February 8, 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 05000331/2007005

Dear Mr. Anderson:

On December 31, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Duane Arnold Energy Center. The enclosed integrated inspection report documents the inspection findings which were discussed on January 17, 2008, with D. Curtland 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, there was one NRC-identified and one self-revealed finding of very low safety significance, both of which involved violations of NRC requirements. However, because these violations were of very low safety significance and because the issues were entered into your CAP, the NRC is treating these findings and issues as Non-Cited Violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

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/

Kenneth Riemer, Chief
Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report 05000331/2007005
(w/Attachment: Supplemental Information)

cc w/encl: M. Nazar, Senior Vice President and Chief
Operating Officer
J. Stall, Senior Vice President, Nuclear and Chief
Nuclear Officer
R. Helfrich, Senior Attorney
M. Ross, Managing Attorney
R. Kundalkar, Vice President, Nuclear Engineering
J. Bjorseth, Site Director
D. Curtland, Plant Manager
S. Catron, Manager, Regulatory Affairs
Chief Radiological Emergency Preparedness Section,
Dept. Of Homeland Security
M. Rasmusson, State Liaison Officer

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Letter to R. Anderson from K. Riemer dated February 8, 2008

SUBJECT: DUANE ARNOLD ENERGY CENTER
NRC INTEGRATED INSPECTION REPORT 05000331/2007005

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-331; 72-032
License No:	DPR-49
Report No:	05000331/2007005
Licensee:	FPL Energy Duane Arnold, LLC
Facility:	Duane Arnold Energy Center
Location:	Palo, Iowa
Dates:	October 1 through December 31, 2007
Inspectors:	R. Orlikowski, Senior Resident Inspector R. Baker, Resident Inspector R. Jickling, Sr. Emergency Preparedness Analyst N. Valos, Senior Operations Engineer D. McNeil, Senior Operations Engineer C. Moore, Operations Engineer T. Go, Health Physicist J. Bartleman, Reactor Engineer J. Tapp, Reactor Engineer K. Barclay, Reactor Engineer
Observers:	None
Approved by:	K. Riemer, Chief Branch 2 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000331/2007005; 10/01/2007 - 12/31/2007; Duane Arnold Energy Center. Access Control to Radiologically Significant Areas and Follow-up of Events.

This report covers a three-month period of baseline resident inspection and announced baseline inspections of emergency preparedness, licensed operator requalification program, and radiation protection. The inspections were conducted by Region III reactor inspectors, an emergency preparedness analyst, a health physicist, operations engineers, and the resident inspectors. Two Green findings were identified by the inspectors. The findings were considered Non-Cited Violations 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-Revealing Findings

Cornerstone: Occupational Radiation Safety

Green. A self-revealed finding of very low safety significance and an associated Non-Cited Violation (NCV) of Title 10 CFR 20.1501 were identified for failure to adequately survey and evaluate the magnitude and extent of radiation levels to ensure that high radiation areas were adequately posted and controlled. On February 7, 2007, a worker entered into an inadequately posted and controlled area in the Reactor Building 734' West Torus Room, which had radiation levels warranting posting and controls for a high radiation area. Corrective actions taken by the licensee included a change in the procedure to survey the Torus Room in the area of shut-down cooling, specifically after low pressure core injection (LPCI) full flow testing that could result in unexpected high radiation areas. A cross-cutting aspect in human performance was associated with this finding in the area of decision-making. (H.1.a)

The issue was more than minor because it was associated with the Program/Process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation. The issue represents a finding of very low safety significance because it did not involve As-Low-As-Is-Reasonably-Achievable (ALARA) planning or work controls, there was no overexposure, nor did a substantial potential for an overexposure exist given the radiological conditions in the area and the workers response to the electronic dosimeter alarm. Also, the licensee's ability to assess worker dose was not compromised. (Section 2OS1.2)

Cornerstone: Mitigating Systems

Green. A finding of very low safety significance and an associated Severity Level IV NCV of 10 CFR 50.72(b)(3)(v) were identified by the inspectors for the failure of the licensee to make an eight-hour notification to the NRC for the loss of both emergency diesel generators (EDGs). The licensee entered this into their corrective action program (CAP) as CAP 053463 and updated the event notification (EN 43692) to include the loss

of safety function resulting from both EDGs being inoperable from 0408 to 0715 on October 5, 2007.

The inspectors determined that the failure to report the loss of safety function of the onsite emergency AC power system in accordance with 10 CFR 50.72(b)(3)(v) was a performance deficiency. The NRC considers the safety implications of non-compliances that may impact the ability to carry out its statutory mission. Non-compliances may be significant because they may challenge the regulatory envelope upon which certain activities were licensed. This issue is greater than minor, because the failure to report the loss of the EDGs affected the NRC's ability to perform a regulatory function. Because violations of 10 CFR 50.72 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process instead of the SDP. However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. Using IMC 0609, "Significance Determination Process," the inspectors screened this issue as having very low safety significance using the phase 1 screening questions under the Mitigation System Cornerstone. (Section 4OA3.1)

B. Licensee-Identified Violations

No violations of significance were identified.

REPORT DETAILS

Summary of Plant Status

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

- On October 31, 2007, reactor power was lowered to approximately 55 percent to repair a steam leak, immediately downstream of the 'B' feedwater pump, located on the high point vent from the 'B' feedwater line. The affected piping was replaced and the plant was returned to full power on November 2, 2007.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Winter Seasonal Readiness Preparations

a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions.

Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Cooling Towers and Circulating Water System; and
- Instrument Air Compressor System.

This inspection constitutes one winter seasonal readiness preparations sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

.2 Readiness For Impending Adverse Weather Condition – Freezing Rain Conditions

a. Inspection Scope

Since freezing rain conditions were forecast in the vicinity of the facility for the week of December 9, 2007, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions and also observed the site's response after the freezing rain had passed. The inspectors observed insulation, heat trace circuits, space heater operation, and weatherized enclosures to ensure operability of affected systems. The inspectors reviewed licensee procedures and discussed potential compensatory measures with control room personnel. On December 13, 2007, the inspectors walked down the 161kv/4160kv startup transformer system because its safety-related functions could be affected as a result of the freezing rain conditions present at the facility. The inspectors focused on plant management's actions for implementing the station's procedures for ensuring adequate personnel for safe plant operation and emergency response would be available. This included plant response to ice falling on the startup transformer with the standby transformer out-of-service. Specific documents reviewed during this inspection are listed in the Attachment.

This inspection constitutes one readiness for impending adverse weather condition sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial walkdowns of accessible portions of trains of risk-significant Mitigating Systems equipment. The documents listed in the Attachment were used by the inspectors to accomplish the objectives of the inspection procedure. Equipment alignment was reviewed to identify any discrepancies that could impact the function of the system and potentially increase risk. Redundant or backup systems were selected by the inspectors during times when the trains were of increased importance due to the redundant trains of other related equipment being unavailable. Inspection activities included, but were not limited to, a review of the licensee's procedures, verification of equipment alignment, and an observation of material condition, including operating parameters of in-service equipment. Identified equipment alignment problems were verified by the inspectors to be properly resolved.

The inspectors selected the following equipment trains to verify operability and proper equipment line-up:

- 'B' Standby Diesel Generator (SBDG) with 'A' SBDG out-of-service (OOS) for maintenance;
- High Pressure Coolant Injection (HPCI) with Reactor Core Isolation Cooling (RCIC) OOS for maintenance; and

- Division 2, 125 VDC Power Distribution System with the Division 1, 125 VDC Power Distribution System OOS for maintenance.

These activities constituted three partial system walkdown samples as defined in Inspection Procedure 71111.04-05

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

The inspectors performed a complete system alignment inspection of the RCIC system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspection consisted of a review of plant procedures (including selected abnormal and emergency procedures), drawings, and the UFSAR to identify proper system alignment. The inspectors also reviewed selected issues identified in CAP documents, to determine if they had been properly addressed in the licensee's corrective actions program. As part of this inspection, the documents in the Attachment were utilized to evaluate the potential for an inspection finding.

These activities constituted one complete system walkdown sample 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 (71111.05AQ)

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) 6, Residual Heat Removal (RHR) Valve Room Elevation, 757'-6";
- AFP 10, Main Exhaust Fan Room, Heating Hot Water Pump Room and the Plant Air Supply Fan Room;
- AFP 11, Reactor Building Laydown Area, Elevation 833'-6";
- AFP 12, Reactor Building Decay Tank and Condensate Phase Separator Rooms;
- AFP 20, Aux Boiler Room, Emergency Diesel Generator (EDG) Rooms, and Generator Day Tank Rooms, Elevation 757'-6";
- AFP 23, Control Building 1D-2, 1D-4, 1D-1 Battery Rooms and Battery Corridor;
- AFP 24, Control Building 1-A3, 1-A4 Essential Switchgear Rooms;

- AFP 28, Pump House Emergency Service Water (ESW)/Residual Heat Removal Service Water (RHRSW) Pump Rooms and Main Pump Room;
- AFP 29, Pump House Fire Pump and Fire Pump Day Tank Rooms; and
- AFP 30, Pump House Safety-related Piping Area

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

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

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors performed a review of the licensee's bio-fouling and cleanliness inspection of the 'A' reactor building closed cooling water heat exchanger. The inspectors utilized the documents listed in the Attachment to accomplish the objectives of the inspection procedure. The inspection focused on potential deficiencies that could mask the licensee's ability to detect degraded performance, identification of any common cause issues that had the potential to increase risk, and ensuring that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspection activities included, but were not limited to, a review of the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing criteria.

This inspection constitutes one sample as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On October 17, 2007, the inspectors observed a crew of licensed operators in the plant's simulator during a licensee evaluated emergency preparedness training drill 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 Technical Specification (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.

Additionally, the inspectors observed portions of the licensee's instructor training sessions associated with reactor vessel breach and core melt, abnormal event analysis, and mitigating core damage strategies.

These inspection activities constituted one quarterly licensed operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

.2 Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of Job Performance Measure operating tests, and simulator operating tests (required to be given per 10 CFR 55.59(a)(2)) administered by the licensee from October 23 through December 5, 2007. The overall results were compared with the significance determination process in accordance with NRC IMC 0609, Appendix I, "Operator Requalification Human Performance SDP." This review represented one sample.

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:

- Site Communications; and
- Feedwater System.

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

These 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)

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Work Week 9740;
- Work Week 9750; and
- Work Week 9751: Remote Shutdown Panel Surveillance Testing.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstone. 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, shift technical advisor, or a senior licensed 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 activities constituted three samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Operability Recommendation (OPR) 000367, Damage to 1B42 Bus Bars;
- OPR 000370, Design Calculations for 161KVA Sources;
- OPR 000371, Evaluation of Switchyard During Severe Weather; and
- OPR 000372, Main Steam Line Drains Upstream of MO-4424.

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

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

.1 Post Maintenance Testing

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) 1139257, 'A' SBDG 2-Year Maintenance Inspections;
- Maintenance Work Order (MWO) 1136907, RCIC System Flow Controller Replacement;
- Corrective Work Order (CWO) A73482 and A73484, Replacement of the ‘A’ and ‘C’ RHRSW Motor Cooling Coil; and
- CWO A82335, Repair Switchyard Disconnect SW8491.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against 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 CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment.

These activities constituted four 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, Standby Diesel Generators Operability Test for the 'B' SBDG;
- STP 3.8.7-01, Low Pressure Coolant Injection (LPCI) Swing Bus AC and DC Undervoltage Transfer Test; and
- STP 3.3.6.3-03, Low-Low Set Pressure Setpoint Channels Functional 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; the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the CAP. Documents reviewed are listed in the Attachment.

These activities constituted three routine surveillance testing samples as defined in Inspection Procedure 71111.22-05.

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 3.5.1-01, Core Spray 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; the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable for 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 CAP. Documents reviewed are listed in the Attachment.

This inspection constitutes one in-service inspection sample as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings of significance were identified.

.3 Reactor Coolant System Leak Detection Inspection

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 3.4.5-04, Functional Test of Equipment and Floor Drain Sump Flow Timers.

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; the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the CAP. Documents reviewed are listed in the Attachment.

This inspection constitutes one reactor coolant system leak detection inspection sample as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification:

- TM 07-021, GEZIP Feedwater Inboard Isolation Valve (V-07-0247) Furmanite Encapsulation.

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 TSs, as applicable, to verify that the modification did not affect the operability or availability of the affected system. The inspectors also compared the licensee's information to operating experience information to ensure that lessons learned from other utilities had been incorporated into the licensee's decision to implement the temporary modification. The inspectors, as applicable, performed field verifications to ensure that the modification was installed as directed; the modification operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modification 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.

This inspection constitutes one sample as defined in Inspection Procedure 71111.23-05.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

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

a. Inspection Scope

The inspectors performed a screening review of Sections B and H, Revisions 28 and 25 respectively, and Appendix 6, Revision 25 of the Duane Arnold Energy Center Emergency Plan to determine whether changes identified in the above revisions decreased the effectiveness of the licensee's emergency planning for the Duane Arnold Energy Center. This review did not constitute an approval of the changes, and as such, the changes are subject to future NRC inspection to ensure that the emergency plan continues to meet NRC regulations.

These activities completed one inspection sample as defined in Inspection Procedure 71114.04-05.

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 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors reviewed licensee controls and surveys performed during the refueling outage in the following five radiologically significant work areas within radiation areas, high radiation areas, and airborne radioactivity areas in the plant and reviewed work packages, which included associated licensee controls and surveys of these areas to determine if radiological controls including surveys, postings, and barricades were acceptable:

- Refuel Floor In-Service Inspections activities;
- Drywell Nozzle In-Service Inspection;
- Diving Refuel Floor/Reactor Vessel Sparger Repair;
- Installation and removal of temporary shielding that included N2 window shielding; and
- Control Rod Drive (CRD) support work including under vessel activities.

The inspectors reviewed the radiation work permits (RWPs) and work packages used to access these five areas and other high radiation work areas to identify the work control instructions and control barriers that had been specified. Electronic dosimeter alarm set points for both integrated dose and dose rate were evaluated for conformity with survey indications and plant policy. The licensee's staffs were interviewed to verify that they were aware of the actions required when their electronic dosimeters noticeably malfunctioned or alarmed.

The adequacy of the licensee's internal dose assessment process for analyzing internal exposures that exceed 50 millirem committed effective dose equivalent was assessed to determine if affected personnel would be properly monitored utilizing calibrated equipment, that the data would be analyzed, and that internal exposures would be properly assessed in accordance with licensee procedures.

The inspectors reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within the spent fuel pool.

These reviews represented two samples as defined in Inspection Procedure 71121.01-05.

b. Findings

No findings of significance were identified.

.2 High Risk Significant, High Dose Rate High Radiation Area and Very High Radiation Area Controls

a. Inspection Scope

The inspectors held discussions with the Radiation Protection Manager concerning high dose rate/high radiation area and very high radiation area controls and procedures, including procedural changes that had occurred since the last inspection, in order to verify that any procedure modifications did not substantially reduce the effectiveness and level of worker protection.

This inspection constitutes one sample as defined by Inspection Procedure 71121.01-05.

The inspectors discussed with Radiation Protection (RP) 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 reviewed the licensee's procedures and discussed with RP staff its practices for access into locked high and very high radiation areas and for areas with the potential for changing radiological conditions such as the drywell and Torus area. In particular, the inspectors reviewed a high radiation area incident that occurred on February 7, 2007. This included review of the circumstances and consequences associated with a worker staging scaffolding in the Torus catwalk area who received a dose rate alarm. These reviews were conducted to determine the adequacy of the radiological controls and the radiological hazards assessment associated with such entries. Work instructions provided in RWPs and in pre-entry briefing documents were discussed with RP staff to determine their adequacy relative to industry practices and NRC Information Notices.

The inspectors also reviewed the licensee's procedure and generic practices associated with dosimetry placement and the use of multiple whole body dosimetry for work in high radiation areas having significant dose gradients for compliance with the requirements of 10 CFR 20.1201(c) and applicable industry guidelines. Additionally, previously completed work in areas where dose rate gradients were subject to significant variation such as work under-vessel were reviewed to evaluate the licensee's practices for dosimetry placement.

The inspectors conducted plant walkdowns to verify the posting and locking of entrances to high dose rate high radiation areas and very high radiation areas.

These reviews represented three samples as defined in Inspection Procedure 71121.01-05.

b. Findings

Introduction: A self-revealed Green finding of very low safety significance and an associated NCV of NRC requirements (10 CFR 20.1501) were identified for the failure to

adequately survey and evaluate the magnitude and extent of radiation levels, which resulted in an unposted high radiation area.

Description: On February 7, 2007, a foreman/worker reported to access control when he received an electronic dosimeter (ED) high dose rate alarm of 81 millirem/hour. The worker was walking on the catwalk of 734' Torus Room at the time of the alarm. The RP staff reviewed the ED records for the worker's RWP entry and found that the worker's ED alarmed at 81 millirem/hour. The staff recognized that the recorded radiation level was abnormally high for the Torus catwalk area, which was posted as a radiation area. The RP staff dispatched a technician to survey the Torus Room where the worker had been on the Torus catwalk. The dose rate surveys indicated that several areas of the Torus Room had elevated dose rates that had apparently resulted from the shut-down cooling system's low pressure core injection full flow tests that had been performed about two days earlier. The licensee attributed the elevated radiation levels to crud bursts within the system and to the shut-down cooling system not running for a sufficient time to ensure that suspended radioactive materials were cleaned up or removed from the system. The resulting suspension of radioactive material in the coolant increased the radiation dose rate to a maximum 160 millirem/hour at 30 centimeters at the RHR piping at the 734' West Torus Room, which caused the worker's ED dose rate alarm at 81 millirem/hour. This area of the Torus catwalk location at the Torus Room 734' West was an inadequately posted and controlled area, because the licensee failed to recognize the changing condition and the increasing dose rate trends in the RHR piping during the LPCI full flow tests. Specifically, the licensee performed dose rate surveys during and after the LPCI full flow tests. Surveys indicated that there was an increasing dose rate trend at the RHR piping after the LPCI full flow test; however, the licensee failed to perform additional dose rate surveys in order to fully evaluate the changing condition, which resulted in a high radiation area.

Analysis: The failure to perform adequate radiological surveys required by 10 CFR 20.1501 to ensure that high radiation areas are properly posted and controlled represents a performance deficiency as defined in NRC IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening." The inspectors determined that the issue was associated with the Program/Process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation. Therefore, the issue was more than minor and represented a finding which was evaluated using the SDP.

Since the finding involved a high radiation area radiological control issue, the inspectors utilized IMC 0609, Appendix C, "Occupational Radiation Safety SDP," to assess its significance. Based on the radiological conditions in the area coupled with the worker response to the ED alarm, the inspectors determined that no overexposure occurred nor did a substantial potential for an overexposure exist. The licensee's ability to assess dose was also not compromised for this incident. Consequently, the inspectors concluded that the SDP assessment for this finding was of very low safety significance (Green).

The inspectors identified a cross-cutting aspect in human performance associated with this finding in the area of decision-making, specifically with risk significant decisions using a systematic process. When the licensee was faced with uncertain or unexpected plant conditions, the licensee did not ensure safety was maintained in the work practices component. Specifically, the licensee did not have a systematic process to evaluate the

increasing radiation levels caused by shut-down cooling operations such as LPCI flow tests and to perform additional radiation measurements, which resulted in an unposted high radiation area (H.1.a).

Enforcement: Title 10 CFR 20.1501 requires that each licensee performed radiation surveys that may be necessary for the licensee to comply with the regulations in 10 CFR Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, and the potential radiological hazards that could be present. Contrary to the above, as of February 7, 2007, the licensee did not perform dose rate surveys to assure compliance with 10 CFR 20.1902, which limits radiation levels to be less than 100 millirem/hour for radiation area posting requirements. A radiation survey performed in the Torus Room by the RP staff after the event indicated that the dose rates at the RHR piping were nominally at 160 millirem/hour at 30 centimeters.

Corrective actions taken by the licensee included reminding the staff during outage briefings to be aware of changing conditions in regard to operating systems that may change radiation levels in the Torus work areas. Since the licensee documented this issue in its CAP (CAPs 047115, 045132, 047794, and 045375) and completed an Apparent Cause Evaluation (ACE 004858) by February 15, 2007, and because the violation is of very low safety significance, it is being treated as an NCV (NCV 05000331/2007005-01).

2OS2 As-Low-As-Is-Reasonably-Achievable Planning And Controls (71121.02)

.1 Radiological Work Planning.

a. Inspection Scope

The inspectors compared the results achieved including dose rate reductions and person-rem used with the intended dose established in the licensee's ALARA planning for these five work activities. Reasons for inconsistencies between intended and actual work activity doses were reviewed for:

- Refuel Floor In-Service Inspections activities;
- Drywell Nozzle In-Service Inspection;
- Diving Refuel Floor/Reactor Vessel Sparger Repair;
- Installation and removal of temporary shielding that included N2 window shielding; and
- CRD support work including under vessel activities.

These reviews represented one inspection sample as defined in Inspection Procedure 71121.02-05.

b. Findings

No findings of significance were identified.

.2 Declared Pregnant Workers

a. Inspection Scope

The inspectors reviewed dose records of declared pregnant workers for the current assessment period to verify that the exposure results and monitoring controls employed by the licensee complied with the requirements of 10 CFR 20.

This inspection constitutes one sample as defined in Inspection Procedure 71121.02-05.

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 (PIs) 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 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures PI for the period from the fourth quarter 2006 through the third 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,” and NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance were used. The inspectors reviewed the licensee’s operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, CAP documents, event reports and NRC Integrated Inspection reports for the period from the fourth quarter 2006 through the third quarter 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 constitutes one safety system functional failures sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - Emergency AC Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Emergency AC Power System PI for the period from the third quarter 2006 through the third 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, MSPI derivation reports, Corrective Action Process Documents, event reports and NRC Integrated Inspection reports for the period from the third quarter 2006 through the third quarter 2007 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constitutes one MSPI emergency AC power system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.4 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - High Pressure Injection Systems PI for the period from the third quarter 2006 through the third 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, MSPI derivation reports, event reports and NRC Integrated Inspection reports for the period from the third quarter 2006 through the third quarter 2007 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified

with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constitutes one MSPI high pressure infection system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.5 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Heat Removal System PI for the period from the third quarter 2006 through the third 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, MSPI derivation reports, and NRC Integrated Inspection reports for the period from the third quarter 2006 through the third quarter to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constitutes one MSPI heat removal system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.6 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Residual Heat Removal System PI for the period from the third quarter 2006 through the third 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, MSPI derivation reports, event reports and NRC Integrated Inspection reports for the period from the third quarter 2006 through the third quarter 2007 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed

the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constitutes one MSPI residual heat removal system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.7 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Cooling Water Systems PI for the period from the third quarter 2006 through the third 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, CAP documents, MSPI derivation reports, event reports and NRC Integrated Inspection reports for the period the third quarter 2006 through the third quarter 2007 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constitutes one MSPI cooling water system sample as defined in 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 CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root

causes, extent of condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the attached List of Documents Reviewed.

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

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six month period of July 2007 through December 2007, although some examples expanded beyond those dates where the scope of the trend warranted.

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

This review constituted a single semi-annual trend inspection sample as defined in Inspection Procedure 71152-05.

b. Assessments and Observations

As part of this semi-annual trend review, the inspectors performed a focused review of the licensee's documentation of an emerging adverse trend affecting on-line work scheduling and risk management processes. On more than three occasions during the fourth calendar quarter of 2007, the licensee's weekly on-line risk analysis was revised to reflect an increased change in Probabilistic Risk Assessment (PRA) risk color. Only revisions which were required due to foreseeable risk significant evolutions not being properly characterized or scheduled were reviewed. Specific examples include:

- Characterized the risk associated with both SBDGs being unavailable during planned maintenance on the 'A' SBDG and performance of the required surveillance testing of the 'B' SBDG as Yellow verses Red;
- Improperly scheduled duration of the Startup Transformer unavailability during the transformer pit restoration project resulted in risk remaining Yellow three additional days and delayed scheduled DC power battery inspections to prevent entering an Orange risk condition; and
- Performed an emergent work clearance activity on equipment powered from the 'B' 480 VAC essential bus (1B42) while the 'A' SBDG was unavailable for planned maintenance which, due to known equipment concerns, caused a loss of 1B42 and resulted in an elevated risk condition requiring increased compensatory actions and equipment protective measures.

The licensee entered these issues into their CAP for further evaluation as CAP 053617. Based upon benchmarking of the FPL fleet and industry peers, the licensee determined that DAEC's protected equipment program had not been maintained at a level comparable to industry best practices, which protect the opposite train down to the 480 VAC/ 120 VAC control power systems. New expectations for the protected systems program were established, communicated to all site personnel, and implemented by the recent revision to DAEC Work Planning Guideline–2, On-Line Risk Management Guideline, Attachment 8.

The inspectors reviewed both the licensee's immediate corrective actions taken to address identified areas for improvements, and the completed condition evaluation. The inspectors will continue to monitor the licensee's performance and progress in the area of on-line work scheduling and risk management.

No findings or significant issues were identified.

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

.1 Loss of 480 Volt AC Essential Bus 1B42

a. Inspection Scope

The inspectors reviewed the plant's response to a loss of the 480 Volt AC essential bus 1B42. Documents reviewed in this inspection are listed in the Attachment.

On October 5, 2007, a loss of the 480 Volt AC essential bus 1B42 occurred during a clearance application on breaker 1B4234A. The loss of bus 1B42 resulted in the loss of the 'B' essential service water (ESW) pump, thus resulting in the loss of cooling to the 'B'

EDG. At the time of the event, the 'A' EDG was OOS and inoperable for planned maintenance. The 'A' ESW pump was inoperable but available following pre-planned maintenance.

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

b. Findings

Introduction: A finding of very low safety significance (Green) and an associated Severity Level IV NCV of 10 CFR 50.72(b)(3)(v) were identified by the inspectors for the failure of the licensee to make an eight hour notification to the NRC for the loss of both EDGs. The licensee entered this into their CAP for resolution.

Description: At 0408 on October 5, 2007, while applying a clearance (tagout) to breaker 1B4234A, a fault occurred on the Motor Control Center (MCC) dual breaker cubicle 1B4234A/B, resulting in the loss of the 480 Volt AC essential bus 1B42. The loss of bus 1B42 resulted in the loss of the 'B' ESW pump, thus resulting in the loss of cooling to the 'B' EDG. At the time of the event, the 'A' EDG was OOS and inoperable for planned maintenance. The 'A' ESW pump was inoperable but available following pre-planned maintenance. With both the 'A' and 'B' EDGs inoperable, there was a loss of the onsite emergency power safety function. At 0715, power was restored to bus 1B42, and the 'B' ESW pump and 'B' EDG were declared operable. At 1030, DAEC made an event notification (EN 43692) per 10 CFR 50.72(b)(3)(v) to the NRC reporting that a loss of safety function occurred due to a loss of both ESW pumps. There was no report made relative to the loss of safety function associated with both EDGs.

On October 26, 2007, the NRC inspectors questioned the licensee why there was not a concurrent event notification made for a loss of both EDGs. The licensee initiated CAP 053463, "NCAQ – Loss of 1B42 and reportability." At 1224, DAEC made an update to EN 43692 to include the loss of safety function resulting from both EDGs being inoperable from 0408 to 0715 on October 5, 2007.

After further review by the licensee, it was determined that while the 'A' ESW pump was inoperable by TS requirements, it was available and could have performed its safety function. On December 4, 2007, EN 43692 was further updated to reflect that there was no loss of safety function for the ESW pumps.

Analysis: The inspectors determined that the failure to report the loss of safety function of the onsite emergency AC power system in accordance with 10 CFR 50.72(b)(3)(v) was a performance deficiency. The NRC considers the safety implications of non-compliances that may impact the ability to carry out its statutory mission. Non-compliances may be significant because they may challenge the regulatory envelope upon which certain activities were licensed. This issue is greater than minor, because the failure to report the loss of the EDGs affected the NRC's ability to perform a regulatory function. Because violations of 10 CFR 50.72 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process instead of the SDP. However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. In this case, only the loss of bus 1B42 (which resulted in the loss of the 'B' EDG) is evaluated. As stated in IMC 0609, "Significance Determination Process," Appendix A, Attachment 1, Step 1.1, the SDP evaluation should not include any equipment

unavailable due to planned maintenance and testing. Therefore, the 'A' EDG OOS due to maintenance is not considered in the assessment. Using IMC 0609, "Significance Determination Process," the inspectors screened this issue as having very low safety significance using the phase 1 screening questions under the Mitigation System Cornerstone.

Enforcement: 10 CFR 50.72(b)(3)(v) requires that the licensee shall notify the NRC within eight hours of the occurrence of any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident. Contrary to this requirement, on October 5, 2007, the licensee failed to inform the NRC that there was a loss of the onsite emergency power safety function. The result of the violation was determined to be of very low safety significance; therefore, this violation of 10 CFR 50.72(b)(3)(v) was classified as a Severity Level IV violation. Because this violation was of very low safety significance, was not repetitive or willful, and it was entered into the licensee's CAP as CAP 053463, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000331/2007005-02).

.2 Review of Personnel Performance During a Planned Downpower to perform repairs on the Main Steam Line Drain and Manway for Main Steam Reheater Drain Tank

a. Inspection Scope

The inspectors reviewed personnel performance following a planned downpower to approximately 55 percent reactor power to repair two steam leaks. The inspectors observed the operators performing plant manipulations to reduce reactor power in order to reduce the dose rates in the secondary steam system. A review of the operator logs, associated procedures, briefings, and contingency plans were observed or evaluated by the inspectors. The inspectors observed operator performance during the evolution. Reviews included, but were not limited to, operator logs, pre-job briefings, instrument recorder data, and procedures. The documents listed in the Attachment were used by the inspectors to accomplish the objectives of the inspection procedure.

This review represented one sample as defined in Inspection Procedure 71153-05.

b. Findings

No findings of significance were identified.

.3 Review of Personnel Performance During an Unplanned Downpower due to a Steam Leak in the 'B' Reactor Feedwater System

a. Inspection Scope

The inspectors reviewed personnel performance following an unplanned downpower to approximately 55 percent reactor power due to a steam leak in the 'B' Reactor Feedwater system minimum flow line high point vent piping. The inspectors observed the operators performing plant manipulations to reduce reactor power in order to take out-of-service and isolate the 'B' feedwater system to repair the steam leak. A review of the operator logs, associated procedures, briefings, and contingency plans were

observed or evaluated by the inspectors. The inspectors observed and reviewed records of operator performance during these evolutions. Reviews included, but were not limited to, operator logs, pre-job briefings, instrument recorder data, and procedures. The documents listed in the Attachment were used by the inspectors to accomplish the objectives of the inspection procedure.

This review represented one sample as defined in Inspection Procedure 71153-05.

b. Findings

No findings of significance were identified.

.4 (Closed) LER 05000331/2007-009-00: "Loss of Essential Bus Resulted in Loss of Safety Function"

At 0408 on October 5, 2007, while applying a clearance (tagout) to breaker 1B4234A, a fault occurred on the MCC dual breaker cubicle 1B4234A/B, resulting in the loss of the 480 Volt AC essential bus 1B42. The loss of bus 1B42 resulted in the loss of the 'B' ESW pump, thus resulting in the loss of cooling to the 'B' EDG. At the time of the event, the 'A' EDG was OOS and inoperable for planned maintenance. The 'A' ESW pump was inoperable but available following pre-planned maintenance. With both the 'A' and 'B' EDGs inoperable, there was a loss of the onsite emergency power safety function. At 0715, power was restored to bus 1B42, and the 'B' ESW pump and 'B' EDG were declared operable.

The primary cause of the event was an equipment failure related to an underlying equipment deficiency that was exacerbated by Operator actions. Specifically, the most probable cause of the arc flash was due to the 'C' phase stab for MCC breaker cubicle 1B4234A/B becoming separated from the right 'C' phase bus work. Contributing to the event was the station management team's failure to effectively identify and resolve previously identified issues with MCC breaker cubicle 1B4234A/B.

Section 4OA3.1 describes an NRC-identified finding associated with the closure of this LER. The licensee entered this into their CAP as CAP 053463. Documents reviewed as part of this inspection are listed in the Attachment. This LER is closed.

4OA6 MANAGEMENT MEETINGS

.1 Exit Meeting Summary

On January 17, 2007, the inspector presented the inspection results to Mr. D. Curtland, Plant Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Access control to radiologically significant areas and the ALARA planning and controls program with Mr. D. Curtland, Plant Manager on November 2, 2007.

Licensed Operator Requalification biannual inspection with Mr. J. Morris, Training Manager, on December 10, 2007.

Emergency Preparedness inspection with Mr. T. MacIntyre on December 19, 2007.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Anderson, 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
G. Fuller, Operations Training
G. Pry, Maintenance Manager
J. Windschill, Chemistry & Radiation Protection Manager
P. Sullivan, Emergency Preparedness Manager
T. MacIntyre, Emergency Planning Coordinator
M. Lingenfelter, Design Engineering Manager
S. Huebsch, System Engineering Supervisor
J. Swales, Design Engineering Supervisor
K. Kleinheinz, Program Engineering Manager
R. Porter, General Supervisor Radiation Protection
P. Louis, Health Physics Supervisor
B. Klotz, Program Engineering Supervisor
R. Schlueter, ALARA Coordinator
N. McKenney, General Supervisor Radiation Protection Support
S. Funk, CHP, REMP Program Manager, Sr. Health Physics Coordinator
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

05000331/2007005-01	NCV	Failure to Adequately Survey Resulting in Unposted, Uncontrolled High Radiation Area. (Section 2OS1.2)
05000331/2007005-02	NCV	Failure to Make an 8 hour Notification to the NRC for Loss of Both EDGs (Section 4OA3.1)

Closed

05000331/2007009-00	LER	Loss of Essential Bus Resulted in Loss of Safety Function

LIST OF DOCUMENTS REVIEWED

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

1R01 Adverse Weather Protection

Corrective Action Process Documents:
- CAP 051247; Tornado Hazards Walkdown Results
- CAP 051527; Use of Open Dumpsters in the Protected Area
- CAP 054283; NCAQ-Ice on Start-up Transformer 1X003 Falling Down as It Melts

Procedures:
- Integrated Plant Operating Instruction (IPOI) 6; Weather Impacted Operations; Revision 43

Miscellaneous:
- System Description 442; Cooling Towers and Circulating Water System; Revision 5
- System Description 518; Instrument and Service Air and Breathing Air Systems; Revision 6

1R04 Equipment Alignment

Procedures:
- Operating Instruction (OI) 324A2; SBDG 1G-21 System Electrical Lineup; Revision 2
- OI 324A4; SBDG 1G-21 Valve Lineup and Checklist; Revision 10
- OI 324A8; SBDG 1G-21 Control Panel Lineup; Revision 1
- OI 152A1; HPCI System Electrical Lineup, Revision 3;
- OI 152A2; HPCI System Valve Lineup and Checklist, Revision 13
- OI 152A4; HPCI System Control Panel Lineup, Revision 2
- 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
- BECH-M124; Reactor Core Isolation Cooling System (Steam Side), Revision 41
- BECH-M125; Reactor Core Isolation Cooling System (Water Side) Sheet 2, Revision 30
- OI 302A4; Division 2, 125 VDC Power Distribution System, 1D20, 1D21, 1D22, and 1D23 Electrical Lineup (In Service); Revision 1

1R05 Fire Protection

Procedures:
- AFP 6; Residual Heat Removal Valve Room Elevation 757'-6"; Revision 24
- AFP 10; Main Exhaust Fan Room, Heating Hot Water Pump Room and the Plant Air Supply Fan Room; Revision 24
- AFP 11; Reactor Building Laydown Area, Elevation 833'-6"; Revision 23
- AFP 12; Reactor Building Decay Tank and Condensate Phase Separator Rooms; Revision 24
- AFP 20; Aux Boiler Room, Emergency Diesel Generator Rooms, and Generator Day Tank Rooms, Elevation 757'-6"; Revision 29
- AFP 23; Control Building 1D-2, 1D-4, 1D-1 Battery Rooms and Battery Corridor; Revision 24
- AFP 24; Control Building 1-A3, 1-A4 Essential Switchgear Rooms; Revision 28

- AFP 28; Pump House Emergency Service Water/Residual Heat Removal Service Water Pump Rooms and Main Pump Room; Revision 29
- AFP 29; Pump House Fire Pump and Fire Pump Day Tank Rooms; Revision 27
- AFP 30; Pump House Safety-related Piping Area; Revision 25

1R07 Heat Sink Performance

Procedures:
- HETPT-1; Heat Exchanger Thermal Performance and Trending Program; Revision 7
- OI 414; Reactor Building Closed Cooling Water System; Revision 33
- GMP-MECH-26; Heat Exchangers; Revision 9

Work Orders:
- PWO 1138068; Open, Inspect and Clean Heat Exchanger: Repair Coating as Required

Miscellaneous:
- Heat Exchanger Program; Revision 1

1R11 Licensed Operator Requalification Program

Corrective Action Process Documents:
- CAP 053316; CAQ-When General Emergency Was Reached, Counties Were Not Notified in 15 Minutes
- CAP 053323; CAQ-Documentation of Grading of DEP-PI for Drill General Emergency

Procedures:
- Administrative Control Procedure (ACP) 101.01; Procedure Use and Adherence; Revision 42
- ACP 110.1; Conduct of Operations; Revision 9
- IPOI 4; Shutdown; Revision 86
- IPOI 5; Reactor Scram; Revision 46
- Emergency Action Level Matrix-Modes 1, 2, 3; Revision 7
- Emergency Operating Procedure 2; Primary Containment Control; Revision 14
- Emergency Operating Procedure 3/4; Secondary Containment/Radiation Release Control; Revision 19
- Emergency Planning Department Manual (EDPM) 1008; Emergency Response Drill and Exercise Program; Revision 8
- EPDM 1015; Scenario Development Program; Revision 2
- EPDM FORM EP-035; Drill/Exercise Objective and Evaluation Process; Revision 5
- Emergency Planning Implementation Procedure 6.1; Drill and Exercise Program; Revision 0
- Abnormal Operating Procedure 901; Earthquake; Revision 17

Miscellaneous:
- 50107, Abnormal Event Analysis-10; Vessel Breach and Core Melt; Revision 2

1R12 Maintenance Effectiveness

Corrective Action Process Documents:
- CAP 047489; Loss of All Plant PBX Telephone System
- Condition Evaluation (CE) 004944; Loss of All Plant PBX Telephone System
- CAP 050535; Benton County All Call Phone Did Not Ring During Test
- CAP 050536; Loss of PBX System

- CE 005478; Loss of PBX System
- CAP 051807; NCAQ-Lack of Procedure to Restore Phone Lines When Lost
- CAP 051808; NCAQ-Loss of PBX
- CAP 052002; NCAQ-Loss of PBX Phone Line
- CAP 052035; CAQ-Loss of PBX Phone Line
- CAP 053341; CAQ-Loss of PBX Phone System
- CE 005831; CAQ-Loss of PBX Phone System
- Corrective Action (CA) 043005; Replace Reactor Feed Pumps
- CAP 047394; End Bracket on Feedwater Sparger Found Broken
- CAP 053545; V07-0113 'B' Reactor Feed Pump Minimum Flow Line High Point Vent Weld Failure
- CAP 043054; Perform Evaluation on Cross-Flow System to Look for Signal Contamination
- CAP 041865; Feedwater Maintenance Rule RED [50.65(a(1))] Declaration

Procedures:
- ACP 1406.10; Communication Systems; Revision 13

Work Orders:
- CWO A77236; Failure of Ultrasonic Flow Crossflow Transducers
- CWO A77237; Failure of Ultrasonic Flow Crossflow Transducers

Miscellaneous:
- DAEC Maintenance Rule Program Module 0; Overview; Revision 3
- DAEC Maintenance Rule Program Module 2; Risk-Significance Determination; Revision 2
- DAEC Maintenance Rule Availability Criteria; Revision 0
- DAEC Maintenance Rule Program Module 4 for Feedwater System; Monitoring Performance, Goal Setting, and EPIX Activities
- DAEC Maintenance Rule Maintenance Preventable Functional Failure Summary List; Revision 0
- DAEC Performance Criteria Basis Document for Site Communications (SUS 12.00, 99.01, 99.06); Revision 2
- Summary of DAEC Maintenance Rule System Goals for RED (a)(1) Systems; December 2007
- DAEC Maintenance Rule Program Module 4 for Feedwater System; Monitoring Performance, Goal Setting, and EPIX Activities
- DAEC System Checklist/Health Report; Feedwater and Condensate System; Period 2007-3; November 29, 2007
- System Monitoring and Reporting Tool; System 44.0, Feedwater and Condensate; December 20, 2007

1R13 Maintenance Risk Assessments and Emergent Work Control

Corrective Action Process Documents:
- CAP 053089; NCAQ-TTT-ACP 1408.1, Work Orders, Not Clear About Risk Flags and Risk Planning

Procedures:
- Work Planning Guideline-2; On-Line Risk Management Guideline; Revision 33
- Work Planning Guideline-2; On-Line Risk Management Guideline; Revision 34

Miscellaneous:
- DAEC On-line Schedule for Work Week 9740

- Maintenance Risk Evaluations for Work Week 9740; Revisions 1 through 4
- DAEC On-line Schedule for Work Week 9750
- Maintenance Risk Evaluations for Work Week 9750; Revisions 1 through 5
- DAEC On-line Schedule for Work Week 9751
- Maintenance Risk Evaluations for Work Week 9751; Revisions 1 through 5

1R15 Operability Evaluations

Corrective Action Process Documents:
- CAP 052960; CAQ-Damage to 1B42 Bus Bars When Tagging Out 1B4234A
- OPR 000367; CAQ-Damage to 1B42 Bus Bars When Tagging Out 1B4234A
- CAP 053706; CAQ-Design Calculations Do Not Adequately Model 161 KV Offsite Sources
- OPR 000370; CAQ-Design Calculations Do Not Adequately Model 161 KV Offsite Sources
- CE 005910; CAQ-Design Calculations Do Not Adequately Model 161 KV Offsite Sources
- CA 048111; CAQ-Design Calculations Do Not Adequately Model 161 KV Offsite Sources
- CAP 053989; Modeling Error Found in LOCA Mode Electrical Calculations
- OPR 000371; Modeling Error Found in LOCA Mode Electrical Calculations
- CAP 054033; Indeterminate Required Actions for Both Offsite Sources Inoperable
- CAP 054037; Standby Transformer Voltage Concerns
- Apparent Cause Evaluation 001791; Standby And Startup Transformer Voltage Concerns
- CAP 054235; Standby Transformer 1X4 Potentially Operable But Degraded When Restored
- CAP 054249; Error in Specification BECH-MRS-M116 Resulted in Incomplete Analysis of Main Steam Line Drain Piping
- OPR 000372; Error in Specification BECH-MRS-M116 Resulted in Incomplete Analysis of Main Steam Line Drain Piping

Procedures:
- ACP 110.3; Operability Determination; Revision 11
- ACP 110.3; Operability Determination; Revision 12

Work Orders:
- MWO 1143077; Change 1X004 (Standby Transformer) Tap Setting from 3 to 4, And Verify Degraded Voltage Relays 127-A1, A2, B1, B2 for Bus 1 and Bus 2 Have Been Calibrated

1R19 Post Maintenance Testing

Corrective Action Process Documents:
- CAP 052889; CAQ-Aggregate Review of SBDG Issues Discovered During the 1G-31 2 Year Overhaul
- CE 005775; CAQ-Aggregate Review of SBDG Issues Discovered During the 1G-31 2 Year Overhaul
- CAP 052926; CAQ-Worn Threads on 'A' EDG #8 & #1 Fuel Oil Injector Drain Fittings
- CAP 052931; CAQ-'A' SBDG Air Start Check Valves
- CAP 052954; CAQ-'A' SBDG Governor Droop Settings at 'MAX' Instead of 'Zero'
- Apparent Cause Evaluation 001771; CAQ-'A' SBDG Governor Droop Settings at 'MAX' Instead of 'Zero'
- CAP 052957; CAQ-'A' EDG Exhaust Fire
- CAP 052959; CAQ-Virginia Sealing Gaskets Failed When 1G-31 Reached Rated Power
- CAP 053595; RCIC Oil Filter High d/p Alarm
- CAP 054226; 'A' RHRSW Pump Motor Cooler Fit-up Issue
- CAP 054295; 'C' RHRSW Pump Motor Cooler Fit-up Issue

- CAP 054240; Degraded Voltage Calibrations Performed Without Entering LCOs
- CAP 054262; NCAQ-Center Phase Contact of SW8491 Bent While Attempting to Close Disconnect

Procedures:
- STP 3.5.3-02; RCIC System Operability Test, Revision 23
- OI 416; RHRSW System; Revision 52

Work Orders:
- PWO 1139258; Complete 2 Year Mechanical Inspection of 'A' SBDG 1G-31
- MWO 1136907; RCIC System Flow Controller Replacement
- CWO A73482; Replace Motor Cooling Coil on 'A' RHRSW Motor
- CWO A73484; Replace Motor Cooling Coil on 'C' RHRSW Motor
- CWO A82335; Repair or Replace Disconnect Switch SW8491

1R22 Surveillance Testing

Corrective Action Process Documents:
- CAP 052913; CAQ-Misleading and Inaccurate General Caution in STP 3.8.1-03 SBDG Test
- CAP 052938; CAQ-Evaluate RISK for Running Operable Diesel STP at 72 Hours with Other Diesel Inoperable
- CAP 053921; CAQ-During STP 3.8.7-01 Section 7.2 Step 7.2.3 1B3401 Took ~11 Minutes to Close
- CAP 053923; LTS 1B37 De-energized for ~11 Minutes
- CAP 053931; CAQ-LPCI Loop Select STP Relay Failure
- CAP 053981; Non-compliance Near Miss with a Continuous Use Procedure

Procedures:
- STP 3.8.1-03; Standby Diesel Generators Operability Test; Revision 13
- OI 324A10; SBDG Standby/Readiness Condition Checklist; Revision 5
- STP 3.3.6.3-03; Low-Low Set Pressure Setpoint Channels Functional Test; Revision 5
- STP 3.3.6.3-04; Low-Low Set Pressure Setpoint Channels Calibration; Revision 9
- STP 3.4.5-04; Functional Test of Equipment and Floor Drain Sump Flow Timers; Revision 6
- STP 3.8.7-01; Low Pressure Coolant Injection (LPCI) Swing Bus AC and DC Undervoltage Transfer Test; Revision 7
- STP 3.5.1-01; Core Spray Operability Test; Revision 18
- STP NS 510002; Core Spray System Inspection and Walkdown; Revision 6
- ACP 1407.5; Surveillance Testing Program; Revision 26

Work Orders:
- CWO A81667; Burnish Relay Contacts for E11A-K31A

1R23 Temporary Plant Modifications

Corrective Action Process Documents:
- CAP 052583; NCAQ-V07-0247 Body to Bonnet Leak is Blowing Steam, Threatens Continued Operation
- CA 047567; NCAQ-V07-0247 Body to Bonnet Leak is Blowing Steam, Threatens Continued Operation

Procedures:

- FP-E-MOD-03; Fleet Modification Procedure for Temporary Modifications; Revision 1
- Furmanite Engineering Procedure N-2007193; Enclosure Installation Procedure for DAEC V07-0247; Revision 0
- General Maintenance Procedure GMP-MECH-40; On-Line Leak Sealing; Revision 2

Work Orders:
- CWO A814162; Install TM-07-021, Perform Furmanite Repair of Valve V07-0247

Miscellaneous:
- Temporary Modification 07-021; Perform Furmanite Leak Sealing Enclosure of V07-0247, GEZIP Injection System Inboard Isolation Valve

1EP4 Emergency Action Level and Emergency Plan Changes

Procedures:
- DAEC Emergency Plan; Sections B and H, Revisions 27, 28, and 24 and 25; and Appendix 6, Revisions 24 and 25

2OS1 Access Control to Radiologically Significant Areas

Procedures:
- HPP 3104.01; Control of Access to High Radiation Area and Above; Revision 38
- ACP 1411.17; Occupational Dose Limits and Upgrades; Revision 20
- ACP 1411.2; Conduct of Radiation Protection; Revision 0
- ACP 1408.30; Control Diving, Revision 2
- HPP 3104.05; Discrete Radioactive Particle Control, Revision 12
- PDA-07-008; FPLE Duane Arnold Nuclear Oversight Quality Report; dated March 30, 2007HP
- ACP 1411.13; Control of Locked High Radiation Areas and Above; Revision 21
- ACP 1411.17; Occupational Dose Limits and Upgrades; Revision 20

2OS2 As Low As Is Reasonably Achievable Planning And Controls

Corrective Action Process Documents:
- CA 045374; Improve HP Procedures For RHR System Surveys Following LPCI Full Flow Test; dated March 8, 2007
- CE 004884; Worker Received Dose Rate Alarm On Torus Catwalk On February 7, 2007; dated February 11, 2007
- CAP 047115; Worker On Wrong RWP Has Dose Rate Alarm; dated February 7, 2007
- CE 004858; Evaluate The Condition Described In The CAP Related To Problems With Area Radiation Levels Changing Due To Crud Bursts; dated February 8, 2007
- CAP 047066; Movement of Material in SFP without Informing Health Physics; dated February 7, 2007

Miscellaneous:
- RWP 30009; Job Step 1; Job Step 3; R1 All Support Work for RFO on RX 855 Elevation
- RWP 30009; Job Step 4; Contaminated Areas-Work on RB855 in Contaminated Areas or Contaminated Systems and Components
- RWP 30009; Job Step 5; Support Work for RFO on RX 855 Elevation; For Work In Areas or On Components That Are Highly Contaminated
- RWP 30014; Job Step 6; R1 All Cavity Work With Vessel Filled To RPV Flange; High Radiation Area Cavity Decon

- RWP 30016; Job Step 4; Work in SFP, Cavity, Cask or Dryer; Underwater Work or Work On Underwater Equipment
- RWP 30016; Job Step 5; Underwater Work or Work On Underwater Equipment
- RWP 40040; Job Step 6; CRD Project Support Work Outside Drywell; Changeout and Shipment Prep For CRD: Staging Equipment Hoist Inspection, Camera Installation, Filter Transfers, Area and Component Decon, and Recovery
- RWP 40041; Job Step 7; CRD Pulls and Filter Removal; Remove and Replace CRDs From Under Vessel
- RWP 40070; Job Step 7; N2 Shielding In Support Of Refuel Outage; N2(A-H) Penetration, Shield Rack Installation and Shielding Support Work
- RWP 40500; Job Step 7; Weld Overlay on N2 Nozzles; Weld overlay on N2 Nozzles In The Drywell Includes Insulation and Shielding Installation and Removal, Weld Preps, and Welding, Machining and NDE Using Ultrasonics, Penetration Testing and Visual Inspections
- RWP 40071; Shielding in Support of Refuel Outage; Drywell General Area Shielding. Not For N2 Penetrations Shielding Work
- RWP 40212; ISI Project General Area; Perform ISI exam And Associated Support Work. No. N2 Penetration Work Will Be Completed on This Job Step (Higher ED alarm set points)
- PDA-06-022; FPL Energy Duane Arnold Nuclear Oversight Quality Report; Conduct of Radiation Protection Assessment; dated October 5, 2006
- PDA-07-024; Daily Quality Summary Rollup; Conduct of RP Assessment; dated from March 27, 2007 thru June 20, 2007
- PDA-07-024; FPL Energy Duane Arnold Nuclear Oversight Quality Report; Second Quarter 2007; Conduct of Radiation Protection Assessment; dated July 3, 2007
- PDA-07-024; FPL Energy Duane Arnold Nuclear Oversight Quality Report; Third Quarter 2007 Conduct Of Radiation Protection Assessment; dated September 27, 2007
- PDA-06-037; FPL Energy Duane Arnold Nuclear Oversight Quality Report; Conduct of Radiation Protection Assessment; dated January 9, 2007
- PDA-07-020; FPL Energy Duane Arnold Nuclear Oversight Quality Report; First Quarter 2007; dated April 11, 2007
- Inter Office Memo; Dosimetry File; dated March 5, 2007
- 97-015-H; Radiological Engineering Calculation; dated September 25, 1997
- HP55; Radiological Work Screening for Cavity Diving to Repair Feedwater Sparger; dated February 24, 2007
- Five Year ALARA Plan-Action Items; updated October 23, 2007

4OA1 Performance Indicator Verification

Corrective Action Process Documents:
- CAP 049991; MSPI Data Revisions for January and February 2007 Needed
- CAP 052211; CAQ – HPCI Temperature and Pressure Elevated After Venting Per STP 3.5.1-13
- CAP 045135; Unplanned RCIC LCO
- CAP 050433; Error Found in CAL-082-301 for RCIC Suction Piping
- CAP 044600; 'A' SBDG tripped on High Crankcase Pressure
- CAP 046148; Jacket Coolant Leak Identified on the 'A' EDG
- CAP 047720; 'B' EDG Failed to Start
- CAP 049012; 1G021 Lube Oil Filter has a 0.5 gallon per minute leak
- CAP 050433; RCIC Suction Tee Stress Levels
- CAP 043088; 1P-022A-M Motor Heater is Cracked
- CAP 043299; Review RHRSW Domain Failures and Impacts on MSPI Data
- CAP 043047; Maintenance Rule Red [10 CFR 50.65(a)(1)] for RHRSW, SUS 16

- CAP 043848; Lack of Self Checking and Inaccuracy in Validation and Verification of MSPI Data
- CAP 050686; Procedures Limiting RHR and RHRSW Pump use during LOOP are overly Restrictive
- CAP 047844; 'A' SBDG Engine Coolant Valve Found in the Open Position
- CAP 049048; FT4938A and E/S4938A

Work Orders:
- CWO A80624; Steam Leak on front of Turbine (East Side) HPCI Reversing Chamber Ring Darin Pipe Connection
- CWO A76805; Relief Valve is Leaking Oil out of Top Cap Under Static Head (Pump not Running)
- CWO A77562; AC Ripple is Running About 4.5 Volts AC, at Approximately 22 VDC. Ripple Should be Less than 5 mVAC, DC Voltage Should be 25 (+/- 1.25)

4OA2 Problem Identification and Resolution

Corrective Action Process Documents:
- CAP 043846; MSPI Unavailability of SBDGs During Surveillance Test
- CA 044109; MSPI Unavailability of SBDGs During Surveillance Test-Update MR
- NG-06-0656; September 19, 2006 DAEC Maintenance Rule Expert Panel Meeting Minutes, SBDG Only; September 26, 2006
- CAP 052942; CAQ-Request TS Change for LCO 3.8.1
- CE 005785; CAQ-Request TS Change for LCO 3.8.1
- CA 048178; CAQ-Request TS Change for LCO 3.8.1
- CAP 052985; NCAQ-PRA Result Is Too High in ORAM Sentinel for 'A' SBDG & 1B42 Combination OOS
- CAP 053114; NCAQ-ORAM Sentinel Program Giving Incorrect Data
- CE 005811; NCAQ-ORAM Sentinel Program Giving Incorrect Data
- CAP 053617; CAQ-On-Line Scheduling Review of Recent Risk Significant Events for HU Implications
- CE 005877; CAQ-On-Line Scheduling Review of Recent Risk Significant Events for HU Implications
- CA 048077; CAQ-RCE1072, CA 3,Damage to 1B42 Bus Bars When Tagging Out 1B4234A
- CAP 054438; NCAQ-HPCI STP Scheduled With No IPTE Prepared
- CAP 054523; NCAQ-Work on Protected System Authorized

Procedures:
- ACP 102.17; Pre/Post-Job Briefs And Infrequently Performed Tests And Evolutions; Revision 36
- ACP 102.17; Pre/Post-Job Briefs And Infrequently Performed Tests And Evolutions; Revision 37
- ACP 114.4; Corrective Action Program; Revision 23
- ACP 114.5; Action Request System; Revision 62
- ACP 114.5; Action Request System; Revision 63
- ACP 114.8; Action Request Trending; Revision 6

4OA3 Follow-up of Events and Notices of Enforcement Discretion

Corrective Action Process Documents:
- CAP 052960; CAQ-Damage to 1B42 Bus Bars When Tagging Out 1B4234A

- CAP 052986; CAQ-Loss of 1B42 with 'A' SBDG and 'A' ESW Inoperable
- Root Cause Evaluation (RCE) 001072; CAQ-Damage to 1B42 Bus Bars When Tagging Out 1B4234A
- CAP 052988; NCAQ-Unable to Pump Identified Drywell Equipment Drain Sump Due to Loss of 1L80
- CAP 052991; NCAQ-Review Existing Practice for Attaching Danger Tags to MCC Cubicle Breakers
- CAP 053013; CAQ-Scope of Protected System Power Supplies Needs to Be Clarified
- CAP 053137; CAQ-CAP 029201 Was Closed Inappropriately with No Final Corrective Action Taken
- CAP 053143; NCAQ-Inconsistent Identification of Protected Systems
- CAP 053144; NCAQ-Consider Alternating Equipment to Align with Protected Systems
- CAP 053463; NCAQ-Loss of 1B42 and Reportability
- CAP 053509; Inaccurate Log Entries Following Loss of 1B42 Event
- CAP 053704; RCE 1072 Loss of Vital Bus 1B42 Potential Missed Corrective Action
- CAP 053741; Revisit How 1B42 Loss Captured In Maintenance Rule
- CAP 053634; RFP Minimum Flow Pipe Vent Vibrations Are High
- CAP 053582; Lessons Learned from Emergent Downpower
- CAP 053545; V07-0113 B RFP Recirculation Line Inboard Vent Line Isolation Valve Steam Leak at Weld

Procedures:
- ACP 114.9; Event Response Procedure; Revision 13
- IPOI 3; Power Operations (35% - 100%) Rated Power; Revision 94
- IPOI 3; Power Operations (35% - 100%) Rated Power; Revision 95
- BECH-M107; Condensate & Feedwater, Revision 66

Work Orders:
- CWO A81632; V07-0013 Repair
- CWO A81767; Repair of EBD003 Steam Leak
- CWO A81548; Weld Repair of E18B MSR Manway Steam Leak

Miscellaneous:
- RCE Manual Attachment N; RCE Report Evaluation (Scoring Sheet) for RCE 1072
- DAEC Root Cause Analysis RCE# 001072; Revision 1; A Loss of Vital Bus 1B42 (480 VAC)
- Site Clock Reset Red Sheet-CAP Number 52986-Loss of 1B42; FORM QF-0414; Human Performance Red/Yellow Sheet; Revision 4
- Prompt Investigation Report for DAEC Event; "Loss of 1B42 (480v) Bus During 1B4234A Clearance Application Resulting in Equipment Damage, Personnel Injury Near Miss, and Unplanned Shutdown LCO Entry"
- Shift Logs for October 4 through 7, 2007
- Shift Logs for October 20 through 22, 2007
- October 20, 2007, Downpower Sequence Plan

LIST OF ACRONYMS USED

AC	Alternating Current
ACE	Apparent Cause Evaluation
AFP	Area Fire Plan
ALARA	As-Low-As-Is-Reasonably-Achievable
CA	Corrective Action
CAP	Corrective Action Process
CE	Condition Evaluation
CFR	Code of Federal Regulations
CRD	Control Rod Drive
CWO	Corrective Work Order
DAEC	Duane Arnold Energy Center
DC	Direct Current
DG	Diesel Generator
d/p	Differential Pressure
DRP	Division of Reactor Projects
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
IMC	Inspection Manual Chapter
IPOI	Integrated Plant Operating Instruction
IR	Inspection Report
IR	Issue Report
ISI	In-service Inspection
IV	Independent Verification
kV	Kilovolt
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LOOP	Loss of Off-site Power
LPCI	Low Pressure Coolant Injection
MCC	Motor Control Center
MSPI	Mitigating Systems Performance Index
MWO	Maintenance Work Order
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
OI	Operating Instruction
OOS	Out-of-service
OPR	Operability Recommendation
PI	Performance Indicator
PRA	Probabilistic Risk Assessment
PWO	Preventative Work Order
RA	Radiation Area
RCE	Root Cause Evaluation
RCIC	Reactor Core Isolation Cooling
RFO	Refueling Outage
RFP	Reactor Feed Pump

RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RP	Radiation Protection
RPV	Reactor Pressure Vessel
RWP	Radiation Work Permit
SBDG	Standby Diesel Generator
SBLC	Standby Liquid Control
SDP	Significance Determination Process
SLC	Standby Liquid Control
STP	Surveillance Test Procedure
SW	Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
Vac	Volts Alternating Current
Vdc	Volts Direct Current
WO	Work Order