



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

January 30, 2013

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

**SUBJECT: DUANE ARNOLD ENERGY CENTER - NRC INTEGRATED INSPECTION  
REPORT 05000331/2012005**

Dear Mr. Anderson:

On December 31, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Duane Arnold Energy Center. The enclosed report documents the results of this inspection, which were discussed on January 10, 2013, with you and other members of your staff.

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

Based on the results of this inspection, two NRC-identified and two self-revealed findings of very low safety significance were identified. The findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as 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.

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.

R. Anderson

-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 Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at [http://www.nrc.gov/reading\\_rm/adams.html](http://www.nrc.gov/reading_rm/adams.html) (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Robert J. Orlikowski, Acting Chief  
Branch 1  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000331/2012005  
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: 05000331/2012005

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: October 1 through December 31, 2012

Inspectors: L. Haeg, Senior Resident Inspector  
R. Murray, Resident Inspector  
R. Orlikowski, Project Engineer  
J. Draper, Reactor Engineer  
D. Jones, Reactor Inspector  
M. Phalen, Senior Health Physicist  
S. Bell, Health Physicist  
R. Elliot, Reactor Engineer

Approved by: Robert J. Orlikowski, Acting Chief  
Branch 1  
Division of Reactor Projects

Enclosure

## TABLE OF CONTENTS

SUMMARY OF FINDINGS .....	1
REPORT DETAILS .....	5
Summary of Plant Status.....	5
1. REACTOR SAFETY.....	5
1R01 Adverse Weather Protection (71111.01).....	5
1R04 Equipment Alignment (71111.04) .....	6
1R05 Fire Protection (71111.05) .....	8
1R08 Inservice Inspection Activities (71111.08G).....	8
1R11 Licensed Operator Requalification Program (71111.11).....	10
1R12 Maintenance Effectiveness (71111.12).....	11
1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13) .....	12
1R15 Operability Determinations and Functional Assessments (71111.15) .....	15
1R18 Plant Modifications (71111.18) .....	18
1R19 Post-Maintenance Testing (71111.19).....	18
1R20 Outage Activities (71111.20).....	19
1R22 Surveillance Testing (71111.22) .....	21
1EP4 Emergency Action Level and Emergency Plan Changes (IP 71114.04).....	22
2. RADIATION SAFETY.....	22
2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01) .....	22
2RS2 Occupational As-Low-As-Is-Reasonably-Achievable Planning and Controls (71124.02).....	29
4. OTHER ACTIVITIES .....	31
4OA1 Performance Indicator (PI) Verification (71151).....	31
4OA2 Identification and Resolution of Problems (71152) .....	34
4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153) .....	36
4OA5 Other Activities .....	38
4OA6 Management Meetings .....	40
4OA7 Licensee-Identified Violations .....	41
SUPPLEMENTAL INFORMATION .....	1
KEY POINTS OF CONTACT.....	1
LIST OF ITEMS OPENED, CLOSED AND DISCUSSED .....	2
LIST OF DOCUMENTS REVIEWED.....	3
LIST OF ACRONYMS USED .....	9

## SUMMARY OF FINDINGS

Inspection Report 05000331/2012005, 10/01/2012 – 12/31/2012; Duane Arnold Energy Center; Maintenance Risk Assessments and Emergent Work Control; Operability Determinations and Functionality Assessments; Radiological Hazard Assessment and Exposure Control; and Follow-Up of Events and Notices of Enforcement Discretion.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were identified by the inspectors and two Green findings were self-revealed. The findings were considered non-cited violations (NCV) 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: Initiating Events**

- Green. A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed on October 24, 2012, for the licensee's failure to accomplish instructions for functional testing of the main steam line safety/relief valve PSV-4402 pilot valve. Specifically, a model work order to perform testing of the pilot valve required the main steam lines to be drained; however, the decision was made to allow performance of the testing following removal of the main steam line plugs. Due to a minor leak of the closed safety/relief valve nitrogen accumulator isolation valve, the testing and the resultant brief opening of the pilot valve's solenoid valve caused nitrogen to reposition the pilot valve disc of the safety/relief valve. This then resulted in momentary opening of PSV-4402 and discharge of approximately 700 gallons of reactor cavity water into the drained suppression pool. The licensee entered the issue into the Corrective Action Program (CAP) as Condition Report (CR) 01816385. The licensee revised the model work orders for safety/relief valve pilot valve functional testing and was in the process of creating separate return-to-service tasks to ensure that testing of the pilot valves could not be performed unless the main steam lines were drained.

The inspectors determined that testing of PSV-4402 without the main steam line plugs installed represented a performance deficiency because it was the result of the licensee's failure to meet a regulatory 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 Initiating Events Cornerstone attributes of configuration control and human performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability during shutdown operations. The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Because the finding pertained to an event while the plant was shutdown, Table 3 instructed reference of IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," and IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs and BWRs."

Because all attributes IMC 0609, Appendix G, Attachment 1, Checklist 7 “BWR Refueling Operation with Reactor Coolant System (RCS) Level > 23’,” were met throughout the event, the finding did not require a quantitative analysis and 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 using conservative assumptions in decision making and adopting a requirement to demonstrate that a proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove an action. [H.1(b)] (Section 4OA3.1)

### **Cornerstone: Mitigating Systems**

- Green. A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified by the inspectors on October 17, 2012, for the licensee’s failure to accomplish procedure EN-AA-203-1001, “Operability Determinations/Functionality Assessments,” when degraded or non-conforming conditions were identified. Specifically, the duty Shift Manager approved Prompt Operability Determination (POD) 01812339 that was performed following the identification of submerged power and control cables associated with the ‘A’ Standby Diesel Generator (SBDG). The POD did not discuss the fact that the applicable cables were not qualified for submergence, incorrectly concluded that the cables conformed to the Updated Final Safety Analysis Report (UFSAR), and did not evaluate whether compensatory actions were required. The POD conclusions were contrary to the requirements of procedure EN-AA-203-1001 that required all degraded or non-conforming conditions be evaluated for compensatory actions. The licensee documented the inspector’s concerns in CR 01813800, revised POD 01812339, and assigned compensatory actions for the degraded and non-conforming conditions.

The inspectors determined that failing to evaluate a degraded or non-conforming condition for compensatory actions represented a performance deficiency because it was the result of the licensee’s failure to meet a regulatory 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 and evaluating the necessity for compensatory actions would have the potential to lead to a more significant safety concern. The inspectors applied IMC 0609.04, “Initial Characterization of Findings,” to this finding. Because the finding pertained to an event while the plant was shutdown, Table 3 instructed reference of IMC 0609, Appendix G, “Shutdown Operations Significance Determination Process.” Because the finding did not require a quantitative assessment, 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 Problem Identification and Resolution, having Operating Experience (OE) components, and involving the licensee implementing and institutionalizing OE through changes to station processes and procedures. [P.2(b)] (Section 1R15.1)

### **Cornerstone: Public Radiation Safety**

- Green. A finding of very low safety significance and associated NCV of Technical Specification (TS) 5.4.1, "Procedures," was identified by the inspectors for the licensee's failure to establish a procedure for filling the condensate storage tanks (CSTs) from multiple sources. Specifically, the lack of procedural instructions or guidance for controlling the CST filling process resulted in over filling the CST overflow tank on October 8, 2012, and subsequent leakage past a missing CST pit penetration seal to the nearby soil. The licensee entered the inspector's concerns into the CAP as CR 01812345. The licensee repaired the penetration seal and revised the applicable Annunciator Response Procedures and Operating Instructions.

The inspectors determined that failing to establish a written procedure for filling the CSTs represented a performance deficiency because it was the result of the licensee's failure to meet a TS 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 Public Radiation Safety Cornerstone attribute of programs and processes and adversely affected the cornerstone objective of ensuring the adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of civilian nuclear reactor operation. The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Because the finding and associated programmatic weakness was in the licensee's Public Radiation Safety Cornerstone, Table 3 instructed reference of IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process." Because the finding was related to the effluent release program, did not constitute a substantial failure to implement the effluent program, and did not result in any public dose, the finding screened as very low safety significance (Green). The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Work Control components, and involving the licensee appropriately planning the work activity by incorporating the need for planned contingencies, compensatory actions, and abort criteria. [H.3(a)] (Section 1R13)

### **Cornerstone: Occupational Radiation Safety**

- Green. A finding of very low safety significance and associated NCV of 10 CFR 20.1501 was self-revealed on October 16, 2012, for the licensee's failure to make surveys to evaluate the potential radiological hazards during work inside the torus. Specifically, ten workers were externally contaminated and nine workers were assigned low level unintended internal radiation doses after installing rigging and fall protection inside the torus proper. The issues were entered into the licensee's CAP as CR 01813761. Immediate corrective actions included performance of radiological dose assessments on the individuals involved and performance management coaching of the individuals in accordance with station management protocols.

The inspectors determined that failing to effectively maintain radiological control of work activities in the torus proper represented a performance deficiency because it was the result of the licensee's failure to meet a regulatory 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, the performance deficiency had the potential to lead to a more significant safety concern (additional unplanned or more significant radiological exposures). The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Per Table 3, because the finding was associated with a programmatic weakness in the licensee's Occupational Radiation Safety Cornerstone, IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," was used. The inspectors determined that the finding was of very low safety significance (Green) because the finding did not involve As-Low-As-Is-Reasonably-Achievable (ALARA) planning or work controls, there was no overexposure or substantial potential for an overexposure, nor was the licensee's ability to assess worker dose compromised. 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 defining and effectively communicating expectations regarding procedural compliance and personnel follow procedures. [H.4(b)] (Section 2RS1.2)

**B. Licensee-Identified Violations**

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



## REPORT DETAILS

### Summary of Plant Status

Duane Arnold Energy Center (DAEC) operated at full power for the entire assessment period except for brief down-power maneuvers to accomplish rod pattern adjustments and to conduct planned surveillance testing activities with the following exceptions:

- On October 6, 2012, a planned refueling outage (RFO) began when the main generator was removed from service. The refueling outage continued through November 26, 2012, with the generator connected to the grid on November 27, 2012.
- On November 29, 2012, while at approximately 70 percent reactor power, a main generator field ground alarm was received. Following online troubleshooting, the licensee removed the main generator from service and shut down the reactor on December 1, 2012. The generator was connected back to the grid on December 7, 2012, and full power achieved on December 13, 2012.

### 1. REACTOR SAFETY

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

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

##### .1 Winter Seasonal Readiness Preparations

##### a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the UFSAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment to this report. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Secondary Containment and Freeze Protection Systems.

This inspection constituted one winter seasonal readiness preparations sample as defined in Inspection Procedure (IP) 71111.01-05.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Condition – Heavy Snowfall and Blizzard Conditions

a. Inspection Scope

On December 19, 2012, a blizzard warning was issued for expected high amounts of snow and high wind conditions. The inspectors observed the licensee's preparations and planning for the significant winter weather potential. The inspectors reviewed licensee procedures and discussed potential compensatory measures with control room personnel. The inspectors focused on plant management's actions for implementing the station's procedures for ensuring adequate personnel for safe plant operation and emergency response would be available. The inspectors conducted a site walkdown including walkdowns of various plant structures and systems to check for maintenance or other apparent deficiencies that could affect system operations during the predicted significant weather. The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. 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 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:

- Various Protected Systems during Operations with the Potential to Drain the Reactor Vessel (OPDRVs) on October 16, 2012;
- Reactor Core Isolation Cooling (RCIC) System with High Pressure Coolant Injection (HPCI) System Out-of-Service (OOS) for Testing; and
- 'B' SBDG and 'B' Emergency Service Water (ESW) Subsystem during an 'A' Emergency Core Cooling System Maintenance Window.

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), CRs, and the impact of ongoing work activities on redundant trains of equipment in order to

identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Specific documents reviewed during these inspections are listed in the Attachment to this report.

These inspections 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 October 23-24, 2012, the inspectors performed a complete system alignment inspection of the Core Spray system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the Attachment to this report.

This inspection 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 that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Area Fire Plan (AFP)-28; Pump House ESW/Residual Heat Removal Service Water (RHRSW) Pump Rooms and Main Pump Room;
- AFP-35; Radwaste Treatment & Access Area;
- AFP-36; Precoat, Radwaste Control Room & Heating Ventilation and Air Conditioning;
- AFP-17; Condenser Bay, Heater Bay, Steam Tunnel; and
- AFP-70; Standby Transformer.

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 OOS, 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. Specific documents reviewed during these inspections are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08G)

From October 15 through October 24, 2012, the inspectors conducted a review of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system, risk-significant piping and components and containment systems.

The ISIs described in Sections 1R08.1 and 1R08.2 below constituted one inspection sample as defined in IP 71111.08-05.

## .1 Piping Systems ISI

### a. Inspection Scope

The inspectors observed or reviewed the following non-destructive examinations mandated by the American Society of Mechanical Engineers (ASME) Section XI Code to evaluate compliance with the ASME Code Section XI and Section V requirements and if any indications and defects were detected, to determine if these were dispositioned in accordance with the ASME Code or an NRC approved alternative requirement.

- Ultrasonic Examination (UT) of the “A” Recirculation Pump Suction Drain Line 90 Degree Long Radius Elbow-Pipe Weld, RDA-J007 (elbow); Report No. VE-12-002;
- UT of the “B” Recirculation Pump Suction Drain Line Pipe-90 Degree Long Radius Elbow, RDB-J009 (elbow); Report No. VE-12-003;
- UT of the Reactor Nozzle – Safe End Weld, JPA-F002, Report No. UT-12-016;
- UT of the Reactor Nozzle – Safe End Weld, JPB-F002, Report No. UT-12-015; and
- Visual Examination of the Reactor Core Plate Hold Down Bolt CP-HDB-46, Report No. VDS0229.

During the prior outage (RF022) non-destructive surface and volumetric examinations, the licensee did not identify any relevant/recordable indications. Therefore, no NRC review was completed for this inspection procedure attribute.

The inspectors reviewed the following pressure boundary weld completed for a risk significant system since the beginning of the last refueling outage to determine if the licensee applied the preservice non-destructive examinations and acceptance criteria required by the ASME Code Section XI. Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine if the weld procedure was qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- Reactor Recirculation Nozzle F2A Weld Overlay; WO 40043846.

### b. Findings

No findings were identified.

## .2 Identification and Resolution of Problems

### a. Inspection Scope

The inspectors performed a review of ISI-related problems entered into the licensee’s CAP and conducted interviews with licensee staff to determine if:

- the licensee had established an appropriate threshold for identifying ISI-related problems;

- the licensee had performed a root cause (if applicable) and taken appropriate corrective actions; and
- the licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity.

The inspectors performed these reviews to evaluate compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action" requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

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

a. Inspection Scope

On November 14, 2012, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and testing was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas of the crew:

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

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

This inspection constituted one quarterly licensed operator regualification program simulator sample as defined in IP 71111.11.

b. Findings

No findings were identified.

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

a. Inspection Scope

On October 5-6, 2012, the inspectors observed the control room operators perform the plant shutdown for RFO 23. This was an activity that required heightened awareness or was related to increased risk. The inspectors evaluated the following areas of the crew:

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

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

This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

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

- Standby Diesel Generator Degraded Cables; and
- 'A' Main Steam Isolation Valve CV-4413 Performance.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;

- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Specific documents reviewed during these inspections 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:

- Main Generator Field Ground Alarm Emergent Troubleshooting;
- Work Week 1240 Risk-Outage Begins/A and B Split Work Week;
- Outage Risk Plan/Actual Plant Conditions for Risk Sectors 1-5; and
- Radwaste Vault and CST Pit Leaks.

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

Specific documents reviewed during these inspections are listed in the Attachment to this report. These maintenance risk assessments and emergent work control activities constituted four samples as defined in IP 71111.13-05.



b. Findings

(1) Lack of Procedure Leads to Over Filling Condensate Storage Overflow Tank

Introduction: A finding of very low safety significance and associated NCV of Technical Specification (TS) 5.4.1, "Procedures," was identified by the inspectors for the licensee's failure to establish a written procedure for filling the CSTs. Specifically, the lack of procedural instructions or guidance for controlling the CST filling process resulted in over filling the CST overflow tank on October 8, 2012, and subsequent leakage past a missing/degraded CST pit penetration seal to the nearby soil.

Description: On October 8, 2012, during RFO 23, the licensee began filling the CSTs in preparations for filling the reactor cavity for refueling operations. While filling the CSTs, the control room received both CST high level alarms and the high level alarm for the CST overflow tank. The control room immediately contacted Radwaste operators and the in-field non-licensed operator to secure filling the CSTs. Due to having multiple evolutions in progress, the in-field operator was not able to immediately suspend filling the CSTs. After the CST filling activity was secured, the control room dispatched operators to the CSTs. It was originally determined by the licensee that the CST overflow tank had likely not been over filled. However, it was later determined that the CST overflow tank had been overfilled. Regardless, neither was a CR written to address the receipt of the CST and CST overflow tank high level alarms, nor was the control room log updated.

Several days later, on October 11, 2012, the licensee was excavating adjacent to the CST pit for planned inspections of underground piping. During excavating activities, the licensee noted a pipe penetration into the CST pit sump was leaking water around the penetration and was being drained into the soil outside of the CST pit. Later investigation revealed that the penetration into the pit sump was not sealed and allowed water from the CST pit sump to leak into the soil adjacent to the CST pit.

The licensee took actions to immediately seal the leak, removed workers from the area, and directed Chemistry technicians to sample the water that had leaked out of the CST pit sump. The Chemistry technicians identified that the water was contaminated and indicative of CST/reactor water. The licensee removed the contaminated soil before resuming excavating activities, calculated that approximately 680 gallons of water had leaked into the soil adjacent to the CST pit, and made required notifications to offsite agencies. Ultimately, the licensee installed a permanent seal around the leaking pipe penetration.

The inspectors reviewed Section 9.2.6.2 of the UFSAR, which states in part, that "the condensate storage tanks overflow to the reactor building equipment drain sump by way of a 1000-gal overflow tank. In an emergency, this tank will overflow to the area around the tanks. The tanks are enclosed by a dike with a concrete pad preventing the entry of condensate into the ground." The inspectors determined that the normal filling of the CSTs did not constitute an emergency which should have overflowed the CSTs or the overflow tank, and that the licensee did not establish or implement procedures for filling the CSTs from multiple sources. The inspectors noted that during excavating activities, the leak revealed itself to workers in the area due to a missing seal around the piping penetration. Because the inspectors did not identify any part of the licensee's current licensing or design basis that identified the CST pit penetration seal installation, the

inspectors considered that the missing CST pit penetration seal was an old design issue and did not constitute a performance deficiency. However, the inspectors were concerned that the licensee did not have instructions or procedures in place for the CST filling process to preclude overfilling the overflow tank to the CST pit sump. The licensee documented the inspector's concerns in CR 01812345, and revised applicable Annunciator Response Procedures and Operating Instructions.

Analysis: The inspectors determined that failing to establish a written procedure for filling the CSTs from multiple sources represented a performance deficiency because it was the result of the licensee's failure to meet a TS 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 Public Radiation Safety Cornerstone attribute of programs and processes and adversely affected the cornerstone objective of ensuring the adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of civilian nuclear reactor operation. Specifically, when combined with the inadequate CST sump pit penetration seal, the lack of a written procedure for filling the CSTs from multiple sources resulted in contaminated water overflowing into the CST pit sump which was then released into the environment in an uncontrolled and unrecorded manner.

The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Because the finding and associated programmatic weakness was in the licensee's Public Radiation Safety Cornerstone, Table 3 instructed reference of IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process." Because the finding was related to the effluent release program, did not constitute a substantial failure to implement the effluent program, and did not result in any public dose, the finding screened as very low safety significance (Green).

The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Work Control components, and involving the licensee appropriately planning the work activity by incorporating the need for planned contingencies, compensatory actions, and abort criteria. Specifically, the licensee did not conduct a detailed pre-job brief prior to the filling evolution which defined specific roles and responsibilities or a target CST level for stopping the evolution. [H.3(a)]

Enforcement: TS 5.4.1, "Procedures," requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Section 4 identifies, in part, instructions for filling, venting, and draining should be prepared, as appropriate for several systems, including 4.n. "Condensate System" and 4.p. "Makeup System."

Contrary to the above, on October 8, 2012, the licensee failed to establish a written procedure for filling the CSTs from multiple sources, specifically to preclude overfilling the CST overflow tank. Specifically, operators filled the CSTs above the high level alarm point, overfilled the CSTs to the CST overflow tank, and eventually released contaminated water into the soil adjacent to the CST pit. Corrective actions included sealing the degraded piping penetration seal and revising applicable Annunciator Response Procedures and Operating Instructions.

Because this violation was of very low safety significance, was entered into the licensee's CAP as CR 01812345, and was not willful, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000331/2012005-01; Lack of Procedure Leads to Over Filling Condensate Storage Overflow Tank).**

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- 'B' SBDG Submerged Cables POD;
- 'A' SBDG Submerged Cables;
- Review of SBDG Operability during Diesel Fuel Oil Main Tank Inspection; and
- Secondary Containment Operability Following Testing Failure.

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

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

b. Findings

(1) Degraded/Non-Conforming Conditions Not Properly Evaluated

Introduction: A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors on October 17, 2012, for the licensee's failure to accomplish procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," when degraded or non-conforming conditions were identified. Specifically, the duty Shift Manager approved POD 01812339 that was performed following the identification of submerged power and control cables associated with the 'A' SBDG. The POD did not discuss the fact that the applicable cables were not qualified for submergence, incorrectly concluded that the cables conformed to the Updated Final Safety Analysis Report (UFSAR), and did not evaluate whether compensatory actions were required. The POD conclusions were contrary to the requirements of procedure EN-AA-203-1001

that required all degraded or non-conforming conditions be evaluated for compensatory actions.

Description: On January 29, 2012, the control room received an unexpected low-low level alarm associated with the 'A' SBDG day tank. Troubleshooting on February 6, 2012, identified a ground fault in the 'A' fuel oil day tank low-low level switch electrical cable. Since the affected level switch did not impact the availability or operability of the 'A' SBDG, the licensee elected to replace the faulted cable during RFO 23 beginning on October 6, 2012. On October 12, 2012, during a maintenance outage of the 'A' SBDG, the licensee enacted a work order to replace the 'A' SBDG day tank level switch cable. This DC control cable, as well as other control and power cables for the 'A' SBDG, were located underneath the turbine building base mat within conduit and ran underground from the 'A' SBDG day tank room to the northeast corner room of the reactor building. Due to the inability to replace only one cable within the conduit, all cables within the conduit were to be removed and replaced with new cables. Upon removing the 'A' SBDG from service and pulling the cable bundle into the northeast corner room, the cables appeared wetted and the outer jacketing degraded. This cable bundle contained safety related cables that had the ability to impact the operability of the "A" SBDG. The licensee documented the cable conditions in CR 01812339, and a POD was requested to evaluate the cable condition impact on restoration of the 'A' SBDG as well as the extent of condition to the 'B' SBDG. Upon completion of the POD, the inspectors reviewed the licensee's evaluation and conclusions. The POD concluded that "the cables should be considered operable and above full qualification but with reduced margin associated with cable aging." Further, the POD concluded that there was "a high degree of confidence that the SSC meets full qualification as described in the current licensing basis and as required by the design specifications of the SSCs which they support," and that "no compensatory actions are required to maintain component operability."

The inspectors were concerned with the licensee's conclusions considering prior issues at DAEC with the discovery of submerged safety-related low-voltage (<600 V) cables. In particular, in July 2009, the licensee received a non-cited violation (NCV 05000331/2009005-01) for failing to maintain low-voltage safety-related cables in an environment for which they were designed (cables were found submerged within a cable vault). Although Engineering Specification BECH-MRS-E019, "600V Power and Control Cable," Revision 26 stated, in part, that "the cable shall be suitable for installation indoors and outdoors in metal trays, conduit, underground duct banks, and direct burial in earth in wet and dry locations," they were not qualified for continual submergence.

The inspectors questioned the conclusion of POD 01812339 considering that the various cables in question did not have a supporting engineering specification as being qualified for continual submergence and the POD did not evaluate the degraded and non-conforming conditions of the cables for compensatory actions as required per EN-AA-203-1001. The licensee documented the inspector's concerns in CR 01813800 on October 17, 2012 and revised POD 01812339. This POD revision concluded that the submerged cable condition did represent a degraded and non-conforming condition, and several compensatory actions were assigned to periodically inspect and test the cables until final corrective actions were taken.

Analysis: The inspectors determined that failing to evaluate a degraded or non-conforming condition for compensatory actions represented a performance deficiency because it was the result of the licensee's failure to meet a regulatory 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 and evaluating the necessity for compensatory actions would have the potential to lead to a more significant safety concern. Specifically, by not identifying and appropriately evaluating degraded or non-conforming conditions, circumstances could exist that warrant declaring an SSC inoperable, or warrant compensatory actions to maintain or enhance a degraded or non-conforming condition.

The inspectors applied IMC 0609.04 "Initial Characterization of Findings," to this finding. Because the finding pertained to an event while the plant was shutdown, Table 3 instructed reference of IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process." Because the finding did not require a quantitative assessment, 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 Problem Identification and Resolution, having OE components, and involving the licensee implementing and institutionalizing OE through changes to station processes and procedures. Specifically, internal operating experience, related NRC generic communications, and NRC findings and non-cited violations from 2009 specifically identifying this type of cable as not qualified for continual submergence was not internalized by licensee personnel by means of process, procedure, and/or current licensing and design bases changes. [P.2(b)]

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, as of October 17, 2012, the licensee failed to accomplish EN-AA-203-1001, "Operability Determinations/Functionality Assessments," Revision 6, that required an evaluation of compensatory actions for degraded and non-conforming conditions associated with the 'A' SBDG electrical cables. Immediate corrective actions included a revision to POD 01812795 to enact compensatory actions, and generating CR 01819695 to perform an apparent cause evaluation review to enhance current procedures, processes and training for evaluating degraded and non-conforming conditions.

Because this violation was of very low safety significance, was entered into the licensee's CAP as CR 01819695, and was not willful, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000331/2012005-02, Degraded/Non-Conforming Conditions Not Properly Evaluated)**.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the following modifications:

- Recirculation Riser Differential Pressure Low Pressure Coolant Injection (LPCI) Loop Select Instrumentation Upgrades; and
- SBDG Cable Replacements.

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

This inspection constituted two plant modification samples as defined in IP 71111.18-05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- Surveillance Test Procedure (STP) 3.9.1-01; Refuel Interlocks STP Following Refueling Bridge Power Cord Replacement;
- Rod Time Testing Following Hydraulic Control Unit Maintenance;
- STP 3.10.1-01; Class 1 Leak Test Following RFO 23; and
- STP NS930003; Main Turbine Overspeed Trip System Tests.

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 the TSs, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with PMTs 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. Specific documents reviewed during these inspections are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R20 Outage Activities (71111.20)

.1 Refueling Outage Activities

a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for RFO 23, conducted October 6 through November 26, 2012, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

- licensee configuration management, including maintenance of defense-in-depth commensurate with the OSP for key safety functions and compliance with the applicable TS when taking equipment out of service;
- implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;
- controls over the status and configuration of electrical systems to ensure that TS and OSP requirements were met, and controls over switchyard activities;
- monitoring of decay heat removal processes, systems, and components;
- controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- controls over activities that could affect reactivity;
- maintenance of secondary containment as required by TS;
- licensee fatigue management, as required by 10 CFR 26, Subpart I;

- refueling activities, including fuel handling and sipping to detect fuel assembly leakage;
- startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing; and
- licensee identification and resolution of problems related to RFO activities.

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

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

b. Findings

No findings were identified.

.2 Other Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for an unscheduled outage that began on December 1, 2012, and continued through December 7, 2012. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

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. On November 29, 2012, a main generator field ground alarm was received in the control room. Per the annunciator response procedure and inability to identify the source of the ground while online, the licensee shut down the reactor and performed troubleshooting on the main generator and exciter. In addition to the activities above, the inspectors also observed performance of the licensee's event response team, operational decision making issue meetings, and other interactions with vendors and outside experts.

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

This inspection constituted one other 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 3.5.1-02A; 'A' LPCI System Operability Test (IST);
- STP 3.4.9-01; Heatup and Cooldown Rate Log (Routine);
- STP 3.8.1-07B; 'B' LOOP-LOCA Test (Routine); and
- STP 3.6.1.1-04; Containment Isolation Valve Leak Tightness Test – Type C Penetrations – Main Steam System (Containment Isolation Valve).

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

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and 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.

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

This inspection constituted two routine surveillance testing samples, one inservice testing sample, and one containment isolation valve sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (IP 71114.04)

a. Inspection Scope

Nuclear Security and Incident Response (NSIR) headquarters staff performed an in-office review of the latest revisions of the Emergency Plan and various Emergency Plan Implementing Procedures (EPIPs) located under ADAMS Accession Number ML12150A252 as listed in the Attachment.

The licensee transmitted the EPIP revisions to the NRC pursuant to the requirements of 10 CFR Part 50, Appendix E, Section V, "Implementing Procedures." The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. Specific documents reviewed during this inspection are listed in the Attachment to this report.

This inspection constituted one emergency action level and emergency plan change sample as defined in IP 71114.04-05.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstones: Public Radiation Safety and Occupational Radiation Safety**

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

This inspection constituted one radiological hazard assessment and exposure control sample as defined in IP 71124.01-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed all licensee performance indicators for the Occupational Exposure Cornerstone for follow-up. The inspectors reviewed the results of radiation protection program audits (e.g., licensee's quality assurance audits or other independent

audits). The inspectors reviewed any reports of operational occurrences related to occupational radiation safety since the last inspection. The inspectors reviewed the results of the audit and operational report reviews to gain insights into overall licensee performance.

b. Findings

No findings were identified.

.2 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors determined whether there had been changes to plant operations since the last inspection that could have resulted in significant new radiological hazards for onsite workers or members of the public. The inspectors assessed whether the licensee evaluated the potential impact of these changes and implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazards.

The inspectors reviewed the last two radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazards.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and performed independent radiation measurements to verify conditions.

The inspectors selected the following radiologically risk-significant work activities that involved exposure to radiation:

- Refuel Floor 360 Degree Platform;
- RFO Support Work; and
- Torus Internals Coating Removal and Re-Coating Work.

For these work activities, the inspectors assessed whether the pre-work surveys performed were appropriate to identify and quantify the radiological hazards and to establish adequate protective measures. The inspectors evaluated the radiological survey program to determine if hazards were properly identified, including the following:

- identification of hot particles;
- the presence of alpha emitters;
- the potential for airborne radioactive materials, including the potential presence of transuranics and/or other hard-to-detect radioactive materials (may include licensee-planned entries into non-routinely entered areas subject to previous contamination from failed fuel);
- the hazards associated with work activities that could suddenly and severely increase radiological conditions and that the licensee had established means to inform workers of changes that could have significantly impacted their occupational dose; and
- severe radiation field dose gradients that could have resulted in non-uniform exposures of the body.

The inspectors observed work in potential airborne areas and evaluated whether the air samples were representative of the breathing air zone. The inspectors evaluated whether continuous air monitors were located in areas with low background to minimize false alarms and were representative of actual work areas. The inspectors evaluated the licensee's program for monitoring levels of loose surface contamination in areas of the plant that had the potential for the contamination to become airborne.

b. Findings

(1) Failure to Make Surveys to Evaluate the Potential Radiological Hazards in the Torus

Introduction: A finding of very low safety significance (Green) and associated NCV of 10 CFR 20.1501 was self-revealed on October 16, 2012, for the licensee's failure to make surveys to evaluate the potential radiological hazards during work inside the torus. As a result, ten workers were externally contaminated and nine workers were assigned low level unintended dose internal radiation dose.

Description: On October 16, 2012, prior to entering the torus radiologically controlled area (RCA), the licensee's radiation protection (RP) staff conducted a radiological control brief for the torus recoat project painters to cover the scheduled work activities. Following the brief, the workers proceeded to enter the RCA to commence work. Once inside the RCA, the painters were assigned the task of installing rigging and fall protection devices within the torus proper. The painters appropriately contacted the radiation protect technicians (RPTs) responsible for radiological controls within the torus proper to inform him/her of the task and to receive a brief. However, during the discussion with the RPTs, it was not properly communicated or understood that the location of this activity was to take place in a location inside the torus proper that had not been previously surveyed. The RPTs assumed that the location where the task was occurring was the same as previously briefed. The briefing was ineffective in that the painters left the briefing believing that they understood the radiological conditions at their work locations and the RPTs believed that they had effective radiological controls in place for the painters' work activities.

During the course of their work activities, several painters became internally and externally contaminated and inadvertently spread radiological contamination within the torus proper. The workers' initial highest dose from the internal contamination was calculated to be 18 mrem committed effective dose equivalent. The licensee entered the issues into the CAP as CR 01813761 and stopped all torus work until the causes were understood and near term corrective actions were taken.

Analysis: The inspectors determined that the failure to effectively maintain radiological control of work activities in the torus proper represented a performance deficiency because it was the result of the licensee's failure to meet a regulatory requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. Specifically, had a successful briefing occurred between the RP staff and the painters prior to entering the work area, the unintended contaminations and resulting doses could have been prevented. The performance deficiency was determined to be more than minor and a finding because, if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern (additional unplanned or more significant radiological exposures).

The inspectors applied IMC 0609.04 "Initial Characterization of Findings," to this finding. Per Table 3, because the finding was associated with a programmatic weakness in the licensee's Occupational Radiation Safety cornerstone, IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," was used. The inspectors determined that the finding was of very low safety significance (Green) because the finding did not involve ALARA planning or work controls, there was no overexposure or substantial potential for an overexposure, nor was the licensee's ability to assess worker dose compromised.

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 defining and effectively communicating expectations regarding procedural compliance and personnel follow procedures. Specifically, several radiation protection procedures were not closely followed and communicated by the RP staff, the RPTs and the painters to ensure the radiological hazards in the torus were well understood. [H.4(b)]

Enforcement: Title 10 CFR 20.1501 requires, in part, that each licensee shall make or cause to be made surveys that may be necessary for the licensee to comply with the regulations in 10 CFR Part 20, and are reasonable under the circumstances to evaluate the potential radiological hazards. Pursuant to 10 CFR 20.1003, 'survey' is defined, in part, as an evaluation of the radiological conditions and potential hazards incident to the production, use and presence of radioactive material or other sources of radiation. Further, 10 CFR 20.1701 and 20.1702 require, in part, that the licensee shall use, to the extent practical, process or other engineering controls to control the concentration of radioactive material in air and, when it is not practical, the licensee shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring by other means or controls.

Contrary to the above, on October 16, 2012, the licensee failed to conduct an adequate radiological evaluation for work associated with installing rigging and fall protection devices in the torus proper. Corrective actions included performing complete radiological dose assessments on the individuals involved and performance management coaching of the individuals in accordance with station management protocols.

Because this violation was of very low safety significance, was entered into the licensee's CAP as CR 01813761, and was not willful, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000331/2012005-03, Failure to Make Surveys to Evaluate the Potential Radiological Hazards in the Torus).**

.3 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors selected various containers holding non-exempt licensed radioactive materials that could have caused unplanned or inadvertent exposure of workers and assessed whether the containers were labeled and controlled in accordance with 10 CFR 20.1904, "Labeling Containers," or met the requirements of 10 CFR 20.1905(g), "Exemptions To Labeling Requirements".

The inspectors reviewed the following radiation work permits used to access high radiation areas and evaluated the specified work control instructions or control barriers:

- Refuel Floor 360 Degree Platform;
- RFO Support Work; and
- Torus Internals Coating Removal and Re-Coating Work.

For these radiation work permits, the inspectors assessed whether allowable stay times or permissible dose (including from the intake of radioactive material) for radiologically significant work under each radiation work permit were clearly identified. The inspectors evaluated whether electronic personal dosimeter alarm set-points were in conformance with survey indications and plant policies.

The inspectors reviewed selected occurrences where a worker's electronic personal dosimeter noticeably malfunctioned or alarmed. The inspectors evaluated whether workers responded appropriately to the off-normal condition. The inspectors assessed whether the issue was included in the CAP and dose evaluations were conducted as appropriate.

For work activities that could have suddenly and severely increased radiological conditions, the inspectors assessed the licensee's means to inform workers of changes that could have significantly impacted their occupational dose.

b. Findings

No findings were identified.

.4 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitored potentially contaminated material leaving the radiological control area and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use and evaluated whether the work was performed in accordance with plant procedures and whether the procedures were sufficient to control the spread of contamination and prevent unintended release of radioactive materials from the site. The inspectors assessed whether the radiation monitoring instrumentation had appropriate sensitivity for the types of radiation present.

The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material. The inspectors evaluated whether there was guidance on how to respond to an alarm that indicated the presence of licensed radioactive material.

The inspectors reviewed the licensee's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters. The inspectors assessed whether or not the licensee had established a de facto "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high-radiation background area.

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact.

The inspectors evaluated whether any transactions since the last inspection, involving nationally tracked sources, were reported in accordance with 10 CFR 20.2207.

b. Findings

No findings were identified.

.5 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

The inspectors evaluated ambient radiological conditions (e.g., radiation levels or potential radiation levels) during tours of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, radiation work permits, and worker briefings.

The inspectors evaluated the adequacy of radiological controls such as required surveys, radiation protection job coverage (including audio and visual surveillance for remote job coverage), and contamination controls. The inspectors evaluated the licensee's use of electronic personal dosimeters in high noise areas as high radiation area monitoring devices.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that the licensee properly employed an NRC-approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in high-radiation work areas with significant dose rate gradients.

The inspectors reviewed the following radiation work permits for work within airborne radioactivity areas with the potential for individual worker internal exposures:

- Refuel Floor 360 Degree Platform;
- RFO Support Work; and
- Torus Internals Coating Removal and Recoating Work.

For these radiation work permits, the inspectors evaluated airborne radioactive controls and monitoring, including potential for significant airborne levels (e.g., grinding, grit blasting, system breaches, entry into tanks, cubicles, and reactor cavities). The inspectors assessed barrier (e.g., tent or glove box) integrity and temporary high-efficiency particulate air ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools. The inspectors assessed whether appropriate controls (i.e., administrative and physical controls) were in place to preclude inadvertent removal of these materials from the pool.

The inspectors examined the posting and physical controls for selected high radiation areas and very high radiation areas to verify conformance with the occupational radiation safety performance indicator.

b. Findings

No findings were identified.

.6 Risk-Significant High Radiation Area and Very High Radiation Area Controls (02.06)

a. Inspection Scope

The inspectors discussed with the radiation protection manager the controls and procedures for high risk high radiation areas and very high radiation areas. The inspectors discussed methods employed by the licensee to provide more strict control of very high radiation area access as specified in 10 CFR 20.1602, "Control of Access to Very High Radiation Areas," and Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas of Nuclear Plants." The inspectors assessed whether any changes to licensee procedures substantially reduced the effectiveness and level of worker protection.

The inspectors discussed the controls in place for special areas that had the potential to become very high radiation areas during certain plant operations with first-line health physics supervisors (or equivalent positions having backshift health physics oversight authority). The inspectors assessed whether these plant operations required communication beforehand with the health physics group, so as to allow corresponding timely actions to properly post, control, and monitor the radiation hazards including re-access authorization.

The inspectors evaluated licensee controls for very high radiation areas and areas with the potential to become a very high radiation area to ensure that an individual was not able to gain unauthorized access to the very high radiation area.

b. Findings

No findings were identified.

.7 Radiation Worker Performance (02.07)

a. Inspection Scope

The inspectors observed radiation worker performance with respect to stated radiation protection work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the radiation work permit controls/limits in place, and whether their performance reflected the level of radiological hazards present.

The inspectors reviewed radiological-related condition reports since the last inspection that found the cause of the event to be associated with human performance errors. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action



approach taken by the licensee to resolve the reported problems. The inspectors discussed with the radiation protection manager any problems with the corrective actions planned or taken.

b. Findings

No findings were identified.

.8 Radiation Protection Technician Proficiency (02.08)

a. Inspection Scope

The inspectors observed the performance of the radiation protection technicians with respect to all radiation protection work requirements. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the radiation work permit controls/limits, and whether their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed radiological-related condition reports since the last inspection that found the cause of the event to be radiation protection technician error. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

b. Findings

No findings were identified.

.9 Problem Identification and Resolution (02.09)

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involved radiation monitoring and exposure controls. The inspectors assessed the licensee's process for applying operating experience to their plant.

b. Findings

No findings were identified.

2RS2 Occupational As-Low-As-Is-Reasonably-Achievable Planning and Controls (71124.02)

This inspection constituted a partial sample as defined in IP 71124.02-05. Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed pertinent information regarding plant collective exposure history, current exposure trends, and ongoing or planned activities in order to assess

current performance and exposure challenges. The inspectors reviewed the plant's three year rolling average collective exposure.

The inspectors reviewed the site-specific trends in collective exposures and source term measurements.

b. Findings

No findings were identified.

.2 Radiological Work Planning (02.02)

a. Inspection Scope

The inspectors assessed whether the licensee's planning identified appropriate dose mitigation features; considered alternate mitigation features; and defined reasonable dose goals. The inspectors evaluated whether the licensee's ALARA assessment had taken into account decreased worker efficiency from use of respiratory protective devices and/or heat stress mitigation equipment (e.g., ice vests). The inspectors determined whether the licensee's work planning considered the use of remote technologies (e.g., tele-dosimetry, remote visual monitoring, and robotics) as a means to reduce dose and the use of dose reduction insights from industry operating experience and plant-specific lessons learned. The inspectors assessed the integration of ALARA requirements into work procedure and radiation work permit documents.

b. Findings

No findings were identified.

.3 Verification of Dose Estimates and Exposure Tracking Systems (02.03)

a. Inspection Scope

The inspectors reviewed the assumptions and basis (including dose rate and man-hour estimates) for the current annual collective exposure estimate for reasonable accuracy for select ALARA work packages. The inspectors reviewed applicable procedures to determine the methodology for estimating exposures from specific work activities and the intended dose outcome.

b. Findings

No findings were identified.

.4 Radiation Worker Performance (02.05)

a. Inspection Scope

The inspectors observed radiation worker and RPT performance during work activities being performed in radiation areas, airborne radioactivity areas, or high radiation areas. The inspectors evaluated whether workers demonstrated the ALARA philosophy in practice (e.g., workers were familiar with the work activity scope and tools to be used, workers used ALARA low-dose waiting areas) and whether there were any procedure compliance issues (e.g., workers not complying with work activity controls). The

inspectors observed radiation worker performance to assess whether the training and skill level was sufficient with respect to the radiological hazards and the work involved.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

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

4OA1 Performance Indicator (PI) Verification (71151)

.1 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator for the period from the fourth quarter 2011 through the third quarter 2012. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance, were used. The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC Integrated Inspection Reports for the period of October 2011 through September 2012 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed during this inspection are listed in the Attachment to this report.

This inspection constituted one safety system functional failures sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index - Residual Heat Removal System performance indicator for the period from the fourth quarter 2011 through the third quarter 2012. 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, dated October 2009, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, Mitigating Systems Performance Index (MSPI)

derivation reports, event reports and NRC Integrated Inspection Reports for the period of October 2011 through September 2012 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 issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed during this inspection are listed in the Attachment to this report.

This inspection constituted one MSPI residual heat removal system sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index - Cooling Water Systems performance indicator for the period from the fourth quarter 2011 through the third quarter 2012. 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, dated October 2009, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection Reports for the period of October 2011 through September 2012 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 issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed during this inspection are listed in the Attachment to this report.

This inspection constituted one MSPI cooling water system sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.4 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system specific activity PI for DAEC for the period from the third quarter 2011 through the third quarter 2012. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline,"

Revision 6, dated October 2009, 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, issue reports, event reports and NRC Integrated Inspection Reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Specific documents reviewed during this inspection 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.

.5 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the occupational radiological occurrences PI for the period from the third quarter 2011 through the third quarter 2012. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, 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. Specific documents reviewed during this inspection 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.

.6 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual  
Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the radiological effluent TS/ODCM radiological effluent occurrences PI for the period from the third quarter 2011 through the

third quarter 2012. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's issue report database and selected individual 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 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. Specific documents reviewed during this inspection 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)

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

a. Inspection Scope

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

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

b. Findings

No findings were identified.

## .2 Daily Corrective Action Program Reviews

### a. Inspection Scope

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

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

### b. Findings

No findings were identified.

## .3 Semi-Annual Trend Review

### a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 40A2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the period of November 2010 through November 2012, although some examples expanded beyond those dates where the scope of the trend warranted. Specifically, the inspectors reviewed outage scope work that was deleted or deferred from RFO 22 and RFO 23 and CRs that were labeled as mode hold items to identify any CAP deficiencies or safety issues.

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

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

### b. Findings

No findings were identified.

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

.1 Safety/Relief Valve PSV-4402 Testing and Discharge of Water to Drained Suppression Pool

a. Inspection Scope

The inspectors reviewed the plant's response to an unexpected discharge of approximately 700 gallons of reactor cavity water to the inside of the drained suppression pool during testing of safety/relief valve PSV-4402 on October 24, 2012. Documents reviewed in this inspection are listed in the Attachment to this report.

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

b. Findings

(1) Failure to Accomplish Safety/Relief Valve Test Instructions

Introduction: A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed on October 24, 2012, for the licensee's failure to accomplish instructions for functional testing of the main steam line safety/relief valve PSV-4402 pilot valve. Specifically, a model work order to perform testing of the pilot valve contained precautions that the main steam lines were to be drained; however, the decision was made to allow performance of the testing following removal of the main steam line plugs. Due to a minor leak of the closed safety/relief valve nitrogen accumulator isolation valve, the testing and the resultant brief opening of the pilot valve's solenoid valve caused nitrogen to reposition the pilot valve disc of the safety/relief valve. This then resulted in momentary opening of PSV-4402 and discharge of approximately 700 gallons of reactor cavity water into the drained suppression pool.

Description: On October 24, 2012, following removal of the main steam line plugs and filling of the main steam lines as part of the refueling outage 23 schedule to begin drain down for reactor vessel head installation, instrumentation and controls (I&C) technicians requested permission to conduct functional testing of the main steam line safety/relief valve PSV-4402 pilot valve. The pilot valve was replaced on October 20, 2012, as part of a routine component replacement under WO 40156105, and testing of the pilot valve was originally scheduled for October 22, 2012, prior to filling the main steam lines. The testing consisted, in part, of a "click" test that briefly energized the PSV-4402 solenoid valve SV-4402 to demonstrate functionality. Due to the I&C technicians not being prepared to perform the functional test on October 22, 2012, the testing was re-scheduled to October 24, 2012. Prior to performing the functional test, the I&C technicians discussed with the control room supervisor the ramifications of performing the test with the main steam lines filled and concluded that since the associated nitrogen accumulator isolation valve was closed, motive force to the PSV-7702 pilot valve would not be available to open the valve when SV-4402 was briefly opened. Other operators in the control room also challenged the I&C technician's assertions that the valve would not be able to open and these operators were also reassured that PSV-4402 could not open during the functional test. These discussions were held due to the Operations Considerations section of WO 40156105 that stated, in part, "...work with STP 3.4.3-02. Work requires main steam lines drained." STP 3.4.2-02, "Reactor Relief



Setpoint Check,” contained a prerequisite of “prior to performing this STP, main steam lines shall be drained such that there is no water at the relief valves.” Although these precautions were recognized, the I&C technicians were given permission to proceed with functional testing of the PSV-4402 pilot valve based on the rationalization that the precautions were not WO-required steps if the nitrogen to the valve was isolated. The nitrogen valve was isolated and there was a belief that the nitrogen accumulator isolation valve was leak tight. After cycling the hand switch for PSV-4402, SV-4402 opened (as expected); however, I&C personnel stationed locally by PSV-4402 heard flow noise through the valve and operators in the control room identified lowering skimmer surge tank level. The test was immediately aborted and the hand switch for PSV-4402 was taken to close. Reports from workers stationed near the torus personnel hatch came into the control room that water had discharged through the safety/relief valve t-quenchers. Subsequent evaluations performed under CR 01816385 identified that the column height of water in the reactor cavity was sufficient to open PSV-4402, along with the pilot valve disc being actuated by sufficient nitrogen pressure that had leaked by the closed nitrogen accumulator isolation valve. Approximately 700 gallons of reactor cavity water had discharged to the drained suppression pool. The licensee de-energized all safety/relief valves until the cause was well understood. No personnel were contaminated or injured as a result of the event.

Analysis: The inspectors determined that testing of PSV-4402 without the main steam line plugs installed represented a performance deficiency because it was the result of the licensee’s failure to meet a regulatory 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 Initiating Events Cornerstone attributes of configuration control and human performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability during shutdown operations (uncontrolled loss of reactor cavity inventory).

The inspectors applied IMC 0609.04, “Initial Characterization of Findings,” to this finding. Because the finding pertained to an event while the plant was shutdown, Table 3 instructed reference of IMC 0609, Appendix G, “Shutdown Operations Significance Determination Process,” and IMC 0609, Appendix G, Attachment 1, “Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs and BWRs.” Because all attributes IMC 0609, Appendix G, Attachment 1, Checklist 7 “BWR Refueling Operation with RCS Level > 23’,” were met throughout the event, the finding did not require a quantitative analysis and 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 using conservative assumptions in decision making and adopting a requirement to demonstrate that a proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove an action. Specifically, the licensee used a non-conservative assumption that the nitrogen accumulator for PSV-4402 was leak-tight in forming a decision to perform functional testing of PSV-4402, although testing was contrary to procedural precautions and considerations. [H.1(b)]

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 October 24, 2012, the licensee failed to accomplish testing of PSV-4402 in accordance with WO 40156105 that required drained main steam lines prior to performing testing. Corrective actions included revisions to the model work orders for safety/relief valve pilot valve functional testing and the licensee was in the process of creating separate return-to-service tasks to ensure that testing of the pilot valves could not be performed unless the main steam lines were drained.

Because this violation was of very low safety significance, was entered into the licensee's CAP as CR 01816385, and was not willful, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000331/2012005-04, Failure to Accomplish Safety/Relief Valve Test Instructions).**

#### 4OA5 Other Activities

##### .1 (Closed) NRC Temporary Instruction (TI) 2515/187, "Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns"

###### a. Inspection Scope

The inspectors verified that licensee's walkdown packages (provide walkdown package identifiers) contained the elements as specified in the NEI document 12-07, "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features," Revision 0-A. On August 28, 2012, the inspectors observed portions of the licensee's tabletop walkthrough of the flood protection strategy, Abnormal Operating Procedure (AOP) 902, "Flood," and verified the licensee confirmed the strategy was adequate and could be performed as written.

The inspectors accompanied the licensee on their walkdown of the pumphouse (including ESW and RHRSW systems) on September 4, 2012, and steam jet air ejector exhaust room (infrequently accessible area) on October 15, 2012, and verified that the licensee confirmed the following:

- Visual inspection of relevant flood protection features. Specifically, external visual inspections were conducted for indications of degradation that could prevent the flood protection feature-credited function from being performed;
- Reasonable simulation of flood protection features not permanently installed;
- Measurements of critical SSC dimensions;
- Available physical margin, where applicable, was adequate; and
- Flood protection feature functionality through visual inspection or review of other documents.

The inspectors independently performed walkdowns of the HPCI and RCIC rooms on November 7, 2012, and verified flood protection features as stated above, where applicable.

The inspectors verified that noncompliances with current licensing requirements, and issues identified in accordance with the 10 CFR 50.54(f) letter, Item 2.g of Enclosure 4, were entered into the licensee's corrective action program. In addition, issues identified in response to Item 2.g that could challenge risk significant equipment and the licensee's ability to mitigate the consequences will be subject to additional NRC evaluation.

b. Findings

No findings were identified.

.2 (Closed) NRC Temporary Instruction 2515/188, "Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns"

a. Inspection Scope

The inspectors accompanied the licensee on seismic walkdowns of equipment located in the Control Building, Reactor Building, and Torus Area on September 24 and 25, 2012; and equipment located in the Drywell on October 12, 2012. The inspectors verified that equipment seismic walkdowns and area walkbys were performed in accordance with Electric Power Research Institute document 1025286 titled, "Seismic Walkdown Guidance," (ADAMS Accession No. ML12188A031). The inspectors verified that the licensee confirmed that the following seismic features associated with the 125 VDC 1D1 Battery, 'A' Residual Heat Removal (RHR) and Core Spray Room Cooler 1V-AC-11, 'B' RHR Drywell Spray Isolation Valve MO-1903, and the 'B' inboard Main Steam Isolation Valve CV-4415 were free of potential adverse seismic conditions (as applicable):

- Anchorages were free of bent, broken, missing, or loose hardware;
- Anchorages were free of corrosion that was more than mild surface oxidation;
- Anchorages were free of visible cracks in the concrete near the anchors;
- Anchorage configuration was consistent with plant documentation;
- SSCs would not be damaged from impact by nearby equipment or structures;
- Overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls were secure and not likely to collapse onto the equipment;
- Attached lines had adequate flexibility to avoid damage;
- The area appeared to be free of potentially adverse seismic interactions that could cause flooding or spray in the area;
- The area appeared to be free of potentially adverse seismic interactions that could cause a fire in the area; and
- The area appeared to be free of potentially adverse seismic interactions associated with housekeeping practices, storage of portable equipment, and temporary installations (e.g., scaffolding, lead shielding).

The inspectors independently performed walkdowns and area walkbys of the 'B' SBDG and 'B' SBDG room, and the HPCI Barometric Condenser Radwaste Discharge Isolation Valve CV-2234 and HPCI room on October 23, 2012. These walkdowns and walkbys verified the seismic features of the equipment and that the areas were free of potential adverse seismic conditions as listed above.

Observations made during the walkdowns and walkbys that could not be determined to be acceptable were entered into the licensee's CAP for evaluation and are listed in the Attachment to this report.

Because the licensee determined that there were no items that could allow the spent fuel pool to drain down rapidly, equipment associated with the spent fuel pool was not included in the licensee's final seismic walkdown equipment list.

b. Findings

No findings were identified.

.3 World Association of Nuclear Operators (WANO) Plant Assessment Report Review

a. Inspection Scope

The inspectors reviewed the final report for a WANO plant assessment conducted in October and November, 2011. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up.

b. Findings

No findings were identified.

.4 Institute of Nuclear Plant Operators (INPO) Duane Arnold Accreditation Report Review

a. Inspection Scope

The inspectors reviewed the final report for an INPO Duane Arnold Maintenance and Technical Training program accreditation visit conducted in April, 2012. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 10, 2013, the inspectors presented the inspection results to R. Anderson, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the inservice inspection with K. Kleinheinz, Engineering Director, on October 24, 2012; and

- The inspection results for the areas of radiological hazard assessment and exposure controls; occupational ALARA planning and controls; and RCS specific activity, occupational exposure control effectiveness, and Radiological Effluent Technical Specification (RETS)/Offsite Dose Calculation Manual (ODCM) radiological effluent occurrences performance indicator verification with R. Anderson, Site Vice President, on October 19, 2012.

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

#### 40A7 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 the NRC Enforcement Policy 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 XII, "Control of Measuring and Test Equipment," on October 18, 2012, following a weekly audit of Measuring and Test Equipment (M&TE) storage areas. The licensee identified 16 M&TE items that were either missing or not properly checked out from tool cribs in accordance with Administrative Control Procedure (ACP) 1408.8, "Control of Measuring and Test Equipment." These concerns were identified following a recent revision to ACP 1408.8 to improve the M&TE checkout process due, in part, as a response to a licensee-identified NCV in NRC Inspection Report 05000331/2012004; and, recent site-wide communications to reinforce expectations for M&TE controls. The licensee performed an Apparent Cause Evaluation (CR 01814517) to determine why prior corrective actions to ensure proper control of M&TE were not effective. Corrective actions included establishing more robust barriers to the M&TE tool cribs to ensure M&TE would be checked out properly.

The failure to establish measures to assure controls of M&TE was a performance deficiency. The performance deficiency was determined to be more than minor and a finding because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, failing to properly control M&TE would have the potential to impact the quality of maintenance or the results of testing of safety-related equipment.

The inspectors evaluated the finding in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," and then proceeded to IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2 Questions. Since the inspectors answered "No" to Question 4, the finding screened as very low safety significance (Green).

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

R. Anderson, Site Vice President  
G. Pry, Plant General Manager  
K. Kleinheinz, Engineering Site Director  
T. Byrne, Licensing Manager (Acting)  
G. Young, Nuclear Oversight Manager  
G. Rushworth, Operations Site Director  
R. Wheaton, Maintenance Site Director  
R. Porter, Radiation Protection Manager  
D. Olsen, Chemistry Manager  
B. Kindred, Security Manager  
B. Simmons, Training Manager  
M. Davis, Emergency Preparedness Manager  
B. Murrell, Licensing Engineer Analyst  
D. Barta, Licensing Engineer Analyst  
C. Conklin, Project Manager  
C. Harberts, Refuel Floor Project Manager  
K. Peveler, Nuclear Oversight Supervisor  
P. Collingsworth, System Engineer  
S. Huebsch, Design Engineering Manager (Acting)  
L. Swenzinski, Licensing Engineer Analyst  
A. Lee, ISI Program Owner  
F. Dohmen, NDE Level III  
A. Thomas, Buried Piping Program Engineer

#### Nuclear Regulatory Commission

K. Feintuch, Project Manager, NRR  
R. Orlikowski, Acting Chief, Reactor Projects Branch 1

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

Opened

05000331/2012005-01	NCV	Lack of Procedure Leads to Over Filling Condensate Storage Overflow Tank (Section 1R13)
05000331/2012005-02	NCV	Degraded/Non-Conforming Conditions Not Properly Evaluated (Section 1R15.1)
05000331/2012005-03	NCV	Failure to Make Surveys to Evaluate the Potential Radiological Hazards in the Torus (Section 2RS1.2)
05000331/2012005-04	NCV	Failure to Accomplish Safety/Relief Valve Test Instructions (Section 4OA3.1)

Closed

05000331/2012005-01	NCV	Lack of Procedure Leads to Over Filling Condensate Storage Overflow Tank (Section 1R13)
05000331/2012005-02	NCV	Degraded/Non-Conforming Conditions Not Properly Evaluated (Section 1R15.1)
05000331/2012005-03	NCV	Failure to Make Surveys to Evaluate the Potential Radiological Hazards in the Torus (Section 2RS1.2)
05000331/2012005-04	NCV	Failure to Accomplish Safety/Relief Valve Test Instructions (Section 4OA3.1)
2515/187	TI	Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns (Section 4OA5.1)
2515/188	TI	Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns (Section 4OA5.2)

Discussed

None.

## LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### 1R01

OP-AA-102-1002 (DAEC); Seasonal Readiness; Revision 7  
CR 01807465; Seasonal Readiness Lessons Learned Process Implementation  
CR 01806773; Winter Readiness Activities  
CR 01807472; Plant Health Committee Review of Seasonal Readiness System Health Action Plans  
CR 01806773; Winter Readiness Activities  
CR 01834153; Entry into Sever Weather AOP due to Blizzard Warning  
Operating Instruction (OI) 324A10; SBDG Standby/Readiness Condition Checklist; Revision 14  
AOP 903; Severe Weather; Revision 38

### 1R04

OP-AA-102-1003; Guarded Equipment; Revision 3  
OP-AA-102-1003 (DAEC); Guarded Equipment (DAEC Specific Information); Revision 23  
OI 324A10; SBDG Standby/Readiness Condition Checklist; Revision 14  
OI 454A4; 'B' ESW System Valve Lineup and Checklist; Revision 16  
BECH-M113; P&ID RHR Service Water & Emergency Service Water Systems; Revision 72  
BECH-M146; P&ID Service Water System Pumphouse; Revision 84  
OI 151A1; Core Spray System Electrical Lineup; Revision 3  
OI 154A2; "A" Core Spray System Valve Lineup and Checklist; Revision 4  
OI 154A4; "B" Core Spray System Valve Lineup and Checklist; Revision 4  
OI 151A6; Core Spray System Control Panel Lineup; Revision 2  
CR 01777992; Frequent 'A' Core Spray Hi Pressure Alarms Received  
CR 01782089; Unexpected Annunciator from 'B' Core Spray discharge Hi Press  
CR 01785863; Unexpected Annunciator from 'B' Core Spray discharge Hi Press  
CR 01716192; Received Unexpected Alarm 1C03A (C-9) During STP 3.5.1-01A

### 1R05

ACP 1203.53; Fire Protection; Revision 016  
ACP 1412.4; Impairments to Fire Protection Systems; Revision 66  
DAEC Fire Plan – Volume 1, Program; Revision 61  
CR 01812240; Fire Extinguisher Not Fully Charged  
AFP-17; Turbine Building Condenser Bay, Heater Bay and Steam Tunnel; Revision 25  
AFP-28; Pump House ESW/RHRSW Pump Rooms and Main Pump Room; Revision 29

### 1R08

Licensee Event Report 2010-004-01; Linear Indication Found During Examination of Safe-End to Nozzle Welds  
CR 00589748; Hanger Rod Slightly Bent; Rod Rubbing on Adjacent Pipe Insulation  
CR 00592119; Loose Nut on Pipe Clamp – Snubber DCA001-SSB-10A



CR 00594392; ISI Exam Revealed Inadequate Thread Engagement on EBD-2-H-4  
Drawing VS-03-10; Core Support Bolt; Revision 1  
Drawing BECH-M116; Reactor Recirculation System; Revision 66  
LMT-10-PAUT-03; Encoded Phased Array Ultrasonic Examination of Austenitic Socket Weld  
Fittings; Revision 0  
ACP 1211.38; Ultrasonic Examination of Dissimilar Metal Piping Welds; Revision 7  
ACP 1211.20; Ultrasonic Examination of Austenitic Piping Welds; Revision 8  
ACP 1211.51; PDI Generic Procedure for the Ultrasonic Examination of Weld Overlaid Similar  
and Dissimilar Metal Welds PDI-UT-8; Revision 0  
ACP 1211.53; Visual Examination of Components In Support of License Renewal; Revision 0  
WO 40043846-01; Install Weld Overlay on Reactor Recirculation Nozzle F2A  
Quality Assurance Procedure 8.0; Control and Issue of Weld Filler Metal; Revision 11  
Welding Procedure Specification (WPS)-08-08-T-001- Buffer SS; Revision 8  
WPS-08-43-S-001; Revision 2  
WPS 08-43-T-804; Revision 1  
Procedure Qualification Record (PQR)- A843256-52 (Gas Tungsten Arc Welding); Revision 1  
PQR- 1001 (Gas Tungsten Arc Welding); Revision 1

### 1R12

VALVE-T020-02; Equipment Specific Maintenance Procedure, Target Rock Main Steam Safety  
Relief Valves; Revision 23  
NEI 94-01; Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50,  
Appendix J; Revision 3  
VALVE-E331-01; MSIV Repair, Section A; Revision 8  
WO 1148609; MSIV Valve Inspection and Overhaul  
1982 DAEC Report; Main Steam Isolation Valve Local Leak Rate Testing  
V-Rep 76-3; Flowserve, Edwards Valves, Nuclear Main Steam Isolation Valves  
WO 1148609; MSIV Inspection and Overhaul  
WO 1339198; Correct the Internal Inside the MSIV  
Equipment Specific Maintenance Procedure: Valve-E331-01, Main Steam Isolation Valves;  
Revision 12  
PI-AA-205; Condition Evaluation and Corrective Action; Revision 16  
Apparent Cause Evaluation 001924; CV4413, "A" Outboard MSIV High Leakage Rate  
Drawing APED-B21-2793-075; Main Steam Isolation Valve; Revision 6  
CR 01814928; Regulator Question on Internal Tolerances of CV4413  
CR 01813991; CV4413 Work Scope Deleted  
Containment Leakage Testing Program 1.1; Containment Leakage Testing Program Plan;  
Revision 4  
Scope Change Request Form for WO 01339198 dates October 15, 2012  
OM-AA-101-1008; Pre-Outage Milestones; Revision 6

### 1R13

Work Planning Guideline-1; Work Process Guideline; Revision 55  
Work Planning Guideline-2; Online Risk Management Guideline; Revision 61  
OP-AA-104-1007; Online Aggregate Risk; Revision 2  
WM-AA-1000; Work Activity Risk Management; Revision 13  
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 23

CR 01828253; 1C08C B-2 Main Generator Field Ground Alarm  
CR 01828387; Request Operational Decision Making Issue (ODMI) for Generator Field Ground Alarm 1C08C (B-2)  
CR 01829748; Dust Found on Generator Collector End Fan  
Annunciator Response Procedure 1C06A; Feedwater and Condensate; Revisions 58-61  
OI 644; Condensate and Feedwater Systems; Revisions 123 and 124  
CR 01812345; CST High Level Alarm Received  
CR 01812156; CST Pit Seal Leaking  
WO 40188212; Condensate and Demin Water  
CR 01818043; Change Procedures to Preclude CST Overflow

#### 1R15

EN-AA-203-1001; Operability Determinations/ Functionality Assessments; Revision 6  
BECH-MRS-E019; 600V Power and Control Cable; Revision 26  
CR 01812795; Water Damaged Cables Present Significant Challenge to the Station  
CR 01815618; Extent of Condition – Water in Conduit 2K231  
CR 01729001; LIS 3207 Fuel Oil Day Tank 1T-37A Low-Low Level Alarm  
CR 01731564; Bad (Shorted) Cable (K00081-V) From 1C008 to LIS-3207  
CR 01812339; Degraded Cable and Water in Conduit  
CR 01812648; Inspect and Megger Selected Cables in Conduits JBox 2J0258  
CR 01813800; TB 734' Embedded Conduit Safety Related Cable Operability Discussion  
CR 01816792; B Diesel Generator DC Control Cable Meggered Low  
CR 01817115; Embedded Conduit Inspection and Dewatering Plan  
CR 01819695; Green NCV on Initial Diesel Generator Cable Prompt Operability Determination  
CR 01820689; Degraded Drain Piping Found in Turbine Building Basement  
CR 01822272; Div-1(A) Inspect 1K110/1K111/1K112 Found Water & Tracer in Conduits  
CR 01824467; Rollup of Issues with Embedded Conduits and Water  
CR 01820633; Cable Embedded Conduit Non-conformance  
Electrical Cable Program Section 4.4; Electrical Manhole Inspection Frequency; Revision 0  
ER-AA-106; Cable Condition Monitoring Program; Revision 3

#### 1R18

CAL-E93-011; Recirculation Riser D/P – LPCI Loop Select; Revision 3  
Engineering Change 2757081; LPCI Loop Select Barton Replacement

#### 1R19

ACP 1408.1; Work Order Task(s); Revision 182  
Maintenance Directive 024; Post Maintenance Testing Program; Revision 75  
WO 40146177-06; SUS 99.99: Return to Service Work Order- RFO  
STP 3.10.4-01; Single Control Rod Withdrawal (Cold Shutdown); Revision 8  
OI 255; Control Rod Hydraulic System; Revision 84  
STP 3.9.1-01; Refuel Interlocks Channel Functional Testing; Revision 12  
STP 3.10.1-01; Non Nuclear Heat Class 1 System Leakage Pressure Test; Revision 39  
STP NS930003; Main Turbine Overspeed Trip System Tests; Revision 13

## 1R20

Integrated Plant Operating Instruction (IPOI) 2; Startup; Revision 133  
Reactivity Management Plan; BOC24 Plant Startup  
DAEC Control Rod Withdrawal Sequence Sheets, Cycle 24, A2 Sequence; Version 12-006  
IPOI 4; Shutdown; Revision 119  
ODMI for CR 01828253  
Reactivity Management Plan; Plant Shutdown – Generator Ground; November 29, 2012  
OM-AA-101-1000 (DAEC); Shutdown Risk Management DAEC Specific Information; Revision 9  
AD-AA-101-1004; Work Hour Controls; Revision 11  
OP-AA-102-1003; Protected Train & Guarded Equipment (DAEC Specific Information);  
Revision 23  
CR 01815530; Miss-oriented Fuel Bundle Identified during Core Verification  
OM-AA-04; Plant Readiness for Operations; Revision 3  
CR 01818370; OPDRVs Guidance and EGM Memo  
CR 01818261; Licensing Evaluation Required on OPDRV for Sampling

## 1R22

ACP 107; Surveillance Tests; Revision 14  
STP 3.5.1-02A; A LPCI system Operability Test; Revision 7  
STP NS490003A; 'A' RHR System Leakage Inspection Walkdown; Revision 4  
STP 3.4.9-01; Heatup and Cooldown Rate Log; Revision 17  
STP 3.6.1.1-04; Containment Isolation Valve Leak Tightness Test- Type C Penetrations, Main  
Steam System; Revision 32

## 1EP4

EPIP 3.3: Dose Assessment and Protective Action; Revision 30

## 2RS1

ACP 1407.2; Material Control in the Spent Fuel Pool and Cask Pool; Revision 23  
ACP 1411.2; Conduct of Radiation Protection; Revision 10  
ACP 1411.13; Control of Locked High Radiation Areas and Above; Revision 30  
ACP 1411.20; Respiratory Protection; Revision 35  
ACP 1411.27; Rules for Conduct of Work in Radiologically Controlled Areas; Revision 36  
CR 01813761; 10 Workers Contaminated during Activity in the Torus Proper  
Health Physics Procedure (HPP) 3103.03; Radiological Area Postings and Surveillances;  
Revision 57  
HPP 3104.02; Personnel Contamination Monitoring, Whole Body Counting, and  
Decontamination; Revision 39  
HPP 3105.01; Dosimetry Issuance and Record Keeping; Revision 25  
HPP 3105.09; Personnel Dosimetry and External Exposure; Revision 26  
HPP 3109.24; Operation of the Thermo Eberline Small Articles Monitor (SAM)-11 Monitor;  
Revision 2  
HPP 3110.13; Calibration of the Eberline Gamma Tool Monitor; Revision 11  
HPP 3110.16; Calibration of the Thermo Eberline SAM-11 Monitor; Revision 3  
HPP 3111.42; Sentinel RWP Writer's Guide; Revision 8  
Radioactive Source Inventories for Exempt and Non-Exempt Sources; dated October 16, 2012  
RP-AA-101-2004; Method for Monitoring and Assigning Effective Dose Equivalent for High Dose

Gradient Work; Revision 2  
RP-AA-104-1000; ALARA Implementing Procedure; Revision 3  
RP-AA-104-1001; Sentinel RWP Writer's Guide; Revision 2  
Radiation Work Permit (RWP) 12-3004; 360 Degree Platform RFO 23; dated October 16, 2012  
RWP 12-3009; All Refuel Outage Support Work RFO 23; dated October 16, 2012  
RWP 12-3010; Refuel Floor Recovery Post RFO 23; dated October 16, 2012  
RWP 12-3014; All Cavity Work with the Vessel Filled to the RPV Flange RFO 23; dated October 16, 2012  
RWP 12-3016; Pool Work RFO 23; dated October 16, 2012  
RWP 12-3017; Cleaning Reactor Studs, Nuts and Washers RFO 23; dated October 17, 2012  
RWP 12-3018; Refueling RFO 23; dated October 16, 2012  
RWP 12-5383; Torus Proper Recoat/Sandblast Work; dated October 16, 2012  
SAM-11 Calibration Forms; Various dates 2011 and 2012  
Spent Fuel Pool/Cask Pool Material Storage Log; dated October 17, 2012

## 2RS2

ACP 1408.16; Heat Stress Control; Revision 9  
ACP 1408.17; Control of Drinking Water Dispensers in the Radiologically Controlled Area; Revision 1  
ACP 1411.1; the ALARA Emphasis Program; Revision 18  
Focused Self – Assessment Report 1706851; Radiation Protection Work Control, Planning, and Scheduling; dated August 20, 2012  
HPP 3101.05; Administration of Radiation Work Permits; Revision 45  
HPP 3102.03; Radiation Protection Job Planning; Revision 35  
HPP 3111.09; Providing Radiological Briefings; Revision 21

## 4OA1

MSPI Basis Document; Revision 14  
PCP 6.10; Reactor Coolant Iodine and Crud Activity; Revision 11  
Reactor Coolant Iodine Activity Data; dated July 1, 2011 through September 30, 2012  
Electronic Dosimeter Alarm Logs; dated August 01, 2011 through October 5, 2012  
NRC PI Data Calculation, Review and Approval; RCS Activity; dated Third Quarter 2011 through Third Quarter 2012  
NRC PI Data Calculation, Review and Approval; Occupational Exposure Control Effectiveness; dated Third Quarter 2011 through Third Quarter 2012  
NRC PI Data Calculation, Review and Approval; RETS/ODCM Radiological Effluent; Dated Third Quarter 2011 through Third Quarter 2012  
Corrective Action Program Document Searches; Dated Third Quarter 2011 through Third Quarter 2012  
NRC PI Data Calculation, Review and Approval; Safety System Functional Failures; Fourth Quarter 2011 through Third Quarter 2012  
NRC PI Data Calculation, Review and Approval; MSPI Residual Heat Removal System; Fourth Quarter 2011 through Third Quarter 2012  
NRC PI Data Calculation, Review and Approval; MSPI Cooling Water Systems; Fourth Quarter 2011 through Third Quarter 2012

#### 4OA2

ACP 1410.15; Plant Status Control Program; Revision 8  
PI-AA-101-1000; Human Performance Program Error Reduction Tools; Revision 9  
ACP 1410.2; Limiting Condition for Operation Tracking and Safety Function Determination Program; Revision 29  
ACP 1410.5; Plant Status Control Program; Revision 104  
ACP 101.01; Procedure Use and Adherence; Revision 52  
PI-AA-204; Condition Identification and Screening; Revision 18  
PI-AA-100-1007; Apparent Cause Evaluation; Revision 6  
RFO 22 and RFO 23 Outage Scope Delete Lists  
CR 01820762; Perform a Historic Review of the A CS Inoperability  
CR 01817021; Piping High Point Vent Location Found Inaccurate  
CR 01793793; Verify the A CS 8-Inch EBB-017 Inject Pipe High Point  
CR 01712033; Vent Line (V49-76/77) on 'B' RHR Inject Line Found Voided  
CR 01817253; Main Steam Line Drain Inboard Isolation Has a Pencil Stream Leak

#### 4OA3

CR 01816385; PSV-4402 Opened Unexpectedly  
STP 3.4.3-02; Reactor Relief Valve Setpoint Check; Revision 5  
WO 40156105; PSV4402: Remove Pilot Valve & Install Spare or Tested Pilot

#### 4OA5

DAEC Seismic Walkdown Equipment List; Revision 0  
CR 01816635; Missing Tubing Support Clamp  
CR 01816677; Missing Screws on Cover Plate for Junction Box 2J414  
CR 01816764; Gap Under a Pipe Support Base Plate  
Seismic Walkdown Checklist Attachments for 1D1, 1V-AC-11, MO-1903, 1G021, CV-4415, and CV-2234  
Area Walk-by Checklist Attachments for the 1D1 Battery Room, Northwest Corner Room, Torus Bay 14, Drywell, B SBDG Room, and HPCI Room  
AOP 902; Flood; Revision 42-43  
CR 01800619; AOP-902 Strategy Differs From UFSAR  
CR 01800380; AOP 902 Deficiency. INTAKE STRUCTURE  
CR 01802038; NEI 12-07, Flood Walkdown, Electrical Penetration Degraded  
CR 01802047; NEI 12-07, Flood Walkdown, Electrical Penetration Degraded  
CR 01802080; NEI 12-07, Flood Walkdown, Penetration Seal Degraded  
CR 01802409; NEI 12-07, Flood Walkdown, Grouted Wall Crack  
CR 01802430; NEI 12-07, Flood Walkdown, Wall Penetration Degraded  
CR 01802431; NEI 12-07, Flood Walkdown, Electrical Penetration Degraded  
CR 01802432; NEI 12-07, Flood Walkdown, Wall Penetration Degraded  
CR 01805216; NEI 12-07, Door 805 Steel Barrier Alignment Issues

#### 4OA7

CR 01814517; Trend in Control of M&TE  
CR 01814358, NOS-Identified Concerns with M&TE Program

## LIST OF ACRONYMS USED

ACP	Administrative Control Procedure
ADAMS	Agencywide Document Access Management System
AFP	Area Fire Plan
ALARA	As-Low-As-Is-Reasonably-Achievable
AOP	Abnormal Operating Procedure
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
CST	Condensate Storage Tank
DAEC	Duane Arnold Energy Center
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EPIP	Emergency Plan Implementing Procedure
ESW	Emergency Service Water
HPCI	High Pressure Coolant Injection
HPP	Health Physics Procedure
HWC	Hydrogen Water Chemistry
I&C	Instrumentation and Controls
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IPOI	Integrated Plant Operating Instruction
ISI	Inservice Inspection
LHRA	Locked High Radiation Area
LPCI	Low Pressure Coolant Injection
M&TE	Measuring and Test Equipment
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NSIR	Nuclear Security and Incident Response
ODCM	Offsite Dose Calculation Manual
ODMI	Operational Decision Making Issue
OE	Operating Experience
OI	Operating Instruction
OOS	Out-of-Service
OPDRV	Operations with the Potential to Drain the Reactor Vessel
OSP	Outage Safety Plan
PARS	Publicly Available Records System
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PMT	Post-Maintenance Test
POD	Prompt Operability Determination
RCA	Radiologically Controlled Area
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specification
RFO	Refueling Outage

RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RP	Radiation Protection
RPT	Radiation Protect Technician
RWP	Radiation Work Permit
SAM	Small Articles Monitor
SBDG	Standby Diesel Generator
SDP	Significance Determination Process
SSC	Systems, Structures, and Components
STP	Surveillance Test Procedure
TI	Temporary Inspection
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UT	Untrasonic Examination
WANO	World Association of Nuclear Operations
WO	Work Order
WPS	Welding Procedure Specification

R. Anderson

-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 Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at [http://www.nrc.gov/reading\\_rm/adams.html](http://www.nrc.gov/reading_rm/adams.html) (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Robert J. Orlikowski, Acting Chief  
Branch 1  
Division of Reactor Projects

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