



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

August 2, 2017

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

**SUBJECT: DUANE ARNOLD ENERGY CENTER—NRC INTEGRATED INSPECTION
REPORT 05000331/2017002**

Dear Mr. Curtland:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Duane Arnold Energy Center. On July 13, 2017, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

Based on the results of this inspection, the NRC has identified one issue that was evaluated under the significance determination process as having very low safety significance (Green). The NRC has also determined that one violation is associated with this issue. Because you initiated condition reports to address this issue, this violation is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. The NCV is described in the subject inspection report.

If you contest the violation or significance of the 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 copies to the Regional Administrator, Region III; the Director, Office of Enforcement, and the NRC Resident Inspector at the Duane Arnold Energy Center.

If you disagree with the cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; and the NRC Resident Inspector at the Duane Arnold Energy Center.

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

Sincerely,

/RA/

Karla Stoedter, Chief
Branch 1
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000331/2017002

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Letter to Dean Curtland from Karla Stoedter dated August 2, 2017

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05000331/2017002

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REGION III

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

Report No: 05000331/2017002

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: April 1 through June 30, 2017

Inspectors: C. Norton, Senior Resident Inspector
J. Steffes, Resident Inspector
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Approved by: K. Stoedter, Chief
Branch 1
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000331/2017002, 04/01/2017 – 06/30/2017; Duane Arnold Energy Center; Identification and Resolution of Problems.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding was identified by the inspectors. The finding involved a Non-Cited Violation (NCV) of the U.S. Nuclear Regulatory Commission (NRC) requirements. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Barrier Integrity

Green. The inspectors identified a finding of very low safety significance and an associated NCV of Technical Specification (TS) 5.5.13, "Control Building Envelope (CBE) Habitability Program," for the licensee's failure to implement all TS required elements in the CBE habitability assessment. Specifically, the assessments were not performed at the required frequency and did not verify that the unfiltered air leakage limits for hazardous chemicals would ensure that the CBE occupants exposure to these hazards were within the assumptions in the licensing basis. The violation was entered into the licensee's Corrective Action Program as Condition Report 02211000, "NRC Violation-CRE Habitability Program." Corrective actions included re-performing the CBE habitability assessment to determine that the unfiltered air leakage limits for hazardous chemicals ensured that the CBE occupants exposure to these hazards were within the assumptions in the licensing basis as required by TS 5.5.13.e and performing a review and revision of the CBE Habitability Program implementing procedure, Administrative Control Procedure (ACP) 1208.12, to ensure full compliance with TS 5.5.13.

The inspectors determined the failure to perform a complete and comprehensive assessment that addressed all CBE Habitability Program requirements was a performance deficiency and was within the licensee's ability to foresee and correct. Specifically, the licensee did not address the impact on CBE occupants from data gathered during the performance of offsite chemical surveys. The finding was determined to be more than minor because the finding was associated with the Barrier Integrity cornerstone attribute of procedure quality and affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was of very low safety significance because no degradation of the barrier function of the CBE against smoke or a toxic atmosphere existed. The inspectors determined this finding affected the cross-cutting area of human performance, in the aspect of documentation, such that the organization creates and maintains complete, accurate and up-to-date documentation. Specifically, the licensee failed to maintain adequate documentation to ensure that TS program requirements were being met. [H.7] (Section 40A2)

REPORT DETAILS

Summary of Plant Status

Duane Arnold Energy Center (DAEC) operated at full power at the beginning of the inspection period. On May 20, 2017, the licensee lowered power to approximately 74 percent to perform a control rod sequence exchange and returned to full power operation on May 21, 2017. On May 25, 2017, the licensee lowered power to approximately 70 percent to repair a steam leak on the 'B' turbine second stage heater drain tank and returned to full power operation on May 27, 2017. The plant remained at full power for the remainder of the inspection period with the exception of brief down-power maneuvers to accomplish rod pattern adjustments or planned surveillance test activities.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

.1 Readiness of Offsite and Alternate AC Power Systems

a. Inspection Scope

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate alternating current (AC) power systems during adverse weather were appropriate. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

- coordination between the TSO and the plant during off-normal or emergency events;
- explanations for the events;
- estimates of when the offsite power system would be returned to a normal state; and
- notifications from the TSO to the plant when the offsite power system was returned to normal.

The inspectors also verified that plant procedures addressed measures to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system prior to or during adverse weather conditions. Specifically, the inspectors verified that the procedures addressed the following:

- actions to be taken when notified by the TSO that the post-trip voltage of the offsite power system at the plant would not be acceptable to assure the continued operation of the safety-related loads without transferring to the onsite power supply;
- compensatory actions identified to be performed if it would not be possible to predict the post-trip voltage at the plant for the current grid conditions;

- re-assessment of plant risk based on maintenance activities which could affect grid reliability, or the ability of the transmission system to provide offsite power; and
- communications between the plant and the TSO when changes at the plant could impact the transmission system, or when the capability of the transmission system to provide adequate offsite power was challenged.

Documents reviewed are listed in the Attachment to this report. The inspectors also reviewed corrective action program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures.

This inspection constituted one readiness of offsite and alternate AC power systems sample as defined in Inspection Procedure (IP) 71111.01–05.

b. Findings

No findings were identified.

.2 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 IP 71111.01–05.

b. Findings

No findings were identified.

.3 Readiness for Impending Adverse Weather Condition—Severe Thunderstorm Watch

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of the facility for May 17, 2017, the inspectors reviewed the licensee’s overall preparations/protection for the expected weather conditions. On May 17, 2017, the

inspectors walked down the standby and start-up transformers systems, in addition to the licensee's emergency AC power systems, because their safety-related functions could be affected or required as a result of high winds, tornado-generated missiles or the loss of offsite power. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the UFSAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of CAP items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures. 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:

- 'A' river water supply; and
- 'B' standby diesel generator and 'B' essential service water systems while significant switchyard work occurred.

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, UFSAR, TS requirements, outstanding work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP

with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted two 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 April 17, 2017, the inspectors performed a complete system alignment inspection of the DAEC switchyard 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:

- pump house elevation 757 (all fire zones);
- main, auxiliary, startup and standby transformers, breathing and instrument air compressor buildings elevation 757 (all fire zones);
- intake structure (all fire zones);
- reactor building elevation 812;
- reactor building elevation 828; and
- reactor building elevation 855.

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.

These activities constituted six quarterly fire protection inspection samples as defined in IP 71111.05–05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

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

- general service water system; and
- reactor recirculation pump motor generator area.

Documents reviewed during this inspection are listed in the Attachment to this report. This inspection constituted one internal flooding sample as defined in IP 71111.06–05.

b. Findings

No findings were identified.

.2 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, 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 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 CAP to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following underground bunkers/manholes subject to flooding:

- MH104; and
- MH106.

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 Requalification Program (71111.11)

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

a. Inspection Scope

On May 24, 2017, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification 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:

- licensed operator performance;
- crew's 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 Technical Specification (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 quarterly licensed operator requalification program simulator sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

From May 20 to May 21, 2017, the inspectors observed a downpower for a rod sequence exchange. This was an activity that required heightened awareness or was related to increased risk. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's 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 (or equipment) manipulations; and
- oversight and direction from supervisors.

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 quarterly licensed operator heightened activity/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:

- standby liquid control system;

- division 1 125 volts direct current battery charger;
- high pressure core injection (HPCI) critical maintenance management work window; and
- permanent placement of banana jacks on terminal strips during performance of Surveillance Test Procedure (STP) 3.3.6.1-06, Main Steam Line Isolation Logic System Functional Test.

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 Title 10 of the *Code of Federal Regulations* (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 performed a quality review for the permanent placement of banana jacks on terminal strips during performance of STP 3.3.6.1-06, Main Steam Line Isolation Logic System Functional Test, as discussed in Inspection Procedure (IP) 71111.12, Section 02.02.

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 Corrective Action Procedure (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted three quarterly maintenance effectiveness samples and one quality control sample 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:

- plant risk during switchyard breaker ‘D’ and ‘S’ replacements;
- emergent high risk work on the standby transformer; and
- emergent high risk work associated with switchyard modifications.

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

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- technical support center habitability, including assumptions made in the Updated Final Safety Analysis (UFSAR); and
- emergency diesel generator load rejection surveillance review.

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 operability inspection constituted two 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 modification(s):

- switchyard open phase modification (opening sample for installation of this modification); and
- well water supply temporary modification to the reactor feed pump lube oil coolers.

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(s). 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 one complete temporary modification sample and one partial permanent plant 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:

- well water supply to reactor feed pump lube oil coolers;
- HPCI post maintenance testing; and
- 'B' core spray system operability test following maintenance window.

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 Nuclear Regulatory Commission (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 three 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:

- STP 3.5.1–10; HPCI system operability test and comprehensive pump test (IST);
- STP NS 130010 caterpillar portable diesel fire pump operability (Routine);
- main steam isolation valve and turbine valves testing (Routine); and
- main steam line isolation logic system functional 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 in-service 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 three routine surveillance testing samples and one in-service test sample (IST) as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on May 24, 2017, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the Technical Support Center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the CAP. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

This emergency preparedness (EP) drill inspection constituted one sample as defined in IP 71114.06–05.

b. Findings

No findings were identified.

.2 Training Observation

a. Inspection Scope

The inspectors observed a tabletop training evolution for licensed operators on May 9, 2017, which required emergency plan event classification and communication by a partial licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the CAP. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the Attachment to this report.

This inspection of the licensee's training evolution with emergency preparedness drill aspects constituted one sample as defined in IP 71114.06–05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational and Public Radiation Safety

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)

.1 Radioactive Material Storage (02.02)

a. Inspection Scope

The inspectors selected areas where containers of radioactive waste are stored, and evaluated whether the containers were labeled in accordance with 10 CFR 20.1904, or controlled in accordance with 10 CFR 20.1905.

The inspectors assessed whether the radioactive material storage areas were controlled and posted in accordance with the requirements of 10 CFR Part 20. For materials stored or used in the controlled or unrestricted areas, the inspectors evaluated whether they were secured against unauthorized removal and controlled in accordance with 10 CFR 20.1801 and 10 CFR 20.1802.

The inspectors evaluated whether the licensee established a process for monitoring the impact of low-level radioactive waste storage that was sufficient to identify potential unmonitored, unplanned releases or nonconformance with waste disposal requirements.

The inspectors evaluated the licensee's program for container inventories and inspections. The inspectors selected containers of stored radioactive material, and assessed for signs of swelling, leakage, and deformation.

These inspection activities constituted one complete sample as defined in Inspection Procedure (IP) 71124.08-05.

b. Findings

No findings were identified.

.2 Radioactive Waste System Walk-down (02.03)

a. Inspection Scope

The inspectors walked down accessible portions of select radioactive waste processing systems to assess whether the current system configuration and operation agreed with the descriptions in plant and/or vendor manuals.

The inspectors reviewed administrative and/or physical controls to assess whether equipment, which is not in service or abandoned in place, would not contribute to an unmonitored release path and/or affect operating systems or be a source of unnecessary personnel exposure. The inspectors assessed whether the licensee reviewed the safety significance of systems and equipment abandoned in place in accordance with 10 CFR 50.59.

The inspectors reviewed the adequacy of changes made to the radioactive waste processing systems since the last inspection. The inspectors evaluated whether changes from what is described in the UFSAR were reviewed and documented in accordance with 10 CFR 50.59 or that changes to vendor equipment were made in accordance with vendor manuals. The inspectors also assessed the impact of these changes on radiation doses to occupational workers and members of the public.

The inspectors selected processes for transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers and assessed whether the waste stream mixing, sampling, and waste concentration averaging were consistent with the process control program, and provided representative samples of the waste product for the purposes of waste classification.

The inspectors evaluated whether tank recirculation procedures provided sufficient mixing.

The inspectors assessed whether the licensee's process control program correctly described the current methods and procedures for dewatering and waste stabilization.

These inspection activities constituted one complete sample as defined in IP 71124.08-05.

b. Findings

No findings were identified.

.3 Waste Characterization and Classification (02.04)

a. Inspection Scope

For select waste streams, the inspectors assessed whether the licensee's radiochemical sample analysis results were sufficient to support radioactive waste characterization as required by 10 CFR Part 61. The inspectors evaluated whether the licensee's use of scaling factors and calculations to account for difficult-to-measure radionuclides was technically sound and based on current 10 CFR Part 61 analysis.

The inspectors evaluated whether changes to plant operational parameters were taken into account to: (1) maintain the validity of the waste stream composition data between the sample analysis update; and (2) assure that waste shipments continued to meet the requirements of 10 CFR Part 61.

The inspectors evaluated whether the licensee had established and maintained an adequate quality assurance program to ensure compliance with the waste classification and characterization requirements of 10 CFR 61.55 and 10 CFR 61.56.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

.4 Shipment Preparation (02.05)

a. Inspection Scope

The inspectors reviewed the technical instructions presented to workers during routine training. The inspectors assessed whether the licensee's training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities. The inspectors assessed whether shippers were knowledgeable of the shipping regulations and demonstrated adequate skills to accomplish package preparation requirements. The inspectors evaluated whether the licensee was maintaining shipping procedures in accordance with current regulations. The inspectors assessed whether the licensee was meeting the expectations in NRC Bulletin 79–19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," and 49 CFR Part 172, Subpart H, "Training."

The inspectors evaluated whether the requirements for Type B shipment Certificates of Compliance had been met. The inspectors determined whether the user was a registered package user and had an NRC-approved quality assurance program. The inspectors assessed whether procedures for cask loading and closure were consistent with vendor procedures.

The inspectors assessed whether non-Type B shipments were made in accordance with the package quality documents.

The inspectors assessed whether the receiving licensee was authorized to receive the shipment packages.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

.5 Shipping Records (02.06)

a. Inspection Scope

The inspectors reviewed select shipments to evaluate whether the shipping documents indicated the proper shipper name; emergency response information and a 24-hour contact telephone number; accurate curie content and volume of material; and appropriate waste classification, transport index, and United Nations number. The inspectors assessed whether the shipment marking, labeling, and placarding was consistent with the information in the shipping documentation.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

.6 Identification and Resolution of Problems (02.07)

a. Inspection Scope

The inspectors assessed whether problems associated with radioactive waste processing, handling, storage, and transportation were being identified by the licensee at an appropriate threshold, were properly characterized, and were properly addressed for resolution. Additionally, the inspectors evaluated whether the corrective actions were appropriate for a selected sample of problems documented by the licensee that involve radioactive waste processing, handling, storage, and transportation.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

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 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System (RCS) Leakage performance indicator (PI) for the period from the second quarter 2016 through the first quarter 2017. 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 logs, RCS leakage tracking data, condition reports, event reports and Nuclear Regulatory Commission (NRC) Integrated Inspection Reports for the period of April 1, 2016, to March 31, 2017, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's condition 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 RCS leakage 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 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 Corrective Action Program (CAP) at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed. Some minor issues were entered into the licensee's CAP as a result of the inspectors' observations; however, they are not discussed in 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.

b. Findings

No findings were identified.

.2 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 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6-month period of January 2017 through June 2017, although some examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the 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.

The inspectors performed a review of the Emergency Preparedness (EP) issues documented in the licensee's CAP to identify trends in EP performance. In December 2016, the inspectors identified that the licensee repeatedly preconditioned EP tabletop drill participants by utilizing the example scenario from the tabletop drill procedure. In May 2017, the licensee credited a tabletop drill notification as successful when the wrong emergency action level was communicated to the off-site agencies. Further, the licensee provided a regulatory interpretation of NEI 99-02, "Regulatory Assessment Performance Guideline," Revision 7, which was non-conservative with respect to industry standards and past licensee practice. Also in May 2017, an EP controller left a scenario guide open and unattended in the presence of drill participants. The licensee has implemented corrective actions to address weaknesses identified in the program.

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

b. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues: Control Building Envelope Habitability Program

a. Inspection Scope

The inspectors selected the following condition reports for in-depth review:

- CR 02189864; Control Room Habitability Assessment;
- CR 02189868; Control Room Habitability Inleakage Testing Grace Period; and
- CR 02189872; [Administrative Control Procedure] (ACP) 1208.12 Procedural Deficiencies.

As appropriate, the inspectors verified the following attributes during their review of the licensee's corrective actions for the above condition reports and other related condition reports:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause, and previous occurrences;
- evaluation and disposition of operability/functionality/reportability issues;
- classification and prioritization of the resolution of the problem commensurate with safety significance;
- identification of the root and contributing causes of the problem;
- identification of corrective actions, which were appropriately focused to correct the problem;
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue;
- effectiveness of corrective actions taken to preclude repetition; and
- evaluate applicability for operating experience and communicate applicable lessons learned to appropriate organizations.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel.

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

b. Findings

Failure to Comply with Technical Specification Program Requirements

Introduction: The inspectors identified a finding of very low safety significance (Green) and an associated NCV of TS 5.5.13, "Control Building Envelope (CBE) Habitability Program," for the licensee's failure to implement all TS required elements in the CBE habitability assessment. Specifically, the assessments were not performed at the required frequency and did not verify that the unfiltered air leakage limits for hazardous chemicals would ensure that the CBE occupants exposure to these hazards were within the assumptions in the licensing basis.

Description: On March 7, 2017, the licensee's Nuclear Oversight group identified that a comprehensive assessment of the CBE Habitability Program was missing from the licensee's record and entered this issue into the CAP as CR 02189864, "Control Room Habitability Assessment." The inspectors followed up on this Condition Report (CR) and determined that the CBE habitability assessment had not been performed since the program's inception in 2008. This was contrary to TS 5.5.13.c, which required that the licensee "assess the CBE habitability at the frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0." Sections C.1 and C.2 of the Regulatory Guide specifies testing and assessment to be performed at least once every 3 years.

In 2008, during the implementation of the CBE Habitability Program, the licensee established ACP 1208.12, "Control Room Envelope Habitability Program," Revision 1. However, ACP 1208.12 recommended, but did not require, a three year assessment

frequency, hence, no periodic assessments were performed. Procedure ACP 1208.12 also provided guidelines for performing self-assessments of the program. It stated, "Self-Assessments should focus on the following types of activities: a) Review all documentation concerning the CBE created within the current assessment period pertaining to: ... 3) recent hazardous chemical surveys."

As a result from the Nuclear Oversight condition report, the licensee performed a comprehensive assessment to restore program compliance on March 13, 2017. The NRC identified that this assessment did not address all program requirements in accordance with TS 5.5.13.e. Specifically, the assessment did not utilize the information from the offsite chemical hazards survey (performed annually under Surveillance Test Procedure (STP) NSEP0013, Offsite Chemical Survey of Hazardous Chemicals), and apply that information to the CBE Habitability Program to validate the assumptions made in the licensing basis contained in Updated Final Safety Analysis Report (UFSAR) Section 6.4.4.3.2, "Survey of Offsite Chemical Hazards." The inspectors subsequently determined that the assumptions in the licensing basis remained valid and conservative, however, the licensee did not determine the potential impact on the CBE, as required per TS 5.5.13.e.

The licensee wrote CR 02189872 to review ACP 1208.12 for procedure deficiencies and wrote CR 02194980 to review ACP 1208.12 for compliance with the CBE Habitability Program and TS 5.5.13.

Analysis: The inspectors determined that failure to perform a complete and comprehensive assessment that addressed all CBE Habitability Program requirements was a performance deficiency. Specifically, the licensee did not address the impact on CBE occupants from data gathered during the performance of offsite chemical surveys. The finding was determined to be more than minor because the finding was associated with the Barrier Integrity cornerstone attribute of procedure quality and affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases cause by accidents or events. Specifically, the failure to assess the offsite chemical surveys and apply that to potential impact on the CBE occupants, lead to a non-compliance with TS program 5.5.13.

Using Inspection Manual Chapter (IMC) 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609 Appendix A, "The Significance Determination Process for Findings at Power," issued June 19, 2012, the finding was screened against the Barrier Integrity cornerstone and determined to be of very low safety significance (Green), because the inspectors answered "No" to all of the questions in Exhibit 3, "Barrier Integrity Screening Questions," Section C, "Control Room, Auxiliary, Reactor, or Spent Fuel Pool Building." No degradation of the barrier function of the control room against smoke or a toxic atmosphere existed, as the follow-up evaluation of the offsite chemical hazard surveys did not result in a change in the assumptions within the licensing basis.

This finding has a cross-cutting aspect in the area of human performance, documentation. Specifically, the licensee failed to maintain adequate documentation to ensure that TS program requirements were being met. [H.7]

Enforcement: Technical Specification 5.5.13, "CBE Habitability Program," requires, in part, that the licensee assesses CBE habitability at the frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope

Integrity at Nuclear Power Reactors," Revision 0. Sections C.1 and C.2 of the Regulatory Guide specifies testing and assessment to be performed at least once every 3 years. In addition, TS 5.5.13 requires, in part, that unfiltered air leakage limits for hazardous chemicals must ensure that the exposure of CBE occupants to these hazards will be within the assumptions in the licensing basis.

Contrary to the above, the licensee failed to perform a comprehensive assessment within the frequency of every 3 years as required by the program. Additionally, when the licensee did perform the comprehensive assessment to restore compliance with TS 5.5.13, the assessment did not ensure that the exposure of CBE occupants to these hazards would be within the assumptions in the licensing basis. Specifically, the licensee did not utilize the information from the offsite chemical hazards survey and apply that information to the CBE Habitability Program to validate the assumptions made in the licensing basis UFSAR.

The licensee's corrective actions included re-performing the CBE habitability assessment to determine that the unfiltered air leakage limits for hazardous chemicals ensured that the CBE occupants exposure to these hazards were within the assumptions in the licensing basis as required by TS 5.5.13.e, and performing a review and revision of the CBE Habitability Program implementing procedure, ACP 1208.12, to ensure full compliance with TS 5.5.13. Because the license entered this issue into the CAP as CR 02211000, this violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000331/2017002-01; Failure to Comply with Technical Specification Program Requirements)**

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

.1 Sodium Hypochlorite Spill in the Pump House

a. Inspection Scope

On May 16, 2017, at approximately 11:55 a.m. CDT, while the site was performing chlorination of the general service water system, using sodium hypochlorite, a leak developed on the sodium hypobromide discharge isolation valve. In accordance with ACP 1411.14, "Chemical/Oil Spill Response," the hazmat response team was dispatched to the pump house to stop, contain and estimate the spill amount. The leak was stopped by closing the sodium hypobromide discharge isolation valve.

While the general service water system is not safety related, the system is contained within the pump house which also contains vital areas and safety related equipment. The hazmat team determined that approximately 5 gallons of sodium hypochlorite had leaked during the event and had been cleaned up or contained to the transformer pit such that a leak to the environment did not occur. The licensee determined, in accordance with Attachment 3 of ACP 1411.14, that 5 gallons of sodium hypochlorite leaked but did not exceed the 67 gallon threshold and therefore, did not constitute a reportable condition. In addition, the licensee took several atmospheric samples in the pump house and determined that at no time did a condition exist that could have impacted normal plant operations due to an asphyxiant. Thus, an emergency declaration was not made in accordance with in the emergency plan implementing procedures (EPIP) 1.1, "Determination of Emergency Action Levels," and guidance

contained in the emergency action level bases document (EBD) H, "Hazards & Other Conditions Affecting Plant Safety." The licensee captured the condition in CR 02205394, "Leak from Valve While Chlorinating the GSW [general service water] System."

The inspectors responded to the control room shortly after spill was announced and remained in the control room throughout the event until it was terminated. The inspectors confirmed that licensee's understanding, determination and actions in response to the event were appropriate and in accordance with established procedures and standards. Documents reviewed are listed in the Attachment to this report.

This event follow-up review constituted one sample as defined in Inspection Procedure (IP) 71153-05.

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report 05000331/2016-002: Unplanned Reactor Core Isolation Cooling Inoperability Results in Safety System Functional Failure

a. Inspection Scope

On April 28, 2016, licensee personnel placed a relay block on the incorrect relay finger. When the relay was actuated, it caused the steam supply to the Reactor Core Isolation Cooling (RCIC) system to isolate, resulting in an unplanned RCIC inoperability. Corrective actions included ceasing the performance of the STP, restoring the RCIC system to an operable status, performing updated and expanded training on the proper implementation of place keeping and error reduction techniques. Documents reviewed are listed in the Attachment to this report. This Licensee Event Report (LER) is closed.

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

b. Findings

This issue was previously reviewed by the inspectors and a violation was documented in Section 1R22 of NRC Integrated Inspection Report 05000331/2016002. No new findings or violations were identified during the LER review.

4OA6 Management Meetings

.1 Exit Meeting Summary

On July 13, 2017, the inspectors presented the inspection results to Mr. D. Curtland, 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

Interim exits were conducted for:

- The inspection results for the Radiation Safety Program review with Mr. P. Hansen, Engineering Site Director, on April 20, 2017.

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

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Curtland, Site Vice President
P. Hansen, Engineering Site Director
M. Davis, Licensing Manager
M. Fritz, Emergency Preparedness Manager
J. Karrick, Nuclear Oversight Supervisor
M. Strobe, Operations Director
D. Morgan, Radiation Protection Manager
M. Casey, Chemistry Manager
J. Schwertfeger, Security Manager
C. Hill, Training Manager
D. Church, Engineering Programs Manager
P. Polfleit, NextEra Energy EP Manager
D. Bloomquist, Radiation Protection Supervisor

U.S. Nuclear Regulatory Commission

K. Stoedter, Chief, Reactor Projects Branch 1

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000331/2017002-01	NCV	Failure to Comply with Technical Specification Program Requirements (Section 4OA2)
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Closed

05000331/2017002-01	NCV	Failure to Comply with Technical Specification Program Requirements (Section 4OA2)
05000331/2016-002	LER	Unplanned RCIC Inoperability Results in Safety System Functional Failure (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

- AOP 903; Severe Weather; Revision 59
- AOP 902; Flood; Revision 60
- AOP 304; Grid Instability; Revision 47
- ACP 1408.23; Controls to the DAEC Switchyard; Revision 19
- CR 02206712; NRC Identified Issues at the Intake
- CR 01800380; AOP 902 Deficiency
- CR 01800985; AOP 902 – Flood
- CR 02211202; NRC Question Regarding Intake Structure AOP 902 Action
- Drawing BECH-CD084; Architectural Intake Structure Floor Plan, Roof Plan, Section & Panel Elevations; Revision 10
- WO 4052268501; Transformer T1; Equipment Outage Request 41637 Transfer Relay Upgrade and Disconnect Switch Maintenance
- WO 4052268503; Post-Maintenance Test: T1: Equipment Outage Request 44278: East Bus Relay Testing
- WO 4052268504; Post-Maintenance Test: T1: Equipment Outage Request 44279: West Bus Relay Testing

1R04 Equipment Alignment

- OP-AA-102-1003; Guarded Equipment; Revision 7
- Operating Instruction (OI) 410; River Water Supply System; Revision 79
- OI 410A2; "A" River Water Supply System Valve Lineup; Revision 22
- OI 324A4; Standby Diesel Generator 1G-21 System Valve Lineup; Revision 18
- OI 454A4; "B" Emergency Service Water System Valve Lineup; Revision 20
- AOP 410; Loss of River Water Supply; Revision 30
- Drawing BECH-M129; River Water Supply System Intake Structure; Revision 46
- System Health Report; 10.00 – River Water Supply; Q2-2017
- CR 02195877; Create WO Per EC288619 to Replace "H" breaker
- CR 02195878; Create WO Per EC288619 to Replace "I" breaker
- CR 02195879; Create WO Per EC288619 to Replace "J" breaker
- CR 02195880; Create WO Per EC288619 to Replace "LQ" breaker
- CR 02200763; Design Engineering to do Their Review Per ACP 1408 For Relay Testing
- CR 02200991; Switchyard Battery Size May Be Inadequate Due to ITC CB Work
- CR 02200998; Design Engineering To Review ITC Relay Settings ASAP
- ACP 1408.23; Controls to the DAEC Switchyard; Revision 18
- OI 304.1A22; Simplified Substation Drawing; Revision 3
- PRB Condition Report PDA-10-0017; Substation Breaker Replacement; Revision 0

1R05 Fire Protection

- ACP 1203.53; Fire Protection; Revision 19
- ACP 1412.4; Impairments to Fire Protection Systems; Revision 80

- FHA-400; Fire Protection Program- Fire Hazards Analysis; Revision 21
- Pre-Fire Plan (PFP)-PH-757; Pre-Fire Plan Pump House; Revision 1
- PFP-OS-757; Pre-Fire Plan OAG-PA South El. 757; Revision 1
- PFP-OE-757; Pre-Fire Plan OAG-PA East El. 757; Revision 1
- PFP-IS-757; Pre-Fire Plan Intake Structure; Revision 0
- PFP-RB-812; Pre-Fire Plan Reactor Building El. 812; Revision 2
- PFP-RB-828; Pre-Fire Plan Reactor Building El. 828; Revision 1
- PFP-RB-855; Pre-Fire Plan Reactor Building El. 855; Revision 2

1R06 Flood Protection

- AOP 902; Flood; Revision 60
- WO 40465128-01; 6-Month Manhole Inspection;
- WO 40472235-01; Electrical Sump Pump Inspection;
- GMP-ELEC-39; Electrical Manhole Inspection; Revision 5
- DAEC PSA-IF-10; Duane Arnold Internal Flood Analysis; Revision 4
- PFP-RB-786; Pre-Fire Plan Reactor Building Elevation 786; Revision 4
- Drawing BECH-M139; P.&I.D. Floor Drain Radwaste System (Open); Revision 65
- Drawing BECH-M146; P.&I.D. Service Water System Pumphouse; Revision 89
- Drawing BECH-M142; P.&I.D. Circulating Water System; Revision 102

1R11 Licensed Operator Regualification Program

- OP-AA-100-1000; Conduct of Operations; Revision 21
- AD-AA-100-1006; Procedure and Work Instruction Use and Adherence; Revision 12
- OP-AA-103-1000; Reactivity Management; Revision 6
- Reactivity Management Plan; Downpower for Control Rod Sequence Exchange; May 2017
- Duane Arnold Energy Center 2017 Emergency Response Drill/Exercise Program; May 24, 2017.

1R12 Maintenance Effectiveness

- ER-AA-100-2002; Maintenance Rule Program Administration; Revision 4
- NUMARC 93-01; Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants; Revision 4A
- PI-AA-104-1000; Condition Reporting; Revision 12
- ER-AA-204-2006-10001; Functional Importance Determination and ER Scoping; Revision 0
- CR 02194250; System Engineering Delay in Entering Standby Liquid Control System Unavailability Time
- System Health Report; 53.00 – River Water Supply; Q1-2017
- DAEC Performance Criteria Basis Document; Standby Liquid Control System SUS 53.00; Revision 1
- EC 288409; Connect 1D12-4 Input to 1B3201 Due to 1D12-1 Breaker Issue; Revision 1
- WO 40351908; V-1D12: Calibrate
- WO 40351909; A-1D12: Calibrate
- WO 40471266; 1D12: Replace Float/Equalize Switch for Battery Charger
- WO 40519965; 1D12-01 AC Power Supply Breaker to 1D12 Failed
- WO 40526464; 1D12 Float Potentiometer not Working Properly
- CR 02196862; 1D12-01 Tripped When Placing Charger 1D12 in Service
- CR 02196925; 1D12 Operational Checks After Maintenance

- 1R13 Maintenance Risk Assessments and Emergent Work Control
- Work Planning Guideline (WPG)-1; Work Process Guideline; Revision 65
- WPG-2; Online Risk Management Guideline; Revision 69
- WPG-4; Conduct of Readiness Challenge Reviews for Online Risk Activities; Revision 2
- OP-AA-102-1003; Guarded Equipment; Revision 20
- OP-AA-104-1007; Online Aggregate Risk; Revision 4
- WM-AA-1000; Work Activity Risk Management; Revision 9
- WM-AA-100-F01; Work Activity Risk Management; Revision 2
- Probabilistic Risk Analysis; Revision 2
- Work Week 1716 Work Activity Risk Management (WARM) Summary and Weekly
- OI 304.1A22; Simplified Substation Drawing; Revision 3
- AOP 304; Grid Instability; Revision 45
- WO 40415359-08; Installing Fiber Optic Current Transformer on Standby Transformer for Open Phase Modification
- GMP-INST-19; Replacement of Terminal Screws with Banana Jack Adaptors; Revision 3
- WO 94159091; Stand Offs Needed For Relay A71B-K7D
- Engineering Evaluation for OTH017377 (Part Dedication for Banana Jack Installation)

1R15 Operability Determinations and Functional Assessments

- EN-AA-203-1001; Operability Determinations/Functionality Assessments; Revision 24
- OP-AA-105-1000; Operational Decision-Making; Revision 6
- ACP 1410.2; LCO Tracking and Safety Function Determination Program; Revision 35
- Drawing BECH-M151; P. & I. D. Control Building & TSC Air Flow Diagram; Revision 23
- CR 02189051; NRC Question TSC Doors Positive Pressure and Habitability
- CR 02199423; NRC Question on Maintaining UFSAR Assumption for TSC Vent
- NUREG-0737; Clarification of TMI Action Plan Requirements; Revision 0
- NUREG-0696; Functional Criteria for Emergency Response Facilities; Revision 0
- TSC-39; DAEC Emergency Response Organization TSC Clerical Position, Position Specific Checklist; Revision 9
- CR 02200241; EDG Load Rejection Surveillance Review

1R18 Plant Modifications

- EN-AA-205-1102; Temporary Configuration Changes; Revision 9
- EN-AA-205-1102-F01; Temp Equipment Tracking (Time) Form; Revision 6
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1R19 Post Maintenance Testing

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1R22 Surveillance Testing

- ACP 107; Surveillance Tests; Revision 23
- STP 3.5.1-10; HPCI System Operability Test and Comprehensive Pump Test; Revision 37
- STP 3.6.2.1-01; Suppression Pool Water Temperature Surveillance; Revision 9
- WO 40522028; HPCI RTS; Revision 0
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- STP NS130009; John Deere Portable Diesel Fire Pump Operability; Revision 23
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- STP 3.3.1.1-17; Main Steam Isolation Valve Functional Test; Revision 12
- NS930002; Main Turbine Stop and Combined Intermediate Valves Test; Revision 5
- STP 3.3.6.1-06; PCIS Main Steam Line Isolation Logic System Functional Test; Revision 12

1EP6 Drill Evaluation

- CR 02204192; Communication Error During Notification Process of Table Top
- EP-AA-101-1000-10001; Nuclear Drill and Exercise Objectives and Demonstration Criteria; Revision 6
- EPIP Note-05; Duane Arnold Energy Center Emergency Notification; Revision 18
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2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

- CR 02172168; Shipment of Asbestos not Manifested Properly; Dated December 6, 2016
- CR 02191961; Level 1 Assessment in Preparation for NRC Inspection Covering 71124.08; March 16, 2017
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- CR 02199788; 71124.08: NRC Observation of DAW Sealand; April 18, 2017
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- CR 02189326; Rad Waste Shipping Check List Review; March 3, 2017
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- CR 02041937; Notice of Deficiency Received for Rad Shipment to Clive Utah; May 12, 2015
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- CR 02074738; Discrepancies Identified in a Rad Shipment to Seabrook; March 16, 2016
- CR 02177389; Review of ACE 2074738; December 30, 2016
- RP-AA-108; Radioactive Waste Program; Revision 0
- RP-AA-108-1102; Shipment of Radioactive Material; Revision 8
- RP-AA-108-1003; Radioactive Materials Surveys for Shipment; Revision 5
- RP-AA-108-1004; Packaging Radioactive Material for Shipment; Revision 2
- RWH 3402.14; Initial Conditions for Radwaste Solid Processing System Startup; Revision 20
- RWH 3410.1; Process Control Program; Revision 20
- RWH 3414.1; Setup and Operation of the Self-Engaging Dewatering System Fillhead; Revision 7
- System Description; SD-969.1; Liquid Radwaste System; Revision 4
- System Description; SD-968; Solid Radwaste System; Revision 4
- 15-006-R; 10 CFR 61 Compliance Data Technical Basis for DAEC Dry Active Waste; Revision 0
- 16-002-R; 10 CFR 61 Compliance Data Technical Basis for DAEC Condensate Resin; Revision 1
- RSR 16-54; Dewatered Condensate Resin (LSA-II); August 16, 2016
- RSR 16-66; Dry Active Waste (LSA-I); September 29, 2016
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- RSR 17-04; Dewatered Condensate Resin (LSA-II); January 25, 2017
- File RP-9b; Review of Radwaste Liquid Sample Data to Determine Representative Sampling Capability; February 28, 1986

4OA1 Performance Indicator Verification

- DAEC MSPI Basis Document; Revision 17

4OA2 Identification and Resolution of Problems

- PI-AA-104-1000; Corrective Action; Revision 13
- CR 02189872; ACP 1208.12 Procedural Deficiencies
- CR 02189868; CRH [Control Room Habitability] Inleakage Testing Grace Period
- CR 02189864; Control Room Habitability Assessment

- ACP 1208.12; Control Room Envelope Habitability Program; Revision 1
- DAEC TS 5.5.13; Control Building Envelope Habitability Program
- DAEC Updated Final Safety Analysis Report; Section 6.4; Habitability Systems
- Regulatory Guide 1.197; Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors, May 2003
- NEI 99-03; Control Room Habitability Assessment Guidance; June 2001
- STP NSEP0013; Offsite Survey of Hazardous Chemicals; Revision 2
- Form EP-013; Offsite Surveillance of Hazardous Chemicals that Could Affect Control Room Habitability; Revision 2

4OA3 Follow-up of Events and Notices

- EPIP 1.1; Determination of Emergency Action Levels; Revision 29
- EBD H; Hazards and Other Conditions Affecting Plant Safety; Revision 13
- EBD REF; EAL Supporting Reference Information; Revision 2
- EPIP Form EAL-01; Emergency Action Level Matrix- Hot Modes; Revision 10
- ACP 1411.14; Chemical/Oil Response; Revision 24
- ACP 1411.6; Management of Chemicals and Hazardous Materials; Revision 42
- CR 02205394; Leak Form Valve While Chlorinating GSW System
- STP 3.3.6.1-28; RCIC Steam Line Flow – High Channel Functional Test; Revision 14
- CR 02128855; RCIC Steam Line Flow Hi Flow Functional Test Should Have Been High Risk

LIST OF ACRONYMS USED

AC	Alternating Current
ACP	Administrative Control Procedure
AOP	Abnormal Operating Procedure
CAP	Corrective Action Program
CBE	Control Building Envelope
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
DAEC	Duane Arnold Energy Center
EBD	Emergency Action Level Bases Document
EPIP	Emergency Plan Implementing Procedure
EP	Emergency Preparedness
HPCI	High Pressure Core Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IST	In-Service Test
LER	Licensee Event Report
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
OI	Operating Instruction
PFP	Pre-Fire Plan
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
STP	Surveillance Test Procedure
TS	Technical Specification
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
WO	Work Order