



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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LISLE, IL 60532-4352

October 21, 2011

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

**SUBJECT: DUANE ARNOLD ENERGY CENTER INTEGRATED INSPECTION REPORT
05000331/2011004**

Dear Mr. Wells:

On September 30, 2011, 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 October 5, 2011, 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, one NRC-identified finding and one self-revealed finding, both of very low safety significance, were identified. The findings both involved a violation of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy. Additionally, a licensee-identified violation is listed in Section 4OA7 of this report.

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

P. Wells

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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 document 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/ By N. Shah Acting For/

Kenneth Riemer, Chief
Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report 05000331/2011004
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000331/2011004

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: July 1 through September 30, 2011

Inspectors: L. Haeg, Senior Resident Inspector
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Enclosure

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SUMMARY OF FINDINGS

IR 05000331/2011004, 07/01/2011 – 09/30/2011; Duane Arnold Energy Center; Operability Evaluations; Problem Identification and Resolution.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding was identified by the inspectors and one Green finding was self-revealed. The findings were considered non-cited violations (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" (SDP). Findings for which the SDP 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 and Self-Revealed Findings

Cornerstone: Mitigating Systems

- 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 for the licensee's failure on two occasions to follow procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," when degraded or non-conforming conditions were identified. Specifically, in one case, the duty Shift Manager incorrectly concluded that an immediate determination of operability for the Ultimate Heat Sink (UHS) was not applicable when a degraded wing dam condition was identified upstream of the intake structure. In another case, the duty Shift Manager incorrectly concluded that immediate determinations of operability for Residual Heat Removal (RHR) and Residual Heat Removal Service Water (RHRSW) thermal relief valves were not applicable when it was identified that several valves had not been tested in accordance with American Society of Mechanical Engineers (ASME) Code requirements. For each issue, the conclusions were contrary to the requirements of procedure EN-AA-203-1001 which requires all degraded or non-conforming conditions be evaluated under an immediate operability determination and prompt operability determination (POD) if warranted. The licensee entered the inspector's concerns into the Corrective Action Program (CAP) as Condition Report (CR) 01679373 and 01684521, for the UHS and RWS system, and RHR and RHRSW systems, respectively. The licensee performed PODs that determined the affected structures, systems, and components (SSCs) were operable but degraded or non-conforming pending restoration of the SSCs to full design and licensing basis qualification.

The inspectors determined that the issues of concern represented a performance deficiency because they were the result of the licensee's failure to meet a procedural requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because, if left uncorrected, failing to properly assess the operability of degraded or non-conforming conditions would have the potential to lead to a more significant safety concern. The inspectors applied IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," to this finding. Because the finding was a qualification deficiency confirmed not to result in loss of operability (Question 1 under the Mitigating Systems Cornerstone column of

Table 4a), 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 Decision-Making components, and involving the licensee making safety-significant decisions using a systematic process. Specifically, by deciding that systematic evaluations of operability were not required to assess the impact of the conditions on the design and licensing bases of the SSCs, the licensee did not ensure that the impact was clearly understood and whether compensatory measures were necessary. [H.1(a)] (Section 1R15)

Cornerstone: Barrier Integrity

- 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 self-revealed on August 16, 2011, for the failure of the licensee to place a spent fuel assembly in its correct location in the spent fuel pool (SFP) in accordance with Refueling Procedure (RFP) 301, "Refueling Bridge Operations." Specifically, the fuel handling team failed to move spent fuel assembly JLE323 to its intended location in the SFP in accordance with Item Control Area (ICA) Transfer Report, Plan Number 11-002. This error was contrary to the requirement of step 4.3.13 of procedure RFP 301 which required movement of spent fuel assemblies in accordance with the ICA Transfer Report. The issue was documented in the licensee's corrective action program as CR 01678733. A prompt evaluation of JLE323 being placed into the incorrect location was performed and determined that the assembly could remain in the incorrect location with no reduction in safety margin. Additional corrective actions included a work stand down, and enhanced fuel handler training and briefings with additional management oversight.

The inspectors determined that the issue of concern represented a performance deficiency because it was the result of the licensee's failure to meet a procedural requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because it was associated with the Barrier Integrity Cornerstone attributes of configuration control and human performance, and it affected the cornerstone objective of providing reasonable assurance that physical design barriers (i.e., fuel cladding) protect the public from radionuclide releases caused by accidents or events. The inspectors applied IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," to this finding. Because the inspectors answered "No" to all questions under "Spent Fuel Pool Issues," under the Barrier Integrity Cornerstone column of Table 4a, the finding 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 Practices components, and involving the licensee using human performance error prevention techniques commensurate with the risk of the assigned task. Specifically, the fuel handling team made the error when they did not correctly apply human performance error prevention tools which were required, expected and appropriate for an activity involving the movement of irradiated fuel and classified as a "high risk" activity. [H.4(a)] (Section 4OA2.3)

B. Licensee-Identified Violations

A violation of very low safety significance that was identified by the licensee was reviewed by inspectors. Corrective actions planned or taken by the licensee have been entered into the licensee's corrective action program. The violation and corrective action tracking number is listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Duane Arnold Energy Center operated at full power for the entire assessment period except for slight reductions in reactor power to compensate for anticipated elevated condenser back pressure conditions during periods of elevated outside ambient and river water temperatures with the following exceptions:

- On August 11, 2011, both River Water Supply (RWS) subsystems were declared inoperable due to a sand intrusion event that impacted the RWS traveling screens. Although the RWS system remained available, the DAEC Technical Specifications required that the plant be taken to cold shutdown. The unplanned shutdown began on August 11, 2011, following a planned reactor scram from approximately 15 percent power. The shutdown continued through August 16, 2011, with the main generator connected to the grid on August 17, 2011. Power ascension was completed on August 25, 2011, when the plant returned to full power.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Impending Adverse Weather Condition – Severe Thunderstorm Watch and High Wind Advisory

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of the facility for July 11, 2011, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of corrective action program (CAP) items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- 'A' RHRSW subsystem during a hot weather alert;
- 'B' Standby Gas Treatment (SBGT) subsystem during planned maintenance on the 'A' SBGT subsystem; and
- portions of the Emergency Service Water (ESW) system during planned maintenance on the Startup Transformer.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TS requirements, outstanding work orders (WOs), condition reports, 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 partial system walkdown samples as defined in IP 71111.04-05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On July 26, 2011, the inspectors performed complete system alignment inspections of the 'B' RHRSW, 'B' Standby Diesel Generator (SBDG), and 'B' ESW subsystems during a maintenance outage of the 'A' RWS subsystem to verify the functional capability of the systems. These systems were selected because they were considered safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors

walked down the systems to review mechanical and electrical equipment line-ups, electrical power availability, system pressures and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system functions. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Area Fire Plan (AFP) 01; Torus Area and North Corner Rooms;
- AFP 13; Refueling Floor;
- AFP 14 and 16; North Turbine Building Basement Reactor Feed Pump Area and Turbine Lube Oil Tank Area, and Condensate Pump Area 734'-0";
- AFP 28, 29 and 30; Pumphouse ESW/ RHRSW Rooms, Fire Pump Rooms and Safety Related Piping Areas; and
- AFP 31 and 32; Intake Structure Pump Rooms El. 767'-0," and Intake Structure Traveling Screen Areas.

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

seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted five quarterly fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

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

- Review of Operating Experience Smart Sample FY2007-02; Flooding Vulnerabilities due to Inadequate Design and Conduit/Hydrostatic Seal Barrier Concerns.

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

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On August 30 and September 14, 2011, inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and

documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

This inspection constituted one quarterly licensed operator requalification program 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:

- Neutron Monitoring system; and
- RWS system and UHS.

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:

- Work Week 1128 Risk;
- 'A' Control Building Chiller subsystem corrective maintenance following spurious trip;
- Containment Radiation Monitor alarms following manual plant scram;
- 'A' SBDG exhaust manifold leak; and
- Risk Evaluation for RHR/RHRSW thermal relief valve missed surveillance tests.

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

Documents reviewed are listed in the Attachment to this report.

This inspection constituted five maintenance risk assessments and emergent work control samples as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- Motor operated valve rotor coating degradation for MO2030-M, RHR Heat Exchanger Bypass Control valve, and MO2001-M, RHR Loop A Drywell Spray Header Outboard Containment Isolation valve;
- Section of exterior siding of reactor building loosened from high winds;
- Leaking 'B' SBDG jacket water heat exchanger return pipe coupling; and
- Licensee evaluation of degraded or non-conforming conditions associated with the UHS and RWS system, and RHR and RHRSW system thermal relief valves.

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

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

b. Findings

(1) Degraded or Non-Conforming Conditions not Properly Evaluated

Introduction: 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 for the licensee's failure on two occasions to follow procedure EN-AA-203-1001, "Operability Determinations/ Functionality Assessments," when degraded or non-conforming conditions were identified. Specifically, in one case, the duty Shift Manager incorrectly concluded that an immediate determination of operability for the UHS was not applicable when a degraded wing dam condition was identified upstream of the intake structure. In another case, the duty Shift Manager incorrectly concluded that an immediate determination of operability for RHR and RHRSW thermal relief valves was not applicable when it was identified that several valves had not been tested in accordance with American Society of Mechanical Engineers (ASME) Code Inservice Testing (IST) requirements.

Description: On August 11, 2011, the licensee entered a forced outage after declaring both RWS subsystems inoperable (refer to Summary of Plant Status, and Sections 1R20 and 71153 of this report). On August 12, 2011, the licensee performed a visual inspection of the east bank of the Cedar River upstream of the intake structure. The licensee identified erosion of varying significance along this portion of the east bank and identified portions of the 'C' and 'D' wing dams along the bank had washed away. The licensee wrote CR 01677455 to document what was found. The CR noted that current river bed conditions were sufficient to provide water flow to the intake structure to

meet ultimate heat sink and river water supply operability requirements. The duty Shift Manager reviewed the CR and concluded that an immediate determination of operability for the condition was not applicable to any TS-required SSCs. Prior to plant startup, the RWS traveling screens were restored and both RWS subsystems were considered operable, permitting entry into Mode 3 for the pending plant startup. Additionally, prior to startup, plant management reviewed all outstanding operable but degraded or non-conforming conditions to justify continued operation following startup. During this review, the continued degraded condition of the 'C' and 'D' wing dams were not addressed. Following plant startup, the inspectors questioned whether ongoing repairs to the wing dams and more frequent and continued dredging in the river constituted compensatory measures for a degraded or non-conforming condition of the UHS or RWS system. The licensee entered the inspectors' question into the CAP as CR 01679373 and the duty Shift Manager requested a POD be performed. The POD concluded that the RWS system and UHS were operable but degraded and below full qualification due to the wing dams not performing their design function as described the UFSAR, Section 9.2.2. The licensee determined that no compensatory measures were necessary to maintain or enhance the operable but degraded condition. Restoration of the 'C' and 'D' wing dams to full qualification was in progress at the end of this inspection period.

On September 1, 2011, the licensee identified that the 'B' RHR heat exchanger thermal relief valve PSV-1975 was not tested within 10 years as required by ASME OM Code, Mandatory Appendix I. The duty Shift Manager applied surveillance requirement 3.0.3, requested a risk assessment within 24 hours, and considered the valve operable. The licensee performed an extent of condition review and identified the 'B' RHRSW heat exchanger tube side pressure relief valve PSV-1988, and the 'A' RHR heat exchanger discharge header relief valve PSV-2057 were also beyond (past due) their required IST frequencies. The duty Shift Manager also applied surveillance requirement 3.0.3 for these valves, had risk assessments performed, and considered the valves operable. The inspectors reviewed Corporate Directive 5.5, "Inservice Testing Program," and noted that NUREG-1482, Revision 1, is referenced as the applicable guidance when ASME Code non-compliances are identified. Per NUREG-1482, Generic Letter 91-18 (superseded by IMC Part 9900 Technical Guidance) is referenced as the means to address degraded and/or non-conforming conditions. Specifically, Section 3.6 of IMC Part 9900 Technical Guidance defines non-conforming conditions, in part, as an SSC failing to conform to one or more applicable codes or standards. The inspectors questioned the licensee whether the past-due ASME IST frequencies for the subject valves represented a non-conformance with ASME Code and whether immediate and/or prompt operability determinations were required. The licensee entered the inspectors' question into the CAP as CR 01684521 and the duty Shift Manager requested PODs be performed for each valve. The POD concluded that all three testing issues represented non-conformances and the affected systems ('A' and 'B' RHR, and 'B' RHRSW) were considered operable but non-conforming to ASME Code requirements. The licensee determined that no compensatory measures were necessary to maintain or enhance the operable but non-conforming conditions. Additionally, the licensee scheduled testing of each valve to be performed at the earliest opportunity.

For both the UHS and RWS, and RHR and RHRSW issues, the inspectors also reviewed licensee fleet procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments." Section 4.2 of this procedure states, in part, that the Shift Manager shall review potential or suspected degraded or

non-conforming conditions for operability and determine whether the affected SSCs are within the scope of SSCs for Operability per Section 2.0, Step 1. Section 2.0, Step 1 states, in part, that the scope of SSCs considered within the operability determination is SSCs required to be operable by TS; and, SSCs that are not explicitly required to be operable by TS, but perform required support functions for SSCs that are required to be operable by TS, immediate operability determinations shall be made for non-conforming or degraded conditions and PODs will be assigned. The procedure describes a non-conforming condition as a condition of an SSC that fails to conform to the UFSAR. In the case of the UHS, the wing dams are specifically described and credited in the UFSAR, in part, as maintaining the elevation of the sediment bed of the Cedar River at the intake structure. Additionally, the procedure describes a non-conforming condition as a condition of an SSC that fails to conform to applicable codes or standards. By not performing testing of the subject thermal relief valves for the RHR and RHRSW systems, the licensee was not in conformance with applicable ASME Code.

Analysis: The inspectors determined that the issues of concern represented a performance deficiency because it was the result of the licensee's failure on two occasions to meet the requirements of EN-AA-203-1001, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because, if left uncorrected, failing to properly identify and evaluate the impact of degraded or non-conforming conditions would have the potential to lead to a more significant safety concern. Specifically, by not identifying and evaluating degraded or non-conforming conditions, circumstances could exist that warrant declaring an SSC inoperable, or warrant compensatory measures to maintain or enhance a degraded or non-conforming condition, or restore an inoperable SSC to an operable but degraded or non-conforming status.

The inspectors applied IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," to this finding. Because the finding was a qualification deficiency confirmed not to result in losses of operability (Question 1 under the Mitigating Systems Cornerstone column of Table 4a), 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 Decision-Making components, and involving the licensee making safety-significant decisions using a systematic process. Specifically, by deciding that systematic evaluations of operability were not required to assess the impact of the degraded or non-conforming conditions on the design and licensing bases of the SSCs, the licensee did not ensure that the impact was clearly understood and whether compensatory measures were necessary. [H.1(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 procedures and shall be accomplished in accordance with these procedures. Contrary to this requirement, on August 12, 2011, and September 1, 2011, the licensee failed to evaluate degraded or non-conforming conditions associated with the 'C' and 'D' degraded wing dams, and 'A' RHR and 'B' RHR and RHRSW thermal relief valves, respectively, in accordance with procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," Revision 2. Immediate corrective actions

included performance of PODs for each issue. The licensee also generated additional CRs to review and enhance current procedures, processes and training for evaluating degraded and non-conforming conditions. Because this violation was of very low safety significance and was entered into the licensee's CAP as CR 01679373 and CR 01684521, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000331/2011004-01, Degraded or Non-Conforming Conditions Not Properly Evaluated).

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- 'B' SBDG testing following corrective maintenance;
- Testing of 1K-3 Control Building/SBG Instrument Air Compressor following preventive maintenance;
- 'A' Low Pressure Coolant Injection operability testing following 'A' RHR valve maintenance;
- Startup Transformer operability testing following maintenance;
- RWS system traveling screen testing following corrective maintenance; and
- 'A' Core Spray system vent valve replacement post-maintenance testing.

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

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

b. Findings

No findings were identified.

1R20 Outage Activities (71111.20)

.1 Non-Refueling Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for an unplanned TS-required shutdown and unscheduled outage that began on August 11, 2011, and continued through August 17, 2011. During testing of the RWS system on the evening of August 10, 2011, the licensee identified a high differential pressure signal across the intake traveling screens. Further investigation revealed the inability of both trains of the RWS traveling screens to rotate. The operators implemented Operating Instruction (OI) 410, "River Water Supply System," which required both RWS systems be declared inoperable because both RWS traveling screens could not rotate in either an automatic or continuous manner. In addition, OI 410 discussed the ability of the screen wash system to operate on the associated high differential pressure signal across a traveling screen. The inability to rotate traveling screens prevented the use of the screen wash system effectively or in accordance with its design. Based on these conditions, the duty Shift Manager entered the applicable shutdown Limiting Condition for Operation for two RWS subsystems inoperable.

Following plant shutdown, divers performed inspections of the intake structure and identified approximately four feet of sand that had entered the intake structure on the river side of the traveling screens, and was the likely cause of the traveling screens not being able to rotate. Additionally, visual inspections identified the traveling screen inboard-to-outboard pressure differential indicating switches were also being affected by sand intrusion. Immediate actions taken by the licensee included sand removal from inside of the intake structure (upstream and downstream of the traveling screens) and dredging/removal of sand from in front of the intake structure. Following removal of the sand from the intake structure and testing to ensure the traveling screens could rotate, the licensee declared the RWS system operable. Plant startup commenced on August 16, 2011.

The inspectors observed or reviewed the reactor shutdown and cooldown, outage equipment configuration and risk management, electrical lineups, selected clearances, control and monitoring of decay heat removal, control of containment activities, personnel fatigue management, startup and heatup activities, and identification and resolution of problems associated with the outage. Section 4OA3.1 discusses the inspectors' response to the site to observe operator performance and conduct during initial troubleshooting of the event.

This inspection constituted one non-refueling outage sample as defined in IP 71111.20-05.

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 NS160004B; RHR Service Water Operability Test and Comprehensive Pump Test (IST);
- STP 3.5.3-02; Reactor Core Isolation Cooling System Operability Test (Routine);
- STP 3.3.6.1-22; Refuel Floor Exhaust Duct Radiation Monitor Channel Functional Test (Routine);
- STP 3.3.8.2-02A; Reactor Protection System A Motor Generator (MG) Set Electrical Protection Assembly (EPA) Channel Functional Test (Routine); and
- STP NS100102B; B River Water Supply and Screen Wash System Vibration Measurement and Operability Test (IST).

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

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers Code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;

- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted three routine surveillance testing samples and two inservice testing samples, as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings were identified.

1EP2 Alert and Notification System Evaluation (71114.02)

a. Inspection Scope

The inspectors held discussions with Emergency Preparedness (EP) staff regarding the operation, maintenance, and periodic testing of the Alert and Notification System (ANS) in the Duane Arnold Energy Center's plume pathway Emergency Planning Zone. The inspectors reviewed monthly trend reports and siren test failure records from June 2009 through August 2011. Information gathered during document reviews and interviews was used to determine whether the ANS equipment was maintained and tested in accordance with Emergency Plan commitments and procedures. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one alert and notification system sample as defined in IP 71114.02-05.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Augmentation Testing (71114.03)

a. Inspection Scope

The inspectors reviewed and discussed with plant EP staff the emergency plan commitments and procedures that addressed the primary and alternate methods of initiating an Emergency Response Organization (ERO) activation to augment the on shift ERO as well as the provisions for maintaining the plant's ERO emergency telephone directory. The inspectors also reviewed reports and a sample of corrective action program records of unannounced off hour augmentation tests, which were conducted between June 2009 and August 2011, to determine the adequacy of post-drill critiques and associated corrective actions. The inspectors also reviewed a sample of the EP training records, approximately 12 records for ERO personnel who were assigned to key and support positions, to determine the status of their training as it related to their assigned ERO positions. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one emergency response organization augmentation testing sample as defined in IP 71114.03-05.

b. Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05)

a. Inspection Scope

The inspectors reviewed a sample of Quality Assurance staff's 2010 and 2011 audits of the Duane Arnold Energy Center's EP program to determine that these independent assessments met the requirements of 10 CFR 50.54(t). The inspectors also reviewed critique reports and samples of corrective action program records associated with the 2010 biennial exercise, as well as various EP drills conducted in 2010 and 2011, in order to determine that the licensee fulfilled its drill commitments and to evaluate the licensee's efforts to identify, track, and resolve concerns identified during these activities.

The inspectors reviewed the May 3, 2011, Alert classification event and resulting Emergency Plan implementation. The adequacy of the licensee's critique of Emergency Plan implementation for this event was also reviewed. Additionally, the inspectors reviewed a sample of EP items and corrective actions related to the facility's EP program and activities between June 2009 and August 2011 to determine whether corrective actions were completed in accordance with the sites corrective action program. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one correction of emergency preparedness weaknesses and deficiencies sample as defined in IP 71114.05-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupation and Public Radiation Safety

2RS5 Radiation Monitoring Instrumentation (71124.05)

This inspection constituted one radiation monitoring instrumentation sample as defined in IP 71124.05-5.

.1 Inspection Planning and Identification of Instrumentation (02.01)

a. Inspection Scope

The inspectors reviewed the UFSAR to identify radiation instruments associated with monitoring area radiological conditions including airborne radioactivity, process streams, effluents, materials/articles, and workers. Additionally, the inspectors reviewed the instrumentation and the associated TS requirements for post-accident monitoring instrumentation including instruments used for remote emergency assessment.

The inspectors reviewed a listing of in-service survey instrumentation including air samplers and small article monitors, along with instruments used to detect and analyze workers' external contamination. Additionally, the inspectors reviewed personnel contamination monitors and portal monitors including whole-body counters to detect workers' internal contamination. The inspectors reviewed this list to assess whether an adequate number and type of instruments were available to support operations.

The inspectors reviewed licensee and third-party evaluation reports of the radiation monitoring program since the last inspection. These reports were reviewed for insights into the licensee's program and to aid in selecting areas for review ("smart sampling").

The inspectors reviewed procedures that governed instrument source checks and calibrations, focusing on instruments used for monitoring transient high radiological conditions, including instruments used for underwater surveys. The inspectors reviewed the calibration and source check procedures for adequacy and as an aid to smart sampling.

The inspectors reviewed the area radiation monitor alarm setpoint values and setpoint bases as provided in the TS and the UFSAR.

The inspectors reviewed effluent monitor alarm setpoint bases and the calculation methods provided in the offsite dose calculation manual (ODCM).

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down effluent radiation monitoring systems, including at least one liquid and one airborne system. Focus was placed on flow measurement devices and all accessible point-of-discharge liquid and gaseous effluent monitors of the selected systems. The inspectors assessed whether the effluent/process monitor configurations aligned with ODCM descriptions and observed monitors for degradation and out-of-service tags.

The inspectors selected portable survey instruments in use or available for issuance and assessed calibration and source check stickers for currency as well as instrument material condition and functionality.

The inspectors observed licensee staff performance as the staff demonstrated source checks for various types of portable survey instruments. The inspectors assessed whether high-range instruments were source checked on all appropriate scales.

The inspectors walked down area radiation monitors and continuous air monitors to determine whether they were appropriately positioned relative to the radiation sources or areas they were intended to monitor. Selectively, the inspectors compared monitor response (via local or remote control room indications) with actual area conditions for consistency.

The inspectors selected personnel contamination monitors, portal monitors, and small article monitors and evaluated whether the periodic source checks were performed in accordance with the manufacturer's recommendations and licensee procedures.

b. Findings

No findings were identified.

.3 Calibration and Testing Program (02.03)

Process and Effluent Monitors (02.03a)

a. Inspection Scope

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

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

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

b. Findings

No findings were identified.

.4 Laboratory Instrumentation (02.03b)

a. Inspection Scope

The inspectors assessed laboratory analytical instruments used for radiological analyses to determine whether daily performance checks and calibration data indicated that the frequency of the calibrations is adequate and there were no indications of degraded instrument performance.

The inspectors assessed whether appropriate corrective actions were implemented in response to indications of degraded instrument performance.

b. Findings

No findings were identified.

.5 Whole Body Counter (02.03c)

a. Inspection Scope

The inspectors reviewed the methods and sources used to perform whole body count functional checks before daily use of the instrument and assessed whether check sources were appropriate and align with the plant's isotopic mix.

The inspectors reviewed whole body count calibration records since the last inspection and evaluated whether calibration sources were representative of the plant source term and that appropriate calibration phantoms were used. The inspectors looked for anomalous results or other indications of instrument performance problems.

b. Findings

No findings were identified.

.6 Post-Accident Monitoring Instrumentation (02.03d)

a. Inspection Scope

Inspectors selected drywell high-range monitors and reviewed the calibration documentation since the last inspection.

The inspectors assessed whether electronic calibrations were completed for all range decades above 10 rem/hour and whether at least one decade at or below 10 rem/hour was calibrated using an appropriate radiation source.

The inspectors assessed whether calibration acceptance criteria were reasonable, accounting for the large measuring range and the intended purpose of the instruments.

The inspectors selected two effluent/process monitors that were relied on by the licensee in its emergency operating procedures as a basis for triggering emergency action levels and subsequent emergency classifications, or to make protective action recommendations during an accident. The inspectors evaluated the calibration and availability of these instruments.

The inspectors reviewed the licensee's capability to collect high-range, post-accident iodine effluent samples.

As available, the inspectors observed electronic and radiation calibration of these instruments to verify conformity with the licensee's calibration and test protocols.

b. Findings

No findings were identified.

.7 Portal Monitors, Personnel Contamination Monitors, and Small Article Monitors (02.03e)

a. Inspection Scope

For each type of these instruments used on site, the inspectors assessed whether the alarm setpoint values were reasonable under the circumstances to ensure that licensed material is not released from the site.

The inspectors reviewed the calibration documentation for each instrument selected and discussed the calibration methods with the licensee to determine consistency with the manufacturer's recommendations.

b. Findings

No findings were identified.

.8 Portable Survey Instruments, Area Radiation Monitors, Electronic Dosimeters, and Air Samplers/Continuous Air Monitors (02.03f)

a. Inspection Scope

The inspectors reviewed calibration documentation for at least one of each type of instrument. For portable survey instruments and area radiation monitors, the inspectors reviewed detector measurement geometry and calibration methods and had the licensee demonstrate use of its instrument calibrator as applicable. The inspectors conducted comparisons of instrument readings versus an NRC survey instrument if problems were suspected.

As available, the inspectors selected portable survey instruments that did not meet acceptance criteria during calibration or source checks to assess whether the licensee had taken appropriate corrective actions for instruments found significantly out of calibration (greater than 50 percent). The inspectors evaluated whether the licensee had evaluated the possible consequences of instrument use since the last successful calibration or source check.

b. Findings

No findings were identified.

.9 Instrument Calibrator (02.03g)

a. Inspection Scope

As applicable, the inspectors reviewed the current output values for the licensee's portable survey and area radiation monitor instrument calibrator unit. The inspectors assessed whether the licensee periodically measured calibrator output over the range of the instruments used through measurements by ion chamber/electrometer.

The inspectors assessed whether the measuring devices had been calibrated by a facility using National Institute of Standards and Technology traceable sources and whether corrective factors for these measuring devices were properly applied by the licensee in its output verification.

b. Findings

No findings were identified.

.10 Calibration and Check Sources (02.03h)

a. Inspection Scope

The inspectors reviewed the licensee's 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," source term to assess whether calibration sources used were representative of the types and energies of radiation encountered in the plant.

b. Findings

No findings were identified.

.11 Problem Identification and Resolution (02.04)

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring instrumentation were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the corrective action program. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involved radiation monitoring instrumentation.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

40A1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index - Emergency Alternating Current (AC) Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Emergency AC Power System performance indicator for the period from the third quarter 2010 through the second quarter 2011. To determine the accuracy of the Performance Indicator (PI) data reported during this period, PI definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, condition reports, event reports and NRC Integrated Inspection Reports for the period from the third quarter 2010 through the second quarter 2011 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to

determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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 MSPI - emergency AC power system sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - High Pressure Injection Systems performance indicator for the period from the third quarter 2010 through the second quarter 2011. To determine the accuracy of the PI data reported during this period, PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's operator narrative logs, condition reports, MSPI derivation reports, event reports and NRC Integrated Inspection Reports for the period from the third quarter 2010 through the second quarter 2011 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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 MSPI - high pressure injection systems inspection sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Heat Removal System performance indicator for the period from the third quarter 2010 through the second quarter 2011. To determine the accuracy of the PI data reported during this period, PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's operator narrative logs, condition reports, event reports, MSPI derivation reports, and NRC Integrated Inspection Reports for the period from the third quarter 2010 through the second quarter 2011 to validate the accuracy of the submittals.

The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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 MSPI - heat removal system inspection sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.4 Drill/Exercise Performance

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill/Exercise PI for the period from the second quarter 2010 through second quarter 2011. To determine the accuracy of the PI data reported during this period, PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the PI; assessments of PI opportunities during pre-designated control room simulator training sessions, performance during the 2010 biennial exercise, and performance during other drills. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one drill/exercise performance sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.5 Emergency Response Organization Drill Participation

a. Inspection Scope

The inspectors sampled licensee submittals for the ERO Drill Participation PI for the period from the second quarter 2010 through second quarter 2011. To determine the accuracy of the PI data reported during this period, PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's records associated with the PI to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the PI; performance during the 2010 biennial exercise and other drills;

and revisions of the roster of personnel assigned to key emergency response organization positions. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one ERO drill participation sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.6 Alert and Notification System

a. Inspection Scope

The inspectors sampled licensee submittals for the ANS PI for the period from the second quarter 2010 through second quarter 2011. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's records associated with the PI to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the PI; and results of periodic ANS testing. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.7 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System Specific Activity PI for the period from the first quarter 2010 through the second quarter 2011. The inspectors used PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's reactor coolant system chemistry samples, TS requirements, condition reports, event reports, and NRC Integrated Inspection Reports for the period from the first quarter 2010 through the second quarter 2011 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. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.8 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Exposure Control Effectiveness PI for the period from the first quarter 2010 through the second quarter 2011. The inspectors used PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff, the scope, and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic personal dosimetry dose rate and accumulated dose alarms and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.9 Radiological Effluent Technical Specification(RETS)/Offsite Dose Calculation Manual
Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the RETS/ODCM Radiological Effluent Occurrences PI for the period from the first quarter 2010 through the second quarter 2011. The inspectors used PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's CAP database and selected individual condition reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates from the first quarter 2010 through the second quarter 2011 to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one RETS/ODCM radiological effluent occurrences 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 they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: identification of the problem was complete and accurate; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Selected Issue Follow-Up Inspection: Misplaced Spent Fuel Assembly in Spent Fuel Pool

a. Inspection Scope

The inspectors reviewed a corrective action item documenting a misplaced spent fuel assembly in the spent fuel pool during preparations for the 2011 Independent Spent Fuel Storage Installation (ISFSI) project. Due to the nature of this event and the immediate causes identified by the licensee, the inspectors also focused their inspection efforts on other events that had recently occurred with similar causes. The inspectors identified an adverse trend in condition reports and issues having either aspects or errors related to human performance and configuration control. The licensee wrote CR 01679391, "NRC Identified- High Number of Mispositioning Events at DAEC," to document the observation.

The inspectors discussed the evaluations and associated corrective actions with licensee personnel and verified the following attributes during their review of the apparent cause evaluation for the misplaced spent fuel assembly:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause and previous occurrences;
- classification and prioritization of the resolution of the problem, commensurate with its safety significance;
- identification of the root and contributing causes of the problem; and
- identification of corrective actions that were appropriately focused to correct the problem.

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

b. Findings

(1) Misplaced Spent Fuel Assembly in the Spent Fuel Pool

Introduction: A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed on August 16, 2011, for the failure of the licensee to place a spent fuel assembly in its correct location in the SFP in accordance with procedure RFP 301, "Refueling Bridge Operations." Specifically, the fuel handling team failed to move spent fuel assembly JLE323 to its intended location in the SFP in accordance with ICA Transfer Report, Plan Number 11-002.

Description: On August 17, 2011, during preparations for the 2011 ISFSI campaign, the licensee was moving spent fuel in the SFP per ICA Transfer Report (i.e., fuel move sheet), Plan Number 11-002 in accordance with RFP 301, "Refueling Bridge

Operations.” Following the first spent fuel move of the day, the fuel handlers (licensed senior reactor operator designated as the fuel handling supervisor, and two contract fuel handlers designated as fuel handling spotter and fuel handling operator) misplaced spent fuel assembly JLE323 into location 05-13-03 rather than the correct location 05-13-05. This error was revealed to the fuel handlers while attempting to perform step 57 of the ICA Transfer Report, when they noticed that they could not place spent fuel assembly YJU136 into SFP location 05-13-03. Because the fuel handlers had just placed spent fuel assembly JLE323 in the destination cell during the previous step (56), they could not proceed with the fuel movement plan. The fuel handlers immediately placed YJU136 back into its original location and informed site management. A prompt evaluation of JLE323 being placed into the incorrect location was performed and determined that the assembly could remain in location 05-13-03 with no reduction in safety margin. Additionally, a prompt investigation of the human performance aspects of the event revealed that the fuel handling supervisor misread the step 56 destination, or “move to” location, and had mistakenly misread the destination immediately below (step 57 destination) on the ICA Transfer Report. The fuel handling spotter independently verified and also mistakenly read the next step’s destination location. The fuel handling operator repeated the incorrect destination location and moved spent fuel assembly JLE323 into location 05-13-03, rather than the correct location 05-13-05.

The licensee entered the issue into the CAP as CR 01678733 and performed an apparent cause evaluation. The evaluation determined that the apparent cause of the misplaced spent fuel assembly was due to inadequate verification techniques since the fuel handlers did not use the required, expected, or appropriate human performance tools. Several contributing causes were also identified by the licensee during the performance of the apparent cause evaluation. Most notably was that the plant was in the midst of a reactor startup following a forced outage, which did not allow the licensee organization to provide the level of oversight and attention warranted for an activity involving the movement of irradiated fuel and classified as a “high risk” activity by the site. Other contributing causes identified were associated with the fuel handling team consisting of a newly qualified SRO and contract fuel handlers new to the site, further highlighting the need for increased scrutiny and supervision.

Analysis: The inspectors determined that the issue of concern represented a performance deficiency because it was the result of the licensee’s failure to meet the requirement of step 4.3.13 of procedure RFP 301, “Refueling Bridge Operations,” and the cause was reasonably within the licensee’s ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because it was associated with the Barrier Integrity Cornerstone attributes of configuration control and human performance, and it affected the cornerstone objective of providing reasonable assurance that physical design barriers (i.e., fuel cladding) protect the public from radionuclide releases caused by accidents or events. Specifically, failing to follow procedures directing fuel movements did not provide reasonable assurance that physical design barriers will protect the public from radionuclide releases caused by accidents or events.

The inspectors applied IMC 0609, Attachment 4, “Phase 1 - Initial Screening and Characterization of Findings,” to this finding. Because the inspectors answered “No” to all questions under “Spent Fuel Pool Issues,” under the Barrier Integrity Cornerstone column of Table 4a, the finding 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 Practices components, and involving the licensee using human performance error prevention techniques commensurate with the risk of the assigned task. Specifically, the fuel handling team made the error when they did not correctly apply human performance error prevention tools which were required, expected and appropriate for an activity involving the movement of irradiated fuel and classified as a “high risk” activity. [H.4(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 procedures and shall be accomplished in accordance with these procedures. Contrary to this requirement, on August 17, 2011, the licensee failed to move a spent fuel assembly in accordance with procedure RFP 301, “Refuel Bridge Operations.” Corrective actions included a work stand down, and enhanced fuel handler training and briefings with additional management oversight. Because this violation was of very low safety significance and was entered into the licensee’s CAP as CR 01678733, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000331/2011003-02, Misplaced Spent Fuel Assembly in Spent Fuel Pool)

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

.1 Technical Specification-Required Plant Shutdown Due To Both River Water Supply Subsystems Declared Inoperable

a. Inspection Scope

The inspectors reviewed the plant’s response to both RWS traveling screens becoming non-functional, the declaration of both RWS subsystems inoperable, and the subsequent plant shutdown. On August 11, 2011, the inspectors responded to the site and reviewed plant status, operating instructions, abnormal operating procedures, operator logs, and observed operator performance during the plant shutdown. The inspectors verified that the licensee’s overall shutdown preparations were conducted in accordance with procedures, and that compensatory measures were considered and reviewed in a proactive manner. Documents reviewed in this inspection are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

4OA5 Other Activities

.1 (Closed) NRC Temporary Instruction (TI) 2517/179, "Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)"

a. Inspection Scope

The inspectors confirmed that the licensee had reported the initial inventories of sealed sources pursuant to 10 CFR 20.2207 and verified that the National Source Tracking System database correctly reflects the Category 1 and 2 sealed sources in custody of the licensee. Inspectors interviewed personnel and performed the following:

- Reviewed the licensee's source inventory;
- Verified the presence of any Category 1 or 2 sources;
- Reviewed procedures for and evaluated the effectiveness of storage and handling of sources;
- Reviewed documents involving transactions of sources; and
- Reviewed adequacy of licensee maintenance, posting, and labeling of nationally tracked sources.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 5, 2011, the inspectors presented the inspection results to Mr. P. Wells, 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 results of the Emergency Preparedness program inspection were discussed with Mr. G. Pry on August 11, 2011; and
- The results of the Radiation Monitoring Instrumentation inspection were discussed with Mr. R. Porter on August 19, 2011.

The inspectors confirmed that none of the potential report input discussed was considered proprietary.

4OA7 Licensee-Identified Violations

The following violation of very low significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

The licensee identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of a control room operator to open the correct out-of-service reactor feed pump recirculation control valve during the conduct of performing a maintenance work order (WO 40105857). Specifically, on August 18, 2011, a control room operator incorrectly manipulated the in-service reactor feed pump recirculation control valve which was not in accordance with the clearance order required to depressurize a maintenance boundary. The operator immediately recognized the error, placed the valve into the closed position, and the issue was entered into the CAP as CR 01679118. No adverse plant response occurred as a result of the error.

This failure to meet the requirements of WO 40105857 was a performance deficiency. The performance deficiency was more than minor because it was associated with the Initiating Events Cornerstone attribute of configuration control and its objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown and power operations. Specifically, had the operator not immediately recognized the error, opening of the incorrect reactor feed pump recirculation control valve would have likely resulted in a significant reactor level or temperature transient. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Initiating Events Cornerstone. Because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available, the inspectors screened the finding as very low safety significance (Green).

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

P. Wells, Site Vice President
D. Curtland, Plant General Manager
G. Pry, Operations Director
K. Kleinheinz, Site Engineering Director
S. Catron, Licensing Manager
G. Young, Nuclear Oversight Manager
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
T. Byrne, Licensing
D. Mothena, Corporate Functional Area Emergency Preparedness Manager

Nuclear Regulatory Commission

K. Feintuch, Project Manager, NRR
K. Riemer, Chief, Reactor Projects Branch 2

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000331/2011004-01	NCV	Degraded or Non-Conforming Conditions not Properly Evaluated (Section 1R15)
05000331/2011004-02	NCV	Misplaced Spent Fuel Assembly in Spent Fuel Pool (Section 4OA2.3)

Closed

05000331/2011004-01	NCV	Degraded or Non-Conforming Conditions not Properly Evaluated (Section 1R15)
05000331/2011004-02	NCV	Misplaced Spent Fuel Assembly in Spent Fuel Pool (Section 4OA2.3)

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

Abnormal Operating Procedure (AOP) 903; Severe Weather; Revision 30

1R04

OI 416A2; "A" RHRSW System Valve Lineup and Checklist; Revision 11
OI 170A6; SGBT System Control Panel Lineup; Revision 3
OI 170A4; "B" SGBT System Valve Lineup and Checklist; Revision 2
OI 170A1; SGBT System Electrical Lineup; Revision 8
OI 454A1; ESW System Electrical Lineup; Revision 5
OI 454A2; 'A' ESW System Valve Lineup and Checklist; Revision 12
OI 454A4; 'B' ESW System Valve Lineup and Checklist; Revision 12
OI 454A6; ESW System Control Panel Lineup; Revision 2

1R05

AFP-01; Torus Area and North Corner Rooms El. 716'9" and 735'-7 1/2"; Revision 25
Administrative Control Procedure (ACP) 1408.2; Scaffold Control; Revision 32
GMP-CNST-09; Scaffolding; Revision 28
AFP-13; Refueling Floor EL. 855'-0"; Revision 26
AFP 14; North Turbine Building Basement Reactor Feed Pump Area and Turbine Lube Oil Tank Area; Revision 30
AFP 16; Condensate Pump Area 734'-0"; Revision 25
AFP 28; Pumphouse ESW/ RHRSW Pump rooms and Main Pump Room; Revision 29
AFP29; Pumphouse Fire Pump and Fire Pump Day Tank Rooms; Revision 27
AFP 30; Pumphouse Safety Related Piping Area, El. 747'-6"; Revision 26
AFP 31; Intake Structure Pump Rooms Elevation 767'-0"; Revision 26
AFP 32; Intake Structure Traveling Screen Areas; Revision 27

1R06

Reactor Building Sump System Performance Criteria Basis Document; Revision 2
CR 00349575; OE 008703 INPO SEN 257, Internal Flood Design Deficiencies
CR 00351126; OE 017725 Conduct an Operating Experience Evaluation – NRC IN 2007-01
CR 01683426; Trend – Degradation in Neutron Monitoring System Health
River Water Supply System Performance Criteria Basis Document; Revision 3
AOP-902; Flood; Revision 38
CR 01693444; Verify Rx Bldg Sump MR Monitoring is Adequate

1R12

CR 01683426; Trend – Degradation in Neutron Monitoring System Health

1R13

Work Planning Guideline-1; Work Process Guideline; Revision 46
Work Planning Guideline-2; Online Risk Management Guideline; Revision 59
OP-AA-104-1007; Online Aggregate Risk; Revision 2
WM-AA-1000; Work Activity Risk Management; Revision 10
WM-AA-1000 (DAEC); Work Activity Risk Management (DAEC); Revision 0
OP-AA-102-1003; Guarded Equipment; Revision 3
OP-AA-102-1003 (DAEC); Guarded Equipment (DAEC Specific Information); Revision 17
Work Week 1128 WARM Summary and Risk Analysis
CR 01673504; 1VCH001A 'A' Control Building Chiller Tripped
CR 01673953; Gasket Missed for the Suction Strainer 1VCH001A A Chiller
CR 01674420; 1VCH001A Compressor Vibration is Excessive
CR 01677204; Containment Air Radiation Monitors: Airborne in Drywell
CR 01677226; Drywell Floor Drain Sump Sample Results
Corporate Directive 5.5; Inservice Testing Program; Revision 2
CR 01684521; Request POD for ASME Tests Past Due
ACP 107; Surveillance Tests; Revision 12
CR 01683000; PSV1975 RHR HX Discharge Hdr Relief not Tested within 10 Yrs
CR 01683504; PSV2057 Not Tested Within 10 Year Requirement
CR 01683433; PSV1988 Not Tested Within 10 Year Requirement

1R15

CR 01668348; Coating Appears to be Failing on the Rotor For MO2030-M
CR 01668441; Degradation Detected During Motor Internal Inspection MO2001-M; Revision 0
CR 01668128; Exterior Siding Came Loose During High Winds 7-11-11
CR 01673191; Improvements to Site Response to CR1668128 – Wind Damage POD
CR 01666713; 24 Drops per Minute Leak on Inlet to 1E053B 1G-21 Jacket Cooling Water Heat Exchanger
CR 01679373; Determine if RWS and the UHS are Degraded or Nonconforming
CR 01680752; POD Quality
CR 01689062; NRC Finding – Inadequate Operability Determinations
CR 01689406; Improvement Efforts in Shift Manager Review of PODs

1R19

STP 3.7.9-01A; Control Building/SBGTS Instrument Air Compressor 1K-3 Functional Test; Revision 2
WO 40063238; 1K003: Inspect Oil, Filters & Check Belts
CR 01672432; 1K3 Low Oil Light Came On During PMT STP 3.7.9-01A
CR 01672457; Low Oil Indicating Light Cycling On 1K003 Control Building/SBGTS Instrument Air Compressor
STP 3.5.1-11A; A Low Pressure Coolant Injection System Operability Tests and Comprehensive Pump Test; Revision 5
OI 151; Core Spray System; Revision 62
WO 40105546-04; CNTG – V21-0064 & V21-0065 Welders Replace
CR 01678909; WO 40105546-04 Step for Operability Check out of Sequence
WO 01282841; 1X003: Periodic Replacement of Control Power Transformer
WO 01339131; 1X003: Water Dripping From Bottom of Non-Seg Bus
WO 01363523; MA: SUS13.01 Startup Transformer Wet Trip Test

WO 40058293; STP NS130104 Startup Transformer Dry Trip Test
OI 304.1; 4160V/480V Nonessential Electrical Distribution System; Revision 73
CR 01685654; WO 1339126 Not Completed as Scheduled
CR 01685655; Level A Work Not Completed as Scheduled
CR 01685658; Work Steps Not Performed on Work Order
CR 01685710; 1A402 Startup Transformer Supply to 1A4 Work Delayed

1R20

Integrated Plant Operating Instruction (IPOI) 3; Power Operations (35% - 100% Rated Power);
Revision 128
IPOI 4; Shutdown; Revision 108
Adverse Condition Monitoring and Contingency Plan; River Water Depth; August 14, 2011
OI 644; Condensate and Feedwater Systems; Revision 118
IPOI 1; Startup Checklist; Revision 129
IPOI 8; Outage and Refueling Operations; Revision 71

1R22

STP 3.5.3-02; Reactor Core Isolation Coolant System Operability Test; Revision 33
STP NS160004B; B RHR Service Water Operability Test and Comprehensive Pump Test;
Revision 2
WO 40049452; RHR Service Water Operability Test
STP 3.3.6.1-22; Refuel Floor Exhaust Duct Radiation Monitor Channel Functional Test;
Revision 3
CR 01674255; RE-4131B is Failed Downscale
STP 3.3.8.2-02A; Reactor Protection System A MG Set EPA Channel Functional Test;
Revision 2
NS100102B; B River Water Supply and Screen Wash System Vibration Measurement and
Operability Test; Revision 11
CR 01686254; RWS Pumps 1P117B and 1P117D in ASME Alert for Low dP

1EP2

Appendix P; Duane Arnold Energy Center Outdoor Warning System/ANS Upgrade Project
FEMA-REP-10 Final Design Report Supplement; Revision 0
EPDM 1013; Emergency Siren (ANS) and Siren Sign Program; Revision 10
Selected Documentation of ANS Repair and Annual Preventative Maintenance; June 2009 to
August 2011

1EP3

EPDM 1009; ERO Training and Qualification Program; Revision 10
EPDM 1016; ERO Augmentation Drill and Testing Program; Revision 15
November 3, 2009, Unannounced Augmentation Drill
December 15, 2009, Remedial Unannounced Augmentation Drill
March 23, 2010, Bi-annual Augmentation Test
June 8, 2010, Bi-annual Augmentation Test
August 9, 2010, Bi-annual Augmentation Test
December 8, 2010, Bi-annual Augmentation Test

1EP3

February 21, 2011, Bi-annual Augmentation Test
June 14, 2011, Bi-annual Augmentation Test

1EP5

PI-AA-204; Condition Identification and Screening Process; Revision 12
PI-AA-205; Condition Evaluation and Corrective Action; Revision 12
PDA 10-019; Emergency Preparedness Audit; 07/29/2010
PDA 11-014; Emergency Preparedness Audit; 07/29/2011
SAQH 01659160; Quick Hit Self-Assessment; 06/09/11
SAQH 01669073; Quick Hit Self-Assessment; 06/24/11
January 27, 2010 ERO Drill Report; 1/27/10
April 7, 2010, ERO Drill Report; 4/28/10
April 19, 2010, ERO Drill Report; 6/20/10
Emergency Plan Implementing Procedure (EPIP) 6.1; Drill and Exercise Program; Revision 3
EPDM 1008; Emergency Response Drill and Exercise Program; Revision 16
EPDM 1020; Actual Event Investigation; Revision 2
CR 01624624; DEP PI Notification Failure During LOR Out of Box Scenario
CR 01624910; DEP PI Notification Failure During LOR Out of Box Scenario
CR 01634909; Issues with EOF Plume Tracking
CR 01634956; Midas at EOF Not Working Properly
CR 01643571; Difference between SA 2.1 and SS 2.1 Not Clearly Documented
CR 01647987; Hydrogen Pad Fire and Alert Declaration
CR 01650242; Drill PAR Change Incorrectly Declared
CR 01650258; Erroneous Drill PAR
CR 01651377; Unexpected General Emergency Drill Declaration
CR 01668601; Hydrogen Fire Event Summary Not Generated

2RS5

ACP 1408.8; Control of Measuring and Test Equipment; Revision 21
CR 01622153; HP1610 As Found Data is Out of Tolerance
CR 01677877; Delays in Restoration of FASTSCAN Whole Body Counter
CAP 63213; Radiation Protection Equipment Outage Readiness Issues
CAP 72589; General Service Water Radiation Effluent Monitor Set-Point Calculation Incorrect –
Conservative Low
Eberline AMS3; HP0408; Annual Calibration; October 21, 2009
Eberline Low Volume Air Sampler; Semi-Annual Calibration; August 21, 2006
Eberline RO-2; HP0129; Annual Calibration; May 12, 2010
Eberline R07; HP0068; Annual Calibration; July 8, 2009
Eberline Teletector; HP0366; Annual Calibration; May 12, 2010
Ludlum 3; HP0145; Annual Calibration; February 17, 2009
Ludlum 177; HP0545; Annual Calibration; May 12, 2010
MGP DRM-1 Annual Calibration; April 29, 2010
MGP Telepole; HP0231; Annual Calibration; May 12, 2010
MGP RMS-3 Annual Calibration; July 8, 2009
HPP 3105.05; Administration of In-Vivo and In-Vitro Bioassay; Revision 18
HPP3108.02; Inventory and Calibration Frequency for Health Physics Instrumentation;
Revision 13

HPP 3108.03; Statistical evaluation and Quality Assurance of Health Physics Instrumentation; Revision 6
HPP 3108.04; Radiation Protection Instrumentation Operational Checks and Quality Control Considerations; Revision 20
HPP 3109.37; Operation of the Eberline Gamma Tool Monitor; Revision 8
HPP 3109.71; Operation of the FASTSCAN Whole Body Counting System; Revision 15
HPP 3109.86; Operation of the RADOS RTM-860 Whole Body Contamination Monitor; Revision 5
HPP 3110.16; Small Article Monitor 11 Calibration; Revision 1
HPP 3110.39; Calibrations and Response Check of the RADOS RTM 950 Portal Monitor; Revision 12
HPP 3110.71; Calibration of Whole Body Counting Systems; Revision 13
STP 3.3.3.1-03; Primary Containment Area Radiation Post Accident Monitor Instrumentation Electronic Calibration; Revision 4
STP 3.3.3.1-08; Primary Containment Area Radiation Post Accident Monitoring Suppression Chamber Instrumentation source Calibration Check; Revision 1
STP 3.3.3.1-12; Primary Containment Area Radiation Post Accident Monitoring drywell Instrumentation Source Calibration Check; Revision 0
STP NS791007; K4 Calibration Procedure; Revision 14
STP NS791013; K10 Calibration Procedure; Revision 14
STP NS790101; Extended Range Effluent Radiation Monitors Calibration (Off-Gas Stack); Revision 11
STP NS790301; General Service Water Radiation Monitor Calibration; Revision 13
STP NS790305; Residual Heat Removal Service Water Radiation Monitor Calibration; Revision 10
STP NS 790503; Extended Range Effluent Radiation Monitors Calibration ("B" Reactor Building Exhaust Stack); Revision 15
STP NS 791101; Extended Range Effluent Radiation Monitors Calibration (Turbine Building Exhaust Stack); Revision 15

40A1

Duane Arnold Energy Center MSPI Basis Document; Revision 12
NRC PI Data Calculation, Review and Approval Packages for MSPI HPCI; 3rd Quarter 2010 through 2nd Quarter 2011
MSPI Unreliability Index Derivation Reports for HPCI System; July 2010 through June 2011
MSPI Unavailability Index Derivation Reports for HPCI System; July 2010 through June 2011
NRC PI Data Calculation, Review and Approval Packages for MSPI Heat Removal (RCIC) System; 3rd Quarter 2010 through 2nd Quarter 2011
MSPI Unreliability Index Derivation Reports for Heat Removal System; July 2010 through June 2011
MSPI Unavailability Index Derivation Reports for Heat Removal System; July 2010 through June 2011
NRC PI Data Calculation, Review and Approval Packages for MSPI Emergency AC Power System; 3rd Quarter 2010 through 2nd Quarter 2011
MSPI Unreliability Index Derivation Reports for Emergency AC Power System; July 2010 through June 2011
MSPI Unavailability Index Derivation Reports for Emergency AC Power System; July 2010 through June 2011
Emergency Planning Department Manual (EPDM) 1010; EP Department Performance Indicators; Revision 16

DAEC Emergency Plan; Revision 34
EPIP 1.1; Determination of Emergency Action Levels; Revision 28
EPIP 1.2; Notifications; Revision 42
Siren System Availability Test Records; April 1, 2010 - June 30, 2011
ERO Personnel Participation; April 1, 2010 - June 30, 2011
DEP Opportunities; April 1, 2010 - June 30, 2011
PCP 2.13; Reactor Water Sampling; Revision 24
STP NS790708; Offsite Effluent Dose Calculation Calculated Dose and Limit Comparisons;
Revision 3
Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological
Effluent Occurrences
NG-001L; NRC Performance Indicator Data Calculation; Review and Approval; Revision 4

4OA2

CR 01679391; NRC Identified – High Number of Mispositioning Events at DAEC
OI 920; Drywell Sump System; Revision 44
CR 01643548; Cycle 23 Average DW Temp Higher than Last Cycle Average
CR 01619280; Increase DW Equipment Drain Sump Leakage
CR 01662605; Drywell Equipment Temperature Trend
CR 01661673; 1C219B Integrated Leak Test Failure
CR 01678733; Spent Fuel Bundle Placed in Wrong Coordinate in Fuel Pool
RFP 301; Refueling Bridge Operations; Revision 43
RFP 403; Performance of Fuel Handling Activities; Revision 45
ICA Transfer Report; Fuel Move Plan 11-002; Pre-Staging Moves for 2011 ISFSI Campaign
CR 01679188; Running Recirc Valve Taken to Open
OI 358; Reactor Protection System; Revision 60
CR 01677416; C EPA Breakers Not in the Position Anticipated by the OI
ACP 1410.15; Plant Status Control Program; Revision 5
PI-AA-101-1000; Human Performance Program Error Reduction Tools; Revision 1
WO 40105857; Replace Valve with Warehouse Spare

4OA3

CR 01676836; Unplanned Entry Into TS 3.7.2 Condition B
CR 01676846; Cedar River in Front of Intake at 2 Feet
OI 410; River Water Supply System; Revision 61
AOP 410; Loss of River Water Supply; Revision 21
AOP 149; Loss of Decay Heat Removal; Revision 37
DAEC Operations Logs; August 10-11, 2011
NS100102A; A River Water Supply and Screen Wash System Vibration Measurement and
Operability Test; Revision 11

LIST OF ACRONYMS USED

AC	Alternating Current
ACP	Administrative Control Procedure
ADAMS	Agencywide Document Access Management System
AFP	Area Fire Plan
ANS	Alert and Notification System
AOP	Abnormal Operating Procedure
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
DRP	Division of Reactor Projects
DAEC	Duane Arnold Energy Center
EP	Emergency Preparedness
EPA	Electrical Protection Assembly
EPIP	Emergency Plan Implementing Procedure
EPDM	Emergency Planning Department Manual
ERO	Emergency Response Organization
ESW	Emergency Service Water
ICA	Item Control Area
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPOI	Integrated Plant Operating Instruction
IR	Inspection Report
ISFSI	Independent Spent Fuel Storage Installation
IST	Inservice Testing
LER	Licensee Event Report
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OI	Operating Instruction
PARS	Publicly Available Records System
PI	Performance Indicator
POD	Prompt Operability Determination
PM	Post-Maintenance
RETS	Radiological Effluent Technical Specification
RFP	Refueling Procedure
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RWS	River Water Supply
SBDG	Standby Diesel Generator
SBGT	Standby Gas Treatment
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SSC	Systems, Structures, and Components
SFP	Spent Fuel Pool
TS	Technical Specification
UHS	Ultimate Heat Sink

UFSAR
WO

Updated Final Safety Analysis Report
Work Order

P. Wells

-2-

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 document 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/ By N. Shah Acting For/

Kenneth Riemer, Chief
Branch 2
Division of Reactor Projects

Docket No. 50-331
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Letter to P. Wells from K. Riemer dated October 21, 2011

SUBJECT: DUANE ARNOLD ENERGY CENTER INTEGRATED INSPECTION REPORT
05000331/2011004

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