



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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LISLE, IL 60532-4352

August 2, 2012

Mr. Richard L. Anderson
Vice President
NexEra Energy Duane Arnold, LLC
3277 DAEC Road
Palo, IA 52324-9785

**SUBJECT: DUANE ARNOLD ENERGY CENTER
INTEGRATED INSPECTION REPORT 05000331/2012003**

Dear Mr. Anderson:

On June 30, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Duane Arnold Energy Center (DAEC). The enclosed report documents the results of this inspection, which were discussed on July 12, 2012, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, two NRC-identified findings of very low safety significance were identified. These findings involved violations of NRC requirements. However, because of the very low safety significance, and because the issues were entered into your corrective action program (CAP), the NRC is treating these issues as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

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

If you disagree with the cross-cutting aspects assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Duane Arnold Energy Center.

R. Anderson

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In accordance with 10 CFR 2.390 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 Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Mark Ring, Chief
Branch 1
Division of Reactor Projects

Docket No: 05000331
License No: DPR-49

Enclosure: Inspection Report 05000331/2012003
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 05000331
License No: DPR-49

Report No: 05000331/2012003

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: April 1 through June 30, 2012

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Enclosure

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SUMMARY OF FINDINGS

IR 05000331/2012003, 04/01/2012 – 06/30/2012; Duane Arnold Energy Center; Heat Sink Performance, and Follow-Up of Events and Notices of Enforcement Discretion.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were identified by the inspectors. These findings were considered NCVs of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process". Findings for which the Significance Determination Process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealed Findings

Cornerstones: Mitigating Systems and Barrier Integrity

- Green. The inspectors identified a finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to prescribe a procedure for activities affecting quality. Specifically, the licensee did not develop procedures for monitoring the thermal performance of the residual heat removal service water pump motor upper thrust bearing oil cooling coils. This finding was entered into the licensee's corrective action program (CAP) to generate procedures to collect monitoring data and to correlate to design conditions.

The performance deficiency was determined to be more than minor because it was associated with the procedure quality and equipment performance attribute of the Mitigating Systems Cornerstone, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding screened as of very low safety significance (Green) because the finding was a qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee performed a functionality evaluation and determined the most limiting cooler had sufficient margin. The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because the licensee did not ensure supervisory and management oversight of work activities associated with the performance of residual heat removal service water pump motor cooler functional testing. Specifically, management did not ensure personnel developed procedures conforming to their Quality Assurance Program to be used when performing activities affecting quality. [H.4(c)] (Section 1R07.1.b(1))

- Green. A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors on May 31, 2012, for the licensee's failure to conduct post-maintenance testing in accordance with Maintenance Directive (MD) 024, "Post-Maintenance Testing Program." Specifically, post-maintenance testing on secondary containment isolation damper 1V-AD-17A3 was not adequate to verify the ability of the secondary containment to perform its intended function and it did not verify that no new problems were created (interference with damper 1V-AD-17B3) as a result of the maintenance performed. The

licensee entered this issue into the CAP as condition report (CR) 01771837 and was in the process of evaluating the adequacy of maintenance practices and formulating corrective actions at the end of the inspection period.

The inspectors determined that failing to perform adequate post-maintenance testing was a performance deficiency because it was the result of the licensee's failure to meet a procedural requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been corrected. The performance deficiency was determined to be more than minor and a finding because it was associated with the structure, system, and component (SSC) and barrier performance attribute of the Barrier Integrity Cornerstone, and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers (secondary containment) protect the public from radionuclide releases caused by accidents or events. The inspectors evaluated the finding in accordance with IMC 0609.04, Table 4a. Because the finding only represented a degradation of the radiological barrier function provided for the secondary containment (Question 1 under the Containment Barrier column), the finding screened as very low safety significance (Green). The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Work Control components, and involving the licensee appropriately planning and coordinating work activities by incorporating risk insights. [H.3(a)] (Section 4OA3.1)

B. Licensee-Identified Violations

No violations were identified.

REPORT DETAILS

Summary of Plant Status

Duane Arnold Energy Center operated at full power for the entire inspection period except for brief down-power maneuvers to accomplish rod pattern adjustments, to conduct planned surveillance testing activities, or to compensate for anticipated condenser back pressure conditions during periods of elevated outside ambient and river water temperatures.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

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:

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

- The 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;
- The 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;
- A 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

- The 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 CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into the 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.

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:

- 1A4 Essential Switchgear with the 'A' River Water Supply (RWS) subsystem out of service for planned maintenance;
- 'B' Residual Heat Removal Service Water (RHRSW) subsystem with the 'A' RHRSW subsystem out of service for planned maintenance; and
- 'A' Emergency Service Water (ESW) subsystem and 'A' Standby Diesel Generator during 'B' Low Pressure Coolant Injection (LPCI) Loop Select relay replacements.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time the systems 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), 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 three quarterly partial system walkdown samples as defined in IP 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Area Fire Plan (AFP)-21; Turbine Building North Operating Floor;
- AFP-22; Turbine Building South Operating Floor;
- AFP-23; Battery Rooms 1D-2, 1D-4, 1D-1, Battery Corridor;
- AFP-24; Essential Switchgear Rooms 1A3 and 1A4; and
- AFP-72; Auxiliary Transformer 1X2.

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 non-functional 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 licensee'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 that 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 quarterly fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On June 11, 2012, the inspectors observed an unannounced fire brigade activation drill for a simulated fire at the auxiliary transformer. Based on this observation, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were:

- proper wearing of turnout gear and self-contained breathing apparatus;
- proper use and layout of fire hoses;
- employment of appropriate fire fighting techniques;
- sufficient firefighting equipment brought to the scene;
- effectiveness of fire brigade leader communications, command, and control;
- search for victims and propagation of the fire into other plant areas;
- utilization of pre-planned strategies;
- adherence to the pre-planned drill scenario; and
- drill objectives.

Documents reviewed are listed in the Attachment to this report.

These activities constituted one annual fire protection drill inspection sample as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T)

.1 Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed completed surveillances, vendor manual information, associated calculations, performance test results and cooler inspection results associated with the RHRSW pump motor coolers and the RWS system. These coolers were chosen based on their risk significance in the licensee's probabilistic safety-analysis, their important safety-related mitigating system support functions, and their operating history.

For the RHRSW pump motor coolers, the inspectors assessed tests, inspections, maintenance, and monitoring of biotic fouling and macrofouling programs relied upon to ensure proper heat transfer. This was accomplished by reviewing: (1) the test method used against accepted industry practices, or equivalent; (2) the test conditions; (3) the test acceptance criteria and their consistency with design basis values; and (4) the results of cooler performance testing. The inspectors also assessed if: (1) the test results appropriately considered differences between testing conditions and design conditions; (2) the frequency of testing based on trending of test results was sufficient to

detect degradation prior to loss of heat removal capabilities below design basis values; and (3) test results considered test instrument inaccuracies and differences. In addition, the inspectors verified the condition and operation of the RHRSW pump motor coolers were consistent with design assumptions in heat transfer calculations and as described in the UFSAR. The inspectors also verified the licensee evaluated the potential for water hammer and established adequate controls and operational limits to prevent heat exchanger degradation due to excessive flow-induced vibration during operation.

The inspectors assessed the licensee's inspection of the Ultimate Heat Sink (UHS) relied upon to identify degradation of the shoreline protection and loss of structural integrity of underwater structures. This included verification that vegetation present along the shoreline was trimmed, maintained and was not adversely impacting the embankment. In addition, the inspectors verified the licensee ensured sufficient reservoir capacity by trending and removing debris or sediment buildup in the intake structure.

The inspectors performed a system walkdown of the RWS system in the intake structure to verify the licensee's assessment on structural integrity and component functionality. This included the verification that the licensee was ensuring proper functioning of traveling screens and strainers, and structural integrity of component mounts. In addition, the inspectors verified that RWS pump bay silt accumulation was monitored, trended, and maintained at an acceptable level by the licensee, and that water level instruments were functional and routinely monitored. The inspectors also verified the licensee's ability to ensure functionality during adverse weather conditions, and how the licensee protected against silt introduction during periods of low flow or low level.

The inspectors were not able to complete elements of the inspection procedure attributes associated with the UHS because the licensee could not locate design records associated with seismic evaluations of the RWS system buried piping and the river overflow-type barrier relied upon to maintain desired flow conditions at very low river flow. The licensee captured this documentation issue in their CAP as CRs 01778284 and 01779927. For the buried piping, the licensee initiated an action to determine the applicable potential seismic factors.

In addition, the inspectors reviewed condition reports related to the inspection samples to verify that the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions.

Documents reviewed are listed in the Attachment to this report.

These inspection activities constituted two heat sink inspection samples as defined in IP 71111.07-05.

b. Findings

(1) Lack of Procedure for Monitoring Performance of RHRSW Pump Motor Cooling Coils

Introduction: A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified by the inspectors for the licensee's failure to prescribe a procedure for activities affecting quality. Specifically, the licensee did not develop procedures for

monitoring the thermal performance of the RHRSW pump motor upper thrust bearing oil cooling coils.

Description: The inspectors noted the cooling coils for the upper thrust bearing oil for the four RHRSW pump motors were not periodically tested, inspected, or cleaned. The inspectors also noted that there was no procedure for performing the functional test specified by Section 3.8.4 (1) of Administrative Control Procedure (ACP) 1208.4, "GL 89-13 Heat Exchanger Performance and Trending," to verify that the coils were capable of removing the required heat load. Specifically, the licensee indicated that some monitoring data was informally collected for the coils and trended to monitor performance of the coils, (e.g., the bearing temperatures). In addition, the inspectors noted the informal monitoring failed to extrapolate the test data from test conditions to the worst case conditions expected after a design basis accident (DBA), and thus failed to ensure the RHRSW pump motor would perform its safety function following a DBA.

As a result of the inspector's concerns, the licensee initiated CR 01778297 and concluded the Core Spray (CS) pump motor coolers were monitored in a similar manner. The recommended actions of CR 01778297 were to generate procedures to collect monitoring data and to correlate to design conditions. In addition, the licensee assessed current functionality of the CS pump motor coolers. Specifically, the informally collected data indicated that the bearing for the "A" RHRSW pump motor had the highest temperatures and, therefore, was the most limiting. The licensee estimated that the "A" RHRSW pump motor bearing temperature would be approximately 185°F if river temperature was extrapolated to worst case river condition of 95°F, which is less than the GL 89-13 program limit of 212°F. However, the inspectors noted that no discussion was documented about instrument uncertainties and extrapolation of the room temperature from test conditions of approximately 74°F to worst case conditions of 104°F. The licensee revised the CR to state in the operability notes section that all cooling coils for the RHRSW and CS pump motors remained functional because there would still be margin to the 212°F bearing limit, no coils exhibited degradation, and all coil flowrates were above UFSAR required values.

Analysis: The inspectors determined that failure to prescribe a procedure for activities affecting quality was contrary to 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the procedure quality and equipment performance attribute of the Mitigating Systems Cornerstone, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failure to have a procedure to perform functional testing of the RHRSW pump motor coolers does not ensure the cooler capacity to remove the required heat from the RHRSW pump motor under worst case DBA conditions. Informal and inadequate monitoring (e.g., no extrapolation of test data to DBA conditions) of the cooler created the potential for unacceptable cooler performance to go undetected that could adversely affect the operability of the RHRSW pump during DBA conditions.

The inspectors determined the finding could be evaluated using the Significance Determination Process in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase I - Initial Screening and Characterization of Findings," Table 4a for the Mitigating Systems Cornerstone. The finding screened as

very low safety significance (Green) because the finding was a qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee performed a functionality evaluation and determined the most limiting cooler had sufficient margin.

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because the licensee did not ensure supervisory and management oversight of work activities associated with the performance of RHRSW pump motor cooler functional testing. Specifically, management did not ensure personnel developed procedures conforming to their Quality Assurance Program to be used when performing activities affecting quality. [H.4(c)]

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by procedures of a type appropriate to the circumstances, and the procedures shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above, as of June 21, 2012, the licensee had not developed a procedure that included appropriate quantitative or qualitative acceptance criteria for determining the performance of the RHRSW pump motor coolers. Specifically, the licensee was informally trending motor oil temperature and, as a result, test results did not account for instrument uncertainties and were not extrapolated to assess cooler functionality at worst case conditions.

This finding was entered into the licensee's CAP to generate procedures to collect monitoring data and to correlate to design conditions.

Because this violation was of very low safety significance and was entered into the licensee's CAP as CR 01778297, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000331/2012003-01, Lack of Procedure for Monitoring the Performance of RHRSW Pump Motor Cooling Coils**).

1R11 Licensed Operator Regualification Program (71111.11)

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

a. Inspection Scope

On May 22 and June 26, 2012, the inspectors observed crews of licensed operators in the plant's simulator during licensed operator regualification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas of the crews:

- licensed operator performance;
- the 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 crews' 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.

b. Findings

No findings were identified.

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

On June 23, 2012, the inspectors observed a crew of licensed operators in the main control room during a power reduction to perform a rod sequence exchange. This was an activity that required heightened awareness or was related to increased risk. The inspectors evaluated the following areas of the crew:

- licensed operator performance;
- the 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; 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.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

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

- Control Building Ventilation System; and

- Primary Containment and Isolation System.

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 SSCs/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

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

This inspection constituted 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:

- BADGER Testing IPTE (Infrequently Performed Test or Evolution) and movement of high radiation source to spent fuel pool;
- Work Week 1222 Risk and LPCI Loop Select Relay Replacements;
- 4B Feedwater Heater Dump Valve air leak and down-power for repair; and
- 'B' ESW discharge check valve functionality causing pump to briefly rotate in reverse following shutdown.

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.

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

These maintenance risk assessments and emergent work control activities constituted four 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:

- CR 01758676; Three Areas of Control Building Didn't Meet Criteria Surveillance Test Procedure (STP) 3.7.4-03A (Standby Filter Unit Train A Control Room Positive Pressure Test);
- CR 01769071; Stem Guide on MO-2318 (High Pressure Coolant Injection (HPCI) Minimum Flow Bypass Isolation Valve) Loose;
- CR 01776321; LPCI Manual Realignment From Shutdown Cooling in Mode Three; and
- CR 01751833; Q663 [Torque Wrench] Failed Post Calibration Check Was Used on WO 40071660 [Diesel Engine General Inspection], and CR 01751793; Q663 [Torque Wrench] Failed Post Calibration Was Used on 1P283A ["A" Control Building Chiller Hermetic Oil Pump].

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 the 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 four 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:

- Engineering Change 274778; Control Building Chiller Well Water Cross-Tie.

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screening against the design basis, the UFSAR, and the TS, to verify that the modification did not affect the operability or availability of the affected system. The inspectors 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 in the course of this inspection are listed in the Attachment to this report.

This inspection constituted one 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:

- Testing of MO-2517, RCIC Outboard Torus Suction Isolation Valve, following replacement of torque switch;
- Testing of Primary Containment Isolation System Group 3 valve relays following relay replacements;
- Testing of MO-2030, 'A' RHR Heat Exchanger Bypass Valve, following replacement of motor; and
- Testing of 'A' LPCI Loop Select relays following relay replacements.

These activities were selected based upon the SSC'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 the 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 four post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- STP 3.3.8.1-04B; 1A4 4kV Emergency Bus Undervoltage Relay Calibration; Revision 2 (Routine);
- STP 3.4.5-01; Calibration of Equipment Drain Sump and Floor Drain Sump Flow Integrators; Revision 10 Reactor Coolant System (RCS);
- STP 3.5.1-03B; B Core Spray System Simulated Automatic Actuation (Routine);
- STP 3.3.3.1-09HPCI; HPCI Valve Position Indicator Verification – Operating; Revision 0 (Inservice Test);
- STP 3.5.1-05; HPCI System Operability Test; Revision 57 (Routine); and
- STP 3.1.2-01; Reactivity Anomalies Check; Revision 17 (Routine).

The inspectors also observed in-plant activities and reviewed procedures and associated records to determine whether:

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

Documents reviewed are listed in the Attachment to this report.

This inspection constituted four routine surveillance testing samples, one inservice testing sample, and one reactor coolant system leak detection inspection sample 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 April 11, 2012, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the Simulator and 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.

This emergency preparedness drill inspection constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

This inspection constituted one sample as defined in IP 71124.06-5.

.1 Inspection Planning and Program Reviews (02.01)

Event Report and Effluent Report Reviews

a. Inspection Scope

The inspectors reviewed the Radiological Effluent Release Reports issued since the last inspection to determine if the reports were submitted as required by the Offsite Dose Calculation Manual (ODCM)/TS. The inspectors reviewed anomalous results, unexpected trends, or abnormal releases identified by the licensee for further inspection to determine if the issues were evaluated, were entered in the CAP, and were adequately resolved.

The inspectors identified radioactive effluent monitor operability issues reported by the licensee as provided in effluent release reports, to review these issues during the onsite inspection, as warranted, given their relative significance and determine if the issues were entered into the CAP and adequately resolved.

b. Findings

No findings were identified.

Offsite Dose Calculation Manual and Updated Final Safety Analysis Report Review

a. Inspection Scope

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

The inspectors reviewed changes to the Offsite Dose Calculation Manual (ODCM) made by the licensee since the last inspection against the guidance in NUREG-1301, 1302 and 0133, and Regulatory Guides (RG) 1.109, 1.21 and 4.1. When differences were identified, the inspectors reviewed the technical basis or evaluations of the change during the onsite inspection to determine whether the basis or evaluations were technically justified and maintained effluent releases as-low-as-is-reasonably-achievable.

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

b. Findings

No findings were identified.

Groundwater Protection Initiative (GPI) Program

a. Inspection Scope

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

b. Findings

No findings were identified.

Procedures, Special Reports, and Other Documents

a. Inspection Scope

The inspectors reviewed Licensee Event Reports (LERs), event reports and/or special reports related to the effluent program issued since the previous inspection to identify any additional focus areas for the inspection based on the scope/breadth of problems described in these reports.

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

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

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

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

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

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

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

The inspectors determined if the licensee had made significant changes to the station's effluent release points, e.g., changes subject to a 10 CFR 50.59 review or requiring NRC approval of alternate discharge points.

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

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.03)

a. Inspection Scope

The inspectors selected effluent sampling activities, consistent with smart sampling, and assessed whether adequate controls had been implemented to ensure representative

samples were obtained (e.g. provisions for sample line flushing, vessel recirculation, composite samplers, etc.)

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

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

The inspectors reviewed the results of the inter-laboratory comparison program to evaluate the quality of the radioactive effluent sample analyses and assessed whether the inter-laboratory comparison program included had-to-detect isotopes as appropriate.

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.04)

Effluent Flow Measuring Instruments

a. Inspection Scope

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

b. Findings

No findings were identified.

Air Cleaning Systems

a. Inspection Scope

The inspectors assessed whether surveillance test results since the previous inspection for TS required ventilation effluent discharge systems (HEPA and charcoal filtration), such as the Standby Gas Treatment System (SBGT) and the Containment/Auxiliary Building Ventilation System, met TS acceptance criteria.

b. Findings

No findings were identified.

.5 Dose Calculations (02.05)

a. Inspection Scope

The inspectors reviewed all significant changes in reported dose values compared to the previous Radiological Effluent Release Report (e.g., a factor of 5, or increases that approach Appendix I Criteria) to evaluate the factors which may have resulted in the change.

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

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

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

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

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

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

b. Findings

No findings were identified.

.6 Groundwater Protection Initiative (GPI) Implementation (02.06)

a. Inspection Scope

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

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

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

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

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

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

For significant, new effluent discharge points (such as significant or continuing leakage to ground water that would continue to impact the environment if not remediated), the inspectors evaluated whether the offsite dose calculation manual was updated to include the new release point.

b. Findings

No findings were identified.

.7 Problem Identification and Resolution (02.07)

a. Inspection Scope

The inspectors assessed whether problems associated with the effluent monitoring and control program were being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the CAP. In addition, the inspectors evaluated the appropriateness of the corrective actions for selected sample of problems documented by the licensee involving radiation monitoring and exposure controls.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

This inspection constituted one sample as defined in IP 71124.07-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the annual radiological environmental operating reports and the results of any licensee assessments since the last inspection, to assess whether the Radiological Environmental Monitoring Program (REMP) was implemented in accordance with the TS and ODCM. This review included reported changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, inter-laboratory comparison program, and analysis of data.

The inspectors reviewed the ODCM to identify locations of environmental monitoring stations.

The inspectors reviewed quality assurance audit results of the program to assist in choosing inspection “smart samples” and audits and technical evaluations performed on the vendor laboratory program.

The inspectors reviewed the annual effluent release report and the 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste,” report, to determine if the licensee was sampling, as appropriate, for the predominant and dose-causing radionuclides likely to be released in effluents.

b. Findings

No findings were identified.

.2 Site Inspection (02.02)

a. Inspection Scope

The inspectors walked down select air sampling stations and thermoluminescent dosimeter (TLD) monitoring stations to determine whether the stations were located as described in the ODCM and to determine the equipment material condition. Consistent with smart sampling, the air sampling stations were selected based on the locations with the highest X/Q, D/Q wind sectors, and TLDs were selected based on the most risk-significant locations (e.g., those that have the highest potential for public dose impact).

For the air samplers and TLDs selected, the inspectors reviewed the calibration and maintenance records to evaluate whether the equipment demonstrated adequate functionality of these components. Additionally, the review included the calibration and maintenance records of select composite water samplers.

The inspectors assessed whether the licensee had initiated sampling of other appropriate media upon loss of required sampling station.

The inspectors observed the collection and preparation of environmental samples from different environmental media (e.g., ground and surface water, milk, vegetation, sediment, and soil) as available to determine if environmental sampling was representative of the release pathways as specified in the ODCM and if sampling techniques were in accordance with procedures.

Based on direct observation and review of records, the inspectors assessed whether the meteorological instruments were functional, calibrated, and maintained in accordance with guidance contained in the UFSAR, NRC RG 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants," and licensee procedures. The inspectors assessed whether the meteorological data readout and recording instruments in the control room and, if applicable, at the tower were functional.

The inspectors evaluated whether missed and or anomalous environmental samples were identified and reported in the annual environmental monitoring report. The inspectors selected events that involved a missed sample, nonfunctional sampler, lost TLD, or anomalous measurement to determine if the licensee had identified the cause and had implemented corrective actions. The inspectors reviewed the licensee's assessment of any positive sample results (i.e., licensed radioactive material detected above the lower limits of detection) and reviewed the associated radioactive effluent release data that was the source of the released material.

The inspectors selected structures, systems, and components (SSC) that involved or could have reasonably involved licensed material for which there is a credible mechanism for licensed material to reach ground water, and assessed whether the licensee had implemented a sampling and monitoring program sufficient to detect leakage of these SSCs to ground water.

The inspectors evaluated whether records, as required by 10 CFR 50.75(g), of leaks, spills, and remediation since the previous inspection were retained in a retrievable manner.

The inspectors reviewed any significant changes made by the licensee to the ODCM as the result of changes to the land census, long-term meteorological conditions (3-year average), or modifications to the sampler stations since the last inspection. The inspectors also reviewed technical justifications for any changed sampling locations to evaluate whether the licensee performed the reviews required to ensure that the changes did not affect the ability to monitor the impacts of radioactive effluent releases on the environment.

The inspectors assessed whether the appropriate detection sensitivities with respect to TS/ODCM were used for counting samples (i.e., whether the samples met the TS/ODCM required lower limits of detection). The licensee used a vendor laboratory to analyze the radiological environmental monitoring program samples so the inspectors reviewed the results of the vendor's quality control program, including the inter-laboratory comparison, to assess the adequacy of the vendor's program.

The inspectors reviewed the results of the licensee's inter-laboratory comparison program to evaluate the adequacy of environmental sample analyses performed by the licensee. The inspectors assessed whether the inter-laboratory comparison tests included the media/nuclide mix appropriate for the facility. If applicable, the inspectors

reviewed the licensee's determination of any bias to the data and the overall effect on the radiological environmental monitoring program.

b. Findings

No findings were identified.

.3 Identification and Resolution of Problems (02.03)

a. Inspection Scope

The inspectors assessed whether problems associated with the REMP were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the CAP. Additionally, the inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involved the REMP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstone: Barrier Integrity

4OA1 Performance Indicator Verification (71151)

.1 Reactor Coolant System (RCS) Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Leakage Performance Indicator (PI) for the period from the second quarter 2011 through the first quarter 2012. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, was used. The inspectors reviewed the licensee's operator logs, RCS leakage tracking data, condition reports, and NRC Integrated Inspection Reports for the period of April 2011 through March 2012 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's CAP database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one reactor coolant system leakage sample as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

.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 that the issues 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 listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 40A2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six month period of January 1, 2012, through June 30, 2012, although some examples expanded beyond those dates where the scope of the trend warranted.

The reviews also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

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

b. Findings

No findings were identified.

.4 Annual Sample: Review of Operator Workarounds

a. Inspection Scope

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

The inspectors performed a review of the cumulative effects of operator workarounds. The documents listed in the Attachment to this report were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into the CAP and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an initiating event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate compensatory actions. Additionally, all temporary modifications were reviewed to identify any potential effect on the functionality of Mitigating Systems, impaired access to equipment, or required equipment uses for which

the equipment was not designed. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified operator workarounds.

This review constituted one annual operator workaround inspection sample as defined in IP 71152-05.

b. Findings

No findings were identified.

.5 Annual Sample: Review of Root Cause Evaluation 01748776; NRC Cross-Cutting Human Performance H.1(a) Issue; Revision 1

a. Inspection Scope

Following issuance of NRC Integrated Inspection Report 05000331/2012002, the NRC had documented four findings over the prior 12 months with an associated cross-cutting aspect of H.1(a) associated with human performance, decision making, and involving the licensee making safety or risk significant decisions using systematic processes. Per the licensee's CAP procedures, this accumulation of findings represented a significant condition adverse to quality and a root cause evaluation was performed by the licensee to determine corrective actions to preclude repetition. The inspectors reviewed the root cause, contributing causes, and corrective actions identified; and, effectiveness reviews planned by the licensee. Based on the inspectors' review, no new issues of concern were identified.

This review constituted one annual selected issue follow-up inspection sample as defined in IP 71152-05.

b. Findings

No findings were identified.

40A3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report (LER) 05000331/2012-003-00: Secondary Containment Damper Failed to Close During Surveillance Testing

a. Inspection Scope

On February 29, 2012, during scheduled secondary containment isolation testing, reactor building damper 1VAD17B3 failed to isolate and was declared inoperable. In order to comply with TS action statements, the licensee attempted to isolate the flow path with damper 1VAD17A3, but the damper failed to fully close. The licensee was ultimately successful in complying with TS action requirements after fully isolating the flow path. The inspectors reviewed a root cause evaluation performed by the licensee for the event. Corrective actions included a rebuild of the damper operators and verification that the two dampers did not interfere with the operation of each other. Documents reviewed as part of this inspection are listed in the Attachment to this report. This LER is closed.

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

b. Findings

(1) Inadequate Testing Following Maintenance on Secondary Containment Isolation Dampers

Introduction: A finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified by the inspectors on May 31, 2012, for the licensee's failure to conduct post-maintenance testing in accordance with MD 024, "Post Maintenance Testing Program." Specifically, post-maintenance testing on secondary containment isolation damper 1V-AD-17A3 was not adequate to verify the ability of the secondary containment to perform its intended function and it did not verify that no new problems were created (interference with damper 1V-AD-17B3) as a result of the maintenance performed.

Description: On February 29, 2012, while performing scheduled surveillance testing, secondary containment isolation damper 1V-AD-17B3 (referred to as the "B3" damper), failed to fully close upon insertion of a group B isolation signal. The B3 damper was declared inoperable and TS 3.6.4.2, Condition A was entered. To comply with TS 3.6.4.2, Condition A, which required isolation of the affected flow path within 8 hours, the licensee inserted a Group A isolation signal and the 1V-AD-17A3 ("A3" damper) damper also failed to isolate. With both dampers in the same flow path unable to isolate, the licensee entered TS 3.6.4.2, Condition B, which required isolation of the affected flow path within 4 hours. The licensee was able to isolate the flow path within the 4 hour action time and was able to comply with TS. However, the condition with both dampers unable to isolate in the same flow path constituted a condition that could have prevented the fulfillment of the secondary containment safety function needed to control the release of radioactive material. The licensee reported the condition as required under 10 CFR 50.72 and 50.73 (see EN #47709 and LER 2012-003).

Starting in December 2011, the licensee began experiencing troubles with the A3 damper not fully closing (indicating an intermediate position). Several CRs from December through February documented these issues. The licensee replaced limit switches on the A3 damper on December 27, 2011. When the damper again showed intermediate indication during surveillance testing on January 20, 2012, the licensee replaced the solenoid valve (SV-7631A) associated with the A3 damper operator. On February 8, 2012, the damper again failed surveillance testing when it failed to indicate fully closed. Following this failure, the licensee commenced a Failure Investigation Process (FIP) team to investigate and correct the cause of the failure. The FIP team determined the damper operator was required to be rebuilt. Following a rebuild of the A3 damper operator on February 14, 2012, and following a seven day holding period to preclude preconditioning, the damper was successfully cycled, demonstrated to fully close, and declared operable on February 22, 2012. During the next scheduled surveillance test on the B3 damper on February 29, 2012, the B3 damper failed to fully close, followed by the A3 damper failing to fully close in an attempt to isolate the flow path to comply with TS as described above.

The licensee conducted a root cause evaluation to investigate the cause of both the A3 and B3 dampers failing to fully close on February 29, 2012. In Root Cause Evaluation (RCE) 01701934, titled "Secondary Containment Damper Failures NRC Reportable

Event,” the licensee determined the root cause of the event to be “inadequate vendor manual/work instruction guidance.” The root cause team did not identify any contributing causes.

During the inspectors’ review of RCE 01701934, the inspectors noted that the FIP team, convened following the February 8, 2012 failure, had generated Field Action Request (FAR) #4 on February 14, 2012. This FAR was written to “verify proper operation of 1VAD017B3 following completion of 1VAD017A3 repairs to verify 1VAD017B3 was not affected by work in the vicinity.” The RCE noted that FAR #4 was never converted to a formal work order or task to be completed prior to declaring the A3 damper operable. When the B3 damper was tested the following week on February 29, 2012, it failed to fully close as described above. The root cause evaluation did not investigate further as to why FAR #4 was not completed prior to declaring the A3 damper operable.

The inspectors noted that licensee procedure MD-24 states, in part, “post-maintenance testing shall verify the following: the ability of the system or component to perform its intended function; the original deficiency is corrected, and no new problems have been created...” The RCE determined that the cause of the B3 damper failing to fully close was due to interference between the A3 and B3 dampers resulting from the February 14, 2012, rebuild of the A3 damper operator. The inspectors determined that per the requirements of MD-24, post-maintenance testing for the A3 damper should have included cycling of the B3 damper to ensure that the maintenance performed on the A3 damper did not affect the B3 damper. The inspectors concluded that since the A3 and B3 dampers were not cycled, nor was any further maintenance performed on the A3 or B3 dampers from February 22 through February 29, 2012, that cycling of the B3 damper on February 29, 2012, following maintenance on the A3 damper would have identified the interference issues. As such, the licensee had a reasonable opportunity to identify the condition prior to declaring the dampers operable and placing the system in a condition that could have prevented the fulfillment of the secondary containment safety function.

Analysis: The inspectors determined that failing to perform adequate post-maintenance testing was a performance deficiency because it was the result of the licensee’s failure to meet a procedural requirement, and the cause was reasonably within the licensee’s ability to foresee and correct and should have been corrected. The performance deficiency was determined to be more than minor and a finding because it was associated with the SSC and barrier performance attribute of the Barrier Integrity Cornerstone, and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers (secondary containment) protect the public from radionuclide releases caused by accidents or events. Specifically, secondary containment isolation dampers were returned to service in a condition which could have prevented the fulfillment of the secondary containment safety function.

The inspectors evaluated the finding in accordance with IMC 0609.04, Table 4a. Because the finding only represented a degradation of the radiological barrier function provided for the secondary containment (Question 1 under the Containment Barrier column), the finding screened as very low safety significance (Green).

The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Work Control components, and involving the licensee appropriately

planning and coordinating work activities by incorporating risk insights. Specifically, the licensee did not recognize the risk involved in not cycling 1V-AD-17B3 as part of the post-maintenance testing for work performed on 1V-AD-17A3. [H.3(a)]

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

Contrary to the above, on February 22, 2012, the licensee did not perform post-maintenance testing of a type appropriate to the circumstances. Specifically, the post-maintenance testing performed for 1V-AD-17A3 did not verify that no new problems were introduced (interference with 1V-AD-17B3) due to the maintenance that resulted in a condition that could have prevented the fulfillment of the secondary containment safety function.

The licensee was in the process of evaluating the adequacy of maintenance practices and formulating corrective actions for this finding at the end of the inspection period.

Because this violation was of very low safety significance and was entered into the licensee's CAP as CR 01771837, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000331/2012003-02, Inadequate Testing Following Maintenance on Secondary Containment Isolation Dampers**).

.2 (Withdrawn) Licensee Event Report (LER) 05000331/2012-001-00: Inoperability of Low Pressure Coolant Injection Due to Discharge Line Voiding

This LER, which was closed in Duane Arnold IR 05000331/2012002, was withdrawn by the licensee in a letter to the NRC on March 30, 2012. The withdrawal of the LER was based on the results of an extensive evaluation of the safety impact on the LPCI system due to an approximate 2.0 cubic foot void found in the RHR system discharge piping on December 2, 2011. The licensee determined that the as-found void would not have prevented the RHR system from performing its LPCI safety function.

The inspectors reviewed the basis for the licensee's withdrawal of the LER and did not identify any further concerns.

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

a. Findings

No findings were identified.

4OA5 Other Activities

.1 Licensee Strike Contingency Plans (92709)

a. Inspection Scope

The inspectors reviewed the licensee's work stoppage plans to determine if the plans adequately addressed the areas of reactor operations, emergency planning, facility security, fire protection, technical specifications, and other regulatory requirements in the event of an employee strike or management lockout. The inspectors reviewed records and conducted interviews with licensee staff to verify that qualified personnel would be available to meet the minimum requirements for safe operation of the plant, if a strike or lockout were to occur. No actual work stoppage occurred during the inspection period.

This inspection did not constitute a complete sample as defined in IP 92709 due to ongoing negotiations at the end of the inspection period. Inspection activity under IP 92709 will continue into the 3rd quarter of 2012 baseline inspection period and be documented as a complete sample when appropriate.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On July 12, 2012, the inspectors presented the inspection results to Mr. R. Anderson, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The inspection results for the areas of radioactive gaseous and liquid effluent treatment; and radiological environmental monitoring with Mr. G. Pry, Plant Manager, on May 4, 2012; and
- The results of the ultimate heat sink inspection with Mr. R. Anderson, Site Vice President on June 28, 2012.

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

R. Anderson, Site Vice President
G. Pry, Plant General Manager
K. Kleinheinz, Site Engineering Director
S. Catron, Licensing Manager
G. Young, Nuclear Oversight Manager
G. Rushworth, Operations Site Director
R. Wheaton, Maintenance Site Director
R. Porter, Chemistry & Radiation Protection Manager
B. Kindred, Security Manager
B. Simmons, Training Manager
M. Davis, Emergency Preparedness Manager
B. Murrell, Licensing Engineer Analyst
D. Barta, Licensing Engineer/Analyst
C. Conklin, Project Manager
C. Harberts, Refuel Floor Project Manager
K. Peveler, Nuclear Oversight Supervisor
P. Collingsworth, System Engineering
J. Dubois, Program Engineering Manager
S. Huebsch, Mechanical Design Engineering Supervisor
L. Swenzinski, Licensing

Nuclear Regulatory Commission

K. Feintuch, Project Manager, NRR
M. Ring, Chief, Reactor Projects Branch 1

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000331/2012003-01	NCV	Lack of Procedures for Monitoring the Performance of RHRSW Pump Motor Cooling Coils (1R07.1.b(1))
05000331/2012003-02	NCV	Inadequate Testing Following Maintenance on Secondary Containment Isolation Dampers (Section 4OA3.1)

Closed

05000331/2012003-01	NCV	Lack of Procedures for Monitoring the Performance of RHRSW Pump Motor Cooling Coils (1R07.1.b(1))
05000331/2012003-02	NCV	Inadequate Testing Following Maintenance on Secondary Containment Isolation Dampers (Section 4OA3.1)
05000331/2012-003-00	LER	Secondary Containment Damper Failed to Close During Surveillance Testing (Section 4OA3.1)
05000331/2012-002-00	LER	Low Pressure Coolant Injection Safety Function due to Inoperable Instrumentation (Closed in Duane Arnold IR 05000331/2012002, Section 4OA3.2)

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

OP-AA-102-1002 (DAEC); Seasonal Readiness; Revision 07
OP-AA-102-1002; Seasonal Readiness; Revision 000
Abnormal Operating Procedure (AOP) 903; Severe Weather; Revision 35
ACP 1408.23; Controls to the DAEC Switchyard; Revision 15
AOP 304; Grid Instability; Revision 30
ACP 101.16; Midwest ISO: Communication and Mitigation Protocols for Nuclear Plant/Electric System Interfaces (DAEC Site-Specific Information for RTO-OP-03); Revision 7
AOP 301; Loss of Essential Electrical Power; Revision 58
NRC Inspection Manual; Operating Experience Smart Sample 2012/01
CR 01762746; CR to Consolidate Response to Point Beach OE EDG Missile
CR 01760501; Evaluate NRC Inspection Manual on Wind Generated Missile Hazards
CR 01778680; Conclusions of CR 01762746 Evaluation Questioned [NRC-Identified]
CR 01777965; PDA Summer Readiness

1R04

OP-AA-102-1003; Guarded Equipment; Revision 003
OP-AA-102-1003 (DAEC); Guarded Equipment (DAEC Specific Information); Revision 022
Operating Instruction (OI) 304.2; 4160V/480V Essential Electrical Distribution System; Revision 85
OI 304.2A1; 4160V/480V Essential Electrical Distribution System Electrical Lineup; Revision 1
BECH-E001<1>; Single Line Diagram Station Connections; Revision 36
OI 416A4; "B" RHRSW System Valve Lineup and Checklist; Revision 11
OI 416A1; RHRSW System Electrical Lineup; Revision 6
OI 416A6; RHRSW System Control Panel Lineup; Revision 5
OI 324A10; Standby Diesel Generator / Readiness Condition Checklist; Revision 14
OI 454A2; 'A' ESW System valve Lineup and Checklist; Revision 14

1R05

ACP 1203.53; Fire Protection; Revision 16
ACP 1412.4; Impairments to Fire Protection Systems; Revision 065
DAEC Fire Plan – Volume 1, Program; Revision 61
AFP-21; Turbine Building North Operating Floor; Revision 24
AFP-22; South turbine Operating Floor, EL. 780'; Revision 25
AFP-23; Battery Rooms 1D-2, 1D-4, 1D-1, Battery Corridor; Revision 25
AFP-24; Essential Switchgear Rooms 1A-4, 1A-3; Revision 29
AFP-072; Auxiliary Transformer 1X2; Revision 3
FHA-400; Duane Arnold Energy Center Fire Protection Program: Fire Hazards Analysis; Revision 11

1R07T

OP-1-5129-61; CVCS-Reactor Letdown and Charging; 9/23/2011
12-EHP-5040-MOD-009; Engineering Change Reference Guide; Revision 29
ACP 1208.5; Service Water Reliability Program; Revision 3
AOP 410; Loss of River Water Supply; Revision 21
STP 3.7.2-02; River Water Depth; Revision 7
STP 3.0.0-01; Instrument Checks; Revision 123
AOP 902; Flood; Revision 41
1C06A; Annunciator Response Procedure 1C06A; Revision 57
1C03B; Annunciator Response Procedure 1C03B; Revision 38
2010 Bathymetric Survey and Channel Stability Analysis; 10/23/2010
2011 Bathymetric Survey and Channel Stability Analysis; 08/18/2011
BECH-M129; RWS Intake Structure; Revision 39
BECH-M146; SW Pumphouse; Revision 84
BECH-M113; RHR SW and Emergency SW Systems; Revision 71
CAL-M06-012; Required Water Depth At River Water Intake; 12/01/2006
CAL-M93-078; ESW/RHRSW Pit Pumpdown Time; 08/11/1995
CAL-466-M-003; ESW Heat Loads; Revision 3
Design Specification E025-0453; RHRSWP Motor Cooling Coil; Revision 0
WO 01283590-01; Calibrate River Water Intake Level
WO 40123765-01; Calibrate River Water Intake Level
WO 40151056-01; STP NS790304 RHRSW Radiation Monitor Functional Test
WO 01282664-01; ESW Pit B Level
WO 01286890-01; RHR and ESW Wet Pit B Level Recorder
WO 40054219-01; LT4935B – Calibrate
WO 40144260-01; Inspect and Clean B RHRSW/ESW Pit
WO 40144253-01; Inspect and Clean Pumphouse Stilling
WO 40144250-01; Inspect and Clean B Intake
WO 40144246-01; Inspect and Clean A Intake
WO 40063685-01; Inspect and Clean Pumphouse Stilling
WO 40076375-01; Inspect and Clean of Stilling Basin
WO 40076376-01; Inspect and Clean of Stilling Basin
WO 01363518-01; RWS Class 3 ISI A
WO 01363519-01; RWS Class 3 ISI B
WO 019271; Visual Examination of Ground Area Above RWS Buried Piping B
WO S019270; Visual Examination of Ground Area Above RWS Buried Piping A
SEWS No.8103; RHRSW Pump B SQUG; 07/20/1993
ACE 01698343-01; RWS 1P117B Failed ASME Testing
CR 00574241; B RWS Pump Failed STP NS100102
CR 00344500; RWS Pumps not Addressed in NRC Bulletin

Corrective Action Program Documents Generated as a Result of NRC Inspection

CR 01778203; WO Missed Post Work Review
CR 01778297; GL 89-13 Requirements not Fully Implemented for RHRSW Motor
CR 01778307; Drafting Error on BECH-M113
CR 01777980; B ESW Pump Pit Silt Level Exceeded Cleaning Criteria
CR 01778284; Cannot Locate Formal Calc or Evaluation for Cedar River Weir
CR 01778345; UFSAR Reference To Pump House Sump Annunciator
CR 01779927; Potential Additional Considerations for Buried Seismic Piping

CR 01779812; 2012 NRC UHS INSP Q No. 91 D RHRSW TE49300 Trend

1R11

NS550006; Channel Interference Testing; Revision 1
Reactivity Management Plan; Control Rod Sequence Exchange and Settle Testing; June 2012

1R12

CR 01774177; Maintenance Rule 50.65(A)(1) Red Evaluation Revision – Chillers
CR 01661052; Low Oil Level on the A Chiller
CR 01663632; TC6116B Failed to Initiate Chilled Water Flow to 1VAC30B
CR 01669068; CV1956A-O: Test Results Per 4007293 Were Not Acceptable
CR 01672075; TCV6924A-O Chiller 3-Way Valve Actuator Hydraulic System Bypassing
CR 01673504; 1VCH001A 'A' CB Chiller Tripped
CR 01680531; Control Building HVAC Temperature Controller Failure
CR 01682302; Maintenance Rule 50.65 (A)(1) Control Building Chillers
CR 01686444; A Control Building Chiller Tripped
CR 01727158; 'A' CB Chiller Tripped and Could Not Be Restarted
CR 01758639; TCV6924A-O – PM Found A CB Chiller 3 Way Valve OOT
Primary Containment and Primary Containment Isolation System Health Reports, dated
4/1/2012-6/30/2012
CR and ACE 1732055; SV8104A Failed to Close During STP 3.6.1.3-11A
CR 1732575; 50.65(A)(1) [Red] Maintenance Rule PCIS Repeat MPFF SV8104A
CR 1735655; Failure of SV8103B Drywell #2 Sample Line Isolation
CR and ACE 1749683; CV8104A Failed to Close on a Group 3A PCIS isolation
CR and CE 1750044; Programmatic Review of Isolation Valves and Dampers needed

1R13

Work Planning Guideline-1; Work Process Guideline; Revision 052
Work Planning Guideline-2; Online Risk Management Guideline; Revision 061
OP-AA-104-1007; Online Aggregate Risk; Revision 002
WM-AA-1000; Work Activity Risk Management; Revision 012
WM-AA-1000 (DAEC); Work Activity Risk Management (DAEC); Revision 000
OP-AA-102-1003; Guarded Equipment; Revision 003
OP-AA-102-1003 (DAEC); Guarded Equipment (DAEC Specific Information); Revision 022
CR 1764253; 1P99B Shaft Observed Rotating Backwards
STP NS540002B; B Emergency Service Water Operability Test; Revision 23
Interim Disposition Document: B ESW Pump Backward Rotation
Letter for MPR Associates to Mr. Mark Lingenfelter dated May 5, 2012; Subject: Preliminary
Assessment of ESW Pump Reverse Rotation (attached to CR 1764253)
CR 1762195; V46-0018 Check Valve Failure to Close
BECH-M142; Circulating Water System; Revision 92
BECH-M113; RHRSW and ESW Systems; Revision 71
Work Week 1222 WARM Summary and Weekly PRA
WO 40167826; CV1328 Downstream Temperature Elevated
Work Week 1220 WARM Summary and Weekly PRA
WO 40070417; BORAL BADGER Test – Perform Testing for PAR Racks

1R15

EN-AA-203-1001; Operability Determinations/ Functionality Assessments; Revision 006
OP-AA-100-1000; Conduct of Operations; Revision 007
VALVE-A391-01; Bolted Bonnet Gate or Globe Valves – Maintenance Procedure; Revision 10
CR and POD 1751833; Torque Wrench Failed Post Calibration Check and was used on Work
Order 40071660 (Diesel Engine General inspection)
CR and POD1751793; Torque Wrench Q663 Failed Post Calibration check and was used on
Work Orders 40071660 and 40126503 (A Control Building Chiller Oil Pump Replacement)

1R18

ACP 103.2; 10 CFR 50.59 Screening Process; Revision 038

1R19

ACP 1408.1; Work Order Task(s); Revision 177
MD 024; Post-Maintenance Testing Program; Revision 71
STP 3.5.3-02; RCIC System Operability Test, Revision 35
WO 40113902-01; RCIC Outboard Torus Suction Valve Operator; Revision 1
CR 1756392; Torque Switch 2 Failed on MO2517-O
WO 40116773; A71B-K4300; Replace Relay; Revision 0 and 1
WO 40117578; A71B-K4309; Replace Relay; Revision 0 and 1
WO 40117579; A71B-K4310; Replace Relay; Revision 0 and 1
WO 40117580; A71B-K4312; Replace Relay
WO 40116772; A71B-K4307; Replace Relay; Revision 0 and 1
WO 40118833; A71B-K4313; Replace Relay;
WO 40117577; A71B-K4308; Replace Relay; Revision 0 and 1
APED-A71-003; ELEM Diagram Nuclear Steam Supply Shutoff system; Revision 47
WO 40059127; MO 2030-O, Diagnostic Test
WO 40099640; MO 2030-O, Replace Motor
STP 3.3.5.1-22; Recirculation Riser D/P A > B Instrument Calibration; Revision 4
WO 1286677; E11A-K035A: Replace Relay
WO 1286679; E11A-K036A: Replace Relay
APED-E11-007, Sheet 6; Residual Heat Removal System Elementary Diagram; Revision 28
STP 3.3.5.1-22; Recirculation Riser D/P A > B Instrument Calibration; Revision 4

1R22

ACP 107; Surveillance Tests; Revision 013
CR 01762417; DW Unidentified Leakage Calculations Expected to Be Greater than 0.1 Gallons
Per Minute
STP 3.5.1-03B; B Core Spray System Simulated Automatic Actuation; Revision 2
ACP 101.01; Procedure Use and Adherence; Revision 51

2RS6

2010 Annual Radioactive Material Release Report; April 27, 2011
2011 Annual Radioactive Material Release Report; April 24, 2012
Duane Arnold Energy Center Annual Radioactive Material Release Report; Revision 29
Duane Arnold Energy Center Offsite Dose Assessment Manual; Revision 29

Updated Final Safety Analysis Report; Section 11.5; Revision 19
08-001-R; 10 CFR Compliance Data Technical Basis for Duane Arnold Energy Center Reactor Water Clean-up Resin; Revision 0
09-001-C; Public Dose Due to the Washout of Tritium during Rain Events; August 3, 2009
10-003-R; 10 CFR Compliance Data Technical Basis for Duane Arnold Energy Center Condensate Resin; Revision 0
10-004-R; 10 CFR Compliance Data Technical Basis for Duane Arnold Energy Center Dry Active Waste; Revision 0
CR 01651792; Unexpected Control Room Alarms for Kaman 8 and 10
CR 01676337; Kaman Inoperable Conditions Not Evaluated Per Technical Review Manual Action Statement
CR 01683083; Elevated Radiation Activities Observed at the Offgas Stack
CR 01714413; Kaman Source Check Failure
EV-AA-100; Fleet Ground Water Protection Program; Revision 2
NG-10-0265; for Duane Arnold Energy Center 2009 Annual Radiological Environmental Operating Report; April 27, 2010
PCP 2.20; Transformer Pit and Condensate Storage Tank Pit Sampling; Revision 15
PCP 10.1; Midas-Offsite Radiation Dose Assessment; Revision 7
QH 01674060; Assessment of Radiological Environmental Monitoring Program and Effluents Pre-NRC Inspection; April 7, 2012
STP NS790206; Stack Flow Monitor Functional Test; February 17, 2012
STP NS791013; K10 Calibration; Revision 14
STP 3.6.3-03A; Standby Gas treatment System High Efficiency Particulate Air and Charcoal Filter Efficiency Tests; Revision 4

2RS7

The Operational Radiological Environmental Monitoring Program for the Duane Arnold Energy Cedar Rapids, Iowa; Revision 22
Radiological Engineering Calculation: Duane Arnold Energy Center 2011 Offsite Dose from Gaseous Carbon-14 Releases; March 23, 2012
2010 Annual Radiological Environmental Operating Report; May 5, 2011
2009 Annual Radiological Environmental Operating Report; May 5, 2010
CR 00345933; Gamma Spectral Analysis on Well Water
CR 00395144; Radiological Environmental Monitoring Program Samples Destroyed in Transit to Vendor Laboratory
CR 00344044; Trace Concentration of Tritium Identified in Sample from Condensate Storage Tank Pit
CR 00345030; Low levels of Tritium Identified in Sample from Condensate Storage Tank Pit
CR 00391075; Low Concentrations of Tritium Identified in a Site Monitoring Well
CR 00395542; Low Levels of Tritium Found in Water from MH-109
CR 00573611; Tritium Identified in Transformer Pit
CR 00580283; Discrepancies between Fleet and Site Ground Water Protection Program Procedures
CR 00580971; Radiological Environmental Monitoring Program Sample Collection and Shipping Issues
CR 00580972; Quality Assurance Finding: Ground Water Protection Program Not Effectively Implemented
CR 00585939; No Resources to Fill In For Sick Radiological Environmental Monitoring Program Technician

CR 00592406; Radiological Environmental Monitoring Program Vendor Laboratory Reports
Cobalt on Air Iodine Cartridge
CR 01632746; Iodine-131 Identified in Rainwater Collected on Site
CR 01667545; Missed Samples at Radiological Environmental Monitoring Program Air Station
D-40 Due to High Voltage
CR 01705806; Tritium Identified in Monitoring Wells MW-08A and B
CR 01710225; Trace Levels of Tritium Identified in Monitoring Well NW-08
CR 01713941; Low level of Tritium Identified in Monitoring Wells MW-08A and B
CR 01724746; Quarterly Monitoring Well Results – Tritium Identified
CR 01731437; Tritium Identified in Monitoring Well NW-08
CR 01731802; Tritium Identified in Monitoring Well Samples
CR 0174031; Radwaste Resources Not Adequate to Support Priority Work
CR 01742609; Tritium Identified in Storm Drain Outfall
CR 01745697; Radiological Environmental Monitoring Program Surface Water Sampling
scheduled for Week 11 Was Not Completed
CR 01750694; Tritium Identified in Samples from Two Monitoring Wells
CR 01750652; Iodine-131 Identified in Radiological Environmental Monitoring Program River
Sample Upstream
CR 01762663; Evaluate Usefulness of Kaman Status Board in the Chemistry Laboratory
CR 01762670; Radiation Monitor Sensor Checks
CR 01762763; Reconsider Definition of Gaseous Effluent Abnormal Release
CR 01762764; Effluent Report Enhancements: Uncertainty and Radiation Monitor Inoperable
CR 01762765; Groundwater Protection Annual Reporting is Currently Segmented in Two
Reports
CR 01762768; Neighboring Sand Pit Could Affect Sited Hydrology
CR 01762770; Failed Sample Shipments Not All Documented in Corrective Action Program
in 2011
CE 00571901; Step Change in Tritium Concentration Measured in Shallow Monitoring Well;
MW-01
CE 01731437; Elevated tritium – Monitoring Well MW-08; February 12, 2012
PCP 2.7; Grab Sampling of Offgas Stack; Reactor, Turbine and Low Level Radwaste
Processing and Storage Building Vent Stacks; Revision 27
PCP 8.2; Kaman Effluent Monitoring System Operating Procedures; Revision 34
PCP 8.3; Alarm Setpoints and Background Determination for Kaman Normal Range Monitors;
Revision 31
PDA 10-022; Nuclear Oversight Report Radiological Environmental Monitoring/Environmental
Protection; September 20, 2010
PDA 10-036; Nuclear Oversight Report Chemistry and Effluents; February 1, 2011
STP NS790302; Liquid Process Radiation Monitor Inoperable Sampling and Analysis;
Revision 13
STP NS790505; Effluent Noble Gas Sampling and Analysis; Revision 2
STP NS790602; Effluent Tritium Sampling and Analysis; Revision 15
STP NS790708; Offsite Effluent Dose Calculation; Revision 3
STP NS791016; Kaman Monitor Inoperable; Revision 15

40A1

Submitted RCS Leakage Data for 2nd Quarter 2011 through 1st Quarter 2012
CR 01731095; Rise in Drywell Identified Leakage Rate
CR 01722130; Drywell Equipment Drain Totalizer is Rotating Without Any Pumps Running

CR 01764619; Noncompliance With Nuclear Energy Institute Guidance [NRC-Identified]

40A2

ACP 1410.15; Plant Status Control Program; Revision 007
ACP 1410.2; LCO Tracking and Safety Function Determination Program; Revision 29
ACP 1410.5; Plant Status Control Program; Revision 104
ACP 101.01; Procedure Use and Adherence; Revision 51
PI-AA-204; Condition Identification and Screening; Revision 17
PI-AA-100-1007; Apparent Cause Evaluation; Revision 5
CR 1729876; Operator work-around SV-3262B and 1K-010D Both OOS
CR 01748776; Trend NRC Findings in H.1.A
PI-AA-103 (DAEC); Human Performance (DAEC Specific Information); Revision 3
PI-AA-104 (DAEC); Corrective Action Program (DAEC Specific Information); Revision 0
OP-AA-108; Oversight and Control of Operator Burdens; Revision 000
ACP 1410.12; Control of Operational Focus items; Revision 24

40A3

CR and RCE 1739467; Secondary Containment Damper Failures
MD 024; Post-Maintenance Testing Program; Revision 22
CR 1756592; Damper and Damper Operator Work orders Poorly Tasked
CR 1739467; 1VAD17B3 Indicates Dual While Performing A GP 3 B STP
CR 1739632; Damper 1VAD017A3 Failed to Indicate Full Closed with a GP 3A
STP 3.6.4.2-01B; Secondary Containment Isolation Damper Closing Time Test Channel B
CR 1741915; 1VAD017A3 did Not Close When Group 3A Inserted
CR 1741923; 1VAD017A3 and B3 Failed to Fully Close
Calculation 0078-0060-05; MPR Calculation, "Evaluation of RHR Pipe Supports and Anchors"
CR 01708305; Technical Assessment for Reportability of RHR LPCI with Air Bubble in 'B' RHR
Discharge Pipe
Calculation file no. 25.2638.0068; CO Knockdown for Piping Attached to Torus; dated
April 15, 1983
APED-T23-001; DAEC Mark I Containment PUAR Appendix A: DAEC Responses to Current
Containment and Piping Licensing Issues; Dated May 25, 2007
IOW-40-199-A; DAEC Responses to Current Containment and Piping Licensing Issues;
Revision 0
Calculation file no. 25.2638.0070; SRV Load Reduction – DAEC; dated August 26, 1983
CR 01712033; Determine Operability of RHR LPCI with Air Bubble in 'B' RHR Discharge Pipe
SD-152; High Pressure Coolant System Description; Revision 6

LIST OF ACRONYMS USED

AC	Alternating Current
ACP	Administrative Control Procedure
ADAMS	Agencywide Document Access Management System
AOP	Abnormal Operating Procedure
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CS	Core Spray
CR	Condition Report
DAEC	Duane Arnold Energy Center
DBA	Design Basis Accident
DRP	Division of Reactor Projects
ESW	Emergency Service Water
FAR	Field Action Request
FIP	Failure Investigation Process
GPI	Groundwater Protection Initiative
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
LER	Licensee Event Report
LPCI	Low Pressure Coolant Injection
MD	Maintenance Directive
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OI	Operating Instruction
PARS	Publicly Available Records System
PI	Performance Indicator
PRA	Weekly Probabilistic Risk Analysis
RCE	Root Cause Evaluation
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RETS	Radiological Effluent Technical Specification
RG	Regulatory Guide
RHRWS	Residual Heat Removal Service Water
RWS	River Water System
SBGT	Standby Gas Treatment System
SSC	Systems, Structures, and Components
STP	Surveillance Test Procedure
TLD	Thermoluminescent Dosimeters
TS	Technical Specification
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
UHS	Ultimate Heat Sink
WARM	Work Activity Risk Management

R. Anderson

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Sincerely,

/RA/

Mark Ring, Chief
Branch 1
Division of Reactor Projects

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