



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

May 2, 2008

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

**SUBJECT: DUANE ARNOLD ENERGY CENTER NRC INTEGRATED INSPECTION
REPORT 05000331/2008002**

Dear Mr. Anderson:

On March 31, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Duane Arnold Energy Center. The enclosed report documents the inspection findings, which were discussed on April 10, 2008, with you and other members of your staff.

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

Based on the results of this inspection, one NRC-identified finding of very low safety significance was identified. The finding involved a violation of NRC requirements. However, because of the very low safety significance, and because the issue was entered into your corrective action program, the NRC is treating the issue as a Non-Cited Violation (NCV) in accordance with Section VI.A.1 of the NRC Enforcement Policy. Additionally, one licensee identified violation is listed in Section 4OA7 of this report.

If you contest the subject or severity of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with 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 accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA by N. Shah, Acting for/

Kenneth Riemer, Chief
Branch 2
Division of Reactor Projects

Docket No. 50-331; 72-032
License No. DPR-49

Enclosure: Inspection Report 05000331/2008002
(w/Attachment: Supplemental Information)

cc w/encl: M. Nazar, Senior Vice President and Chief
Operating Officer
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J. Bjorseth, Site Director
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Chief Radiological Emergency Preparedness Section,
Dept. Of Homeland Security
M. Rasmusson, State Liaison Officer

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SUBJECT: DUANE ARNOLD ENERGY CENTER NRC INTEGRATED INSPECTION
REPORT 05000331/2008002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-331; 72-032
License No: DPR-49

Report No: 05000331/2008002

Licensee: FPL Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: January 1 through March 31, 2008

Inspectors: R. Orlikowski, Senior Resident Inspector
R. Baker, Resident Inspector
S. Sheldon, Senior Reactor Engineer
T. Go, Health Physicist

Observers: None

Approved by: K. Riemer, Chief
Branch 2
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000331/2008002; 01/01/2008 – 03/31/2008; Duane Arnold Energy Center; Identification and Resolution of Problems.

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

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

Green. A finding of very low safety significance, and an associated NCV of Technical Specification (TS) 5.2.2.e, Administrative Controls, Organization, Unit Staff, was identified by the inspectors for the licensee's failure to follow the Administrative Control Procedure (ACP) 101.4, "Overtime Limits and Requirements," Section 3.1 (3) requirement for assuring that personnel do not exceed the overtime requirements without prior authorization. The licensee entered this issue into its corrective action program to evaluate the adequacy and effectiveness of the ACP, and to identify required procedure revisions to prevent recurrence.

Using the minor questions in Appendix B of IMC 0609, the inspectors determined that the finding was more than minor because the issue was associated with the Initiating Events Cornerstone attribute of Human Performance and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the unrecognized periods of excessive work hours would increase the likelihood of human errors during refueling outage activities and response to plant events, i.e. fire watches. Since these periods were unrecognized and not authorized in advance by management, the excessive work hours could result in more significant safety concerns. Because this issue occurred during the last refueling outage, the finding was evaluated in accordance with IMC 0609, Appendix G, "Shutdown Operations SDP." Using Checklist 7, "Boiling Water Reactor (BWR) Refueling Operation with RCS Level > 23", contained in Attachment 1, the inspectors determined that since the plant had appropriately met the safety function guidelines for core heat removal, inventory control, power availability, containment integrity, and reactivity control, and since a phase 2 or phase 3 analysis was not required, the finding screened as Green using Figure 1.

This finding has a cross-cutting aspect in the area of Human Performance for the Resources safety culture component because the licensee did not ensure that sufficient trained personnel and procedures were available and adequate to assure nuclear safety by maintaining work hours within working hour limits. [H.2.(b)] (Section 40A2.3)

B. Licensee-Identified Violations

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

REPORT DETAILS

Summary of Plant Status

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

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R02 Evaluations of Changes, Tests, or Experiments (71111.02)

.1 Review of 10 CFR 50.59 Evaluations and Screenings

a. Inspection Scope

The inspectors followed up on an Unresolved Item (URI), URI 05000331/2007007-03, which was opened during a recent baseline inspection of the Evaluation of Changes, Tests, or Experiments and Permanent Plant Modifications. Specific documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significant were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- 'A' Standby Diesel Generator (SBDG) with the 'B' SBDG out-of-service (OOS) for planned maintenance;
- 'A' River Water Supply (RWS) system with the 'B' RWS system OOS for planned maintenance; and
- Reactor Core Isolation Cooling (RCIC) with the High Pressure Coolant Isolation (HPCI) System OOS for planned maintenance.

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, Updated Final Safety Analysis Report (UFSAR), Technical Specification (TS) requirements, Administrative TS, outstanding work orders, 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 corrective action program with the appropriate significance characterization. Documents reviewed are listed in the Attachment.

These inspection activities constituted three partial system walkdown samples as defined in Inspection Procedure 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) 8, Reactor Building Standby Gas Treatment System and Motor Generator Set Rooms, Elevation 786'-0";
- AFP 18, North Turbine Building Ground Floor, and Tube Pulling Area, Elevation 757'-6";
- AFP 19, South Turbine Building Ground Floor, Elevation 757'-6";
- AFP 26 and 27, Control Building Control Room Complex and Control Room Heating, Ventilation, and Air Conditioning (HVAC) Room, Elevations 786'-0" and 800'-4";
- AFP 31 and 32, Intake Structure Pump Rooms and Traveling Screen Areas, Elevations 754'-0" and 767'-0";
- AFP 34, Radwaste Building Drum Filling, Storage, and Shipping, Elevation 757'-6";
- AFP 35, Radwaste Treatment and Access Area, Elevation 773'-6"; and
- AFP 36, Radwaste Building Precoat and Access Area, Control Room, and HVAC Equipment Room, Elevation 786'-0".

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 had implemented adequate compensatory measures for OOS, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later

additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment, 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 corrective action program.

These inspection activities constituted eight quarterly fire protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On February 20, February 27, and March 10, 2008, the inspectors observed the fire brigade team activation and deployment for drill purposes to combat a fire in the turbine building from an ignited hydrogen leak, an 'A' Class fire in the low level radwaste building, and an 'A' Class fire in the warehouse receiving area. The observations were used to determine the readiness of the plant fire brigade teams to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre planned strategies; (9) adherence to the preplanned drill scenario; and (10) drill objectives.

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

b. Findings

No findings of significance were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents,

including the UFSAR, engineering calculations, and abnormal operating procedures (AOPs), for licensee commitments. The specific documents reviewed are listed in the Attachment. 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:

- HPCI Room and RCIC Room.

These inspection activities constituted one internal flooding sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On February 25 and March 3, 2008, the inspectors observed crews of licensed operators in the plant's simulator during licensed operator requalification (LOR) examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

These inspection activities constituted one quarterly LOR program sample as defined in Inspection Procedure 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:

- Offsite Power; and
- Control Building HVAC.

The inspectors reviewed plant systems to assess the maintenance effectiveness. Documents reviewed are listed in the Attachment. The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Inspection activities included, but were not limited to, 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/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

These inspection activities constituted two quarterly maintenance effectiveness samples as defined in Inspection Procedure 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:

- Troubleshooting of Reactor Level Control during Work Week 9801;
- Troubleshooting Associated with Main Generator #7 Bearing Rising Vibration Levels and 'A' Recirculation Pump Motor Generator Scoop Tube Lockup During Work Week 9803;
- SBDG Unavailability Tracking while Performing Surveillance Testing During Work Week 9806;
- Emergent Work Due to Main Steam Reheater Drain Valve Controller Failure During Work Week 9809; and
- Work Activity Removed from the Schedule to Evaluate Actual Risk Significance for Potential Loss of Feedwater During Work Week 9813.

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 a licensed senior operator, 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.

These inspection activities constituted five samples as defined in Inspection Procedure 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:

- Residual Heat Removal Pump Suction Pressure not in the Desired Range;
- Current Operability of the 'A' and 'B' SBDG After Identifying Blower Bearing Lube Oil Supply Line Leak on the 'B' SBDG;
- Operability Recommendation (OPR) 000376, Washington Group International (WGI) Analysis Raises Concerns about Motor Operated Valve (MOV) Motor Starter Pickup Voltage; and
- Condition Evaluation (CE) 006159, Past Operability Evaluation for the 'B' Emergency Diesel Generator (EDG) Oil Leak on Supply Line to Blower.

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 TSs 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.

These inspection activities constituted four samples as defined in Inspection Procedure 71111.15.-05

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modifications:

- Temporary Modification (TM) 08-003, Furmanite Repair of the Body-to-Bonnet Leak on the 'A' Reactor Feed Pump Suction Valve, V07-001; and
- TM 08-004, Level Transmitter 1056/Level Controller 0157 Cross-Tie, to Control Both the Moisture Separator Reheater Second Stage Drain Tank Dump and Drain Valves Using the Same Level Transmitter.

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(s). 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.

These inspection activities constituted two temporary modification samples as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings of significance were identified.

.2 Review of Permanent Plant Modifications in Support of Future Power Uprate Activities

a. Inspection Scope

The inspectors used the guidance contained in Inspection Procedure 71111.18 to review two planned permanent plant modifications: an upgrade to control room indications and installation of new feedwater flow measurement equipment. These modifications were planned to support future power uprate activities as described in section 4OA5.2.

These inspection activities were selected in accordance with Inspection Procedure 71004-02 guidance for choosing samples of risk-significant plant modifications. This inspection did not constitute the completion of any samples for baseline inspection procedures.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- Preventative Work Order (PWO) 1141516, Replace Packing in the 'B' Emergency Service Water (ESW) pump;
- PWO 1140913, Complete the 2-Year Mechanical Inspection of the 'B' SBDG;
- Corrective Work Order (CWO) A80713, Perform Diagnostic Testing and Repair of CV 4914, the 'B' RWS Loop Inlet Isolation to the Stilling Basin;
- PWO 1135586, Replace HPCI Woodward EG-M Governor Module;
- CWO A80624, Repair/Replace HBB011 for Steam Leak on HPCI Turbine Reversing Chamber Ring Drain Pipe; and
- CWO A83092, Perform Troubleshooting Instruction Form to Verify/Correct Intermittent Invalid Overspeed Alarm on 'B' SBDG.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (TMs 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 Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action

program and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment.

These inspection activities constituted six samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 Routine Surveillance Testing

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) 3.8.1-03, 'A' Standby Diesel Generator Operability Test;
- STP 3.8.1-06, 'B' Standby Diesel Generator Operability Test (Fast Start);
- STP 3.3.6.1-11, Reactor LO-LO Water Level Anticipated Transient Without Scram (ATWS)-RPT [Recirculation Pump Trip]/ARI [Alternate Rod Insertion] Trip/RWCU Isolation) and LO-LO-LO Water Level (Main Steam Line Isolation Trip) Channel Functional Test; and
- STP 3.8.1-04, 'A' Standby Diesel Generator Operability Test (Slow Start from Normal Start Air).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as-left setpoints were within required ranges; and the calibration frequency 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, 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 corrective action program. Documents reviewed are listed in the Attachment.

These inspection activities constituted four routine surveillance testing samples as defined in Inspection Procedure 71111.22.

b. Findings

No findings of significance were identified.

.2 In-service Testing

a. Inspection Scope

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

- STP 3.5.1-07, HPCI System Simulated Automatic Actuation; and
- STP 3.5.1-05, HPCI System Operability Test.

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as-left setpoints were within required ranges; and the calibration frequency 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 in-service testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers Code, and reference values were consistent with the system design basis; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were

appropriately documented and dispositioned in the corrective action program. Documents reviewed are listed in the Attachment.

These inspection activities constituted two in-service inspection samples as defined in Inspection Procedure 71111.22.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

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 March 12, 2008, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the training simulator and the technical support center to verify that 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 verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package listed at the end of this report.

These inspection activities constituted one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Review of Licensee Performance Indicators for the Occupational Exposure Cornerstone

a. Inspection Scope

The inspectors reviewed the licensee's occupational exposure control cornerstone performance indicators (PIs) to determine whether or not the conditions surrounding the PIs had been evaluated, and identified problems had been entered into the corrective action program for resolution.

This review constituted one sample as defined in Inspection Procedure 71121.01.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors reviewed licensee controls and surveys for the following three radiologically significant work activities within radiation areas, high radiation areas, and airborne radioactivity areas in the plant, and determined if radiological controls including surveys, postings, and barricades were acceptable:

- Maintenance of generator brushes in Turbine Building;
- Steam jet air ejector area cleanup; and
- Reactor building exhaust shaft radiation monitor functional test.

The inspectors reviewed the Radiation Work Permits (RWPs), and work packages used to access these areas, and other high radiation work areas to identify the work control instructions and control barriers that had been specified. Electronic dosimeter alarm setpoints for both integrated dose and dose rate were evaluated for conformity with survey indications and plant policy. Workers were interviewed to assess whether they were aware of the actions required when their electronic dosimeters noticeably malfunctioned or alarmed.

The inspectors walked down and surveyed (using an NRC survey meter) these areas, to determine if the prescribed RWP, procedure, and engineering controls were in place, that licensee surveys and postings were complete and accurate, and that air samplers were properly located.

The inspectors also reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within spent fuel or other storage pools. Specifically, a walkdown of the refuel floor was conducted. Overall, the radiological control for non-fuel materials stored in the spent fuel pools was evaluated to ensure adequate barriers were in-place to reduce the potential for the inadvertent movement of these materials and to determine compliance with the licensee's procedure and for consistency with NRC regulatory guidance.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed a sample of the licensee's self-assessments, audits, license events reports (LERs), and special reports related to the access control program to

determine whether identified problems were entered into the corrective action program for resolution.

The inspectors reviewed corrective action reports, related to access controls, and high radiation area radiological incidents (non-Performance Indicators (PIs)) identified by the licensee in high radiation areas (HRAs) <1R/hr). Staff members were interviewed, and corrective action documents were reviewed to determine whether follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

- 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.

The inspectors evaluated the licensee's process for problem identification, characterization, prioritization, and assessed whether problems were entered into the corrective action program and resolved. For repetitive deficiencies and/or significant individual deficiencies in problem identification and resolution, the inspectors assessed whether the licensee's self-assessment activities were capable of identifying and addressing these deficiencies.

The inspectors reviewed licensee documentation packages for all PI events occurring since the last inspection to determine if any of these PI events involved dose rates >25 R/hr at 30 centimeters or >500 R/hr at 1 meter. Barriers were evaluated for failure and to determine if there were any barriers left to prevent personnel access. Unintended exposures >100 millirem total effective dose equivalent (or >5 rem shallow dose equivalent or >1.5 rem lens dose equivalent), were evaluated to determine if there were any regulatory overexposures or if there was a substantial potential for an overexposure.

These reviews constituted four samples as defined in Inspection Procedure 71121.01.

b. Findings

No findings of significance were identified.

.4 Job-In-Progress Reviews

a. Inspection Scope

The inspectors observed the following two jobs that were being performed in radiation areas, airborne radioactivity areas, or high radiation areas for observation of work activities that presented the greatest radiological risk to workers:

- Maintenance of generator brushes in Turbine Building; and
- Steam jet air ejector area cleanup.

The inspectors reviewed radiological job requirements for these activities including RWP requirements and work procedure requirements, and attended As-Low-As-Is-Reasonably-Achievable job briefings.

Job performance was observed with respect to these requirements to assess whether radiological conditions in the work area were adequately communicated to workers through pre-job briefings and postings. The inspectors also assessed if radiological controls were adequate, including required radiation, contamination, and airborne surveys for system breaches.

These reviews constituted two samples as defined in Inspection Procedure 71121.01.

b. Findings

No findings of significance were identified.

.5 High Risk-Significant, High Dose Rate High Radiation Area (HRA) and Very High Radiation Area Controls

a. Inspection Scope

The inspectors held discussions with the Radiation Protection (RP) Manager concerning high dose rate/HRA, and very high radiation area controls and procedures, including procedural changes that had occurred since the last inspection, in order to determine whether any procedure modifications could substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with RP general supervisors the controls that were in place for special areas that had the potential to become very high radiation areas during certain-plant operations, to determine if these plant operations required communication beforehand with the RP group, so as to allow corresponding timely actions to properly post and control the radiation hazards.

The inspectors conducted plant walkdowns to assess the adequacy of the posting and locking of entrances to high dose rate HRAs, and very high radiation areas.

These reviews constituted three samples as defined in Inspection Procedure 71121.01.

b. Findings

No findings of significance were identified.

.6 Radiation Worker Performance

a. Inspection Scope

During job performance observations, the inspectors assessed radiation worker performance with respect to stated radiation protection work requirements and evaluated whether workers were aware of the significant radiological conditions in their workplace, the RWP controls and limits in place, and that their performance had accounted for the level of radiological hazards present.

The inspectors reviewed radiological problem reports, which found that the cause of the event was due to radiation worker errors to determine if there was an observable pattern traceable to a similar cause, and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. Problems or issues along with planned and taken corrective actions were discussed with the RP Manager.

These reviews constituted two samples as defined in Inspection Procedure 71121.01.

b. Findings

No findings of significance were identified.

.7 Radiation Protection Technician Proficiency

a. Inspection Scope

During job performance observations, the inspectors evaluated Radiation Protection Technician performance with respect to radiation protection work requirements and evaluated whether they were aware of the radiological conditions in their workplace, the RWP controls and limits in place, and if their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed radiological problem reports for which the cause of the event was radiation protection technician error. In addition, the inspectors assessed whether there was an observable pattern traceable to a similar cause, and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

These reviews constituted two samples as defined in Inspection Procedure 71121.01.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the Fourth Quarter 2007 performance indicators for any obvious inconsistencies prior to its public release in accordance with IMC 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings of significance were identified.

.2 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours performance indicator for the period from the Second Quarter 2007 through Fourth Quarter 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in Revision 5 of the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of April 2007 through December 2007 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constituted one unplanned scrams per 7000 critical hours sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.3 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams with Complications performance indicator for the period from the Second Quarter 2007 through Fourth Quarter 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in Revision 5 of the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, corrective action process documents, event reports and NRC Integrated Inspection Reports for the period of April 2007 through December 2007 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constituted one unplanned scrams with complications sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.4 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Transients per 7000 Critical Hours performance indicator for the period from the Second Quarter 2007 through Fourth Quarter 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in Revision 5 of the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, corrective action process documents, maintenance rule records, event reports and NRC Integrated Inspection Reports for the period of April 2007 through December 2007 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constituted one unplanned transients per 7000 critical hours sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.5 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled the licensee's PI submittals for the periods listed below. The inspectors used PI definitions and guidance contained in Revision 5 of NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to determine if the PI data were accurate. The following PIs were reviewed:

The inspectors reviewed the licensee's determination of the PI for the occupational radiation safety cornerstone to determine if the licensee accurately assessed the performance indicator and had identified all occurrences. Specifically, the inspectors reviewed the licensee's corrective action process documents for 2007/2008 and associated occupational exposure PI data to ensure that there were no PI occurrences that were not identified by the licensee. Additionally, as part of plant walkdowns, the inspectors selectively examined the adequacy of posting and controls for locked HRAs. The inspectors interviewed members of the licensee's staff who were responsible for performance indicator data acquisition, verification and reporting, to determine if their review and assessment of the data was adequate.

This review constituted one occupational exposure control effectiveness sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of items Entered Into the Corrective Action Program

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program 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 corrective action program 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 corrective action program. 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 Selected Issue Follow-up Inspection: Administration and Documentation of Overtime Limits, Requirements, and Deviations

a. Inspection Scope

Based upon recently identified industry issues concerning overtime deviation controls during extended outages at operating facilities, the inspectors reviewed the licensee's documentation of approved overtime deviations and compared the information to data obtained for a sample of individuals' plant access records. The inspectors' review focused on the first two weeks of the most recent refueling outage, from February 4 through February 15, 2007. The inspectors' activities included, but were not limited to, verifying work hours for the time periods surrounding the dates of the approved deviations, comparing review data to the licensee's TS requirements and procedures for controlling and documenting overtime deviations to the work hour limitations. The documents reviewed during this inspection activity are listed in the Attachment.

The above activities constituted completion of one annual in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Observations

The inspector's assessment of the licensee's control and documentation of overtime deviations for personnel potentially conducting safety-related activities during the first two weeks of the refueling outage noted several inconsistencies in the level of supervisory and departmental management implementation of Administrative Control Procedure (ACP) 101.4 requirements. The inspectors determined that there was a lack of rigor in the level of control implemented for supervision of contractor work hours and deviations to overtime limits. The deficiencies noted in the approval and documentation of required overtime deviations resulted in numerous instances where, in the worst case, personnel did not have overtime deviations approved in advance of exceeding the work hour limits.

Specific examples of control inconsistencies include:

- Eighteen of the 25 individual samples evaluated had examples where the personnel exceeded a work hour limit (working more than 72 hours in any seven day period) without receiving advanced authorization for the deviation;
- Six of the 25 individual samples evaluated had examples where the personnel were approved for exceeding overtime limits, but did not work sufficient hours to exceed any work hour limits; three of these examples resulted from the personnel terminating their outage assignment early, however, this was one week prior to the deviation being approved; and
- Since the current revision of ACP 101.4 states that the procedure applies to all salaried, hourly, union, as well as all contractor and vendor personnel working at the facility, and does not segregate personnel performing activities which are directly safety-related, the relative significance of these activities is inconsistently emphasized.

The licensee has revised the ACP to remove a statement under section 3.2 that stated, "during refueling outages, management may provide blanket overtime authorization,

within the requirements of this procedure.” This will ensure that all overtime deviation authorizations are reviewed on an individual case-by-case basis.

Additionally, the licensee generated a corrective action process (CAP) document to perform an evaluation of the effectiveness of the current ACP and track completion of assigned corrective actions (CAP 055182). The inspectors plan to continue inspection activities of the licensee’s efforts to improve control and documentation overtime limits and deviations by reviewing the cumulative effect of their corrective actions.

c. Findings

Introduction: A finding of very low safety significance and an associated NCV of TSS was identified by the inspectors for the licensee failing to follow the ACP 101.4, “Overtime Limits and Requirements,” Section 3.1 (3) requirement for assuring that personnel do not exceed the overtime requirements without prior authorization. The licensee entered this issue into its corrective action program for evaluation and resolution to prevent recurrence.

Description: During a review of recent industry operating experience and identified issues concerning overtime deviation controls during extended outages at other facilities, the inspectors identified an item in the licensee’s corrective action program concerning the administration and documentation of approved deviations for exceeding overtime limits during the most recent refueling outage. The inspector reviewed the licensee’s documentation of approved overtime deviations and compared the information to data obtained from a sample of individuals’ plant access records, to verify work hours for the time periods surrounding the dates of the approved deviations. The specific focus period for the inspector’s review was during the first two weeks of the refueling outage, from February 4 through February 15, 2007. The inspectors compared these results to the licensee’s TS requirements and procedures for controlling and documenting overtime deviations to the work hour limitations.

Analysis: The inspectors determined that the failure to recognize all periods where personnel subject to the requirements of the ACP 101.4 will exceed overtime limits, and authorize overtime deviation in advance, was contrary to the licensee’s ACP 101.01, “Procedure Use and Adherence,” and was a performance deficiency warranting further evaluation.

Using the minor questions in Appendix B of IMC 0609, the finding was determined to be more than minor because the finding was associated with the Initiating Events Cornerstone attribute of Human Performance and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the unrecognized periods of excessive work hours would increase the likelihood of human errors during refueling outage activities and response to plant events, i.e. fire watches. Since these periods were unrecognized and not authorized in advance by management, the excessive work hours could result in more significant safety concerns.

The inspectors determined that since this issue occurred during the last refueling outage and that no significant instances had been identified following the outage, the finding could be evaluated in accordance with IMC 0609, Appendix G, “Shutdown Operations SDP.” The inspectors used Checklist 7, “BWR Refueling Operation with

RCS Level > 23””, contained in Attachment 1 and determined that the plant had appropriately met the safety function guidelines for core heat removal, inventory control, power availability, containment integrity, and reactivity control. Therefore, the finding did not require a phase 2 or phase 3 analysis and screened as very low safety significance, Green, using Figure 1.

This finding has a cross-cutting aspect in the area of Human Performance for the Resources safety culture component because the licensee did not ensure that sufficient trained personnel and procedures were available and adequate to assure nuclear safety by maintaining work hours within working hour limits. [H.2.(b)]

Specifically, supervisors and responsible department managers did not recognize all periods of work hours that exceeded overtime limits, and thereby did not authorize deviations in advance for those personnel affected. This deficiency directly impacts the licensee’s ability to ensure sufficient qualified personnel to maintain work hours within working hour limits.

Enforcement: TS Section 5.2.2.e states, in part, that “Administrative procedures shall be developed and implemented to limit the working hours of personnel who perform safety-related functions . . . Any deviation from the working hour guidelines shall be authorized in advance by the responsible department manager or responsible department manager’s designee, in accordance with approved administrative procedures . . .” The licensee established ACP 101.4, “Overtime Limits and Requirements,” as the implementing procedure for control, approval, and documentation of overtime deviations for affected personnel.

Contrary to the above, during the week of February 11, 2007, with the plant shutdown for the Cycle 20 refueling outage, numerous instances of personnel exceeding an overtime limit occurred without the required advance authorized deviations from responsible department managers. Specifically, responsible department managers did not recognize that personnel with approved deviations for an initial 7-day work period ending February 10, would continue to exceed the 7-day limit for the next 4 or 5 days (February 11 through 15) due to initially working 5 consecutive 12-hour days followed by consecutive 10-hour days with only 14 hours off in between the work periods. This resulted in these personnel exceeding overtime limits without an approved overtime deviation. Because this violation was of very low safety significance, was not repetitive or willful, and the issue was entered into the licensee’s corrective action program as CAP 056730, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000331/2008002-01).

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

.1 Review of Personnel Performance in Response to a Failed Open Dump Valve on a Moisture Separator Reheater Drain Tank While Operating at 100 Percent Power

a. Inspection Scope

The inspectors reviewed the plant’s response to a failure of the ‘A’ Moisture Separator Reheater Drain Tank Dump Valve Level Controller. This resulted in the dump valve failing open, a loss of feedwater heating event, and a commensurate power excursion. Documents reviewed during this inspection are listed in the Attachment.

These inspection activities constituted one sample as defined in Inspection Procedure 71153-05.

b. Findings

No findings of significance were identified.

.2 Review of Personnel Performance During a Preplanned Non-Routine Plant Evolution

a. Inspection Scope

The inspectors reviewed the plant's response to an infrequently performed evolution of performing a downpower evolution for a rod sequence exchange and required quarterly surveillance procedures. The inspectors also observed troubleshooting of control rod drive 14-11 while the plant was at reduced power. Documents reviewed during this inspection are listed in the Attachment.

These inspection activities constituted one sample as defined in Inspection Procedure 71153-05.

b. Findings

No findings of significance were identified.

.3 (Closed) LER 05000331/2007-010-00: Safety System Functional Failure of Alternate Preferred Offsite Power Source

On November 30, 2007, at 1339 CST, with the plant at 100% power, the licensee identified that at the minimum grid contingency voltage (i.e. 98.8%), the Standby Transformer was not capable of providing adequate voltage to the 4160 volt essential buses under defined loss of coolant accident conditions. The postulated voltage drop would result in actuation of the degraded voltage relays causing the busses to automatically transfer to their respective EDGs. Analysis determined that a minimum contingency grid voltage in excess of 102.8% would be required to prevent the automatic transfer if a loss of coolant accident occurred and required safety systems actuated. This was never the case, and therefore the alternate preferred offsite power source (i.e. the Standby Transformer) was inoperable during the time period from April 3, 2006, through implementation of Engineering Change Package 1846 on December 14, 2007. The licensee entered TS Limiting Condition of Operation (LCO) 3.8.1 Condition A, following discovery of the degraded condition. Note that the period of inoperability started commensurate with the licensee's response submittal for Generic Letter 2006-02, dated April 3, 2006, based upon the commitment to declare both offsite sources of offsite power inoperable if it is determined that a trip of the Duane Arnold Energy Center (DAEC) generator would lead directly to voltages in the DAEC switchyard below the trip setpoints for loss of offsite power instrumentation.

A review of the licensee's electronic log entries indicated that on four separate occasions during the time period from April 3, 2006, through September 20, 2007 (April 10, 2006, May 18 2006, December 13, 2006, and September 17, 2007), planned TS LCO 3.8.1 condition A was entered for the preferred offsite power source (start-up transformer). This resulted in both offsite power sources being inoperable without the associated

TS LCO action statements being entered, and on the two latter dates, the associated completion times for the action statements being exceeded. Also, the resulting plant conditions constituted Safety System Functional Failures, and conditions prohibited by TS. The licensee evaluated this condition to be of very low safety significance due to the following reasons:

- the combined frequency of small, medium, and large loss of coolant accidents is estimated to be one occurrence every 75 years for DAEC;
- two SBDGs are available for providing emergency AC power to the essential busses; and
- the supply of power from the Startup Transformer to the two non-essential busses (1A1 and 1A2) is not expected to be interrupted since their bus undervoltage relay setpoints are much lower than that of the essential busses, and therefore, feedwater and condensate pumps are expected to remain operating and inject water into the reactor vessel.

Corrective actions taken by the licensee included implementing a modification to change the tap setting of the Standby Transformer to boost its output voltage by ~2.8%, coordinating with the American Transmission Company to raise the minimum contingency switchyard voltage alarm setpoint from 98.8% to 99.2%, resetting the nominal setpoint of the essential bus degraded voltage relays from 92.5% down to 91.6%, and revising plant operating procedures to limit the operation of Residual Heat Removal (RHR) and Residual Heat Removal Service Water pumps to 6 of 8 running at any one time.

This LER was reviewed by the inspectors who determined that this finding was more than minor because the TS limits were exceeded when the LCOs were not entered and the allowable outage times were not met. This finding affects the Initiating Events Cornerstone and was evaluated as having a very low safety significance (Green) using IMC 0609, Attachment 4, "Significance Determination Process Phase 1 – Initial Screening and Characterization of Findings," Exhibit 1, "User Guidance," since the finding does not contribute to both the likelihood of a reactor trip AND the likelihood that mitigation equipment or functions will not be available. The licensee entered this issue into their corrective action program as CAP 054037. This licensee-identified finding involved a violation of TS 3.8.1, AC Sources – Operating, and the enforcement aspects of the violation are discussed in Section 4OA7. Documents reviewed as part of this inspection activity are listed in the Attachment. This LER is closed.

This inspection activity constituted one sample as defined in Inspection Procedure 71153-05.

.4 (Closed) LER 05000331/2007-011-00: Undervoltage Condition Resulted in the Actuation of the Emergency Diesel Generators

On December 1, 2007, at 1435 CST, while operating at 100% power with the Standby Transformer inoperable due to latent design issues, a fault developed on the 161 kV electrical transmission line to the Fairfax substation causing DAEC switchyard voltage to dip to ~ 62%. Switchyard circuit breakers (CBs)-3110 and CB-8090 opened to clear the fault from the 161 kV East Bus in approximately 3 cycles. At the time, the essential busses 1A3 and 1A4 were being supplied from the Startup Transformer. Since the Startup Transformer is supplied directly from the switchyard, the essential busses

experienced a voltage drop similar to the switchyard voltage and dropped to ~ 62% for 3 cycles. This resulted in a start signal being sent to both EDGs (< 65% voltage on the respective 4 kV essential bus). Both Diesel Generators started as expected, but neither diesel generator connected to its respective bus since the supply breakers from the Startup Transformer remained closed as essential bus voltage recovered immediately once CB-3110 and CB-8090 opened and cleared the fault. The licensee evaluated this condition to have no nuclear safety significance since the EDGs were capable of fulfilling their safety function throughout the event, and the Startup Transformer continued to power the essential busses. Additionally, the automatic starting of the EDGs had no personnel or radiological safety significance, and this event did not result in a Safety System Functional Failure. Corrective actions included securing both the EDGs and returning them to a standby readiness condition.

This LER was reviewed by the inspectors with no further action required and no findings of significance identified. Documents reviewed as part of this inspection activity are listed in the Attachment. This LER is closed.

This inspection activity constituted one sample as defined in Inspection Procedure 71153-05.

40A5 Other Activities

.1 (Closed) URI 05000331/2007007-03

A URI was opened during the 2007 baseline inspection of the Evaluation of Changes, Tests, or Experiments and Permanent Plant Modifications, Inspection Report 05000331/2007007 Division of Reactor Safety (DRS) involving a digital upgrade for the Reactor Building Vent Shaft, and Control Building Air Intake Radiation Monitors. In 2001, Duane Arnold replaced the analog Reactor Building Vent Shaft and Control Building Air Intake Radiation Monitoring systems with a new digital Sorrento radiation monitoring system. This change was evaluated by the licensee under 10 CFR 50.59. However, after initial review of the 10 CFR 50.59 evaluation, the inspectors were unable to verify that the modification did not require prior approval.

Nuclear Energy Institute (NEI) 01-01/EPRI TR-102348, "Guideline on Licensing Digital Upgrades," provides NRC endorsed guidance that a licensee should use for evaluating this type of digital upgrade in accordance with 10 CFR 50.59. The inspectors subsequently reviewed documents associated with the modification to verify that the digital equipment installed was sufficiently simple, (with one input and a few outputs) that a system-level failure modes analysis met the requirements for a failure analysis, similar to that described in example 5-1 of NEI 01-01. The inspectors reviewed the watchdog timer design and concluded that it was appropriate to credit the watchdog timer to address software failure modes. The inspectors observed that the licensee should also have credited the structured software development process and associated quality assurance program to address potential common mode software failures.

Based upon this more extensive review, the inspectors determined that it was reasonable to implement this modification without requesting prior approval from the NRC. No violation of NRC requirements occurred. Therefore, this URI is closed.

.2 Review of Licensee Activities Related to Future Power Uprate to Licensed Limit of 1912 Megawatts Thermal

a. Inspection Scope

Using the guidance in Inspection Procedure 71004, Power Uprate, the inspectors observed activities at DAEC related to a future power ascension to their licensed power level of 1912 megawatts thermal. The documents listed in the Attachment were used by the inspectors to accomplish the objectives of the inspection procedure.

The inspectors' activities included, but were not limited to, verifying that: tests and experiments not described in the Final Safety Analysis Report and changes to the facility or procedures as described in the UFSAR for power uprate were evaluated in accordance with 10 CFR 50.59 as appropriate; the licensee took the required actions to alleviate or prevent the affects of new or likely initiating events in accordance with the license amendment or NRC safety evaluation; plant modifications for power uprate were in accordance with the licensing and design bases, license commitments, and Final Safety Analysis Report; mitigating systems could initiate and perform their safety function in accordance with the time lines in new accident analyses, acceptance tests for plant modifications for power uprate, and applicable surveillance tests; individual components in mitigating systems that were altered or replaced can perform their intended safety function; new operator actions (normal, abnormal, and emergency) for power uprate were administered procedurally and had an appropriate basis; and that the licensee monitored changes, in accordance with the NRC safety evaluation, made on systems and their effects on those systems and interfacing systems including potential problems that were slow in developing and issues that could not be immediately tested.

Inspection activities were selected in accordance with Inspection Procedure 71004-02 for sample selection of risk-significant plant modifications.

b. Findings

No findings of significance were identified.

.3 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted the following 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.

- Multiple tours of operations within the Central and Secondary Security Alarm Stations;
- Tours of selected security towers/security officer response posts;
- Direct observation of personnel entry screening operations within the plant's Main Access Facility; and
- Security force shift turnover activities.

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.

40A6 Management Meetings

.1 Exit Meeting Summary

On April 10, 2008, the inspectors presented the inspection results to Mr. R. Anderson and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exits were conducted for:

Results for access control to radiologically significant areas with Mr. D. Curtland, Plant Manager, and other members of licensee staff on February 8, 2008; and

Closure of URI 05000331/2007007-03 with Mr. S. Catron, Licensing Manager, and other members of licensee staff on February 14, 2008.

40A7 Licensee-Identified Violations

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

On November 30, 2007, at 1339 CST, with the plant at 100% power, the licensee identified that at the minimum grid contingency voltage (i.e. 98.8%), the Standby Transformer was not capable of providing adequate voltage to the 4160 volt essential buses under defined loss of coolant accident conditions. The postulated voltage drop would result in actuation of the degraded voltage relays causing the busses to automatically transfer to their respective EDGs.

Based upon an analysis of this degraded condition, the licensee declared that the alternate preferred offsite power source (i.e. the Standby Transformer) was inoperable during the time period from April 3, 2006, through implementation of Engineering Change Package 1846 to change the transformer tap setting on December 14, 2007. The licensee entered TS LCO 3.8.1 Condition A, for one offsite circuit inoperable while in Modes 1, 2, and 3. Note that the period of inoperability started commensurate with the licensee's response submittal for Generic Letter 2006-02, dated April 3, 2006, based upon the commitment to declare both offsite sources of offsite power inoperable if it is determined that a trip of the DAEC generator would lead directly to voltages in the DAEC switchyard below the trip setpoints for loss of offsite power instrumentation.

Technical Specification 3.8.1 Condition C requires that, when two offsite circuits are inoperable while in Modes 1, 2, and 3, the required feature(s) be declared inoperable when the redundant required feature(s) are inoperable, within 12 hours of discovery of Condition C concurrent with inoperability of redundant required feature(s) AND that one offsite circuit be restored to an operable status within 24 hours. Condition E requires that, when the required action and associated completion time of Condition C is not met, the plant shall be placed in Mode 3 within 12 hours AND be placed in Mode 4 within 36 hours. Contrary to these requirements, a review of the licensee's electronic log entries indicated that on four separate occasions (April 10, 2006, May 18 2006, December 13, 2006, and September 17, 2007) during the time period from April 3, 2006, through September 20, 2007, the Startup Transformer was removed from service. This resulted in both offsite power sources being inoperable without the associated TS LCO action statements being entered, and the associated Completion Times for the action statements being exceeded. The longest period of time that the two required offsite circuits were inoperable was approximately 107 hours, which resulted in exceeding the required Completion Times for both Condition C and Condition E.

Since this finding affected the Initiating Events Cornerstone but did not contribute to both the likelihood of a reactor trip AND the likelihood that mitigation equipment or functions would not be available, this issue was evaluated as having a very low safety significance (Green) using IMC 0609, Attachment 4, "Significance Determination Process Phase 1 - Initial Screening and Characterization of Findings," Exhibit 1, "User Guidance." The licensee entered this issue into their corrective action program as CAP 054037.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Anderson, Site Vice President
D. Curtland, Plant Manager
B. Eckes, NOS Manager
S. Catron, Licensing Manager
J. Cadogan, Engineering Director
B. Kindred, Security Manager
J. Morris, Training Manager
C. Dieckmann, Operations Manager
R. Harter, Operations Support Manager
G. Pry, Maintenance Manager
J. Windschill, Chemistry & Radiation Protection Manager
P. Sullivan, Emergency Preparedness Manager
M. Lingenfelter, Design Engineering Manager
K. Kleinheinz, Program Engineering Manager
J. Kuehl, Supervisor, Programs Engineering
D. Albrecht, Radwaste Supervisor
N. McKenney, General Supervisor Radiation Protection Support
S. Funk, CHP, REMP Program Manager, Sr. Health Physics Coordinator
K. Jewett, Health Physics Supervisor
R. Schlueter, Foreman Health Physics
P. Louis, Foreman Health Physics
T. Schmidt, Health Physics Technician
L. Swenzinski, Regulatory Affairs
D. Johnson, Radwaste Operator/Chem Tech, Rad Environmental Technician

Nuclear Regulatory Commission

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

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000331/2008002-01	NCV	Failure to Properly Administer and Document Overtime Limits, Requirements, and Deviations (Section 40A2.3)
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Closed

05000331/2007007-03	URI	Digital Upgrade For The Reactor Building Vent Shaft and Control Building Air Intake Radiation Monitors (Section 40A5.1)
05000331/2007010-00	LER	Safety System Functional Failure of Alternate Preferred Offsite power Source (Section 40A3.3)
05000331/2007011-00	LER	Undervoltage Condition Resulted in the Actuation of the Emergency Diesel Generators (Section 40A3.4)

LIST OF DOCUMENTS REVIEWED

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

1R02 Evaluation of Changes, Tests, and Experiments

Miscellaneous:

- 01-025; 10 CFR 50.59 Evaluation for ECP 1628; Revision 0
- 04503001; Schematic; CPU; Revision A
- 04507001; RM-1000 Software Requirements Specification; Revision A
- 04507002; RM-1000 Software Design Document; Revision –
- 04508805; RM-1000 and RP-86A Failure History and Mean Time Between Failures (MTBF); Revision –
- ECP 1628; Replace Reactor Building Vent Shaft and Control Building Air Intake Radiation Monitors; Revision 0

1R04 Equipment Alignment

Procedures:

- Operating Instruction (OI) 324A3; SBDG 1G-31 System Valve Lineup and Checklist; Revision 9
- OI 324A7; SBDG 1G-31 System Control Panel Lineup; Revision 3
- OI 324A10; SBDG Standby/Readiness Condition Checklist; Revision 6
- OI 410A1; 'A' RWS System Electrical Lineup; Revision 9
- OI 410A2; 'A' RWS System Valve Lineup and Checklist; Revision 17
- OI 150A1; RCIC System Electrical Lineup; Revision 2
- OI 150A2; RCIC System valve Lineup and Checklist; Revision 11
- OI 150A4; RCIC System Control Panel Lineup; Revision 3

Drawings:

- BECH-M132<1>; 1G031 Standby Diesel Generator; Revision 4
- BECH-M132<2>; 1G031 Standby Diesel Generator; Revision 6
- BECH-M132<3>; 1G031 Standby Diesel Generator; Revision 7
- BECH-M124; Reactor Core Isolation Cooling System (Steam Side); Revision 41
- BECH-M125; Reactor Core Isolation Cooling System (Water Side); Revision 30

1R05 Fire Protection

Corrective Action Program Documents:

- CAP 055801; CAQ [Condition Adverse to Quality] – Security Department Without Fire Brigade Personnel for 2 Hours

Procedures:

- ACP 1412.3; Control of Ignition Sources; Revision 20
- ACP 1412.2; Control of Combustibles; Revision 32
- ACP 1203.53; Fire Protection; Revision 11

Area Fire Plans:

- AFP 08; Standby Gas Treatment System and Motor Generator Set Room; Revision 24
- AFP 18; North Turbine Building Ground Floor, and Tube Pulling Area, Elevation 757'-6"; Revision 28
- AFP 19; South Turbine Building Ground Floor; Revision 25
- AFP 26; Control Building Control Room Complex; Revision 31
- AFP 27; Control Building Control Room HVAC Room; Revision 25
- AFP 31; Intake Structure Pump Rooms, Elevation 767'-0"; Revision 26
- AFP 32; Intake Structure Traveling Screen Areas; Revision 27
- AFP 34; Radwaste Building Drum Filling, Storage, and Shipping, Elevation 757'-6"; Revision 25
- AFP 35; Radwaste Treatment and Access Area, Elevation 773'-6"; Revision 24
- AFP 36; Radwaste Building Precoat and Access Area, Elevation 786', Control Room and HVAC Equipment Room; Revision 25

1R06 Flooding

Procedures:

- NS200301; Reactor Building Water Level Indication Loops (for EOP [Emergency Operating Procedure] 3 Entry) Test; Revision 0
- Calibration Procedure I.UA-T116-01 Reactor Building Level Switches (for EOP 3 Entry) Calibration, Section A; Revision 5
- Equipment Specific Maintenance Procedure I.LT-M977-01; Metritape Model LA/715T Level Transmitters; Revision 2
- Abnormal Operating Procedure (AOP) 902; Flood; Revision 28

1R11 Licensed Operator Regualification Program

Corrective Action Program Documents:

- CAP 055822; CAQ – Incorrect EAL [Emergency Action Level] Classification
- CAP 055878; CAQ – LOR CA [Corrective Action] 046579 Actions SAT, Attached Documentation of Actions Taken Not Complete
- CAP 055883; CAQ – Reactor Operator Failed LOR Cycle Exam
- CAP 056167; CAQ – Crew Failure of an LOR Evaluated Scenario
- CAP 056168; CAQ – Failure of a DEP-PI Opportunity
- CAP 056212; CAQ – NSPEO Out of the Box Evaluation Failure

Procedures:

- ACP 110.1; Conduct of Operations; Revision 10
- ACP 110.1; Conduct of Operations; Revision 11
- EOP 1; RPV Control; Revision 14
- EOP 2; Primary Containment Control; Revision 14
- Emergency RPV Depressurization; Revision 5
- EAL Matrix - Modes 1, 2, 3; Revision 7
- AOP 573; Primary Containment Control; Revision 1
- Integrated Plant Operating Instruction (IPOI) 4; Shutdown; Revision 86
- IPOI 5; Reactor Scram; Revision 47
- IPOI 5 - Quick Response Card 1; Reactor Scram Immediate Actions; Revision 5
- AOP 255.2; Power/Reactivity Abnormal Change; Revision 29
- Emergency Plan Implementing Procedure (EPIP) 1.1; Determination of Emergency Action Levels; Revision 27

- EPIP 1.2; Notifications; Revision 38
- EPIP 2.5; Control Room Emergency Response Operation; Revision 17

1R12 Maintenance Effectiveness

Corrective Action Program Documents:

- CAP 054663; CAQ – SUS 1 Offsite Power in 50.65(a)(1)[RED] Maintenance Rule Status
- MRE 000221; CAQ – SUS 1 Offsite Power in 50.65(a)(1)[RED] Maintenance Rule Status
- CAP 055240; CAQ – Grid Operating Agreement Needs to be Revised
- CAP 055527; CAQ – Electrical System Design Calculations Review
- ACE 001829; CAQ – Electrical System Design Calculations Review
- CAP 056015; CAQ – “B” Control Building Chiller Discharge Pressures and Oil Temperatures Cycling
- CAP 056216; CAQ – ‘B’ Chiller Should be Listed as an Operator Work Around
- PCR 049202; CAQ – ‘B’ Chiller Control Building Chiller is Inoperable per STP 3.7.5-01
- CAP 055977; CAQ – Unexplained Change in ‘B’ Chiller Oil Temperature
- CAP 055137; NCAQ [Non-Condition Adverse to Quality] – ‘B’ Chiller Temperature Oscillations
- CAP 028082; ‘A’ Control Building Chiller (1VCH001A) Developed Oil Leak, Declared Inoperable
- CAP 040721; CAQ – 1K004 Compressor Overheats – Unplanned LCO

Procedures:

- STP 3.7.5-01; Control Building Chiller Operability; Revision 13

Miscellaneous:

- Maintenance Rule Performance Criteria Basis Document; Offsite Power SUS 1.00, 3.00, 86.00, 87.00; Revision 3
- Maintenance Rule Program Module 0; Overview; Revision 3; Attachment 2; Startup Systems Containing Components in the Scope of the Maintenance Rule at DAEC; Revision 1
- Maintenance Rule Program Module 0; Overview; Revision 3; Attachment 3; Startup Systems Containing Components Performing Maintenance Rule Risk-Significant or Standby Functions at DAEC; Revision 3
- Maintenance Rule Criteria Calculation Report: Control Building HVAC; 1K3 and 1K4 (safety-related compressor) Unavailability
- Maintenance Rule Criteria Calculation Report: Control Building HVAC; Functional Failures of Chillers
- Maintenance Rule Criteria Calculation Report: Control Building HVAC; Safety-Related Air Compressor Functional Failures

1R13 Maintenance Risk Assessments and Emergent Work Control

Corrective Action Program Documents:

- CAP 054622; NCAQ – Slight packing Leak on Feedwater Regulating Valve, CV-1579
- CAP 054293; CAQ – Reactor Level Lowered 2 inches without Operator Action
- CAP 055859; CAQ – Unexpected MSR Drain Tank Alarms

Procedures:

- WPG-2; On-Line Risk Management Guideline; Revision 36
- WPG-2; On-Line Risk Management Guideline; Revision 37
- WM-AA-1000; Work Activity Risk Management Process; Revision 0

- NG-07-0944; Maintenance Rule Expert Panel Meeting Minutes, October 18, 2007, for Review of STP 3.8.1-03 for SBDG Unavailability; dated November 8, 2007
- STP 3.8.1-03; Standby Diesel Generators Operability Test; Revision 14
- STP 3.8.1-05; Standby Diesel Generators Operability Test (Slow Start From Emergency Start Air); Revision 33
- STP 3.8.1-06; Standby Diesel Generators Operability Test (Fast Start); Revision 40
- OI 264; Reactor Recirculation System; Revision 100
- AOP 646; Loss of Feedwater Heating; Revision 16
- AOP 255.2; Power/reactivity Abnormal Change; Revision 29

Work Orders:

- CWO A79985; Core Flow Lowered in Generator Outlet and APRM [Average Power Range Monitor] Power. Core Flow Returned to 48.5 Mlbm/hr by itself (No Operator Action Taken)
- CWO A82110; Reactor Level Lowered 2 inches without Operator Action
- CWO A82467: Main Steam Reheater Tank 1T-92A Drain Valve Found Full Open

Miscellaneous:

- Work Week 9801 Weekly Risk Analysis; Revision 0
- Work Week 9801 Weekly Risk Analysis; Revision 1
- Level A, B, and C Main Activity Look ahead for Work Week 9801
- Work Week 9803 Weekly Risk Analysis; Revision 0
- Level A, B, and C Main Activity Look ahead for Work Week 9803
- Work Week 9806 Weekly Risk Analysis; Revision 0
- Work Week 9806 Weekly Risk Analysis; Revision 1
- Work Week 9806 Weekly Risk Analysis; Revision 2
- 'B' SBDG Maintenance Risk Characterization
- Level A, B, and C Main Activity Look ahead for Work Week 9806
- Level A Plan for 1G021 Emergency Diesel Generator 2-Year Inspection
- Operational Decision Making Action Plan Working Forms for troubleshooting FY4450F and I/I4450
- Work Week 9809 Weekly Risk Analysis; Revision 0
- Work Week 9809 Weekly Risk Analysis; Revision 1
- Level A, B, and C Main Activity Look ahead for Work Week 9809
- Work Week 9813 Weekly Risk Analysis; Revision 0
- Work Week 9813 Weekly Risk Analysis; Revision 1
- Work Week 9813 Weekly Risk Analysis; Revision 2
- Level A, B, and C Main Activity Look ahead for Work Week 9813

1R15 Operability Evaluations

Corrective Action Program Documents:

- CAP 054687; CAQ – RHR Pump Suction Pressure not in the Desired Range
- CAP 007413; RHR Pump Suction Pressure Instruments Found out of Tolerance
- CAP 055329; CAQ – 1G021 Blower Oil Tube Leak
- CE 006160; CAQ – 1G021 Blower Oil Tube Leak – Past Operability
- CA 049250; CAQ – 1G021 Blower Oil Tube Leak
- CAP 055411; NCAQ – 'B' EDG Blower Lube Oil Supply Tube Failure analysis – Vibration Fatigue Cracking
- CAP 055366; CAQ – WGI Analysis Raises Concern About MOV Motor Starter Pickup Voltage
- OPR 000376; CAQ – WGI Analysis Raises Concern About MOV Motor Starter Pickup Voltage
- CE 006170; CAQ – WGI Analysis Raises Concern About MOV Motor Starter Pickup Voltage

Procedures:

- ACP 110.3; Operability Determinations; Revision 13
- ACP 110.3; Operability Determinations; Revision 14
- OI 149; Residual Heat Removal System; Revision 104
- STP 3.5.1-02; LPCI [Low Pressure Coolant Injection] System Operability Tests; Revision 23

Miscellaneous:

- Work Week 9801 Weekly Risk Analysis; Revision 0
- FPL-85812; Failure Analysis of 3/8" Copper Lube Oil Line to the Diesel Engine Blower Outboard Bearings. Duane Arnold PO Number: K121564

1R18 Plant Modifications

Corrective Action Program Documents:

- CAP 055552; CAQ – Body to Bonnet Leak on V-07-01 "A" RFP [Reactor Feed Pump] Suction Isolation Valve
- CAP 055642; NCAQ – Body to Bonnet Steam Leak Found on V-07-001
- CAP 055859; CAQ – Unexpected MSR Drain Tank Alarms

Procedures:

- FP-E-MOD-03; Temporary Modifications; Revision 1
- GMP-MECH-40; General Maintenance Procedure for On-line Sealing; Revision 2
- TM-08-003; Temporary Modification for Sealant Injection of V-07-001
- NAP-406; On-Site Review Group; Revision 3
- WM-AA-1000; Work Activity Risk Management Process; Revision 0
- TM-08-004; Temporary Modification to Install LT1056/LC1057 Cross-Tie

Work Orders:

- CWO A82732; Repair Valve [V-07-001] and Remove Temp Mod TM-08-003
- CWO A80738; Steam Leak Approximately 1 gpm from RFP 1P-1A Suction Valve
- CWO A82254; Perform Furmanite Second Injection Leak Seal on Body to Bonnet Joint for V-07-001
- CWO A82468; Install TM-08-004 to Cross-Tie LT 1056 to LC 1057 and LC 1056

Miscellaneous:

- 026501; 10CFR 50.59 Screening for TM-08-004; dated February 27, 2008

1R19 Post-maintenance Testing

Corrective Action Program Documents:

- CAP 055278; CAQ-Replacement Studs Wrong Size for CWO A77555
- CAP 055329; CAQ-1G021 Blower Oil Tube Leak
- CAP 055253; NCAQ-'B' ESW Pump Repack Scheduled for 2/5/08 But Run-In for 2/7/08
- CAP 055303; CAQ – 1P099B ESW Pump Packing
- CAP 055421; CAQ – During STP NS100102 CV-4914 Failed to Open Within ASME Acceptance Criteria
- CAP 055579; NCAQ – Need a Procedure to Perform a Maintenance Run for HPCI for the Week 10 LCO
- CAP 056142; CAQ – Several Work Orders Needed to be Revised During HPCI LCO
- CAP 054120; CAQ – HPCI Turbine Shell Steam Leaks

- CAP 056032; CAQ – FO2203 HPCI HV2201 Drain Line Flow Orifice Pipe Misalignment
- CAP 056053; CAQ – FO2204 Nuts Were Not All Heavy Hex

Procedures:

- OI 324; Standby Diesel Generator System; Revision 86
- STP NS540002; Emergency Service Water Operability Test; Revision 30
- STP NS100102; River Water Supply and Screen Wash System Vibration Measurement and Operability Test; Revision 22
- TURBIN-T147-01; Calibration of Turbine Woodward Governor; Section M; Revision 11
- OI 152; High Pressure Coolant Injection System; Revision 88

Work Orders:

- PWO 1140913; Complete 2-Year Mechanical Inspection on 'B' SBDG. Replace Exhaust Gaskets per Requirements of EMA 1139258
- PWO 1140914; Complete Generator Electrical Inspection on 'B' SBDG
- PWO 1141516; Replace Packing per Procedure on 'B' ESW Pump
- CWO A80713; Perform Troubleshooting Instruction Form for CV4914 Valve Position Indication Issues
- PWO 1135586; Replace Woodward EG-M Governor Module for HPCI Turbine in 1C440
- CWO A80624; Inspect, Repair/Replace and Reassemble HBB011 Drain Piping on HPCI Reversing Chamber Ring
- CWO A75516; Disassemble, Clean Sealing Surfaces, Replace Gaskets and Torque Fasteners
- CWO A83133; Realign Piping for Orifice Flanges on Both Sides of HPCI Turbine Stop Valve Drains
- CWO A83092; Troubleshoot Cause of Spurious 1C94 Overspeed Alarms by Inspecting Swapping Annunciator Cards

Miscellaneous:

- GE SIL [Service Information Letter] No. 336; Surveillance Testing Recommendations for HPCI and RCIC Systems; Revision 1; dated December 8, 1989

1R22 Surveillance Testing

Corrective Action Program Documents:

- CAP 055465; CAQ – Both Mini-Purge Isolation Valves Closed During STP 3.3.6.1-11

Procedures:

- STP 3.5.1-07; HPCI System Simulated Automatic Actuation; Revision 14
- ACP 102.17; Pre/Post-Job Briefs and Infrequently Performed Tests and Evolutions; Revision 37
- STP 3.8.1-03; Standby Diesel Generators Operability Test; Revision 15
- STP 3.8.1-03; Standby Diesel Generators Operability Test; Revision 14
- STP 3.8.1-06; Standby Diesel Generators Operability Test (Fast Start); Revision 40
- STP 3.5.1-05; HPCI System Operability Test; Revision 39
- STP 3.6.2.1-01; Suppression Pool Water Temperature Surveillance; Revision 4
- OI 324A10; SBDG Standby/Readiness Condition Checklist; Revision 7
- GMP-TEST-56; General Maintenance Procedure: Oil Samples – General; Revision 14
- STP 3.8.1-01; Offsite Power Sources; Revision 2

- STP 3.8.1-04; Standby Diesel Generators Operability Test (Slow Start From Normal Start Air); Revision 34
- STP 3.3.6.1-11; Reactor LO LO Water Level (ATWS-RPI/ARI Trip/RWCU Isolation) and LO LO LO Water Level (Main Steam Line Isolation Trip) Channel Functional Test; Revision 6

Miscellaneous Documents:

- GE SIL No. 336; Surveillance Testing Recommendations for HPCI and RCIC Systems; Revision 1; dated December 8, 1989

1EP6 Drill Evaluation

Corrective Action Program Documents:

- CAP 056260; CAQ – 08TD1-Difficulty in NRC Notification for NOTE-03 During Training Drill
- CAP 056232; CAQ – 08-TD1-50.54(x) Question About Security Plan & Communications with NRC
- CAP 056242; CAQ – 08-TD1-Simulated Fire in EP Drill Was on Actual Protected Equipment
- CAP 056247; NCAQ – During EOP 4 Implementation, ED Was Delayed

Procedures:

- EPIP 1.1; Determination of Emergency Action Levels; Revision 27
- EPIP 1.2; Notifications; Revision 38
- EAL Matrix - Modes 1, 2, 3; Revision 7
- EAL Matrix - Modes 4, 5; Revision 6
- EPIP 6.1; Drill and Exercise Program; Revision 0
- Emergency Planning Department Manual (EPDM) 1008; Emergency Response Drill and Exercise Program; Revision 10
- EPDM 1010; Emergency Planning Department Performance Indicators; Revision 10
- EPDM 1015; Scenario Development Program; Revision 6
- EPDM FORM EP-035; Drill/Exercise Objective & Evaluation Process; Revision 7
- EPIP FORM NOTE-05; EAL Notification Form; Revision 10

Miscellaneous Documents:

- NEP 2008-0007; Emergency Response Organization Training Drill 1 – March 12, 2008; dated February 22, 2008

2OS1 Access Control to Radiologically Significant Areas

Corrective Action Program Documents:

- CAP 052074; CAQ – Control of LHRA [Locked High Radiation Area] Key Associated with Temporarily Establishing a LHRA Was found Unsatisfactory; dated August 27, 2007
- CAP 053029; CAQ – Trend of Issues Associated with Source Shipments; dated October 8, 2007
- CAP 053615; NCAQ – Conduct a Formal Bench Marking Trip for Locked High Radiation Area Controls; dated November 2, 2007
- CAP 053623; NCAQ – Gap Exists Relative to actual and Desired RWP Planning Effectiveness, dated November 2, 2007
- CA 047510; Very High Radiation Area (VHRA) Keys Shall be Identifiable from Other Locked High Radiation Area (LHRA) Keys; dated September 17, 2007
- CA 047508; Place all LHRA Backup Keys in a Separate Alarmed, Locked and/or Sealed Key Box Health Physics Supervisor's Office. The Primary Key to the Backup LHRA Key Box Would Be Located In the LHRA Key Box for Backup Keys; dated September 17, 2007

- CE 005651; CAQ – LHRA Key Inventory Not Detailed Enough to Ensure All Keys are Accounted For; dated August 24, 2008
- CE 005889; CAQ – Fixed and Smearable Contamination Found in a Clean Area; dated November 8, 2007
- CE 005918; CAQ – Personnel Contamination Threshold on Ion Chromatograph; dated November 19, 2007
- CE 005925; CAQ – Neutron Area on the Auxiliary Building; dated November 21, 2007
- CE 005793; CAQ – Trend of Issues Associated with Source Shipments; dated October 10, 2007
- CE 005903; CAQ – Contractor Equipment Brought into Radioactive Contaminated Area; dated November 12, 2007
- CE 005902; CAQ – Post Various Floor Plugs and Wall Plugs with HP Information; dated November 12, 2007

Procedures:

- RWP 08-500, Task No. 7; Planning Walkdown and Repair at Reduced Reactor Power Levels; Revision 0; dated January 4, 2008
- ACP 1408.30; Control of Diving; Revision 2
- HPP 3104.07; Diving Operations within Radiological Areas; Revision 15
- RFP 701; Radiological Diving Operations; Revision 1
- HPP 3104.06; Control of Radiography Activities; Revision 13
- HPP 3104.01; Control of Access to High Radiation Areas and Above; Revision 39
- HPP 3111.38; Conduct of radiation Protection; Revision 1
- HP-55 Form; Radiological Work Screening Form; RWP 2007, Task 7; Install/Remove Plywood Door in Steam Jet Air Ejector Hallway for Repair of Floor Leak; dated January 23, 2008
- HP-55 Form; Radiological Work Screening Form; RWP 2007, Task 7; Lubricate and Vibes at Condenser Bay; dated January 10, 2008
- HP-55 Form; Radiological Work Screening Form; RWP 51/29, Tasks 2 and 7; Remove and Install, Operator, Accessories and Repack During Forced Outage in the Turbine Heaterbay; dated July 9, 2007
- HP-55 Form; Radiological Work Screening Form; RWP 500, Task 7; Determination of the Chrome Content Using Alloy Analyzer in the Turbine Building Heaterbay; dated January 31, 2008
- HP-SELF.001; Issue Radiation Detection Instruments For Self Coverage; Revision 5, D
- HP-SELF.002; Perform Radiation Survey For Self Coverage; Revision 8
- HP-SELF.003; Perform Contamination Survey For Self Coverage; Revision 8

Miscellaneous Documents:

- Personnel Contaminations Report For June 6, 2007, through February 7, 2008
- Memo to Site Managers and Supervisors from Dean Curtland; DAEC Plant Manager; Proper Radiation Worker Practices; dated February 22, 2007
- Personnel Contamination Reports from January 1, 2007 through February 7, 2008
- SA-048051; Self Assessment; Conduct a Bench Marking Trip for Locked High Radiation Area Controls; dated November 6, 2007

40A1 Performance Indicator Verification

Procedures:

- ACP 1411.13; Control of Locked High Radiation Area and Above; Revision 22
- DAEC Radiation Protection Performance Indicator Summary; dated December 2007
- ACP 1402.4; NRC & WANO Performance Indicators Reporting; Revision 13

- AOP 639; Reactor Water/Condensate High Conductivity; Revision 27
- DAEC PI Report for Unplanned Scrams per 7000 Critical Hours for April 2007 through December 2007
- DAEC PI Report for Unplanned Scrams with Complications for April 2007 through December 2007
- DAEC PI Report for Unplanned Power Changes per 7000 Critical Hours for April 2007 through December 2007
- Nuclear Energy Institute 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 5
- DAEC Second Quarter 2007 PI Summary, July 17, 2007
- DAEC Third Quarter 2007 PI Summary, October 15, 2007
- DAEC Fourth Quarter 2007 PI Summary, January 14, 2008

Miscellaneous Documents:

- E-Mail from James Andersen (NRC) to Robert Murrell (DAEC); FAQ Appeal Decision for Duane Arnold; dated November 29, 2007

40A2 Problem Identification and Resolution

Corrective Action Program Documents:

- CAP 055182; CAQ-Blanket Overtime Deviations
- CA 048850; CAQ-Blanket Overtime Deviations
- CAP 047634; ACP 101.4 'Overtime Limits And Requirements' Implementation
- TND 000092; ACP 101.4 'Overtime Limits And Requirements' Implementation
- CAP 052997; NCAQ – Overtime Limit Exceeded
- CAP 056586; NCAQ – TTT-HU Trap in ACP 101.4 for Work Hour Deviations
- CAP 056730; CAQ – RFO 20 Overtime Limits Exceeded

Procedures:

- ACP 114.4; Corrective Action Program; Revision 23
- ACP 114.5; Action Request System; Revision 65
- ACP 101.4; Overtime Limits And Requirements; Revision 13
- ACP 101.4; Overtime Limits And Requirements; Revision 14

Miscellaneous Documents:

- NG-148K; Revision 11; ACP 101.4, Overtime Limits and Requirements, Revision 13, Attachment 1 for Maintenance Support Department; dated February 4, 2007
- NG-148K; Revision 11; ACP 101.4, Overtime Limits and Requirements, Revision 13, Attachment 1 for Maintenance Support Department; dated February 6, 2007
- NG-148K; Revision 11; ACP 101.4, Overtime Limits and Requirements, Revision 13, Attachment 1 for Maintenance Support Department; dated February 17, 2007
- NG-148K; Revision 11; ACP 101.4, Overtime Limits and Requirements, Revision 13, Attachment 1 for Mechanical Maintenance Department; dated March 8, 2007
- DAEC ELog; Operations Electronic Logbook Entries; dated April 10, 2006; May 18, 2006; December 13 through December 17, 2006; September 17 through September 18, 2007

40A3 Follow-up of Events and Notices of Enforcement Discretion

Corrective Action Program Documents:

- CAP 055859; CAQ – Unexpected MSR Drain Tank Alarms
- CAP 055896; NCAQ – Lessons Learned from LT 1057 ERT [Emergency Response Team]

- CAP 056382; NCAQ – CWO A79973 TIF 1 for Control Rod Drive (CRD) 14-11 Outcomes and TIF/Look Ahead Process Lessons Learned
- CAP 056349; CAQ – Sequence Exchange Plan Specified Wrong Sequence Number in Step 30
- CAP 056351; NCAQ – Lessons Learned from March 15th 2008 Sequence Exchange
- CAP 056348; NCAQ – RFT – Training Anecdote for TIF of CWO A79973 for CRD 14-11
- CAP 056346; CAQ – HCU [Hydraulic Control Unit] 14-11 Accumulator Alarm
- CAP 056340; NCAQ – Clerical Error on TIF for CRD 14-11 – MD-026 Versus ACP 1408.1 Discrepancy
- CAP 054037; CAQ – Standby Transformer Voltage Concerns
- ACE 001791; CAQ – Standby and Startup Transformer Voltage Concerns
- CAP 054065; CAQ – Tech Spec Bases Requirement Not Supported by Design Bases
- CE 005950; CAQ – Tech Spec Bases Requirement Not Supported by Design Bases
- CAP 054053; CAQ – ‘A’ and ‘B’ SBDG Auto Start Due to 161 KV Breaker Cycling (DAEC to Fairfax)
- ACE 001792; CAQ – ‘A’ and ‘B’ SBDG Auto Start Due to 161 KV Breaker Cycling (DAEC to Fairfax)

Procedures:

- ACP 114.9; Event Response Procedure; Revision 12
- AOP 646; Loss of Feedwater Heating; Revision 15
- AOP 255.2; Power/Reactivity Abnormal Change; Revision 28
- Reactivity Management Plan: Control Rod Sequence Exchange for March 15/16, 2008

Work Orders:

- CWO A82467; Troubleshoot/Replace LC 1057
- Troubleshooting Instruction Form WR/CWO A79973 TIF 1; Troubleshoot CRD 14-11 by performing Isolated Insert/Withdraw Stall Flow Tests with Various HCU Subcomponents Isolated to determine Why the CRD Requires Increased Drive Water Pressure or Double Clutching to Move

Miscellaneous Documents:

- LER 2007010-00; Safety System Functional Failure of Alternate Preferred Offsite Power Source; January 29, 2008
- LER 2007011-00; Undervoltage Condition Resulted in the Actuation of the Emergency Diesel Generators; January 29, 2008
- DAEC ELog; Operations Electronic Logbook Entries; dated April 10, 2006; May 18, 2006; December 13 through December 17, 2006; September 17 through September 18, 2007

40A5 Other Activities

Miscellaneous

- Design Description Form for modification ECP1854; Power Uprate to 1912 MWt Control Room Indication Modification; Revision 0
- Cameron Measurement Systems Site Management Project Briefing – Feedwater Flow Measurement Project
- DAEC Power Uprate Expert Panel Charter; Revision 0

4OA7 Licensee-Identified Violations

Corrective Action Program Documents:

- CAP 054037; CAQ – Standby Transformer Voltage Concerns

LIST OF ACRONYMS USED

AC	Alternating Current
ACP	Administrative Control Procedure
AFP	Area Fire Plan
AOP	Abnormal Operating Procedure
ATWS	Anticipated Transient Without Scram
CA	Corrective Action
CAP	Corrective Action Process
CAQ	Condition Adverse to Quality
CB	Circuit Breaker
CE	Condition Evaluation
CFR	Code of Federal Regulations
CRD	Control Rod Drive
CWO	Corrective Work Order
BWR	Boiling Water Reactor
DAEC	Duane Arnold Energy Center
DRS	Division of Reactor Safety
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
EPDM	Emergency Planning Department Manual
EPIP	Emergency Plan Implementing Procedure
ERT	Emergency Response Team
ESW	Emergency Service Water
HCU	Hydraulic Control Unit
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter
IPOI	Integrated Plant Operating Instruction
IR	Inspection Report
kV	Kilovolt
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LHRA	Locked High Radiation Area
LOR	Licensed Operator Requalification
MTBF	Mean Time Between Failures
MOV	Motor-Operated Valve
NCAQ	Non-Condition Adverse to Quality
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NUREG	NRC Technical Report Designation
OI	Operating Instruction
OOS	Out-of-service
OPR	Operability Recommendation
PI	Performance Indicator
PWO	Preventative Work Order
RCIC	Reactor Core Isolation Cooling
RFP	Reactor Feed Pump

RHR	Residual Heat Removal
RP	Radiation Protection
RWP	Radiation Work Permit
RWS	River Water Supply
SBDG	Standby Diesel Generator
SDP	Significance Determination Process
SIL	Service Information Letter
STP	Surveillance Test Procedure
TM	Temporary Modification
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WGI	Washington Group International