Hours performance indicator for the period from the first quarter of 2015 through the fourth quarter of 2015. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, maintenance rule records, event reports and NRC Integrated Inspection Reports for the period of January 1, 2015, through December 31, 2015, to

validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

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

.1 (Retracted) Event Notification 51697: Offsite Power Declared Inoperable Due to Lowering Generator Voltage

a. Inspection Scope

On January 29, 2016, as part of normal routine plant maneuvers, the Iowa Transmission Company (ITC) contacted the DAEC control room and requested that main generator megavolt-ampere reactive (MVAR) load be adjusted to unity, i.e. to adjust MVARs to zero out of the main generator. The control room operators conducted a plant maneuver brief and lowered main generator voltage from 30 MVARs in the lag direction to zero MVARs. As MVARs were lowered, the control room operators noticed that both non-essential and essential bus voltages lowered and that main generator amperes increased. In accordance with the control room brief, this was not an expected condition and the operators ceased the maneuver. Concurrent with the unexpected electric plant changes, the control room received a computer alarm and a phone call from ITC stating that offsite source voltage was at 159 Kilovolt (kV), approximately 98.8 percent of the nominal 161 kV grid voltage.

In response to Generic Letter 2006–02, “Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power,” dated February 1, 2006, DAEC committed to declare the offsite sources inoperable when alerted by ITC that the 161 kV offsite lines had dropped to 99.2 percent or less of nominal voltage. As documented in the TS, ITC was to inform DAEC once it “determines that offsite power grid conditions are such that a trip of the DAEC turbine/generator would lead directly to voltages in the DAEC switchyard below the trip set point for Loss of Power (LOP) Instrumentation.” In response to the computer generated alarm as well as the ITC notification of 161 kV offsite source being below the 99.2 percent required value for operability, the licensee entered Condition C of TS 3.8.1 and declared two offsite electrical power circuits inoperable. The licensee took immediate action to restore the 161 kV line voltage to above its operable value and exited TS 3.8.1, Condition C. In accordance with site procedures, the licensee made an 8–hour non-emergency notification to the NRC per 10 CFR 50.72(b)(3)(v)(D), “Any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.”

The licensee performed an Apparent Cause Evaluation (ACE) to determine the causes and contributors for two offsite circuits being declared inoperable during routine grid manipulations. The licensee determined through ACE 02106338, “Discrepancy Between DAEC and ITC MVAR Indications,” Revision 2, that the causes of the low grid voltage stemmed from the crew’s failure to verify the desired effect of the adjustment requested by ITC prior to execution and the failure to have communication protocols in place for the evolution. The licensee immediately implemented compensatory measures and ultimately procedure requirements for the control room crew to verify the request by ITC including intended electrical effects. Furthermore, the licensee, while working with ITC, required the two sides to remain on the phone during the entirety of the evolution.

In addition to performing an ACE, the licensee evaluated offsite source operability during the time when 161 kV line voltage dropped below 99.2 percent until it was restored. The licensee determined that even though the line voltage did exceed the 99.2 percent operability threshold, as noted above, the TS were written with the acknowledgement that the grid condition was of concern, should the main generator trip offline and safety systems would then be relying on offsite to perform their safety functions. However, in this case the cause of the low offsite grid condition, as determined in the DAEC switchyard, was due to the manual manipulation of the main generator. The licensee determined that in this instance that since the DAEC main generator was the cause of the grid low voltage, if the turbine had tripped offline, the offsite voltages would have restored and not caused any of the LOP instrumentation to trip and thus offsite power remained operable during the entire evolution. On February 5, 2016, the licensee retracted Event Notice (EN) 51697 due to the causal analysis results and operability review. The inspectors reviewed the EN, licensee procedures, the response to the event, applicable TS, the ACE, and operating experience, and did not identify any issues. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Tritium in Monitoring Well 8A

a. Inspection Scope

The inspectors reviewed the licensee's response to an increase in tritium in monitoring well 8A. Early in the first quarter of 2016, the licensee observed an increase in the tritium activity in monitoring well 8A located inside the licensee controlled protected area, southeast of the turbine building. The licensee took action to preliminarily determine the source of the tritium and mitigate further spread.

The increased tritium activity in monitoring well 8A was preliminarily attributed to the spread of a 2012 spill that occurred when the condensate storage tank overflowed and the containment berm was breached. The licensee continuously pumped and treated monitoring well 8A to mitigate and reduce the further spread of tritium contaminated ground water.

The licensee contracted a company experienced in ground water tritium mitigation to drill 29 additional wells to more precisely determine the source of the tritium, map the spread of the tritium and provide information and recommendations for developing a long term tritium mitigation strategy.

The licensee made a voluntary notification to inform the state of Iowa and local government agencies of shifting ground water tritium activity preliminarily attributed to the 2012 spill and the mitigation actions in place. The licensee identified no ground water with greater than the Environmental Protection Agency standard for drinking water outside the licensee controlled protected area.

The inspectors continue to follow licensee actions to contain and mitigate tritium contaminate ground water on licensee owned and controlled property. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.3 (Closed) Licensee Event Report 05000331/2015–005–00: Automatic Start of Both Emergency Diesel Generators Due to Lightning Strike

This event, which occurred on October 20, 2015, involved an automatic start of both of the site's SBDGs due to an offsite power system voltage transient caused by a lightning strike. Neither SBDG loaded onto its respective essential bus, as offsite power remained available. The Licensee Event Report was reviewed. No findings or violations of NRC requirements were identified.

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

.4 (Closed) Licensee Event Report 05000331/2015–006–00: High Pressure Coolant Injection and Reactor Core Isolation Cooling Condensate Storage Tank Suction Transfer Inoperable

This event, which occurred on July 23, 2015, involved an unrecognized time delay relay failure that caused the HPCI and RCIC automatic pump suction swap from the Condensate Storage Tank to the Suppression Pool to be inoperable. A finding and violation, each of very low safety significance, associated with the licensee's failure to identify and report the HPCI and RCIC automatic suction swap failure were documented in NRC report number 05000331/2015004. The NRC Residents reviewed the Licensee Event Report. No additional findings or violations of NRC requirements were identified.

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

4OA6 Management Meetings

.1 Exit Meeting Summary

On April 15, 2016, the inspectors presented the inspection results to you 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.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Vehec, Site Vice President
P. Hansen, Plant General Manager
S. Brown, Site Engineering Director
M. Davis, Licensing Manager
M. Fritz, Emergency Preparedness Manager
B. Simmons, Nuclear Oversight Manager
R. Wheaton, Operations Director
B. Hanscel, Acting, Radiation Protection Manager
D. Olsen, Chemistry Manager
J. Schwertfeger, Security Manager
C. Hill, Training Manager
B. Murrell, Licensing Senior Engineer
L. Swenzinski, Licensing Senior Engineer
P. Collingsworth, System Engineering
D. Church, Engineering Programs Manager

U.S. Nuclear Regulatory Commission

K. Stoedter, Chief, Reactor Projects Branch 1
M. Chawla, Project Manager, NRR

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Closed

05000331/2015005-00	LER	Automatic Start of Both Emergency Generators Due to Lightning Strike (Section 4OA3)
05000331/2015006-00	LER	HPCI and RCIC Condensate Storage Tank Suction Transfer Inoperable (Section 4OA3)

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

- Abnormal Operating Procedure (AOP) 903; Severe Weather; Revision 55
- Operating Procedure (OP)–AA–102–1002; Plant Winterization Checklist; (DAEC–Specific Attachment); NG–270K; Revision 12
- Operating Instruction (OI) 410; River Water Supply System; Revision 75
- Radwaste Heating, Ventilation and Air Conditioning (HVAC) 3407.1; Operation of Radwaste Building HVAC System; Revision 19
- CR 02093007; 1V–SF–80A Intake Duct Heater 1V–EC–80A Not Working Properly
- CR 02098647; Configuration Control of River Water Supply Sand Gates and Sand Jets
- CR 02092123; Local Valve Stroke Timing
- CR 02068880; Valve Indicates Dual with Position Verified as Closed

1R04 Equipment Alignment

- OP–AA–102–1003; Guarded Equipment; Revision 7
- OI 730; Control Building [Heating, Ventilation and Air Conditioning] HVAC System; Revision 120
- OI 730A1; Control Building HVAC System Electrical Lineup; Revision 3
- OI 730A4; Plant Chilled Water System; Revision 17
- OI 730A6; Control Building HVAC System Control Panel Lineup; Revision 9
- OI 454; ESW System; Revision 66
- OI 454A1; ESW System Electrical Lineup; Revision 5
- OI 454A2; “A” ESW System Valve Lineup and Checklist; Revision 15
- OI 151A1; Core Spray System Electrical Lineup; Revision 3
- OI 151A4; “B” Core Spray System Valve Lineup and Checklist; Revision 4
- OI 151A6; Core Spray System Control Panel Lineup; Revision 2
- OI 304.1; 4160 V [Volts]/480 V Nonessential Electrical Distribution System; Revision 81
- OI 304.1A1; 4160 V/480 V Nonessential Electrical Distribution System; Revision 12
- OI 304.1A1; 4160 V/480 V Nonessential Electrical Distribution System; Revision 11; Completed November 12, 2014
- OI 304.1A2; 4160 V/480 V Nonessential Electrical Distribution System Startup Transformer 1X3 and Standby Transformer 1X4 Valve Lineup; Revision 6
- OI 304.1A2; 4160 V/480 V Nonessential Electrical Distribution System Startup Transformer 1X3 and Standby Transformer 1X4 Valve Lineup; Revision 4; Completed March 17, 2009
- OI 304.1A3; Nonessential Electrical Distribution System Startup Transformer Control Panel Lineup; Revision 3; Completed March 13, 2009
- OI 304.2; 4160 V/480 V Essential Electrical Distribution System; Revision 93
- OI 304.2A1; 4160 V/480 V Essential Electrical Distribution System Electrical Lineup; Revision 1
- OI 304.2A1; 4160 V/480 V Essential Electrical Distribution System Electrical Lineup; Revision 1; Completed November 9, 2014

- OI 304.2A10; 4160V/480 V Essential Electrical Distribution Control Panel Lineup; Revision 1; Completed August 28, 2007
- OI 317.1; 120 VAC [Volts Alternating Current] Instrument Control Power System; Revision 62
- OI 317.1A2; 120 VAC Regulated AC [Alternating Current] Distribution 1Y11 and 1Y21; Revision 11
- OI 317.1A4; 120 VAC Regulated AC Distribution 1D15/1Y1A and 1D25/1Y2A Panel Lineup (In-service); Revision 3
- OI 317.1A6; 120 VAC Regulated AC Distribution 1Y16 and 1Y26 Panel Lineup (In-service); Revision 1
- OI 317.1A8; 120 VAC Regulated AC Distribution 1Y10 and 1Y20 Panel Lineup (In-service); Revision 3
- OI 357A2; 120 VAC Uninterruptible Power Supply System 1Y23 Electrical Lineup (In-service); Revision 4
- OI 357A4; 120 VAC Uninterruptible Power Supply System 1D45/1Y4 Panel Lineup (In-service); Revision 3
- CR 0211019; Clarification of NRC Concern Regarding Synchroscope Check Relay Calibration
- Drawing BECH-M113; P.&I.D. RHR Service Water and Emergency Service Water Systems; Revision 75
- Drawing BECH-M146; P.&I.D. Service Water System Pumphouse; Revision 89
- Drawing BECH-M121; P.&I.D. Core Spray System; Revision 40
- Drawing BECH-M169 [2]; P.&I.D. Control Building Chillers 1VCH001A and 1VCH001B; Revision 14
- Drawing BECH-M169 [3]; P.&I.D. Control Building Chillers 1VCH001A and 1VCH001B; Revision 14
- Drawing BECH-M113; P.&I.D. Residual Heat Removal Service Water and Emergency Service Water Systems; Revision 75
- Surveillance Test Procedure (STP) NS992806; Lisega Hydraulic Snubbers Visual Inspection; Revision 9
- STP NS992802; Bergen Paterson Hydraulic Snubbers Visual Inspection; Revision 15
- OI 410A2; "A" River Water Supply Valve Lineup and Checklist; Revision 21

1R05 Fire Protection

- Administrative Control Procedure (ACP) 1203.53; Fire Protection; Revision 11
- ACP 1412.4; Impairments to Fire Protection Systems; Revision 74
- FHA-400; Fire Protection Program-Fire Hazards Analysis; Revision 17
- Pre-Fire Plan (PFP)-RB-786; Pre-Fire Plan Reactor Building Elevation 786; Revision 1
- PFP-CB-757; Pre-Fire Plan Control Building Elevation 757; Revision 2
- PFP-TB-734; Pre-Fire Plan Turbine Building Elevation 734; Revision 3
- PFP-RB-716; Pre-Fire Plan Reactor Building Elevation 716; Revision 2
- PRP-LL-757; Pre-Fire Plan [Low Level Radwaste Processing Storage Facility] LLRSF; Revision 1
- PFP-RR-001; Pre-Fire Plan Radioactive Release; Revision 0
- CR 02107507; Torus to Northwest Corner Room Penetration Has String In It-NRC Identified
- Drawing E011-013; Rack Assembly-2 Step EP Cat III "L" Series; Revision 2
- Drawing E011-015; Battery Arrangement 2 Step EP 3 (2) Sets of (58) LC-17 Cells; Revision 2
- Calculation M87-46; Battery Rack Anchorage Evaluation; Revision 0

1R06 Flooding

- AOP 902; Flood; Revision 52
- WO 40386371-01; SUS 99.09: Inspect Manholes [MH] for Water Intrusion
- WO 40390688-01; SUS 99.09: Inspect MH 104, MH 105, MH 106, and MH 107
- CR 02118415; Cable in water in MH 105

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

- OP-AA-100-1000; Conduct of Operations; Revision 15
- AD-AA-100-1006; Procedure and Work Instruction Use and Adherence; Revision 5
- OP-AA-103-1000; Reactivity Management; Revision 4
- OP-020; Area Inspections; Revision 27
- STP 3.1.3-01; Control Rod Exercise; Revision 1
- Reactivity Management Plan; Downpower for Control Rod Exercise; August 2015
- Simulator Exercise Guide PDA OPS ESG 184; Revision 0
- Simulator Exercise Guide PDA OPS 2016A-01E; Revision 1
- Reactivity Management Plan Downpower and Control Rod Sequence Exchange; January 2016; Revision 2016-01-14

1R12 Maintenance Effectiveness

- ER-AA-100-2002; Maintenance Rule Program Administration; Revision 2
- CR 02059125; Perform Duane Arnold Maintenance Rule (a)(3) Assessment
- NUMARC 93-01; Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants; Revision 4A
- HTECCH-D270-01; Maintenance; Revision 24
- OLM Plan; RCIC 1608; February 22-26, 2016; Revision 0
- WO 7111112; B21B-K801A; Replace Fan for Abacus Controls Inverter
- WO 40362303; B21B-K801A; Calibrate
- WO 40371027; MO 2516-O; Perform Diagnostic Testing
- WO 40443108; RCIC Pump; RTS Work Order for RCIC WW 1608
- CR 02112173; MO 2516O Has a Degraded Cam
- CR 2111912; CMM RCIC Tag Out Started Earlier than Scheduled
- CR 2112112; Recorder Display Went Dark After Power Restoration
- CR 2112175; MO 2516-O Has Degraded Tripper Fingers

1R13 Maintenance Risk Assessment and Emergent Work Control

- Work Planning Guideline-1; Work Process Guideline; Revision 62
- Work Planning Guideline-2; Online Risk Management Guideline; Revision 67
- OP-AA-104-1007; Online Aggregate Risk; Revision 3
- WM-AA-1000; Work Activity Risk Management; Revision 4
- OP-AA-102-1003; Guarded Equipment; Revision 7 and 8
- HTECCH-D27001; Maintenance; Revision 24
- WO 403796701; 1G021/ENG: 4 Year Mechanical Inspection
- WO 4027112903; ISFSI Site Power Supply Transformer
- CR 02101061; "A" Control Building Chiller Oil Pressure Low Out of Spec
- WO 40368507; "A" Control Building Chiller Monthly Inspection
- CR 02114861; "A" CBC Oil Low Out Of Spec, Slide Valve Drifting
- WO 40451985; 1K032A: Replace "A" CB Chiller Compressor
- WO 40451986; 1P283A: Replace Oil Pump

1R15 Operability Determinations and Functionality Assessments

- EN-AA-203-1001; Operability Determinations/Functionality Assessments; Revision 20
- EN-AA-205-1102; Temporary Configuration Changes; Revision 6
- EN-AA-203-1201; 10 CFR Applicability and 10 CFR 50.59 Screening Reviews; Revision 7
- OP-AA-105-1000; Operational Decision-Making; Revision 1
- MA-AA-100-1011-F01; Initial Troubleshooting Investigation for CR 02064123 for MO2239 loss of position indication; August 1, 2015
- ACP 1410.2; Limiting Condition for Operation (LCO) Tracking and Safety Function Determination Program; Revision 33
- CR 02064123; Loss of Position Indication for MO2239
- CR 02104095; "B" Fuel Pool Cooling Pump Discharge Check Valve, V34-0008, Hinge Pin Not Engaged
- CR 02100486; Minor Problem Overcame When Starting Temporary Air Compressor
- CR 02100886; Temporary Modification-Diesel Air Compressor: Effects on Instrument Air Compressor Cooling Water Recirculation Pumps
- Drawing BECH-M130 [2]; P.&I.D. Instrument and Service Air Compressors 1K90A, [1K90]B, [1K90]C; Revision 27
- CR 2114579; V24-0010 Does Not Prevent Reverse Flow
- CR 2114581; V24-0010 is Not Preventing Reverse Flow
- WO 40350886; 25-1: Calibrate Relay

1R18 Plant Modifications

- OI 695.1; Hydrogen Seal Oil; Revision 18
- Clearance 9500-1PO94
- WO 40417619-04; Hydrogen Seal Oil Vacuum Pump
- ACP 1408.9; Control of Transient Equipment; Revision 9
- WO 40387396-33; 14" Core Bore from Stairwell 6 to Southwest Corner Room
- CR 02109458; HCB140-H-007 Pipe Support Installed in Incorrect Position
- GE-NE-0100-23-01-R2; DAEC Power Uprate SAR Input; Appendix A
- CR 02102754-01; Water Temperature Input to Mark I Analysis
- Drawing BECH-M111; P.&I.D. General Service Water System; Revision 76
- CR 02115338; Main Generator "B" Isolated Phase Bus Duct Cooler Damper Malfunction Leading to Elevated Temperatures
- CR 02116059; Isolated Phase Cooler Drawing and Equipment Database Discrepancies
- WO 40452921-03; [Main Generator "B" Isolated Phase Bus Duct Cooler Heat Exchanger] 1E064B: Temporary Modification
- CR 02115338; Main Generator "B" Isolated Phase Bus Duct Cooler Damper Malfunction Leading to Elevated Temperatures
- CR 02116239; Review Strategy for Alternating Bus Duct Cooling Fans
- CR 02117111; [Main Generator "A"/"B" Isolated Phase Bus Duct Cooler Heat Exchanger] 1E064 "A"/"B" Iso-Phase Cooling

1R19 Post Maintenance Testing

- MD-024; Post Maintenance Testing Program; Revision 80
- MD-062; Work Order Task(s); Revision 10
- STP 3.8.1-06A; "A" Standby Diesel Generator Operability Test (Fast Start); Revision 20
- OI 324A9; Standby Diesel Generator Checklist; Revision 12
- WO 40416988-01; Return to Service Work Order for Inspection Scope

- "A" Standby Diesel Generator Week 1543
- WO 40297132-01; V32-0047 [1K-10B B Standby Diesel Generator AC Motor Driven Air Compressor Discharge Check Valve to 1T-115B Air Receiver]: Replace Valve with Resilient Seat Valve
- STP 3.8.1-11B; "B" Standby Diesel Generator Air Compressor and Air Start Check Valve Tests; Revision 9
- OI 695.1; Hydrogen Seal Oil; Revision 18
- Clearance 9500-1PO94
- WO 40417619-04; Hydrogen Seal Oil Vacuum Pump
- CR 02063768; Inconsistent Opinions on Operability
- Drawing BECH-E106 [3]; Standby Diesel Generator and Auxiliary Control; Revision 11
- Drawing BECH-E021; Schematic Meter and Relay Diagram 4.16 Kilovolt 1A1 and Auxiliary Transformer; Revision 37
- WO 40350886-01; [Synchroscope Check Relay] 25-1: Calibrate Relay
- OI 324; Standby Diesel Generator System; Revision 116
- HTECCH-D270-01; Maintenance; Revision 24
- WO 40448107; Excessive Packing Leak; D RHR SW Pump
- STP NS1600002B; "B" RHR Service Water Operability Test; Revision 8
- Equipment-Specific Maintenance Procedure; Pump-J105-02 RHR Service Water Pumps Repair; Revision 18
- WO 40410012-01; Replace Cable 2A0406-A from 2A406-A to 1P229D-M
- WO 40410012-02; EC283914-RTS Testing for RHR Motor 1P229D-M
- WO 40382912; RCIC System Operability Test
- WO 40382903; RCIC System Leakage Inspection Walkdown
- WO 40415738; MO 2202: Adjust Packing
- WO 40451985; 1K032A: Replace "A" CB Chiller Compressor
- WO 40451986; 1P283A: Replace Oil Pump

1R22 Surveillance Testing

- WO 40323256-01; "A" RHR Loop Keep Fill Supply Line Stop Check Valve
- CR 02092300; Missed ASME Code Surveillance for V19-0124 CVCM Disassembly
- CR 02092682; V19-022-Missed ASME Code Inspection
- Duane Arnold Energy Center- Relief Request No. VR-03 Related to the Inservice Testing Program for the Fourth 10-Year Interval (ADAMS Accession No. ML 14144A002)
- NEXTERA internal Memo; Missed ASME Code Surveillance for V19-0124 CVCM Disassembly; December 18, 2015
- OI 149; Residual Heat Removal System; Revision 151
- GMP-Mech-03; Pipe Freeze Seals; Revision 25
- EPRI, TR-016384R1; Freeze Sealing (Ice Plugging) of Piping; Revision 1
- ACP 107; Surveillance Tests; Revision 19
- STP 3.3.3.2-02; Remote Shutdown Panel Functional Test for Division 2 Switchgear and "B" SBDG; Revision 16
- STP 3.8.1-06B; "B" Standby Diesel Generator Operability Test (Fast Start); Revision 22
- OI 324A9; SBDG Operating Checklist; Revision 12
- OI 324A10; SBDG Standby/Readiness Condition Checklist; Revision 18
- OI 324; Standby Diesel Generator System; Revision 115
- CR 02059993; "B" SBDG Oil Leak
- STP 3.3.3.2-03; Remote Shutdown Panel Functional Test for Core Spray and Instrumentation; Revision 21
- CR 02061661; Evaluate STPs That Have Us Enter and Exit Equipment LCOs

- STP 3.3.1.1-17; Main Steam Isolation Valve Functional Test; Revision 11
- STP 3.7.7-01; Bypass Valves Test; Revision 17
- STP 3.3.1.1-13; Turbine Control Valve EOC RPT Logic and RPS Instrument Functional Test; Revision 15
- STP 3.3.1.1; Functional Test of TSV closure input to RPS and RPT; Revision 19
- NS930002; Main Turbine Stop and Combined Intermediate Valves; Revision 5
- STP 3.5.1-02A; "A" LPCI System Operability Test; Revision 15
- STP 3.3.6.1-50A; "A" PCIS Group 3 Isolation-Logic System Functional Test; Revision 16
- CR 02107148; Group 3 Logic System Functional Test Stopped Due to Inability to Install Relay Block
- WO 40425181-01; HPCI INBD Steam Line Isolation Valve Operator
- STP 3.5.1-05; HPCI System Operability Test; Revision 71
- OI 149; Residual Heat Removal System; Revision 151
- STP 3.6.2.1-01; Suppression Pool Water Temperature Surveillance; Revision 8
- STP 3.1.7-01; SBLC Pump Operability Test; Revision 38
- OI 153; Standby Liquid Control System; Revision 41
- Drawing BECH-M126; P.&I.D. Standby Liquid Control System; Revision 26
- WO 40382912; RCIC System Operability Test
- WO 40382903; RCIC System Leakage Inspection Walk down
- WO 40390688; Electrical Manhole Inspection; Manholes 104,105,106,107
- CR 2118145; Cables in Water

4OA1 Performance Indicator Verification

- DAEC MSPI Basis Document; Revision 17

4OA2 Problem Identification and Resolution

- OP-AA-100-1002; Plant Status Control Management; Revision 9
- PI-AA-100-1005; Root Cause Analysis; Revision 19
- PI-AA-100-1006; Common Cause Evaluation; Revision 11
- PI-AA-100-1007; Apparent Cause Evaluation; Revision 14
- PI-AA-103; Human Performance Program; Revision 4
- PI-AA-103-1000; Human Performance Program Error Reduction Tools; Revision 5
- PI-AA-104-1000; Corrective Action; Revision 8
- OP-AA-101-1000; Clearance and Tagging; Revision 15
- 4OA3 Follow-Up of Events and Notices of Enforcement Discretion
- OI 698; Operating Instruction Main Generator System; Revision 89
- OI 698; Operating Instruction Main Generator System; Revision 90
- AOP 304; Grid Instability; Revision 42
- CR 2111716; Increasing Tritium in Monitoring Well 8A

LIST OF ACRONYMS USED

AC	Alternating Current
ACE	Apparent Cause Evaluation
ACP	Administrative Control Procedure
ADAMS	Agencywide Document Access Management System
AOP	Abnormal Operating Procedure
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CBC	Control Building Chiller
CFR	Code of Federal Regulations
CMM	Critical Maintenance Management
CR	Condition Report
DAEC	Duane Arnold Energy Center
EN	Event Notice
ESW	Emergency Service Water
HPCI	High Pressure Core Injection
HVAC	Heating, Ventilation and Air Conditioning
IP	Inspection Procedure
ITC	Iowa Transmission Company
kV	Kilovolt
LCO	Limiting Condition for Operation
LOP	Loss of Power
LPCI	Low Pressure Coolant Injection
MH	Manhole
MVAR	Megavolt-ampere Reactive
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
OI	Operating Instruction
OP	Operating Procedure
PARS	Publicly Available Records
PFP	Pre-Fire Plan
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
SBDG	Standby Diesel Generator
STP	Surveillance Test Procedure
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
V	Volts
VAC	Volts Alternating Current
WO	Work Order

T. Vehec

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Sincerely,

/RA/

Karla Stoedter, Chief
Branch 1
Division of Reactor Projects

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