



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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November 9, 2009

Mr. Christopher R. Costanzo
Vice President
Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324-9785

**SUBJECT: DUANE ARNOLD ENERGY CENTER INTEGRATED INSPECTION REPORT
05000331/2009004**

Dear Mr. Costanzo:

On September 30, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Duane Arnold Energy Center. The enclosed report documents the inspection results, which were discussed on October 2, 2009, with you and other members of your staff.

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

Based on the results of this inspection, two NRC-identified findings of very low safety significance were identified. Each finding involved a violation of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section VI.A.1 of the NRC Enforcement Policy.

If you contest the subject or severity of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Duane Arnold Energy Center. In addition, if you disagree with the characterization of 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. The information that you provide will be considered in accordance with Inspection Manual Chapter 0305.

C. Costanzo

-2-

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Sincerely,

/RA/

Kenneth Riemer, Chief
Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report 05000331/2009004
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: 05000331/2009004

Licensee: FPL Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: July 1 through September 30, 2009

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Enclosure

TABLE OF CONTENTS

SUMMARY OF FINDINGS	1
REPORT DETAILS	3
Summary of Plant Status.....	3
1. REACTOR SAFETY	3
1R01 Adverse Weather Protection (71111.01)	3
1R04 Equipment Alignment (71111.04).....	4
1R05 Fire Protection (71111.05).....	5
1R06 Flooding (71111.06)	6
1R11 Licensed Operator Requalification Program (71111.11)	7
1R12 Maintenance Effectiveness (71111.12)	8
1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)..	8
1R15 Operability Evaluations (71111.15)	9
1R18 Plant Modifications (71111.18).....	12
1R19 Post-Maintenance Testing (71111.19)	13
1R22 Surveillance Testing (71111.22).....	13
1EP2 Alert and Notification System Evaluation (71114.02)	15
1EP3 Emergency Response Organization Augmentation Testing (71114.03) ...	15
1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05)	16
1EP6 Drill Evaluation (71114.06)	19
2. RADIATION SAFETY	20
2PS2 Radioactive Material Processing and Transportation (71122.02).....	20
4. OTHER ACTIVITIES.....	23
4OA1 Performance Indicator Verification (71151)	23
4OA2 Identification and Resolution of Problems (71152).....	26
4OA5 Other Activities	30
4OA6 Management Meetings	30
SUPPLEMENTAL INFORMATION	1
Key Points of Contact.....	1
List of Items Opened, Closed and Discussed.....	1
List of Documents Reviewed	2
List of Acronyms Used	12

SUMMARY OF FINDINGS

IR 05000331/2009004; 07/01/2009 – 09/30/2009; Duane Arnold Energy Center; Operability Evaluations and Correction of Emergency Preparedness Weaknesses and Deficiencies.

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. The findings were considered Non-Cited Violations (NCVs) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for a failure of the Shift Manager to perform an Immediate Operability Determination (IOD) of the 'B' Standby Diesel Generator (SBDG) after being notified by engineers of a concern with the seismic adequacy of the 'B' SBDG normal air start system. The Shift Manager's failure to follow procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," and Administrative Control Procedure (ACP) 110.1, "Conduct of Operations," was considered a performance deficiency. The licensee entered this issue into the Corrective Action Program (CAP) as item CAP 070061, and isolated the 'B' SBDG normal air start system from the emergency air start system. A detailed seismic analysis was performed on the 'B' SBDG normal air start system to fully evaluate operability of the system during the design basis earthquake.

The performance deficiency was determined to be more than minor because if left uncorrected, the failure to adequately implement the operability procedures could result in safety-related components being incorrectly declared operable rather than inoperable or operable but non-conforming (a more significant safety concern). The inspectors evaluated this finding using the SDP and determined the finding was of very low safety significance (Green) because it did not represent an actual loss of safety function of a single train for longer than its Technical Specification (TS) allowed outage time. The inspectors also determined that this finding has a cross-cutting aspect in the area of Human Performance, Decision-Making, because the licensee failed to make a safety-significant or risk-significant decision using a systematic process, especially when faced with uncertain or unexpected plant conditions, and thereby demonstrate that nuclear safety is an overriding priority. Specifically, the licensee did not make and document an IOD for the 'B' SBDG once an adverse condition affecting a SBDG support system was identified. [H.1(a)] (Section 1R15)

Cornerstone: Emergency Preparedness

- Green. A finding of very low safety significance and associated NCV of the emergency planning standard 10 CFR 50.47(b)(4) was identified by the inspectors. The finding involved an inadequate threshold for river water level identified in the emergency classification scheme. The classification scheme did not provide the threshold values related to specific instruments, parameters, and status indicators for river water low level and low water depth and did not address the effect of sand and silt accumulation on the River Water Supply (RWS) and Ultimate Heat Sink (UHS) systems. The thresholds for the Notification of Unusual Event and Alert were unusable for the condition of low river water level when the river bed elevation becomes greater than the low river water level threshold. The licensee entered the finding into their CAP (CAP 068505 and CE 007573).

The inspectors determined the licensee's failure to adjust the Emergency Action Level (EAL) threshold criteria for river water low level at the Unusual Event and Alert classification was a performance deficiency. Because the licensee did not recognize the challenge to the RWS and the UHS due to increasing river bed level in the EALs, the EAL thresholds were not adjusted to accommodate for sand accumulation and the river bed rising. The performance deficiency was more than minor since the Emergency Preparedness Cornerstone objective to ensure the licensee is capable of implementing adequate measures to protect the health and safety of the public in a radiological emergency was adversely affected, and the finding involved a risk-significant planning standard. The finding impacted the attribute of procedure quality (emergency planning standard, emergency classification, and action level scheme). The finding was assessed using the emergency preparedness SDP and was determined to be of very low safety significance (Green). The finding was similar to the example given of the 'emergency classification process would not declare any Alert or Notification of Unusual Event that should be declared', as in the case when the river bed elevation exceeds the river water low level threshold values. The inspectors also determined that this finding has a cross-cutting aspect in the area of Human Performance, Decision-Making, because the licensee did not use conservative assumptions and validate the underlying assumption in the decision to not change the EAL scheme and assumed the technical specifications for the RWS and the UHS systems would address the EAL requirement. [H.1(b)] (Section 1EP5.b1)

B. Licensee-Identified Violations

No violations of significance were identified.

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.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Impending Adverse Weather Condition – Severe Thunderstorm Watch

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecasted in the vicinity of the facility for August 7, 2009, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. On August 3rd and 4th, 2009, the inspectors walked down the licensee's emergency alternating current (AC) power systems, because their safety-related functions could be affected or required as a result of high winds or tornado-generated missiles or the loss of offsite power. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of CAP items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- 'B' Residual Heat Removal (RHR) System with 'A' RHR Out-of-Service (OOS);
- 'A' RWS System with 'B' RWS OOS;
- 'B' Emergency Service Water (ESW) System with High Pressure Coolant Injection (HPCI) System OOS; and
- Reactor Core Isolation Cooling (RCIC).

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

These inspection activities constituted four partial system walkdown samples as defined in IP 71111.04-05.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On September 2, 2009, 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 line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or

debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Area Fire Plan (AFP) 03, Reactor Building HPCI, RCIC, and RadWaste Tank Rooms;
- AFP 13, Reactor Building Refueling Floor;
- AFP 14 and 16, North Turbine Building Basement Reactor Feed Pump Area and Turbine Lube Oil Tank Area & Turbine Building Basement Condensate Pump Area;
- AFP 34, 35, & 36, RadWaste Building Drum Filling, Storage, and Shipping Area, & RadWaste Treatment and Access Area, & Precoat and Access Area, Control Room, and HVAC [Heating, Ventilation, and Air Conditioning] Equipment Rooms; and
- AFP 69, 70, 71, & 72, Yard Main Transformer 1X1, Standby Transformer 1X4, Startup Transformer 1X3, and Auxiliary Transformer 1X2.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan.

The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor

issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1R06 Flooding (71111.06)

.1 Underground Vaults

a. Inspection Scope

The inspectors selected underground manholes (MHs) subject to flooding that contained cables whose failure could disable risk-significant equipment. The inspectors determined that the cables were not submerged, that splices were intact, and that appropriate cable support structures were in place. In those areas where dewatering devices were used, such as a sump pump, the device was operable and level alarm circuits were set appropriately to ensure that the cables would not be submerged. In those areas without dewatering devices, the inspectors verified that drainage of the area was available, or that the cables were qualified for submergence conditions.

The inspectors also reviewed the licensee's corrective action documents with respect to past submerged cable issues identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following underground MHs located between the RWS intake structure and the essential switchgear rooms in the control building:

- 1MH109, 1MH110, 1MH111, 1MH112, & 1MH113; and
- 2MH207, 2MH208, 2MH209, 2MH210, & 2MH211.

Documents reviewed are listed in the Attachment to this report.

This inspection activity constituted one underground vaults sample as defined in IP 71111.06-05.

.2 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action

documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant area(s) to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Reactor Building basement Torus area and Core Spray/RHR Corner rooms.

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

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On August 20 and September 15, 2009, the inspectors observed an initial license training crew, conducting an audit examination scenario in the plant's simulator, and a crew of licensed operators, during licensed operator requalification examinations, in the plant's simulator to verify that student and operator performances were adequate, that evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

This inspection activity constituted one quarterly licensed operator requalification program sample as defined in IP 71111.11.

b. Findings

No findings of significance 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:

- HPCI System;
- 'A' Control Building Chiller ESW System; and
- 'B' RWS System.

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

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for 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. Documents reviewed are listed in the Attachment to this report.

These inspection activities constituted three quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings of significance 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:

- Emergent Work Related to the RCIC System Division 1 Leak Detection Power Monitor Relay Failure and Replacement During Work Week 9928;
- Emergent Work Related to the 'A' Control Building Chiller ESW System Discharge Isolation Valve Failure to Open While Conducting the 'A' ESW System Brominating Activities During Work Week 9931;
- Emergent Work to Inspect and Replace Fuse FU6 located in the 'B' SBDG Control Power Circuitry During Work Week 9933;
- Emergent Work Revisions Related to Planned HPCI Outage Window During Work Week 9935;
- Multiple Work Activities Affecting Plant Risk During Work Week 9937; and
- Emergent Work to Troubleshoot Moisture Separator Reheater Second Stage Drain Valve, CV-1068, During Work Week 9939.

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

These inspection activities constituted six samples as defined in IP 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- HPCI Response Time Correction Factor Outside of the Band;
- 'B' Standby Filter Unit (SFU) Bolting Deficiencies Found During System Walkdown;
- 'A' SBDG Exhaust Header Candle Flame Occurring During Slow Start Surveillance Testing;
- Thermography Anomaly in Panel 1C118, 'B' SBDG 1G21 Control Relay and Terminal Panel;
- 'A' Standby Liquid Control (SBLC) Pump Declared Inoperable; and
- Seismic Issues Identified on 'A' SBDG Air Start Piping.

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 also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

These inspection activities constituted six samples as defined in IP 71111.15-05.

b. Findings

Failure to Perform an Immediate Operability Determination for 'B' Standby Diesel Generator

Introduction: A Green finding and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the failure to follow procedures EN-AA-203-1001, "Operability Determinations/Functionality Assessments," and Administrative Control Procedure (ACP) 110.1, "Conduct of Operations," to adequately address a degraded condition on the 'B' SBDG.

Description: On September 28, 2009, the 'A' SBDG was declared inoperable to support TS surveillance testing. During the testing, engineers discovered that two seismic supports on the normal air start piping were not installed per design requirements. Calculation CAL-M84-034, Revision 1, was reviewed and it was determined that the calculation did not analyze the actual configuration of the supports in the plant. During the review, engineers raised additional questions about the adequacy of the analysis and the piping support configuration. A preliminary review of the 'A' SBDG normal air start piping calculation determined that the existing support arrangement would not pass design basis seismic requirements or Appendix F operability basis requirements. The licensee isolated the normal air start system piping from the 'A' SBDG.

At the time of discovery of the issue with the 'A' SBDG (approximately 3:27 PM), engineers initiated CAP 070040 to document the identified discrepancy with the 'A' SBDG normal air start piping. Additionally, it was not known if a similar condition existed with the 'B' SBDG normal air start system seismic supports. As a precautionary measure, Operations personnel isolated the normal air start piping from the 'B' SBDG air start system by shutting valve V32-0147 at 3:55 PM. A separate CAP document was never initiated to identify if a similar issue with the 'B' SBDG normal air start piping existed.

Because the 'A' SBDG was inoperable for surveillance testing, the 'B' SBDG was being guarded per station procedure OP-AA-102-1003, "Guarded Equipment (DAEC)". Although procedure OP-AA-102-1003 (DAEC) does not explicitly prohibit personnel entry into areas that are guarded, DAEC management made the decision to delay an

engineering inspection of the 'B' SBDG air start piping until the 'A' SBDG surveillance testing was completed and the 'A' SBDG was declared operable.

ACP 110.1, Attachment 10, states that "shift supervision is ultimately responsible for making timely operability determinations." Additionally, Attachment 10 states that "when there is cause to question the status of a structure, system or component, the process of determining its status is expected to be thorough and prompt." DAEC procedure EN-AA-203-1001, step 4.1.7, states "an Immediate Operability Determination (IOD) of SSC Operability is required following discovery of a degraded or nonconforming condition." If the Shift Manager declares the SSC Operable, the basis used for the IOD is required to be documented in the CAP identifying the concern. If the SSC is declared inoperable, the Shift Manager is required to document the SSC as Inoperable and implement any TS required actions.

A review of the DAEC station logs and CAP system by the inspectors did not identify any documented operability determination of the 'B' SBDG between the period of 3:27 PM and 3:55 PM on September 28, 2009. At 3:55 PM, the DAEC station logs contained an entry that stated "V-32-147, DIESEL AIR START ISOL [Isolation] FROM ELECTRIC COMPRESSOR has been unlocked and closed due to concerns over an Air Start Piping Support discrepancy that was discovered on the "A" SBDG. This valve is for the "B" SBDG and is being closed as a precaution and to ensure operability is maintained for the "B" SBDG until an inspection can occur on that unit." The inspectors concluded that the licensee failed to follow Attachment 10 of ACP 110.1 and step 4.1.7 of procedure EN-AA-203-1001 when the Shift Manager was notified by engineers of a concern with the seismic adequacy of the 'B' SBDG normal air start piping, and failed to make and document an IOD for the 'B' SBDG.

Analysis: The inspectors determined that the failure to declare and document operability of the 'B' SBDG was contrary to Attachment 10 of ACP 110.1 and step 4.1.7 of procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," and was a performance deficiency.

The inspectors determined that the performance deficiency was more than minor because, if left uncorrected, failure to adequately implement the operability procedure could result in safety-related components being incorrectly declared operable rather than inoperable or operable but non-conforming (a more significant safety concern). This finding affects the Mitigating Systems Cornerstone.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of findings," Table 4a for the Mitigating Systems Cornerstone. The finding screens as Green because the finding did not represent an actual loss of safety function of a single train for longer than its TS allowed outage time.

This finding has a cross-cutting aspect in the area of Human Performance, Decision-Making, because the licensee failed to make a safety-significant or risk-significant decision using a systematic process, especially when faced with uncertain or unexpected plant conditions, and thereby demonstrate that nuclear safety is an overriding priority. Specifically, the licensee did not make and document an IOD for the 'B' SBDG once an adverse condition affecting a SBDG support system was identified. [H.1(a)]

Enforcement: 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed and accomplished by procedures appropriate to the circumstances. The licensee established ACP 110.1, "Conduct of Operations," and EN-AA-203-1001, "Operability Determinations/Functionality Assessment," as the implementing procedures for declaring operability of safety systems, an activity affecting quality.

Contrary to the above, on September 28, 2009, the Shift Manager failed to follow Attachment 10 of ACP 110.1 and step 4.1.7 of procedure EN-AA-203-1001. Specifically, the Shift Manager failed to declare and document operability of the 'B' SBDG after being notified by engineers of a concern with the seismic adequacy of the 'B' SBDG normal air start. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as CAP 070061, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000331/2009004-01).

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification(s):

- Troubleshooting and installation of gag device on CV-1068, Moisture Separator Reheat Second Stage Drain Tank Drain Valve.

The inspectors compared the temporary configuration changes and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system. The inspectors also compared the licensee's information to operating experience information to ensure that lessons learned from other utilities had been incorporated into the licensee's decision to implement the temporary modification. The inspectors, as applicable, performed field verifications to ensure that the modifications were installed as directed; the modifications operated as expected; 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. Lastly, the inspectors discussed the temporary modification with operations, engineering, and training personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance. Documents reviewed in the course of this inspection are listed in the Attachment to this report.

This inspection constituted one temporary modification sample as defined in IP 71111.18-05.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- Calibration and Functional Testing Following Replacement of the RCIC Division 1 Steam Leak Detection Power Monitor Relay;
- Operational Testing Following Repair of the 'A' RHR Torus Suction Isolation Valve (MO-2069) Power Supply Breaker (1B3448);
- Post Maintenance Testing Activities Following Performance of the Annual Inspection and Oil Change for the 1K090B Instrument Air Compressor;
- Calibration and Functional Testing of the 'B' RWS Stilling Basin Inlet Flow Instrument to Support Inservice Testing of the 'B' & 'D' RWS Pumps;
- Calibration and Operational Testing Following Replacement of the Drywell Floor Drain Sump Level Switch; and
- Post Maintenance Testing Activities Following Replacement of the Packing of the "B" ESW Pump Discharger Strainer.

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

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

b. Findings

No findings of significance 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:

- Surveillance Test Procedure (STP) 3.3.1.1-05, Reactor High and Lo Water Level (HPCI, RCIC, RPS [Reactor Protection System], PCIS [Primary Containment Isolation System]) Instrument Channel Calibration;
- STP NS160004, RHR Service Water (RHRSW) Operability Test and Comprehensive Pump Test;
- STP 3.5.3-02, RCIC System Operability Test;
- STP 3.8.1-06B, 'B' SBDG Operability Test (Fast Start);
- STP 3.4.5-01, Calibration of Equipment Drain Sump and Floor Drain Sump Flow Integrators; and
- STP 3.3.5.1-14; 'A' Core Spray Logic System Functional Test.

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

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency were 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 (ASME) code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;

- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

These inspection activities constituted four routine surveillance testing samples, one inservice testing sample, and one reactor coolant system leak detection inspection sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Evaluation (71114.02)

a. Inspection Scope

The inspectors held discussions with plant Emergency Preparedness (EP) staff regarding the operation, maintenance, and periodic testing of the Alert and Notification System (ANS) in the Duane Arnold Energy Center's plume pathway Emergency Planning Zone. The inspectors reviewed monthly trend reports and siren test failure records from July 2007 through June 2009. Information gathered during document reviews and interviews was used to determine whether the ANS equipment was maintained and tested in accordance with Emergency Plan commitments and procedures. Documents reviewed are listed in the Attachment to this report.

This ANS inspection constituted one sample as defined in IP 71114.02-05.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization Augmentation Testing (71114.03)

a. Inspection Scope

The inspectors reviewed and discussed with plant EP staff the emergency plan commitments and procedures that addressed the primary and alternate methods of initiating an Emergency Response Organization (ERO) augmentation to the on-shift ERO as well as the provisions for maintaining the plant's ERO emergency telephone book. The inspectors also reviewed reports and a sample of CAP records of unannounced off hour augmentation tests, which were conducted from July 2007 through June 2009, to determine the adequacy of post-drill critiques and associated corrective actions. The inspectors also reviewed the EP training records of a sample of approximately 19 ERO personnel assigned to key and support positions to determine the current status of their ERO position training. Documents reviewed are listed in the Attachment to this report.

This ERO augmentation testing inspection constituted one sample as defined in IP 71114.03-05.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed a sample of Nuclear Oversight staff's 2008 and 2009 audits of the DAEC EP program to determine if the independent assessments met the requirements of 10 CFR 50.54(t). The inspectors also reviewed critique reports and samples of CAP records associated with the 2008 biennial exercise, as well as various EP drills conducted in 2008 and 2009, in order to determine if the licensee fulfilled drill commitments, and to evaluate the licensee's efforts to identify, track, and resolve identified concerns. Additionally, the inspectors reviewed a sample of EP items and corrective actions related to the facility's EP program and activities to determine whether corrective actions were completed in accordance with the sites corrective action program.

The inspectors reviewed the event summary for an implementation of the emergency plan for an actual event declared on June 12, 2008, to determine if the licensee effectively implemented the requirements of the plan. The licensee declared a Notification of Unusual Event for loss of communications (SU 6.2) as a result of the flooding of the Cedar River. The flooding caused numerous communications failures outside of the Duane Arnold Energy Center and resulted in the loss of the site's commercial phone system, the Federal Telephone System, and the microwave phone system. The event was exited on June 19, 2008, after minimum communication requirements had been restored.

b. Findings

(1) Inadequate threshold for river water low level identified in the emergency classification scheme

Introduction: A finding of very low safety significance and associated NCV of the emergency planning standard 10 CFR 50.47(b)(4) was identified by the NRC inspectors. The finding involved an inadequate threshold for river water level identified in the emergency classification scheme.

Description: The DAEC Emergency Plan describes the EALs, which provide the threshold values related to specific instruments, parameters, and status indicators used to establish the emergency classification. In the hazards category of the emergency classification scheme, the EAL HU 1.9 and HA 1.7 are associated with river water level for the Unusual Event and Alert classification, respectively. The EAL threshold value for HU 1.9 of 725.5 feet and for HA 1.7 of 724.5 feet addresses the effects of water level on the River Water Supply (RWS) System and the Ultimate Heat Sink (UHS) for the safety-related cooling water for systems, such as RHR service water and Emergency Service Water (ESW). The RWS also provides make-up water to the Circulating Water System.

The plant takes water in for system cooling at the intake structure for the safety-related RWS system and is located on the west bank of the Cedar River. The minimum river water level requirement ensures sufficient suction pressure and water volume to allow the RWS system pumps to provide sufficient flow of water for cooling safety-related heat loads and providing make-up water to the UHS. If the river water level drops below the threshold levels, the pump suction would not have the continuous supply of water needed and a potentially substantial degradation in the level of safety of the plant and challenge to the UHS could occur.

The intake structure has a sand gate to control the sand entering the structure pits where the pumps are located. As the sand accumulates at the base of the intake structure, the gate is raised to hold back the sand. As the gate is raised, the opening allowing water into the intake structure is reduced. The river bed in front of the intake structure has to be maintained below the sill level per the UFSAR in order to ensure adequate flow to meet UHS requirements.

In 1990, an NRC inspection report identified concerns with the intake structure sand accumulation and sand gate position. The licensee's corrective actions included several commitments to provide direction for the operation and control of the sand gates and precautions and limitations for the gate positions.

In 2006, a condition evaluation was conducted to evaluate the sand gate position since the gate was one foot of being full up with a build up of sand below the gate. The evaluation concluded the gate should be lowered and the sand removed so if the river water level lowered the gate could be adjusted to allow water to flow into the intake structure. In addition, a concern was expressed by the NRC inspectors relative to the RWS and UHS systems because of the effects of significant sand accumulation. An operability review and recommendation was conducted and determined the RWS and UHS were fully capable of performing their functions; however, the UHS was considered to be non-conforming to the requirements in the UFSAR due to sand build-up in front of the structure. A determination was made that the RWS and UHS could perform their function if 725.2 feet and a water depth of 6.5 inches of water are present at the inlet to the intake structure. Surveillances, TSs, and procedures were established to periodically measure the water depth and sand height in front of the intake structure to coordinate for dredging and removal of the sand at established action levels. Wing dams/spur dikes and riprap were installed to increase river flow at the inlet and to control erosion.

An additional corrective action was initiated by the licensee to review the effects of increased river bed elevation due to sand accumulation on the EALs for low river water level since the EALs addressed the water level and not the river bed level. The licensee concluded no changes to the EALs were warranted because the changes to the TS surveillance requirements would preclude the RWS and UHS water supply being challenged.

In 2008, the NRC expressed concern with the adequacy of the EALs for low river water level due to the river bed level increase. The licensee conducted a condition evaluation and concluded no changes to the EALs were warranted even though the river bed elevation was higher than the low river water level action threshold.

Analysis: The inspectors determined the licensee's failure to adjust the EAL's threshold criteria for low river water level at the Unusual Event and Alert classification was a performance deficiency. Because the licensee did not recognize the challenge to the RWS and the UHS due to increasing river bed level in the EALs, the EAL thresholds were not adjusted to accommodate for sand accumulation and the river bed rising. The EALs at the Notification of Unusual Event and Alert levels were invalid in the case for actual river bed elevation greater than low river water level threshold EALs.

Traditional enforcement did not apply since there were no actual safety consequences, no potential for impacting the NRC's regulatory function, and the performance deficiency was not the result of any willful violation. The performance deficiency was more than minor since the EP cornerstone objective to ensure the licensee is capable of implementing adequate measures to protect the health and safety of the public in a radiological emergency was adversely affected and the finding involved a risk-significant planning standard. The finding had the attribute of procedure quality (emergency plan standard emergency classification and action level scheme). The finding was assessed using the emergency preparedness SDP and was determined to be of very low safety significance (Green) and was similar to the example given of the 'emergency classification process would not declare any Alert or Notification of Unusual Event that should be declared', as in the case when the river bed elevation exceeds the river water low level threshold values.

The licensee's failure to maintain the EAL scheme to provide the proper threshold values for maintaining the RWS and the UHS to ensure an adequate river water level and water depth had a cross cutting aspect in the Human Performance area of the decision-making component. Specifically, the licensee did not use conservative assumptions and validate the underlying assumption in the decision to not change the EAL scheme and assumed the technical specifications for the RWS and the UHS systems would address the EAL requirement. [H.1(b)]

Enforcement: In accordance with 10 CFR 50.54(q), a licensee authorized to possess and operate a nuclear power reactor shall follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b). In accordance with 10 CFR 50.47(b)(4), a standard emergency classification and action level scheme shall be in use by facility licensees which provide the threshold values related to specific instruments, parameters, and status indicators used to establish the emergency classification. State and local response plans call for reliance on information provided by facility licensees for the determination of minimum initial offsite response measures.

Contrary to the above, the licensee did not maintain the EAL scheme to provide the proper threshold values for river water low level in all conditions. The EAL scheme did not provide the threshold values related to specific instruments, parameters, and status indicators for river water low level and low water depth and did not address the effect of sand and silt accumulation on the RWS and UHS systems. The EALs for the Notification of Unusual Event and Alert were unusable for the condition of low river water level when the river bed elevation became greater than the low river water level threshold. Because the finding is of very low safety significance and has been entered into the licensee's CAP (CAP 068505 and CE 007573), the violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000331/2009004-02).

(2) Adequacy of the licensee's critique for the May 20, 2009, EP Drill

Introduction: During a drill conducted on May 20, 2009, the resident inspector observed a drill controller interject concerning a simulated plant parameter posted on the electronic status board. The controller interject was near the time of the Site Area Emergency declaration by the Emergency Coordinator (EC) in the Technical Support Center. The licensee credited all the performance indicators for Drill/Exercise Performance as successful. The failure of the licensee to critique the potential impact of the controller interject on the ERO's performance is being considered an Unresolved Item (URI) pending final review by the licensee's staff.

Description: On May 20, 2009, the licensee conducted an ERO training drill involving the licensee's emergency response facilities with participation of the offsite response agencies. A controller interject was made to correct a simulated plant parameter posted on the electronic status board in the TSC involving reactor water level. The controller interject was made near the time when the EC was considering the plant status and evaluating the EAL classification scheme for the proper declaration of the emergency level. The licensee's review and critique of the drill concluded the interjection did not affect the Site Area Emergency declaration, all Drill/Exercise Performance PI opportunities were successful, and the interjection met procedural guidance. The licensee initiated corrective actions to evaluate the effects of the controller interject during the drill. Pending further review of the licensee's drill evaluation and supporting documentation by the NRC staff to determine if the critique was accurate for the events and circumstances during the drill, the issue is considered an Unresolved Item (URI 05000331/2009004-03).

Documents reviewed are listed in the Attachment to this report.

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

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on September 16, 2009, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the Control Room Simulator and Technical Support Center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the CAP. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

This inspection activity constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Radioactive Waste System

a. Inspection Scope

The inspectors reviewed the liquid and solid radioactive waste system description in the UFSAR for information on the types and amounts of radioactive waste (radwaste) generated and disposed. The inspectors reviewed the scope of the licensee's audit program with regard to radioactive material processing and transportation programs to verify that it met the requirements of 10 CFR 20.1101(c).

This inspection activity constituted one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

.2 Radioactive Waste System Walk-downs

a. Inspection Scope

The inspectors performed walkdowns of the liquid and solid radwaste processing systems to verify that the systems agreed with the descriptions in the UFSAR and the Process Control Program and to assess the material condition and operability of the systems. The inspectors reviewed the status of radwaste processing equipment that was not operational and/or was abandoned in place. The inspectors reviewed the licensee's administrative and physical controls to ensure that the equipment would not contribute to an unmonitored release path or be a source of unnecessary personnel exposure.

The inspectors reviewed changes to the waste processing system to verify that the changes were reviewed and documented in accordance with 10 CFR 50.59 and to assess the impact of the changes on radiation dose to members of the public. The inspectors reviewed the current processes for transferring waste resin into shipping containers to determine if appropriate waste stream mixing and/or sampling procedures were utilized. The inspectors also reviewed the licensee's methods for waste concentration averaging to determine if representative samples of the waste product were provided for the purposes of waste classification, as required by 10 CFR 61.55.

This inspection activity constituted one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

.3 Waste Characterization and Classification

a. Inspection Scope

The inspectors reviewed the licensee's radiochemical sample analysis results for each of the licensee's waste streams, including dry active waste (DAW), spent resins, and filters. The inspectors also reviewed the licensee's use of scaling factors to quantify difficult-to-measure radionuclides (e.g., pure alpha or beta emitting radionuclides). The reviews were conducted to verify that the licensee's program assured compliance with 10 CFR 61.55 and 10 CFR 61.56, as required by Appendix G of 10 CFR 20. The inspectors also reviewed the licensee's waste characterization and classification program to ensure that the waste stream composition data accounted for changing operational parameters and thus remained valid between the annual sample analysis updates.

This inspection activity constituted one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

.4 Shipment Preparation and Shipment Manifests

a. Inspection Scope

The inspectors reviewed the documentation of shipment packaging, radiation surveys, package labeling and marking, vehicle inspections and placarding, emergency instructions, determination of waste classification/isotopic identification, and licensee verification of shipment readiness for a sample of non-excepted material and radwaste shipments made in 2008 and 2009. The shipment documentation reviewed consisted of:

- Four LSA-II, Two LSA-1, One SCO-1, and Two Type-A Shipments to Waste Processors; and
- One Type-B(M) Package to Envirocare of Utah, Inc.

For each shipment, the inspectors determined if the requirements of 10 CFR Parts 20 and 61 and those of the Department of Transportation (DOT) in 49 CFR Parts 170-189 were met. Specifically, records were reviewed and staff involved in shipment activities was interviewed to determine if packages were labeled and marked properly, if package and transport vehicle surveys were performed with appropriate instrumentation, if radiation survey results satisfied DOT requirements, and if the quantity and type of radionuclides in each shipment were determined accurately. The inspectors also determined whether shipment manifests were completed in accordance with DOT and NRC requirements, if they included the required emergency response information, if the recipient was authorized to receive the shipment, and if shipments were tracked as required by 10 CFR Part 20, Appendix G.

This inspection activity constitutes one sample as defined in IP 71122.02-5.

Selected staff involved in shipment activities were interviewed by the inspectors to determine if they had adequate skills to accomplish shipment related tasks and to determine if the shippers were knowledgeable of the applicable regulations to satisfy package preparation requirements for public transport with respect to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," and 49 CFR Part 172 Subpart H.

This inspection activity constitutes one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed condition reports, audits and self-assessments that addressed radioactive waste and radioactive materials shipping program deficiencies since the last inspection to verify that the licensee had effectively implemented the corrective action program and that problems were identified, characterized, prioritized and corrected. The inspectors also verified that the licensee's self-assessment program was capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors reviewed corrective action reports from the radioactive material and shipping programs since the previous inspection, interviewed staff and reviewed documents to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of NCVs tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

This inspection activity constituted one sample as defined in IP 71122.02-5.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index - Emergency AC Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Emergency AC Power System performance indicator for the period from the third quarter 2008 through the second quarter 2009. To determine the accuracy of the Performance Indicator (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, issue reports, event reports and NRC Integrated Inspection Reports for the period from the third quarter 2008 through the second quarter 2009 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one MSPI emergency AC power system sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.2 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - High Pressure Injection Systems performance indicator for the period from the third quarter 2008 through the second quarter 2009. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, 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 from the third quarter 2008 through the second quarter 2009 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one MSPI high pressure injection system sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Heat Removal System performance indicator for the period from the third quarter 2008 through the second quarter 2009. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC Integrated Inspection Reports for the period from the third quarter 2008 through the second quarter 2009 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. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

.4 Drill/Exercise Performance

a. Inspection Scope

The inspectors sampled licensee PI submittals for the Drill/Exercise Performance for the period from the third quarter 2008 through the first quarter 2009. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors verified the accuracy of the number of reported drill and exercise opportunities and the licensee's critiques and assessments for timeliness and accuracy of the opportunities. The inspector reviewed the licensee's documentation for control room simulator training sessions, the 2008 biennial exercise, and other designated drills and tabletops to validate the accuracy of the submittals. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

.5 Emergency Response Organization Drill Participation

a. Inspection Scope

The inspectors sampled licensee submittals for the ERO Drill Participation PI for the period from the third quarter 2008 through the first quarter 2009. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's records and ERO roster to validate the accuracy of the submittals for the number of ERO members assigned to fill key positions and the percentage of ERO members who had participated in a performance enhancing drill or exercise. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

.6 Alert and Notification System

a. Inspection Scope

The inspectors sampled licensee submittals for the ANS PI for the period from the third quarter 2008 through the first quarter 2009. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's siren tests processes and procedures on assessing opportunities for the PI. The licensee siren operability records were reviewed to validate the accuracy of the submittals of the licensee's reported number of successful siren tests and the number of siren tests conducted during the reporting period. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one ANS sample as defined in IP 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

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

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

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that 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 attached List of Documents Reviewed.

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 of significance 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 of significance were identified.

.3 Annual Sample: Review of Operator Workarounds

a. Inspection Scope

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

The inspectors performed a review of the cumulative effects of OWAs. The documents listed in the Attachment to this report were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into their CAP and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an Initiating Event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate compensatory actions. Additionally, all temporary modifications were reviewed to identify any potential effect on the functionality of Mitigating Systems, impaired access to equipment, or required equipment uses for which the equipment was not designed. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified OWAs.

This inspection activity constituted one OWA annual inspection sample as defined in IP 71152-05.

b. Findings

No findings of significance were identified.

.4 Selected Issue Follow-Up Inspection: Duane Arnold Energy Center's Implementation of the Operability Determination Process

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized that the use of the station's Prompt Operability Determination (POD) documentation form was not being consistently utilized. The inspectors decided to perform a closer inspection of the station's operability determination process, and compare DAEC's process to the guidance contained in Regulatory Issue Summary 2005-20, "Revision to NRC Inspection Manual Part 9900 Technical Guidance, 'Operability Determinations and Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety.'"

b. Observations and Assessment

The inspectors reviewed DAEC's procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," and compared the procedure to the Part 9900 guidance. For clarification, the Part 9900 Technical Guidance is provided to NRC inspectors to assist their review of licensee determinations of operability and resolution of degraded or nonconforming conditions. In addition, many licensees have found this guidance useful in developing their plant-specific operability determination process. Users of the guidance should be aware that, although it generally reflects existing practice, it may not be directly applicable in every case at every plant. The Part 9900 Technical Guidance does not contain any regulatory requirements.

The inspectors reviewed issues entered into the DAEC corrective action program that resulted in equipment being declared Operable but Degraded (OBD) or Operable but Nonconforming (OBN). Procedure EN-AA-203-1001 defines a degraded condition as "one in which the qualification of an SSC or its functional capability is reduced. Examples of degraded conditions are failures, malfunctions, deficiencies, deviations, and defective material and equipment." EN-AA-203-1001 defines a nonconforming condition as "a condition of an SSC that involves a failure to meet the CLB [Current Licensing Basis] or a situation in which quality has been reduced because of factors such as improper design, testing, construction, or modification."

The Shift Manager is responsible for making an Immediate Operability Determination (IOD) of an SSC following discovery of a degraded or nonconforming condition. Following the IOD, the Shift Manager may request a POD to document the basis for the declaration of Operability or conformance with the CLB. The Part 9900 Technical Guidance for Operability Determinations, Section 4.4, provides guidance for the scope of Operability Determinations. The inspectors compared DAEC's EN-AA-203-1001 procedure and determined that when the station performs a POD, the items in Section 4.4 of the Part 9900 Technical Guidance are documented.

The inspectors identified several instances where a CAP documented an SSC as OBD or OBN, however, the Shift Manager did not request a POD. Because a POD was never prepared, the scope of the Operability Determination did not include all of the items that section 4.4 of the Part 9900 Technical Guidance recommends. Specific examples include:

- CAP 067132 was written to document the failure of CV-1956A, the ESW supply valve to the 'A' Control Building Chiller. The Shift Manager determined that CV-1956A was OBD, and the basis for operability was documented in the CAP, and not in a POD. However, the CAP did not document the extent of condition relative to the 'B' Control Building Chiller.
- CAP 069503 was written to document a nonconformance identified with the seismic support for the discharge piping on the 'A' Core Spray Pump suction pressure relief valve. The Shift Manager declared the support OBN, documented the basis for operability in the CAP, but did not request a POD. The CAP did not document the specified safety function of the affected SSC.
- CAP 068410 was written to document a discrepancy when it was discovered that the actual weight of valve V-44-0043 was 20 pounds greater than the weight used in calculation CAL-M05-043 to analyze the Well Water Piping from Penetration X24A outside the Drywell. The Shift Manager declared V-44-0043

OBN, but did not request a POD. The CAP documented the basis for operability, but did not address the effect or potential effect of the nonconforming condition on the Drywell. Additionally, the extent of condition was not addressed in the CAP.

- CAP 068701 was written to document a discrepancy between the actual plant configuration and the plant drawings for circuit sensors installed upstream of the Drywell Cooling Well Water Return Isolation valves V-44-0033 and V-44-0031. The Shift Manager declared the system OBD but did not request a POD. The CAP documents the basis for operability, but did not document the extent of condition. The CAP documented the basis for operability, but did not address the effect or potential effect of the nonconforming condition on the Drywell. Additionally, the extent of condition was not addressed in the CAP.

The inspectors discussed the above discrepancies with the licensee. CAP 069987 was written to address DAEC's practice of not requiring PODs for SSC's that are declared OBD or OBN. The documents listed in the Attachment to this report were reviewed to accomplish the objectives of the inspection procedure. The inspectors did not identify any findings of significance.

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

.5 Annual Sample: Root Cause Evaluation 1078, 'B' Emergency Diesel Generator Output Breaker Trip

NRC Inspection Report 05000331/2009009 documents an annual Problem Identification and Resolution inspection sample that was performed to close Unresolved Item (URI) 05000331/2008005-03.

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

.6 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 (Closed) NRC Temporary Instruction 2515/175 "Emergency Response Organization, Drill/Exercise Performance Indicator, Program Review"

The inspectors performed Temporary Instruction 2515/175, ensured the completeness of the Temporary Instruction's Attachment 1 and then forwarded the data to NRC Headquarters.

a. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 2, 2009, the inspectors presented the inspection results to Mr. C. Costanzo, 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:

- Radioactive material processing and transportation with Mr. R. Anderson, Site Vice President on August 07, 2009.
- Emergency Preparedness inspection interim exit with the Site Vice President, Mr. R. Anderson, was conducted at the site on July 17, 2009, and a final EP inspection exit meeting with Site Vice President, Mr. C. Costanzo, was conducted by telephone on September 22, 2009. Proprietary material received during the inspection was returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

C. Costanzo, Site Vice President
D. Curtland, Plant General Manager
B. Eckes, NOS Manager
S. Catron, Licensing Manager
K. Kleinheinz, Engineering Director
B. Kindred, Security Manager
R. Minear, Training Manager
C. Dieckmann, Operations Manager
G. Rushworth, Assistant Operations Manager
R. Porter, Chemistry & Radiation Protection Manager
M. Davis, Emergency Preparedness Manager
M. Lingenfelter, Design Engineering Manager
J. Swales, Design Engineering Supervisor
G. Pry, Maintenance Manager
D. Albrecht, Radwaste Supervisor
R. Patrilla, Radwaste Instructor
M. Heerman, Radwaste Shipper in Training
N. McKenney, General Supervisor Radiation Protection
T. Zimmerman, EP Coordinator
J. Mac Intyre, EP/Scheduling Coordinator

Nuclear Regulatory Commission

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

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000331/2009004-01	NCV	Failure to Perform an Immediate Operability Determination for the 'B' Standby Diesel Generator (1R15)
05000331/2009004-02	NCV	Failure to Maintain EAL Scheme for River Low Level ((1EP5.b1)
05000331/2009004-03	URI	Adequacy of the licensee's critique for the May 20, 2009, EP Drill (1EP5.b2)

Closed

05000331/2009004-01	NCV	Failure to Perform an Immediate Operability Determination for the 'B' Standby Diesel Generator (1R15)
05000331/2009004-02	NCV	Failure to Maintain EAL Scheme for River Low Level ((1EP5.b1)

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors 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.

Section 1R01

OP-AA-102-1002; Seasonal Readiness; Revision 0
OP-AA-102-1002 (DAEC); Seasonal Readiness; Revision 0
ENG-CS-233; Basis for Requirements in Procedure SP 1039; Revision 0
CAP 068159; NCAQ [Condition Not Adverse to Quality] – Loose Poles at ‘B’ Well

Section 1R04

Operating Instruction (OI) 149A1; RHR System Electrical Lineup; Revision 3
OI 149A4; ‘B’ RHR System Valve Lineup and Checklist; Revision 4
OI 149A6; RHR System Control Panel Lineup; Revision 2
OI 410A1; RWS System Electrical Lineup; Revision 9
OI 410A2; ‘A’ RWS System Valve Lineup and Checklist; Revision 18
OI 710A1; Intake Structure HVAC System Electrical Lineup; Revision 3
OI 710A2; Intake Structure HVAC System Valve Lineup; Revision 2
CAP 068380; NCAQ – LCO [Limiting Condition for Operation] Paperwork Not Properly Filled Out
OI 151A1; Core Spray System Electrical Lineup; Revision 3
OI 151A2; ‘A’ Core Spray System Valve Lineup and Checklist; Revision 4
OI 151A4; ‘B’ Core Spray System Valve Lineup and Checklist; Revision 4
OI 151A6; Core Spray System Control Panel Lineup; Revision 2
CAP 061456; CAQ [Condition Adverse to Quality] – ‘B’ Core Spray Discharge Line Hi Pressure Unexpected Alarm
CAP 061497; CAQ – Unexpected Alarm 1C03C C-2, ‘B’ Side Core Spray Discharge Line Hi Pressure
CAP 062140; CAQ – Core Spray Valves V21-0073 and MO-2135 Potential Seat Leakage
CAP 062661; CAQ – CAP 47017 Closed Without Identifying Leaking Valves
CAP 065994; CAQ – ‘B’ Core Spray Discharge Header Pressure Rose Approximately 30 PSIG in 18 Hours
CAP 066026; CAQ – ‘B’ Core Spray High Pressure Unexpected 1C03 (C-2) Annunciator
WO A80361; Check Valve May Be Leaking Back From Reactor During STP 3.5.101B
WO A80362; MO-2135 May Be Leaking Through Backwards
Core Spray System Checklist/Health Report; 07/07/2009
OI 150A1; Reactor Core Isolation Cooling System Electrical Lineup; Revision 2
OI 150A4; Reactor Core Isolation Cooling System Control Panel Lineup; Revision 3
OI 150A2; Reactor Core Isolation Cooling System Valve Lineup and Checklist; Revision 12
BECH-M113; Piping and Instrument Drawing (P&ID) RHR Service Water and Emergency Service Water Systems; Revision 64
OI 454A4; ‘B’ ESW System Valve Lineup and Checklist; Revision 10
OI 454A6; ESW System Control Panel Lineup; Revision 2

Section 1R05

Administrative Control Procedure (ACP) 1412.2; Control of Combustibles; Revision 36
ACP 1412.3; Control of Ignition Sources; Revision 23
ACP 1412.4; Impairments to Fire Protection Systems; Revision 55
AFP 14; Turbine Building North Basement Reactor Feed Pump Area and Turbine Lube Oil Tank Area; Revision 30
AFP 16; Turbine Building Condensate Pump Area, Elevation 734'-0"; Revision 25
AFP 69; Yard Main Transformer 1X1; Revision 3
AFP 70; Yard Standby Transformer 1X4; Revision 4
AFP 71; Yard Startup Transformer 1X3; Revision 3
AFP 72; Yard Auxiliary Transformer 1X2; Revision 2
AFP 34; Radwaste Building Drum Filling, Storage, and Shipping, Elevation 757'-6"; Revision 25
AFP 36; Radwaste Building Precoat and Access Area – Elevation 786', Control Room and Heating, Ventilation, and Air Conditioning Equipment Room; Revision 25
AFP 03; Reactor Building HPCI, RCIC, and Radwaste Tank Rooms; Revision 26
AFP 35; Radwaste Treatment and Access Area, Elevation 773'-6"; Revision 24
AFP 13; Refueling Floor Elevation 855'-0"; Revision 25
FHA-400; Fire Hazards Analysis; Revision 9
Fire Plan – Volume 1, Program; Revision 56

Section 1R06

Maintenance WO 1151250; Remove Asbestos Conduit Seals in Manholes 1MH109, 1MH110, 1MH111, 1MH112, & 1MH113
Maintenance WO 1151251; Remove Asbestos Conduit Seals in Manholes 2MH207, 2MH208, 2MH209, 2MH210, & 2MH211
CAP 068682; CAQ – Missed Hourly Firewatch and FPLCO Entry During 1B9 Outage
CAP 068665; NCAQ – Standing Water in Manhole 2MH207
CAP 068541; NCAQ – Standing Water in Manhole 1MH109
CAP 068502; CAQ – Poor Planning/Design for ECP 1855
CAP 068494; NCAQ – Intake Manhole Sump Pump Mod Installation Delayed
CAP 068498; CAQ – TS LCO 3.8.7 Condition D and 3.7.2 Condition A for WO 1151250 Exited Prematurely
CAP 068976; Documentation of Water Levels in Manholes during NRC Inspections Duane Arnold Energy Center Individual Plant Examination, Section 3.3.6 'Internal Flooding Analysis', November 1992
CAP 069548; 'A' Core Spray took longer to drain than anticipated; 09/08/2009
CAP 052312; CAQ – Long-term drain blockage condition; 09/07/2007
WO A78787; Inspect and cleanout the floor drain MRD002 in Torus Bay 10.

Section 1R11

Audit 09-02 Evaluation Scenario Guide; Revision 0
ACP 110.1; Conduct of Operations; Revision 22
AOP 255.2; Power/Reactivity Abnormal Change; Revision 32
CAP 069168; NCAQ – Not Able to Perform OI-304.1 Section 7.6 in Simulator Training Due to Mod ECP1748 Deficiency
CAP 069192; LOR Simulator Scenario Debrief Did Not Identify All Operator Performance Issues LORT Simulator Scenario performed on September 15th, 2009

Section 1R12

DAEC Maintenance Rule Program Module 0; Overview; Revision 3
DAEC Performance Criteria Basis Document; HPCI System SUS 52.00; Revision 3
Summary of DAEC Maintenance Rule System Goals for RED (a)(1) Systems; dated July 30, 2009
DAEC System Checklist/Health Report for SUS 52.00 HPCI System
DAEC Performance Criteria Basis Document; RWS System SUS 9.00, 10.01, 10.02, 10.03; Revision 3
STP NS100102B; B RWS and Screen Wash System Vibration Measurement and Operability Test; Revision 5
CAP 066713; CAQ – HPCI Suction from Torus Pipe Support HBB-8-SR-3 Wall Plate Gap
CAP 066750; CAQ – HPCI Torus Suction Pipe Support HBB-8-SR-3 Not in Accordance with Design
CAP 069028; 1F036B [River Water Intake Traveling Screen] Making Rubbing Noise and Jumps Once in a While
CAP 069089; ‘B’ RWS Pump Inoperable Due to Failed ASME Specifications
CAP 069090; ‘B’ Side RWS Screen Wash Didn’t Initiate When Expected
CAP 069162; ‘B’ RWS Inoperable
CAP 069190; Results of ‘B’ RWS Pit Inspection
CAP 069202; Differential Pressure for RWS Pump 1P117B in ASME Alert Range
NS100102B; ‘B’ RWS and Screen Wash System Vibration Measurement and Operability Test; Revision 4
BECH-M129; RWS System Intake Structure; Revision 38
BECH-M146; Service Water System Pumphouse; Revision 82
CAP 067180; CAQ – CV1956A: The Internals Inspection Results Unsatisfactory
Duane Arnold Energy Center System Overview Report of Control Building Heating, Ventilation, and Air Conditioning; Date July 30, 2009
CAP 068703; CAQ – CV1956A Failed to Open when A ESW Pump Started for Bromination
CAP 068808; CAQ – CV1956A, Indications of Stem Galling
CAP 068996; CV1956A Disc Binding
CAP 056820; NCAQ – 1P088B Discharge Flow was Indicating Low
CAP 062216; CAQ – ‘A’ ESW Pump Secured due to Inadequate System Flow
CAP 068952; ESW Pump Minimum Flow Required During Planned Maintenance on ESW System Loads
CAP 069007; Inoperability of ESW not Considered in Work Order Planning for SBDG Fuse Replacement
WO A95781; CV1956A Failed to Open, Plan Corrective WO to Blue Check Disc and Lap Seats as Required to achieve Proper Fit Up
CAP 067773; CAQ – Flowserve didn’t Provide Adequate Controls over Sub-tier Supplier for CV-1956A
CAP 067864; ORG / Challenge Board Actions for ECP-1811 (CV-1956A/B)
CAP 067413; CAQ – Excess Air Pressure May Cause CV-1956A to Stick Closed
BECH-M113; P&ID RHR Service Water and ESW Systems; Revision 64
BECH-M169<2>; Control Building Cooling Chilled Water System; Revision 17
BECH-M169<3>; Control Building Chillers 1VCH001A and 1VCH001B; Revision 12

Section 1R13

Work Planning Guideline 1; Work Process Guideline; Revisions 32 and 33
Work Planning Guideline 2; On-Line Risk Management Guideline; Revisions 52 and 53
WM-AA-1000; Work Activity Risk Management Process; Revisions 1 and 3
Maintenance Risk Evaluations for Work Week 9928; Revisions 0, 1, and 2
DAEC On-line Schedule for Work Week 28
Maintenance Risk Evaluations for Work Week 9931; Revisions 0, 1, 2, 3, 4, and 5
DAEC On-line Schedule for Work Week 31
Corrective WO A95563; Replace and Test Relay P110500-1, RCIC Div 1 Leak Detection Power Monitor Relay
Maintenance Risk Evaluations for Work Week 9933; Revisions 0, 1, 2, and 3
DAEC On-line Schedule for Work Week 33
Maintenance Risk Evaluations for Work Week 9935; Revisions 0, 1, 2, 3, 4, and 5
DAEC On-line Schedule for Work Week 35
CAP 068265; CAQ – Annunciator 1C04B (C-4) RCIC Steam Leak Det Logic Power Failure Activated
CAP 068703; CAQ – CV1956A Failed to Open When ‘A’ ESW Pump Started for Bromination
CAP 067132; CAQ – CV1956A Failed to Open When ‘A’ ESW Pump Started for ‘A’ SBDG STP 3.8.1-04A
CAP 068815; CAQ – Thermography Anomaly in 1C118 (Diesel Generator 1G-21 Control Relay) WO 1151790; Clean Fuse Holder and Replace Fuse
WO A94323; Remove Existing Fuse, Clean Fuse Block and Install Replacement Fuse
CAP 069268; 1D1 125 VDC Battery Was Not Guarded
CAP 069269; Wrong Gaskets Ordered for HPCI Rupture Disc Replacement
CAP 069301; Weld Rod Package Not Marked with Date and Time Prior to Opening
CAP 069317; EOP-2 (Primary Containment Control) Entered During HPCI STP on High Torus Temp > 95F
NG-003F; Operation Decision Making Action Plan Working Form for CV-1068 Stuck in the 50% Open Position; Meeting Held September 24, 2009
WO A96351; Determine if Foreign Material is Preventing Movement of Valve by Attempting to Open
DAEC On-line Schedule for Work Week 39
Maintenance Risk Evaluations for Work Week 9939; Revision 0
Maintenance Risk Evaluations for Work Week 9937; Revisions 0, 1, 2, and 3
CAP 069517; ‘C’ Well Piping Underground Leak. Abnormal Operating Procedure (AOP) 408 Entered
Abnormal Operating Procedure 408; Well Water System Abnormal Operations; Revision 26
OP-AA-104-1007; Online Aggregate Risk; Revision 0

Section 1R15

Operability Recommendation (OPR) 000402; Minor Bolting Issues Found During SFU Walk Down Required by CA [Corrective Action] 0052742
CAP 068030; CAQ – Two Flange Studs Appear to Be Loose on AV7322B
CA 0052742; CAQ – Two Flange Studs Appear to Be Loose on AV7322B
CAP 068263; Minor Bolting Issues Found During SFU Walk Down Required by CA 0052742
OPR 000404; CAQ – Candle Fire While Running 1G-31
CAP 068652; CAQ – Candle Fire While Running 1G-31
CAP 068709; CAQ – Difficulty Closing 1A311
CAP 069217; Candle Fire on A SBDG

Corrective WO A95262; Check Tightness of Ring Catcher Inspection Port Bolting on Both Four Barrel Manifolds
OI 324; SBDG System; Revision 93
CAP 068394; HPCI Response Time Testing STP Does Not Recognize HPCI LCO Entry
CAP 068320; HPCI Response Time Testing Correction Factor Outside of Band
OPR 000403; HPCI Response Time Testing Correction Factor Outside of Band
STP NS520002; HPCI Response Time Correction Factor Verification; Revision 1
OPR 000405; Thermography Anomaly in 1C118 (Diesel Generator 1G21 Control Relay and Terminal Panel)
Infrared Thermography Inspection Report for Div 'B' SBDG STP Rte-33; August 2, 2009
CAP 068815; CAQ – Thermography Anomaly in 1C118 (Diesel Generator 1G-21 Control Relay)
CAP 069502; A SBLC Pump Declared Inoperable, Pumps above ASME Limits
STP 3.1.7-01; SBLC Pump Operability Test; Revision 27; Performance Date September 4, 2009 at 0940
STP 3.1.7-01; SBLC Pump Operability Test; Revision 27; Performance Date September 4, 2009 at 1645
STP 3.1.7-03; SBLC System Boron Concentration Test; Revision 21; Performance Date September 5, 2009
CAP 070040; A SBDG Air Start Piping Support Discrepancy
CAP 070061; CAP 070040 (Air Start Piping Issues on a SBDG) Issues
OP-AA-102-1003 (DAEC); Guarded Equipment (DAEC Specific Information); Revision 0

Section 1R18

White Paper on CV-1068 Flow Accelerated Corrosion Evaluation; Al Thomas, DAEC Flow Accelerated Corrosion Engineer
BECH-M103<3>; P&ID Main Steam Moisture Separators and Reheaters; Revision 12
WO A963515; Valve CV-1068 is in Intermediate Position. Troubleshoot to determine if Problem is a Controller or Valve Concern
CAP 069846; Unexpected Moisture Separator Reheater Second Stage Drain Tank 1T-92B Hi Level
TM-09-25; CV-1068 Valve Gag to Prevent Valve Traveling Fully Closed

Section 1R19

Corrective WO A95563; Replacement and Calibration of Relay P110500-1 Due to Failure
STP 3.0.0-01; Instrument Checks; Revision 95
CAP 068265; Repeat Event – CAQ – Annunciator 1C04B (C-4) Activated
Apparent Cause Evaluation 001967; CAQ – Annunciator 1C04B (C-4) 'RCIC Steam Leak Det Logic Power Failure' Activated
WO 1146179; Inspect and Repair, Per Procedure, 1B3448
CAP 068414; The Case is Cracked on the Forward Contactor for 1B3448
WO 1146579; Perform Annual Inspection and Oil Change on 1K090B
CAP 068845; Post Maintenance Testing Failed on 1K090B Due to Leaking Gasket
CAP 068826; 1BR9-200 Would Not Close Using Handswitch
CAP 069138; 1K090B Instrument Air Compressor Manual Drain Valve V30-700 is Leaking through Closed Seat
WO 1147266; Calibrate Flow Instrument Loop Per Procedure
Equipment-Specific Maintenance Procedure (EMP) I.PDT-G080-01; G.E. Type 555 D/P Transmitters Dry Calibration, Section A; Revision 15
EMP I.II-G080-01; Linear Calibration, Section A; Revision 5

EMP I.ER-H260-01; Honeywell Vultronik Recorders Non-Linear Calibration, Section B;
Revision 3
WO A94390; Replace LS3701 and Calibrate Per Procedure
EMP I.LIS-G050-01; GEMS Model 31924 Level Indicating Switches Calibration, Section A;
Revision 5
CAP 069035; Trend CAP – Trend in Drywell Floor Drain Leakage
CAP 069279; Containment Leakage Monitoring Notifications
OI 920; Drywell Sump System; Revision 38
WO A93410; Strainer Packing Leak

Section 1R22

STP 3.3.1.1-05; Reactor High and Lo Water Level (HPCI, RCIC, RPS [Reactor Protection System], PCIS [Primary Containment Isolation System]) Instrument Channel Calibration;
Revision 7
WO A76492; Replace 3 Way Valve Manifold: Work During STP 3.3.1.105
CAP 054727; NCAQ – LIS 4592D-V-15 LP Isolation Does Not Isolate Properly
CAP 068519; Valve V46-0031 RHRSW Pump A Disc Isolation Valve Degraded
CAP 068518; Revise STP NS16004A/B to Permanently Incorporate DCF 47657
CAP 068488; 1P22A Differential Pressure outside Acceptance Criteria
STP NS160004A; RHR Service Water Operability Test and Comprehensive Pump Test;
Revision 1
STP 3.5.3-02; RCIC System Operability Test; Revision 26
STP 3.8.1-06B; 'B' SBDG Operability Test (Fast Start); Revision 6
STP 3.8.1-01; Offsite Power Sources; Revision 3
OI 324A9; SBDG Operating Checklist; Revision 9
OI 324A10; SBDG Standby/Readiness Condition Checklist; Revision 10
CAP 068709; Difficulty Closing 1A311
CAP 064137; 'B' SBDG Governor Mode Select Bypass Testing
CAP 066658; SBDG STP Operability in Parallel
STP 3.4.5-01; Calibration of Equipment Drain Sump and Floor Drain Sump Flow Integrators;
Revision 10
STP 3.3.5.1-14; 'A' Core Spray Logic System Functional Test; Revision 1
WO S016291; Core Spray Logic System Functional Test 'A'
Drawing 791E419RS; Elementary Diagram Core Spray System; Revision 25

Section 1E02

An Offsite Emergency Plan Prompt ANS Addendum for the Duane Arnold Energy Center;
November 1985
Duane Arnold Energy Center Outdoor Warning System/ANS Upgrade Project Federal
Emergency Management Agency REP-10 Final Design Report Supplement; Revision 0;
Appendix P; dated January 6, 2009
Letter from Federal Emergency Management Agency to Mr. J. Michael Davis concerning
approval of the siren upgrade package; dated January 30, 2009
CE 007565; Evaluate Extent of Condition for Other Sirens in EPZ; dated July 16, 2009
CAP 059419; Siren Found Inoperable; dated August 8, 2008
CAP 059530; Gap Exists in Organization for Supporting EP Siren Maintenance; dated
August 13, 2008

CAP 049492; Alert and Notification System (ANS) Testing Needs Improvement; dated May 3, 2007
CAP 049493; Siren Work Order Process Needs Improvement; dated May 3, 2007

Section 1E03

Duane Arnold Energy Center Emergency Telephone Book; dated July 2009
2009 State Annual EAL Training Attendance Sheet; dated January 28, 2009
PDA-EPR-ERO; Emergency Response Organization Training and Qualification Manual, Qualification Requirements for Various Positions

Section 1E05

PI-AA-204; Nuclear Process Description, Condition Identification and Screening Process; Revision 4
PDA-08-006; Nuclear Oversight Quality Report, 2008 EP Assessment; dated February 20, 2008
PDA-08-023; Nuclear Oversight Quality Report, 2008 Emergency Planning Program, July 14, 2008
PDA-09-023; Nuclear Assurance Report, Emergency Preparedness; dated July 20, 2009
Event Summary Report for Notification of Unusual Event and ACE 001860; Unusual Event Declared Based on Loss of Communications Capability; dated August 17, 2008
CAP 058387; Loss of FPLE DA Emergency Operations Facility; dated June 17, 2008
CAP 058386; Loss of Ability to Contact Linn County Sheriff Office; dated June 17, 2008
CAP 058377; Flood Damaged Sirens and Related Equipment; dated June 17, 2008
CAP 058292; Eight-hour Reportable Notification Made for Loss of Offsite Response Capability; dated June 12, 2008
CAP 058279; Loss of Power to Siren Repeater; dated June 11, 2008
CAP 058235; Possible Loss of Two Siren Activation Points; dated June 10, 2008
CAP 067417; Appropriateness of Controller Interjection Questioned; dated May 20, 2009
CAP 068506; Evaluate Impact of 5/20/2009 ERO Training Drill Controller Interject; dated July 17, 2009
CAP 061050; NRC Concern with Adequacy of EALs for Low River Levels; dated October 17, 2008
CAP 042883; Operability Recommendation for Intake Structure Fore-Bay Inspection Identified Significant Sand Accumulation; dated June 23, 2006
Condition Evaluation for the Sand Gates at the Intake Structure Are within One Foot of Being in the Full Up Position; dated July 18, 2006
CAP 068505; Review Adequacy of EALs HU 1.9 and HA 1.7; dated July 17, 2009
CAP 069930; Assess Operating Crew Table Top Drills; dated September 23, 2009
CAP 059302; MET Tower Computer Points out of Tolerance; dated August 4, 2008
CAP 066817; High Radiation Alarm for Kaman 4 Activated; dated April 24, 2009
CAP 054144; Nuclear Oversight Station Paging System Corrective Action Review; dated December 6, 2007
CAP 061267; 08IPX Review Notification Performed on June 30, 2008 for Possible DEP Failure; dated October 23, 2008
CAP 059835; DEP Failure – Delay of EAL Classification after Initiating Conditions Recognized; dated August 26, 2008
AP 058809; Unexpected Annunciator for Drywell Equipment Leakage; dated July 10, 2008
CAP 068122; Was Correct EAL Declared for Unannounced Fire Drill; dated June 26, 2009

Section 1E06

Duane Arnold Emergency Preparedness Drill, September 16th, 2009
2009 ERO Dress Rehearsal Final Report; September 23, 2009
CAP 069730; 09DR – Controller Prompted Crew to Start all Reactor Building Supply and Exhaust Fans
CAP 069764; 09DR – Drill Validation Crew Response Different than Drill Operations Crew for EOP-3
CAP 069762; 09DR – Controller Intervention to Prevent Crew from Scramming due to Conservative Action Based on Plant Conditions
CAP 069739; 09DR – Simulator Lead Controller Drill Interjection (DEP-PI Issue)

2PS3 Radioactive Material Processing and Transportation Program (71122.02)

AR-36733; Quick Hit Assessment Report; dated July 9, 2009
PI-AA-101-1001; Nuclear Fleet Guidelines; Quick Hit Assessments; Revision 2
RWH-3406.6; Characterizing Radioactive Material for Transport; Revision 8
RWH-3406.1; Waste Classification and Characterization; Revision 8
STP-NS790707; Radioactive Liquid Release Sampling and Analysis; Revision 0
RWH-3402.6; Radwaste Handling Procedure; Processing Contents of 1T-71A(B) Waste Sampling Tanks; Revision 30
RWH-3402.21; Radwaste Handling Procedure; IT-60 Evaporator Bottom Tank Resin Transfer and Dewatering; Revision 25
RWH-3409.2; Radwaste Handling Procedure; Sampling Instructions and Analysis of Radwaste Stream; Revision 11
PDA-07-020; Assessment; Daily Quality Summary Rollup
PDA-08-007; FPLE Duane Arnold Nuclear Oversight Quality Report; dated March 3, 2008
2008 Annual Radioactive Material Release Report; dated April 22, 2009
08-003-R; 10 CFR Part 61 Compliance Data Technical Basis for DAEC Condensate Resin; dated May 6, 2008
08-001-R; 10 CFR Part 60 Compliance Data Technical Basis for DAEC Reactor Water Clean-Up Resin; dated June 10, 2008
08-002-R; 10 CFR Part 60 Compliance Data Technical Basis for DAEC DAW; dated July 7, 2008
08-003-R; 10 CFR Part 60 Compliance Data Technical Basis for DAEC Condensate Resin; dated May 6, 2008
RSR-07-57; 10 CFR Part 61 Sample Package; DAW Smear Composite, Condensate Resin, Reactor Water Clean-Up Resin to General Engineering Labs; dated October 15, 2007
RSR-07-46; Radioactive Material, Type B(M), 7, UN2917, RQ, Radionuclide; RWCUC/Condensate Resin; dated May 29, 2007
RSR-09-27; Radioactive Material, Low Specific Activity (LSA-II), 7, UN 3321, Fissile Excepted; Solid, Metal Oxides; dated July 13, 2009
RSR-09-19; Radioactive Material, LSA-1, 7, UN2912, Fissile Excepted; dated March 6, 2009, 40' Sealand of Contaminated Laundry
RSR-09-22; Radioactive Material; LSA-1, 7, UN 2912; dated March 26, 2009; 20' Sealand Diver Platform
RSR-09-25; Radioactive Material, Surface Contaminated Object (SCO-II), 7, UN2913; dated June 23, 2009; "Clean" Electronic Equipment Boxes
RSR-09-18; Radioactive Material, Type A Package, 7, UN 2915; dated March 5, 2009; Type A Containers of Contaminated Equipment

RSR-09-17; Radioactive Material, Type A Package, 7, UN 2915; dated March 4, 2009; GE Metal Boxes
RSR-0913; Radioactive Material, Low Specific Activity (LSAII), 7, 3321, dated February 20, 2009; 4' General Design Containers of Control Rad Boxes
RSR-08-13; Radioactive Material; Low Specific Activity (LSA-II), 7, UN 3321, Fissile Excepted, RQ-Radionuclide Condensate Resin Shipment; dated May 29, 2008
RSR-08-18; Radioactive Material, LSA II, 7, UN 3321, Fissile Excepted; dated October 20, 2008; Dewatered Condensate Resin in Radlok 195, Poly HIC

Section 4OA1

NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 5
ACP 1420.4; NRC & WANO Performance Indicator Reporting; Revision 13
FPL Nuclear Administrative Procedure-206; NRC Performance Indicators; Revision 3
DAEC Open Work Order Report for the RCIC System
DAEC Open Work Order Report for the HPCI System
DAEC Open Work Order Report for the 'A' and 'B' SBDG Systems
DAEC Level A and B CAP Items Report for the RCIC System
DAEC Level A and B CAP Items Report for the HPCI System
DAEC Level A and B CAP Items Report for the 'A' and 'B' SBDG System
DAEC MSPI Derivation Report for the Heat Removal System through June 2009
DAEC MSPI Derivation Report for the High Pressure Injection System through June 2009
DAEC MSPI Derivation Report for the Emergency AC Power System through June 2009
EPDM 1010, Performance Indicator Data Retrieval Worksheets, 3rd quarter 2008 through 1st Quarter 2009
EPDM 1013; Emergency Siren (ANS) and Siren Program; Monthly Siren Test Results, 3rd quarter 2008 through 1st Quarter 2009
EPDM 1016, ERO Augmentation Drill and Testing Program; dated November 2007 through June 2009
Emergency Response Organization ERO Drill Key Participation Indicator Report; 3rd quarter 2008 through 1st Quarter 2009

Section 4OA2

PI-AA-204; Condition Identification and Screening Process; Revision 4
PI-AA-205; Condition Evaluation and Corrective Action; Revision 3
DAEC Corrective Action Effectiveness Review Manual; Revision 3
ACP 101.11: Control of Posted Documents, Labels, and Signs; Revision 5
ACP 1410.11; Control of Operator Aids; Revision 4
ACP 1410.12; Operator Burden Program; Revision 18
CAP 069147; NCAQ – Operations Audits Not Completed and No Ops Manager Approval is Documented
CAP 069148; NCAQ – An Apparent Operator Aid is Not Being Controlled As Such
EN-AA-203-1001; Operability Determinations/Functional Assessments; Revision 1
CAP 068701; CAQ – Circuit Sensor Flanges not Shown on ISO-JBD-28-1/2 nor Accounted for
CAP 068263; CAQ – Minro Bolting Issues Found During Standby Filter Unit Walk Down Required under CA 052742
CAP 057435; CAQ – SBDG Scavenging Air to Lube Oil Heat Exchanger Bolting Thread Engagement
CAP 060657; CAQ – Bolted Joint Between 1E053A1 and 1E053A2 Doesn't have Full Thread Engagement

CAP 062356; CAQ – Pipe Stress at Weld on the HPCI Vent Line off HBB006 does not meet Code Allowables

CAP 067132; CAQ – CV1956A Failed to Open when A ESW Started for A SBDG STP 3.8.1-04A

CAP 066168; NCAQ – Q200 for Drain/Vent Valves on RHRSW/ESW Line to Dilution Structure

CAP 069987; OPR [Operability Determination] Process

CAP 069503; CAQ – Core Spray Piping Support HBB-2-H-7 Small Bore Pipe Support

CAP 069484; Walk Down of Core Spray Piping Supports Identify Differences

CAP 066750; CAQ – HPCI Torus Pipe Support HBB-8-SR-3 not in Accordance with Design

LIST OF ACRONYMS USED

AC	Alternating Current
ACP	Administrative Control Procedure
ADAMS	Agencywide Document Access Management System
AFP	Area Fire Plan
ANS	Alert and Notification System
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CAQ	Condition Adverse to Quality
CFR	Code of Federal Regulations
DAEC	Duane Arnold Energy Center
DAW	Dry Active Waste
DRP	Division of Reactor Projects
DOT	Department of Transportation
EAL	Emergency Action Level
EC	Emergency Coordinator
EMP	Equipment-Specific Maintenance Procedure
EP	Emergency Preparedness
ERO	Emergency Response Organization
ESW	Emergency Service Water
HPCI	High Pressure Coolant Injection
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter
IOD	Immediate Operability Determination
IP	Inspection Procedure
LCO	Limiting Condition for Operation
MH	Manhole
MSPI	Mitigating Systems Performance Index
NCAQ	Condition Not Adverse to Quality
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
OBD	Operable but Degraded
OBN	Operable but Nonconforming
OI	Operating Instruction
OOS	Out-of-Service
OPR	Operability Recommendation
OWA	Operator Workaround
P&ID	Piping and Instrument Drawing
PARS	Publicly Available Records
PI	Performance Indicator
POD	Prompt Operability Determination
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RWS	River Water Supply
SBDG	Standby Diesel Generator
SBLC	Standby Liquid Control
SDP	Significance Determination Process
SFU	Standby Filter Unit

SSC	Systems, Structures, and Components
STP	Surveillance Test Procedure
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UHS	Ultimate Heat Sink
URI	Unresolved Item
WO	Work Order

C. Costanzo

-2-

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Sincerely,

/RA/

Kenneth Riemer, Chief
Branch 2
Division of Reactor Projects

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05000331/2009004

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