



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

November 12, 2010

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

**SUBJECT: DUANE ARNOLD ENERGY CENTER INTEGRATED INSPECTION REPORT
05000331/2010004**

Dear Mr. Costanzo:

On September 30, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Duane Arnold Energy Center. The enclosed report documents the results of this inspection, which were discussed on October 5, 2010, with you and other members of your staff.

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

Based on the results of this inspection, three NRC-identified findings of very low safety significance were identified. The findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

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

C. Costanzo

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Kenneth Riemer, Chief
Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report 05000331/2010004
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000331/2010004

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: July 1 through September 30, 2010

Inspectors: L. Haeg, Senior Resident Inspector, Acting
R. Murray, Resident Inspector
R. Baker, Resident Inspector
M. Mitchell, Health Physicist
R. Walton, Senior Operations Engineer
C. Zoia, Operations Engineer
B. Cushman, Resident Inspector, Quad Cities Nuclear
Power Station

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

Enclosure

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SUMMARY OF FINDINGS

IR 05000331/2010004; 07/01/2010 – 09/30/2010; Duane Arnold Energy Center; Licensed Operator Requalification Program, and Surveillance Testing and Identification and Resolution of Problems.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Three Green findings were identified by the inspectors. These findings were considered a non-cited violation (NCV) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process". Findings for which the Significance Determination Process 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 Findings

Cornerstone: Mitigating Systems

- Green. A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the licensee's failure to include appropriate acceptance criteria within Surveillance Test Procedure (STP) NS540002A, "A Emergency Service Water Operability Test," Revision 6; and, NS540002B, "B Emergency Service Water Operability Test," Revision 5. Specifically, STP NS540002A and B did not include appropriate as-found and as-left acceptance criteria to demonstrate prior and ongoing equipment functionality or operability. The licensee entered the issue into the corrective action program (CAP) as condition report (CR) 576584 and significantly revised STP NS540002A and B to include appropriate acceptance criteria.

The inspectors determined that the issue was a performance deficiency because it was the result of the failure to meet a requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented.

The inspectors determined that the performance deficiency was more than minor and a finding because, if left uncorrected, it had the potential to lead to a more significant safety concern. The inspectors applied IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings" to this finding. Under Table 4a, the inspectors answered "No" to all five questions under the Mitigating Systems Cornerstone Column, and screened the finding as Green. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency affected the cross-cutting area of Human Performance, having resource components, and involving aspects associated with complete, accurate, and up-to-date procedures. [H.2(c)] (Section 1R22.1)

- Green. A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for the licensee's failure to promptly identify and correct a condition adverse to quality on August 6, 2010. Specifically, during the performance of STP NS540002B, "B Emergency Service Water Operability Test," the licensee did not identify abnormal, elevated Emergency Service Water (ESW) flow to the 'B' Standby Diesel Generator

(SBDG), and the impact on other ESW system Technical Specification (TS) and TS support equipment. The licensee entered the issue into the CAP as CR 582068.

The inspectors determined that the issue was a performance deficiency because it was the result of the failure to meet a requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The inspectors determined that the performance deficiency was more than minor and a finding because, if left uncorrected, it had the potential to lead to a more significant safety concern. The inspectors applied IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings" to this finding. Under Table 4a, the inspectors answered "No" to all five questions under the Mitigating Systems Cornerstone Column, and screened the finding as Green. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency affected the cross-cutting area of Problem Identification and Resolution, having corrective action program components, and involving aspects associated with implementing a corrective action program with a low threshold for identifying issues. [P.1(a)] (Section 1R22.2)

- Green. A non-cited violation (NCV) of 10 CFR 50.9, "Completeness and Accuracy of Information," was identified due to the submittal of inaccurate medical information for licensed operators. The submittals to the NRC were inaccurate because they certified that the operators had been medically examined and had met all medical qualifications, when in fact, olfactory testing to detect odor of products of combustion had not been performed. The licensee planned corrective actions to administer an olfactory test for products of combustion to all on-shift licensed operators.

The licensee's medical physician failed to adequately test all licensed operators (both initial and renewal licensees) in accordance with 10 CFR 55.21 and 55.33 with respect to American National Standards Institute/American Nuclear Society (ANSI/ANS) 3.4-1983. The licensee submitted medical information for its licensed operators and applicants that was incomplete and incorrect in its assessment of the medical condition and general health of its licensed operators and initial applicants. Because violations of 10 CFR 50.9 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the Traditional Enforcement process. The licensee's failure to provide complete and accurate information to the NRC, which could have resulted in an incorrect licensing action, is also a performance deficiency because the licensee is expected to comply with 10 CFR 50.9 and because it was within the licensee's ability to foresee and prevent. This was also considered a performance deficiency and was more than minor as determined by IMC609, Appendix I, "Licensed Operator Requalification Significance Determination Process." The inspectors determined that this finding had a cross-cutting aspect in the area of Problem Identification & Resolution associated with the component of operating experience, to implement and institutionalize Operating Experience through changes to station processes, procedures, equipment, and training programs. [P.2(b)]. (Section 1R11.8)

B. Licensee-Identified Violations

No violations of significance were identified.

REPORT DETAILS

Summary of Plant Status

The 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 September 15, 2010, plant operators lowered reactor power to 97.5% following the unexpected repositioning of the 'B' Feedwater Regulating Valve to the full open position. On September 18, 2010, plant power was lowered to 49.5% reactor power to allow for repairs to the 'B' Feedwater Regulating Valve. The plant returned to full power on September 23, 2010.

1. **REACTOR SAFETY**

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- 'A' ESW System with the 'B' SBDG Out-of-Service for Surveillance Testing;
- 'B' Standby Gas Treatment (SBGT) System and the 1K04 Instrument Air Compressor System with the 'A' SBGT System Out-of-Service for Planned Maintenance;
- Reactor Core Isolation Cooling (RCIC); and
- 'A' Control Building Chiller (CBC) with 'B' CBC Unavailable for Planned Maintenance.

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

significance characterization. Documents reviewed are listed in the Attachment to this report.

These partial system walkdowns constituted four quarterly inspection samples as defined in Inspection Procedure (IP) 71111.04-05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

During the week of August 30, 2010, the inspectors performed a complete system alignment inspection of the High Pressure Coolant Injection (HPCI) system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability or functionality of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders (WOs) was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

This complete system walkdown constituted one semi-annual inspection sample as defined in IP 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Area Fire Plan (AFP) 25; Cable Spreading Room;
- AFPs 34, 35, 36; Radwaste Building Areas;
- AFPs 14, 16; Turbine Building Basement Reactor Feed Pump, Turbine Lube Oil and Condensate Pump Areas; and
- AFP 13; Refueling Floor.

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

These fire protection tours constituted four quarterly inspection samples as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

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

- River Water Supply (RWS) System (Intake Structure).

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

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On August 17, 25, and September 1, 2010, the inspectors observed a crew of licensed operators in the plant's control room simulator during licensed operator requalification examinations. The observations were to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

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

b. Findings

No findings were identified.

.2 Facility Operating History (71111.11B)

Completion of Sections .2 through .9 constituted one biennial licensed operator requalification inspection sample as defined in IP 71111.11B.

a. Inspection Scope

The inspectors reviewed the plant's operating history from January 2009 through August 2010 to identify operating experience that was expected to be addressed by the Licensed Operator Requalification Training (LORT) program. The inspector verified that the identified operating experience had been addressed by the facility licensee in accordance with the station's approved Systems Approach to Training (SAT) program to satisfy the requirements of 10 CFR 55.59(c). The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings were identified.

.3 Licensee Requalification Examinations (71111.11B)

a. Inspection Scope

The inspectors performed an inspection of the licensee's LORT test/examination program for compliance with the station's SAT program which would satisfy the requirements of 10 CFR 55.59(c)(4). The reviewed operating examination material consisted of 1 operating test, containing two dynamic simulator scenarios and five job performance measures (JPMs). The written examinations reviewed consisted of five written examinations, and each of the exams contained 30 questions. The inspectors reviewed the annual requalification operating test and biennial written examination material to evaluate general quality, construction, and difficulty level. The inspectors assessed the level of examination material duplication from week-to-week during the current year operating test. The examiners assessed the amount of written examination material duplication from week-to-week for the written examination administered in 2010. The inspectors reviewed the methodology for developing the examinations, including the LORT program 2-year sample plan, probabilistic risk assessment insights, previously identified operator performance deficiencies, and plant modifications. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings were identified.

.4 Licensee Administration of Requalification Examinations (71111.11B)

a. Inspection Scope

The inspectors observed the administration of a requalification operating test to assess the licensee's effectiveness in conducting the test to ensure compliance with 10 CFR 55.59(c)(4). The inspectors evaluated the performance of 2 crews in parallel with the facility evaluators during 4 dynamic simulator scenarios and evaluated various licensed crew members concurrently with facility evaluators during the administration of several JPMs. The inspectors assessed the facility evaluators' ability to determine adequate crew and individual performance using objective, measurable standards. The inspectors observed the training staff personnel administer the operating test, including conducting pre-examination briefings, evaluations of operator performance, and individual and crew evaluations upon completion of the operating test. The inspectors evaluated the ability of the simulator to support the examinations. A specific evaluation of simulator performance was conducted and documented in the section below titled, "Conformance with Simulator Requirements Specified in 10 CFR 55.46." The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings were identified.

.5 Examination Security (71111.11B)

a. Inspection Scope

The inspectors observed and reviewed the licensee's overall licensed operator requalification examination security program related to examination physical security (e.g., access restrictions and simulator considerations) and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors also reviewed the facility licensee's examination security procedure, any corrective actions related to past or present examination security problems at the facility, and the implementation of security and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the examination process. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings were identified.

.6 Licensee Training Feedback System (71111.11B)

a. Inspection Scope

The inspectors assessed the methods and effectiveness of the licensee's processes for revising and maintaining its LORT Program up-to-date, including the use of feedback from plant events and industry experience information. The inspectors reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. The inspectors evaluated the licensee's ability to assess the effectiveness of its LORT program and their ability to implement appropriate corrective actions. This evaluation was performed to verify compliance with 10 CFR 55.59(c) and the licensee's SAT program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings were identified.

.7 Licensee Remedial Training Program (71111.11B)

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous biennial requalification examinations and the training from the current examination cycle to ensure that they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans. This evaluation was performed in accordance with 10 CFR 55.59(c) and with respect to the licensee's SAT program. The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings were identified.

.8 Conformance with Operator License Conditions (71111.11B)

a. Inspection Scope

The inspectors reviewed the facility and individual operator licensees' conformance with the requirements of 10 CFR Part 55. The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators and which control room positions were granted watch-standing credit for maintaining active operator licenses. The inspectors reviewed the facility licensee's LORT program to assess compliance with the requalification program requirements as described by 10 CFR 55.59(c). Additionally, medical records for six licensed operators were reviewed for compliance with 10 CFR 55.53(l). The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

(1) Completeness and Accuracy of Information

Introduction: An NCV of 10 CFR 50.9, "Completeness and Accuracy of Information," was identified due to the submittal of inaccurate medical information for licensed operators. The submittals to the NRC were inaccurate because they certified that the operators had been medically examined and had met all medical qualifications, when in fact, olfactory testing to detect odor of products of combustion had not been performed.

Description: The NRC's requirements related to the conduct and documentation of medical examinations for operators are contained in Subpart c, "Medical Requirements" of 10 CFR Part 55, Operators' Licenses. Specifically, Section 55.21, "Medical Examination," required every operator to be examined by a physician when the applicant first applies for a license, and every two years, once receiving their license. The physician must determine whether the operator meets the requirements of Section 55.33(a)(1), i.e., the operator's medical condition and general health will not adversely affect the performance of assigned operator duties or cause operational errors that endanger public health and safety.

On November 24, 2004, the NRC issued Information Notice (IN) 2004-20, "Recent Issues Associated with NRC Medical Requirements for Licensed Operators." The IN communicated recent examples of facility medical requirements not receiving sufficient management oversight to ensure that the fitness of licensed operators was being maintained. The IN also stated that the facility licensee must certify which industry standard (e.g., which specific version of ANSI/ANS-3.4, "Medical Certification and Monitoring of Personnel Requiring operator Licenses for Nuclear Power Plants," or other NRC-approved method) was used in making the fitness determination. For this inspection, the licensee is under the industry standard (ANSI 3.4-1983). Paragraph 5.4.2 of the standard, "Nose," required licensed operators to have, "Ability to detect odor of products of combustion and of tracer or marker (sic) gases."

During the medical records review, the inspectors determined that the olfactory testing performed by the facility licensee did not meet the ANSI/ANS-3.4-1983 testing requirements. The facility had exclusively tested for tracer gases, (natural gas, banana gas, and wintergreen) but had not performed a specific test for products of combustion.

The failure to perform olfactory testing for products of combustion has the potential to be significant since, during a fire, the operators were required to perform actions to mitigate the effects of a postulated fire. The inability to detect the onset of fire by smelling products of combustion could result in the fire becoming more destructive. It should be noted that most areas of the plant (including the control room) are equipped with smoke detectors.

The licensee's failure to provide complete and accurate information to the NRC, which could have resulted in an incorrect licensing action, was a performance deficiency because the licensee was expected to comply with 10 CFR 50.9 and because it was within the licensee's ability to foresee and prevent. Because violations of 10 CFR 50.9 were considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the Traditional Enforcement process.

Analysis: This finding is more than minor because information was provided to the NRC, signed under oath by the company medical doctor and the Site Vice President, which documented that each operator was given a complete examination. There was no evidence that the operators endangered plant operations as a result of inadequate olfactory exams while performing licensed duties. The licensee's failure to provide complete and accurate information to the NRC, which could have resulted in an incorrect licensing action, is a performance deficiency because the licensee is expected to comply with 10 CFR 50.9 and because it was within the licensee's ability to foresee and prevent.

Violations of 10 CFR 50.9 are dispositioned using the traditional enforcement process instead of the significance determination process because they are considered to be violations that potentially impede or impact the regulatory process. In addition, the underlying finding is evaluated under the significance determination process to determine the significance of the violation. This issue was screened using IMC 0610, Appendix B. The inspectors determined that there was a Performance Deficiency (PD) since the standards described in ANSI for olfactory testing (products of combustion) was not implemented for all licensed operators. This PD was also screened more-than-minor and was evaluated using the IMC 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process." In the flow chart, Box 27 was answered "Yes" since all licensed operators had not received olfactory testing for the products of combustion. This was considered a Green finding (FIN 05000331/2010004-04).

The inspectors determined that this finding has a cross-cutting aspect in the area of Problem Identification & Resolution (PI&R) associated with the component of operating experience, to implement and institutionalize Operating Experience through changes to station processes, procedures, equipment, and training programs [P.2(b)]. Specifically, the licensee failed to evaluate results of olfactory testing to ensure that the requirements of 10 CFR 55.21, 55.33 and ANSI/ANS 3.4-1983 were satisfied.

In accordance with Section 6.4.d.1.b of the NRC Enforcement Policy, this violation is categorized as Severity Level IV because the licensed operators did not require a license restriction or require additional monitoring. In accordance with Section 2.3.2 of the Enforcement Policy, this was considered an NCV (NCV 05000331/2010004-03)

since the issue was not repetitive, not willful, and placed in the licensee's corrective program as AR 579623. Planned interim corrective actions included administration of an olfactory test for products of combustion to all on-shift licensed operators. Additional corrective actions will be identified by the licensee's corrective action process.

Enforcement: The inspectors determined that a long-standing deficiency had existed at the Duane Arnold Energy Center, in that the licensee's medical physician was not adequately testing all licensed operators (both initial and renewal licensees) in accordance with 10 CFR 55.21 and 55.33 with respect to ANSI/ANS-3.4-1983. Title 10 CFR 55.23 required that an authorized representative of the facility licensee shall certify the medical fitness of an applicant by completing and signing and NRC Form 396. The NRC Form 396, when signed by an authorized representative of the facility licensee, certifies that a physician conducted a medical examination of the applicant as required in 10 CFR 55.21, and that the guidance contained in ANSI/ANS-3.4-1983 was followed in conducting the examination and making the determination of medical qualification.

Title 10 CFR 50.9 requires, in part, that information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects.

Title 10 CFR 55.21 requires, in part, that an applicant for a license shall have a medical examination by a physician and the licensee shall have a medical examination by a physician every two years. The physician shall determine that the applicant or licensee meets requirements of Section 55.33(a)(1).

Title 10 CFR 55.33(a)(1) requires, in part, that applicants medical condition and general health will not adversely affect the performance of assigned operator job duties or cause operational errors endangering public health and safety.

Title 10 CFR 55.23 requires, in part, that to certify the medical fitness of the applicant, an authorized representative of the facility licensee shall complete and sign NRC Form-396, "Certification of Medical Examination by Facility Licensee."

NRC Form-396, when signed by an authorized representative of the facility licensee, certifies that a physician conducted a medical examination of the applicant and that the guidance contained in the specified edition of ANSI/ANS 3.4, "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants" was followed in conducting the examination and making the determination of medical qualification. The licensee certified that ANS/ANSI 3.4-1983 would be followed.

American National Standards Institute/American Nuclear Society 3.4-1983, Section 5.4 provides specific minimum capacities required for medical qualifications. Section 5.4.2, requires, "Ability to detect odor of products of combustion and tracer or marker gases."

Contrary to the above, the facility licensee had not completed physical examinations of licensed operators in accordance with ANSI/ANS 3.4-1983. The licensee submitted numerous NRC Form-396s for renewal of operator licenses and for initial license applicants who certified that the applicants had met the medical requirements of ANSI/ANS 3.4-1983 when, in fact, adequate olfactory testing had not been completed.

This information was material to the NRC because it formed the basis for licensing decisions for plant operators. Submitting incomplete or inaccurate information to the NRC that would have resulted in a reconsideration of a regulatory position was considered an NCV of 10 CFR 50.9.

(2) Unresolved Item (URI) 05000331/2010004-05: Use of Continuous Positive Airway Pressure Device

Introduction: The licensee identified on June 29, 2010, that six licensed operators had been prescribed, and were using, a CPAP device (Continuous Positive Airway Pressure – a therapeutic device to treat sleep apnea) without notification of the permanent change of a medical condition to the NRC. Title 10 CFR 55.25 states that the NRC shall be notified within 30 days of a permanent condition that causes the licensee to fail to meet medical requirements of 10 CFR 55.21.

Description: In June 2009, the site clerk received information from one of the initial license applicants that he was using a CPAP device. The site clerk spoke to NRC personnel, who advised that the condition be reported to the NRC on Form 396, “Certification of Medical Examination by Facility Licensee.” In October 2009, the site received the first license with the restriction, “Must use therapeutic device as prescribed to maintain medical qualifications.” However, the licensee missed an opportunity to determine if any other licensed operators were using a CPAP device.

On June 29, 2010, a licensed operator reviewing the NRC website, identified that the use of CPAP was a reportable condition to the NRC. The operator emailed the site clerk who received and resent the email to all licensed operators in an effort to identify other personnel who were using CPAP devices. On August 5, 2010, the NRC notified the site clerk that additional medical information was required. On September 2, 2010, the licensee submitted six licensed operator medical files with sleep studies that described the use of CPAP devices dating back to 2001 for one person, and most recently two licensed operators in 2008.

The inspectors determined that this deficiency had existed at Duane Arnold Station as far back as 2001. This issue was considered an URI (URI 05000331/2010004-05), pending review of the licensed operator medical files by NRC doctors.

.9 Conformance with Simulator Requirements Specified in 10 CFR 55.46 (71111.11B)

a. Inspection Scope

The inspectors assessed the adequacy of the licensee’s simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements as prescribed in 10 CFR 55.46, “Simulation Facilities.” The inspectors also reviewed a sample of simulator performance test records (i.e., transient tests, malfunction tests, steady state tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy process to ensure that simulator fidelity was maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions, as well as on nuclear and thermal hydraulic operating characteristics. The inspectors conducted interviews with members of the licensee’s simulator staff about the configuration control process and completed the IP 71111.11, Appendix C,

checklist to evaluate whether or not the licensee's plant-referenced simulator was operating adequately as required by 10 CFR 55.46(c) and (d). The documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

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

- HPCI System; and
- Residual Heat Removal (RHR) System.

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

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These maintenance effectiveness reviews constituted two quarterly inspection samples as defined in IP 71111.12-05.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

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

- Emergent and planned activities for Reactor Water Cleanup and RHR Systems following grid disturbance on July 5, 2010;
- Operations and Maintenance following loss of 1C04 Annunciator Panel on July 13, 2010;
- Aggregate risk of sequential maintenance activities scheduled during the work week ending August 7, 2010;
- Emergent and planned activities for HPCI System maintenance and replacement of Auxiliary Boiler connection flange gasket on August 25, 2010;
- High aggregate risk resulting from high risk activities and sequential maintenance activities performed during the work week ending September 11, 2010; and
- Emergent and planned activities for 'B' Feedwater Regulating Valve manual closure and controller replacement during the week ending September 18, 2010.

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

These maintenance risk assessments and emergent work control reviews constituted six inspection samples as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- 1D2 125 VDC Battery Trouble Annunciator;
- VR27 Pre-Regulator Module Component Upgrades not Fully Implemented;
- HPCI Operability with Respect to Station Black Out Initial Room Conditions (120°F);
- 'B' SBDG Past Operability Review due to Low ESW Flow; and
- RCIC Past Operability Review due to Low ESW Flow.

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

These operability evaluation reviews constituted five inspection samples as defined in IP 71111.15-05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification:

- 10-009; 'A' CBC Monitoring Equipment.

The inspectors compared the temporary configuration changes and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system. The inspectors also compared the licensee's information to operating experience information to ensure that lessons learned from other utilities had been incorporated into the licensee's decision to implement the temporary modification. The inspectors, as applicable, performed field verifications to

ensure that the modifications were installed as directed; the modifications operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. Lastly, the inspectors discussed the temporary modification with operations, engineering, and training personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance. Documents reviewed in the course of this inspection are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- 'A' SBGT System testing following replacement of QEV7602A, quick exhaust valve for AV7602A, reactor building to SBGT inlet valve;
- 'A' RHR valve testing following lube and inspect;
- 'A' control building SBGT instrument air compressor 1K003 testing following maintenance;
- HPCI operability test following Auxiliary Boiler connection flange gasket replacement;
- 'D' RWS pump operability test following pump replacement;
- 'A' Core Spray (CS) operability test following planned maintenance;
- 'B' Feedwater Regulating Valve testing following corrective maintenance; and
- Standby Liquid Control (SBLC) squib valve continuity meter testing following corrective maintenance.

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 to this report.

These post-maintenance testing reviews constituted eight inspection samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- STP 3.8.1-04B; B Standby Diesel Generator Operability Test (routine);
- STP NS540002B; B Emergency Service Water Operability Test; Revision 7 (routine)
- STP 3.5.1-03A; A Core Spray System Simulated Automatic Actuation (routine);
- STP NS540002B; B Emergency Service Water Operability Test; Revision 5 (routine);
- STP 3.8.4-01; Battery Pilot Cell Checks (routine); and
- STP 3.5.1-02; A Low Pressure Coolant Injection (LPCI) System Operability Test (in-service test).

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

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria clearly stated, demonstrated operational readiness, and consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequencies were in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;

- where applicable for in-service testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

These surveillance testing reviews constituted five routine inspection samples, and one in-service testing inspection sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

(1) Surveillance Test Procedure did not Include Appropriate Acceptance Criteria

Introduction: A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the licensee's failure to include appropriate acceptance criteria within STP NS540002A, "A Emergency Service Water Operability Test," Revision 6; and, NS540002B, "B Emergency Service Water Operability Test," Revision 5. Specifically, STP NS540002A and B did not include appropriate as-found and as-left acceptance criteria to demonstrate prior and ongoing equipment functionality or operability.

Description: On August 30, 2010, while performing a monthly TS surveillance test of the 'B' SBDG, total 'B' ESW flow was observed to be approximately 100 gallons per minute (GPM) below the normal flow rate (1000 vs. 1100 GPM). The licensee initiated CR 576548 and attributed the abnormal total flow rate to the August 6, 2010, quarterly performance of STP NS540002B. During this test, ESW flow to the 'B' SBDG was manually throttled to 583 GPM due to flow being found high (674 GPM) out of the band specified in the STP (greater than 527.5, but less than 600 GPM). The inspectors questioned the flow rate adjustment methodology of STP NS540002B and how as-found and as-left flow rates were recorded for the 'B' SBDG and other TS-support systems served by the ESW system. At DAEC, the ESW system provides cooling to several components, some of which have inlet throttle valves. Procedure STP NS540002B verifies on a quarterly basis that 'B' ESW flow rates are adequate to provide cooling to the 'B' SBDG, 'B' CBC, and Division II RHR and CS northwest corner room (NWCR) cooler. On a once-per-cycle basis, NS540002B also verifies that flow rates are adequate to provide cooling to the 'B' HPCI and 'B' RCIC room coolers. The inspectors

noted, for example, Step 7.1.38 of STP NS540002B, Revision 5, for the 'B' SBDG stated:

- a. *Record the Diesel Cooler dP [differential pressure] as read on PDI-1987.*
- b. *Adjust V-13-34, SBDG 1G-21 COOLER 1E-53B ESW INLET THROTTLE, as required to obtain a 'B' SBDG cooler dP of approximately 141 inches of water [580.5 GPM] as indicated on PDI-1987.*
- c. *Record the AS LEFT Diesel Cooler dP as read on PDI-1987.*

NOTE: The differential pressure acceptance criteria listed in the following steps correspond to the minimum flow required with river water temperature at 95°F. If acceptance criteria cannot be satisfied, the CRS and System Manager shall be informed to determine OPERABILITY and any need for rebalancing flows.

- d. *Confirm the SBDG AS LEFT dP value recorded in Step 7.1.38.c is greater than (>) 116.4 inches of water [527.5 GPM] and less than (<) 150.6 inches of water [600 GPM].*

After reviewing STP NS540002B, the inspectors noted that as-found and as-left steps for other TS and TS-support components were similar. Specifically, the procedure did not consider nor address the overall change in the flow balance to the individual components when adjustments were made either before, during, or after as-found and as-left flow rate values were recorded.

The licensee entered the inspectors' observations into the CAP as CR 576584 and performed an immediate operability determination (IOD) regarding the as-left flow rate values from the August 6, 2010, performance of STP NS540002B. Because the only ESW flow rate adjustment was to the 'B' SBDG, and all subsequent as-left values were within the acceptable flow bands, all other as-left flow rate values were considered accurate and supported functionality and operability for the affected components. The licensee also quarantined STP NS540002A and B so that the procedures could not be implemented before significant revisions were incorporated to establish adequate acceptance criteria.

Although the licensee considered the August 6, 2010, as-left ESW flow rates accurate, the inspectors continued to question the as-found functionality and operability of other components (namely the NWCR cooler) when the ESW flow rate to the 'B' SBDG was found to be 674 GPM. The basis for the inspector's question surrounded a licensee-estimated ESW flow rate of 98 GPM to the NWCR cooler that would have been below the required as-left flow rate (greater than 115 GPM) specified in STP NS540002B. On September 8, 2010, the licensee entered the inspector's question into the CAP as CR 578294 and assigned a condition evaluation (CE) to engineering to evaluate the prior impact of the estimated as-found NWCR flow rate on TS systems supported by the NWCR cooler (Division II RHR and CS).

The inspectors also reviewed CR 567240, written on July 14, 2010, and the resultant CE. The CR identified that during the May 22, 2010, performance of STP NS540002B, the as-found ESW flow rate to the 'B' RCIC room cooler was recorded as 8 GPM versus a required as-left flow rate of 17 GPM. Because the 'B' RCIC room cooler ESW flow rate was throttled to greater than 17 GPM prior to completing the STP, an IOD was not

required. The CE determined that the 8 GPM reading was likely inaccurate and attributed the reading error to improper installation of a temporary ultrasonic flow instrument used to measure RCIC and HPCI room cooler ESW flows. The action out of the CE was to verify proper installation of the flow instrument during the next performance of the STP and determine whether a technical assessment for reportability (TAR) would be required to review the past operability status of RCIC.

On September 9, 2010, while further evaluating ESW flow rate data, the licensee determined that the 674 GPM flow rate value to the 'B' SBDG on August 6, 2010, was likely an incorrectly high value based on total recorded ESW flow and readings taken before and after the 'B' SBDG ESW differential pressure instrument was aligned. Based on engineering estimates, the as-found flow on August 6 was likely inside the acceptance band. Subsequent throttling of the inlet ESW valve would have then rendered the as-left flow rate actually low outside of the acceptance band. The licensee further estimated that the as-left flow rate was approximately 481 GPM and represented a potential operability concern for the 'B' SBDG. Condition Report 578749 was written, an IOD was performed ('B' SBDG was determined to be operable, but degraded), and a prompt operability determination was requested by the operations department. On September 10, 2010, the licensee vented air from the 'B' SBDG differential pressure instrument sensing lines for ESW, generated CR 579312, and determined that the apparent cause of the faulty ESW flow reading was air entrapment in the sensing lines due to an improper sequence of valve manipulations in the STP.

Based on the various questions and concerns raised by the inspectors, and following revisions to STP NS540002A and B to address the acceptance criteria and air entrapment issues, the licensee performed NS540002B, Revision 7, on September 13, 2010. As suspected from CR 578749, performance of the STP determined the actual ESW flow to the 'B' SBDG to be low (448 GPM), and outside of the acceptance band. The licensee generated CR 579312 to document this condition and performed a TAR to determine whether the 'B' SBDG system was always operable between the applicable dates of May 22, 2010, to August 6, 2010. Section 1R22.2 of this report further documents a finding for the high ESW flow condition adverse to quality that was not promptly identified and corrected during the August 30, 2010, performance of STP NS540002B.

Finally, during the September 13, 2010, performance of STP NS540002B, ESW flow to the 'B' RCIC room cooler was found within band. This demonstrated that the 8 GPM flow rate that was recorded on May 22, 2010, was, most likely, accurate. The licensee generated CR 578386 to document this condition and performed a TAR to determine whether ESW flow rates were adequate to the RCIC room coolers to support RCIC system operability from the period of May 6, 2009, (last accurate as-found data known) to May 22, 2010. The licensee determined that on one day, August 14, 2009, ESW flow to the 'B' RCIC room cooler, coupled with actual river temperature, would have rendered the room cooler unable to perform its TS-support function for the RCIC system. However, because ESW flow to the 'A' RCIC room cooler was adequate on August 14, 2009, at no point during the timeframe in question would the RCIC system have been considered inoperable.

Analysis: The inspectors determined that STP NS540002A and B, Revision 6 and 5, respectively, did not include appropriate acceptance criteria to verify as-found and as-left flow rate values were adequate to demonstrate prior and ongoing equipment

functionality or operability. The failure to include appropriate quantitative or qualitative acceptance criteria to determine that important activities were satisfactorily accomplished was contrary to 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and was a performance deficiency. The performance deficiency was determined to be more than minor and a finding because, if left uncorrected, the continued implementation of the inadequate procedures had the potential to lead to a more significant safety concern. Specifically, because STP NS540002A and B allowed for adjusting as-found flow rates without considering the impact on other components and, because the procedures did not contain adequate controls to ensure that as-left flow values were accurate, one or more components could have been rendered non-functional or inoperable. The inspectors concluded this finding was associated with the Mitigating Systems Cornerstone.

The inspectors applied IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings" to this finding. Using Table 4a, the inspectors answered "No" to all five questions under the Mitigating Systems Cornerstone column, and screened the finding as Green. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency affected the cross-cutting area of Human Performance, having resources components, and involving aspects associated with complete, accurate, and up-to-date procedures. Specifically, the licensee did not ensure that STP NS540002A and B were adequate when improper changes were adopted in April 1999, which removed appropriate recording of as-found and as-left flow rate data. The continued implementation of the procedure contributed to equipment heat removal capabilities being found degraded; challenging the functionality of TS-support equipment or the operability of equipment required by TS. [H.2(c)]

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures; and, that these procedures shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Contrary to the above, between April 1999 and September, 2010, the licensee failed to include appropriate acceptance criteria within procedures STP NS540002A and B. Specifically, because STP NS540002A and B did not verify as-found and as-left flow rate values, there were several instances where TS and TS-support equipment operability or functionality was degraded. Corrective actions included significant revisions to STP NS540002A and B to include appropriate acceptance criteria. Because this violation was of very low safety significance, was not repetitive or willful, and it was entered into the licensee's CAP as CR 576584, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000331/2010004-01, Surveillance Test Procedure did not Include Appropriate Acceptance Criteria).

(2) Condition Adverse to Quality Not Promptly Identified and Corrected

Introduction: A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for the licensee's failure to promptly identify and correct a condition adverse to quality on August 6, 2010. Specifically, during the performance of STP NS540002B, "B Emergency Service Water Operability Test," the licensee did not identify an abnormal, elevated ESW flow rate value to the 'B' SBDG, and the impact on other ESW system TS and TS-support equipment.

Description: On August 6, 2010, while performing STP NS540002B, as-found ESW flow to the 'B' SBDG was recorded high (674 GPM) out of the band specified in the STP (greater than 527.5, but less than 600 GPM). Per step 7.1.38.b, the operators performing the test manually throttled flow to 583 GPM and recorded this value as the as-left flow rate to the 'B' SBDG. The operators continued on with the procedure, recording as-found flow rates for total ESW flow, the 'B' CBC, and the NWCR cooler. The only additional adjustment made was to the NWCR cooler since it was slightly above the desired flow rate value. During the performance of STP NS540002B, a CR was not issued to document and evaluate the abnormal elevated as-found ESW flow rate to the 'B' SBDG, nor was a CR generated to evaluate the as-found values for the 'B' CBC and NWCR cooler prior to throttling flow to the 'B' SBDG.

On August, 30, 2010, following questions related to observed abnormal 'B' ESW total flow during a 'B' SBDG monthly TS surveillance test, the inspectors questioned the lack of a CR identifying the elevated flow to the 'B' SBDG on August 6, 2010. The licensee acknowledged the lack of a CR and generated CR 576548 to evaluate the condition adverse to quality. Section 1R22.1 documents a finding for inadequate acceptance criteria contained within STP NS540002A and B; and, provides a timeline of the issues associated with past performances of STP NS540002A and B, including the outcome of the licensee's evaluation of the August 6, 2010, performance of STP NS540002B. The licensee determined that the as-left flow rate did not impact 'B' SBDG operability given the ESW flows and river temperatures.

Analysis: The inspectors determined that although STP NS540002B, Revision 5, did not specifically require that a CR be generated when as-found flow rates were identified, a condition adverse to quality (CAQ) for the 'B' SBDG as-found ESW flow rate existed on August, 6, 2010, and was not promptly identified and corrected. The inspectors determined that the CAQ was reasonably within the licensee's ability to identify and enter into their CAP. The failure to promptly identify the CAQ was contrary to 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," and was a performance deficiency. The performance deficiency was determined to be more than minor and a finding because, if left uncorrected (not promptly identifying and correcting CAQs in the CAP), it had the potential to lead to a more significant safety concern. Specifically, because the CAQ was not promptly identified, latent testing methodology issues, such as air entrapment in the differential pressure instrument sensing lines and degraded flow impact on TS and TS-support systems served by ESW, was not known to the licensee. The inspectors concluded this finding was associated with the Mitigating Systems Cornerstone.

The inspectors applied IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings" to this finding. Using Table 4a, the inspectors answered "No" to all five questions under the Mitigating Systems Cornerstone column, and screened the finding as Green. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency affected the cross-cutting area of Problem Identification and Resolution, having corrective action program components, and involving aspects associated with implementing a corrective action program with a low threshold for identifying issues. Specifically, over the last several years, abnormal flow rates had been recorded during the performance of STPs NS540002A and B, but in many instances the abnormal conditions were not identified in the CAP. [P.1(a)]

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, on August 6, 2010, the licensee failed to identify a condition adverse to quality when abnormal elevated as-found ESW flow rates were recorded for the 'B' SBDG. Because this violation was of very low safety significance, was not repetitive or willful, and it was entered into the licensee's corrective action program as CR 582068, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000331/2010004-02, Condition Adverse to Quality not Promptly Identified and Corrected).

1EP6 Drill Evaluation (71114.06)

.1 Training Observations

a. Inspection Scope

The inspectors observed two simulator training evolutions for licensed operators on August 11, 2010, which required emergency plan implementation by licensee operations crews. These evolutions were planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crews. The inspectors also attended the post-evolution critiques for the scenarios. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crews' performance and ensure that the licensee evaluators noted the same issues and entered them into the CAP. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the Attachment to this report.

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

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

Cornerstones: Occupational and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed all licensee performance indicators (PIs) for the Occupational Exposure Cornerstone for follow-up. The inspectors reviewed the results of radiation protection program audits (e.g., licensee's quality assurance audits or other independent audits). The inspectors reviewed any reports of operational occurrences related to occupational radiation safety since the last inspection. The inspectors reviewed the results of the audit and operational report reviews to gain insights into overall licensee performance.

b. Findings

No findings were identified.

.2 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors reviewed the last two radiological surveys from selected plant areas. The inspectors determined whether the thoroughness and frequency of the surveys are appropriate for the given radiological hazard.

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

b. Findings

No findings were identified.

.3 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors reviewed the following radiation work permits (RWPs) used to access high radiation areas (HRAs) and evaluated RWP specified work control instructions or control barriers.

- 10-3017, Cleaning Reactor Studs, Nuts and Washers, Revision 0; and
- 10-3004, 360 Degree Platform, Revision 0.

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

b. Findings

No findings were identified.

.4 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitors potentially contaminated material leaving the radiologically controlled area, and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use and evaluated whether the work was performed in accordance with plant procedures and whether the procedures were sufficient to control the spread of contamination and prevent unintended release of radioactive materials from the site. The inspectors

assessed whether the radiation monitoring instrumentation had appropriate sensitivity for the type(s) of radiation present.

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

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

The inspectors selected several sealed sources from the licensee's inventory records and determine whether the sources were accounted for and verified to be intact (i.e., they were not leaking their radioactive content).

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

b. Findings

No findings were identified.

.5 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

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

The inspectors inspected the posting and physical controls for selected HRAs and very high radiation areas (VHRAs), to verify conformance with the Occupational PI.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors discussed with the Radiation Protection Manager the controls and procedures for high-risk HRAs and VHRAs. The inspectors discussed methods employed by the licensee to provide stricter control of VHRA access as specified in 10 CFR 20.1602, "Control of Access to Very High Radiation Areas," and Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas of

Nuclear Plants.” The inspectors assessed whether any changes to licensee procedures substantially reduce the effectiveness and level of worker protection.

The inspectors discussed the controls in place for special areas that have the potential to become VHRAs during certain plant operations with first-line health physics supervisors. The inspectors determined whether these plant operations require communication beforehand with the Health Physics group, so as to allow corresponding timely actions to properly post, control, and monitor the radiation hazards including re-access authorization.

The inspectors evaluated licensee controls for VHRAs and areas with the potential to become a VHRA to determine whether an individual was able to gain unauthorized access to the VHRA.

b. Findings

No findings were identified.

.7 Radiation Worker Performance (02.07)

a. Inspection Scope

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be human performance errors. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors determined whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. The inspectors discussed with the Radiation Protection Manager any problems with the corrective actions planned or taken.

b. Findings

No findings were identified.

.8 Radiation Protection Technician Proficiency (02.08)

a. Inspection Scope

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

b. Findings

No findings were identified.

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

2RS2 Occupational ALARA Planning and Controls (71124.02)

.1 Radiological Work Planning (02.02)

a. Inspection Scope

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

b. Findings

No findings were identified.

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

a. Inspection Scope

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

The inspectors evaluated whether the licensee had established measures to track, trend, and if necessary to reduce, occupational doses for ongoing work activities. The inspectors assessed whether trigger points or criteria were established to prompt additional reviews and/or additional ALARA planning and controls.

The inspectors evaluated the licensee's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors assessed whether adjustments to exposure estimates (intended dose) were based on sound radiation protection and ALARA principles or if they are just adjusted to account for failures to control the work. The inspectors evaluated whether the frequency of these adjustments called into question the adequacy of the original ALARA planning process.

b. Findings

No findings were identified.

.3 Source Term Reduction and Control (02.04)

a. Inspection Scope

The inspectors used licensee records to determine the historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure. The inspectors assessed whether the licensee had made allowances or developed contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.06)

a. Inspection Scope

The inspectors determined whether problems associated with ALARA planning and controls are being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's corrective action program.

b. Findings

No findings were identified.

This occupational ALARA planning and controls review constituted one inspection sample as defined in IP 71124.02-05.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

Cornerstones: Mitigating Systems and Public Radiation Safety

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

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Emergency AC Power System performance indicator for the period from the third quarter 2009 through the second quarter 2010. To determine the accuracy of the Performance Indicator (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, issue reports, event reports and NRC Integrated Inspection Reports for the period from the third quarter 2009 through the second quarter 2010 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so,

that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - High Pressure Injection Systems performance indicator for the period from the third quarter 2009 through the second quarter 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection Reports for the period from the third quarter 2009 through the second quarter 2010 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Heat Removal System performance indicator for the period from the third quarter 2009 through the second quarter 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC Integrated Inspection Reports for the period from the third quarter 2009 through the second quarter 2010 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to

determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.4 Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual
Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent Technical Specifications (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences performance indicator for the period of August 2009 through July 2010. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6 to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates between August 2009 and July 2010 to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose.

This PI review constituted one Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual radiological effluent occurrences inspection sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.5 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System Specific Activity PI for Duane Arnold Energy Center for the period from the second quarter 2009 through the second quarter 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's Reactor Coolant System chemistry samples,

Technical Specifications requirements, issue reports, event reports, and NRC Integrated Inspection Reports for the period of second quarter 2009 through the second quarter 2010, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Documents reviewed are listed in the Attachment to this report.

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

.6 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Radiological Occurrences performance indicator for the period from the second quarter 2009 through the second quarter 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff, the scope and breadth of its data review, and the results of those reviews. The inspectors independently reviewed electronic dosimetry dose rate and accumulated dose alarm and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

This PI review constituted one occupational radiological occurrences inspection sample as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

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

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities

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

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Selected Issue Followup Inspection: Root Cause Evaluation for Three Cross-Cutting Aspects in One Area

a. Inspection Scope

During the first quarter 2010, the inspectors reviewed CAP 072908, "NRC Finding Cross-Cutting Aspect – H.1.b," and CAP 072909, "NRC Findings with Cross-Cutting Aspects – P.1.c" (IR 05000331/2010-002). The inspectors observed that per licensee procedures LI-AA-200 and PI-AA-204, a root cause evaluation (RCE) should have been performed for CAP 072908. At the time the inspection report was issued, RCE 001088 for CAP 072908 was still in progress. The inspectors chose to review RCE 001088 to understand whether any common causes existed, what the extents of condition and cause were, the status and adequacy of planned corrective actions, and the scope of planned effectiveness reviews.

b. Observations

Based on the inspectors' review of RCE 001088, they noted that the root and common causes were identified using systematic processes. The inspectors also determined that corrective actions to prevent recurrence, if successfully implemented, appeared reasonable to address the root causes identified. Considering the effectiveness review scopes and completion dates (some reviews were in progress at the end of the inspection period), the inspectors did not identify any concerns with the licensee's plans to verify that the corrective actions were being effectively implemented.

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

c. Findings

No findings were identified.

.4 Selected Issue Followup Inspection: Water Intrusion into Turbine Building

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors noted that there were several condition reports generated over the past several years regarding water intrusion into plant buildings, switchgear rooms, and cable manholes; and elected to review applicable CAP documents and corrective actions taken. As part of the review, on August 31, 2010, the inspectors performed a walkdown of plant areas that have shown a history of water intrusion following periods of heavy rainfall. The inspectors also specifically reviewed corrective actions taken as a result of an NRC finding documented in G 05000331/2009005-01.

b. Observations

The inspectors noted instances where documentation of CAQ and Non-Conditions Adverse to Quality (NCAQ) were inconsistent with respect to water intrusion into plant buildings and cable manholes containing safety and/or non-safety related cables. The inspectors also noted that following issuance of a Green NCV identified in IR 05000331/2009005-01, the licensee did not perform an Apparent Cause Evaluation or document justification for not performing an ACE in accordance with PI-AA-204, "Condition Identification and Resolution," Revision 10. Additional aspects of the inspectors' review are documented below.

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

c. Findings

(1) Unresolved Item 050003312010004-06: Water Intrusion into Cable Vaults Containing Safety-Related Cables

Introduction: An Unresolved Item was identified by the inspectors for the licensee's failure to promptly identify that water intrusion into the turbine building cable vault could have affected safety-related cables. Specifically, the licensee failed to identify and

evaluate whether conduits containing safety-related cables were subject to water intrusion following discovery of water filling an adjacent conduit containing non-safety related cables in the same cable vault. In order to close this URI, the licensee needs to complete their evaluation to determine if the conduits containing safety-related cable were actually submerged.

Description: During the inspectors' review of water intrusion issues since 2008, they noted several condition reports documenting water intrusion into the 1A2 non-essential switchgear room, the Turbine Building (TB) east corridor and cable vault, and several exterior manholes containing electrical cables. The NRC issued a Green NCV in IR 05000331/2009005 for failing to maintain safety-related cables in manhole 1MH109 in an environment for which they were designed. This was following an inspection of 1MH109 that found safety-related ESW cables submerged in water. As a result of this finding, the licensee performed CE 07853 and developed several corrective actions to prevent long term cable submergence at the station. Immediate corrective actions included dewatering the manholes; interim corrective actions included the development of periodic inspection work tasks to be performed in manholes that were subject to water intrusion. The periodic inspections were to take place until the final corrective actions could be implemented; including the installation of sleeve extensions (to raise the top of the manhole) to prevent water intrusion, and the installation of sump pumps.

Additional review by the inspectors noted that on October 23, 2009, the licensee generated CAP 070736 which documented the source of water intrusion found in the 1A2 non-essential switchgear room. There had been a trend of water seeping from underneath the 1A2 non-essential switchgear and pooling around the breaker cabinets in the room. Investigation revealed the water was coming through cable conduit K208 leading to the 1A210 breaker (General Service Water Pump 1P-89C). This conduit was traced back to the TB east cable vault and the cable was found to originate from manhole MH206. The licensee determined that as rain water would fill MH206, water would leak through the cable penetrations in MH206 and migrate to the TB east cable vault and 1MH109. As water entered the TB east cable vault, the water would enter open conduits below the penetrations and also fill the floor of the cable vault. The inspectors noted that CAP 070736 did not identify whether conduits containing safety-related cables were in the vault or if they had been filled with water.

According to corrective action (CA) 53855 for CAP 070736, the licensee had established an administrative limit of 6" of accumulated rainfall to initiate a CR in order to inspect the condition of manholes MH206 and 1MH109, and dewater if necessary. The inspectors questioned the basis for the 6" of rainfall since it was not documented in the corrective action document. Review of all corrective action documents did not indicate what condition the licensee was intending to prevent (i.e., prevent safety-related cables in 1MH109 from becoming submerged or prevent non-safety related cables in MH206 from becoming submerged and therefore prevent water from entering the TB).

On August 16, 2010, CR 573648 was initiated to document recent intense rains approaching the 6" accumulated rainfall limit, and Work Request 94007646 was written to remove the manhole covers and inspect for water. On August 31, 2010, the inspectors identified water on the floor of the 1A2 switchgear room and the licensee wrote CR 577166 on September 1, 2010, which again identified the need to inspect manholes MH 206 and 1MH109 (since this was previously identified as the source of water into 1A2), and also noted that Work Request 94007646 had not yet been

completed. On September 2, 2010, the manholes were inspected and revealed that MH206 contained approximately seven feet of water and 1MH109 contained approximately 6 inches of water. The licensee dewatered both manholes and dug a trench to help direct any new rainfall away from the lid of MH206.

On September 9, 2010, the inspectors questioned the licensee whether the TB east cable vault contained any safety-related cables and what type of environment the cables were exposed to. The licensee wrote CR 579006 on September 10, 2010, to document potential standing water behind Door 112 which accesses the TB east cable vault. Inspection of the TB east cable vault on September 13, 2010 showed approximately two inches of water on the floor of the vault. The inspectors noted that water level in the vault likely had fallen since there was evidence of water seeping into the TB through the vault wall. There was additionally evidence of water streaking on the walls of the vault below the cable penetrations. The licensee noted in AR 579006 it is "reasonable to assume that there may be water in some if not all of the conduits exposed to the water coming into the Turbine Building in this vault." The inspectors determined that there were two possible ways water was entering safety-related conduits. First, as water entered the vault at the cable penetration, it could spray into the "open" conduits located below the cable penetrations. Second, as water filled the bottom of the cable vault, it could submerge the conduit penetration on the floor and leak into the conduit.

The inspectors noted that by not performing the manhole inspections for two weeks after CR 573648 was written and as required by CA 53855 (documenting the need for the manhole inspections), additional rainfall was sufficient to allow for water intrusion into the TB east cable vault and 1MH109, and furthered the potential to submerge safety-related cables with water. The licensee has planned inspections of the conduits in the TB cable vault to identify if water had actually entered the conduits. These inspections are planned under WO 40046280. Once these inspections are completed by the licensee, the inspectors will be able to determine if a violation of NRC requirements exist and close this URI (URI 05000331/201004-06).

40A3 Followup of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report (LER) 05000331/2010-003-00: Unplanned Manual Reactor Scram due to Increasing Turbine Vibrations

a. Inspection Scope

On April 26, 2010, with the plant operating at 14% power, plant operators were in the process of shutting the plant down for a planned maintenance outage when they received indications of rising vibrations on Main Turbine Bearing #6. Operators initiated a manual scram prior to reaching the Main Turbine vibration limit. The licensee determined the turbine vibrations resulted from turbine rub caused by excessive cooldown rate differences between the two low pressure turbines. Corrective actions included verifying no turbine damage existed as a result of the turbine rub and incorporating additional operational limits into their shutdown procedure. Documents reviewed as part of this inspection are listed in the Attachment to this report. This LER is closed.

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

b. Findings

No findings were identified.

.2 Small Fire in 1C04 Annunciator Panel

a. Inspection Scope

The inspectors reviewed the plant's response to a small fire in the main control room 1C04 annunciator panel on July 13, 2010. During circuit board replacement activities, technicians noticed a candle-size flame develop in an annunciator card behind the 1C04 annunciator panel. A reactor operator quickly extinguished the flame with a water mist extinguisher in less than one minute. The 1C04 annunciators were de-energized and no other effect on the plant occurred. Following extensive troubleshooting, circuit board replacement and testing, the licensee restored the annunciators to service. Documents reviewed in this inspection are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.3 Spurious Opening of 'B' Feedwater Regulating Valve and Downpower to Replace Valve Controller Components

a. Inspection Scope

The inspectors reviewed the plant's response to a spurious opening of the 'B' feedwater regulating valve on September 15, 2010. The inspectors reviewed the event consequences, attended several challenge board meetings, observed downpower activities, reviewed return-to-service testing, and observed power ascension activities. Documents reviewed in this inspection are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 5, 2010, the inspectors presented the inspection results to Mr. C. Costanzo and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Radiological Hazard Assessment and Exposure Controls, Occupational ALARA Planning and Controls and Occupational and Public Radiation Safety and Reactor Coolant System Performance Indicator Verification inspectors with Site Vice President, Mr. C. Costanzo on August 20, 2010.
- The inspector conducted a Biennial Operator Requalification Program Inspection exit with Mr. C. Costanzo, Site Vice President on September 17, 2010.

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

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

C. Costanzo, Site Vice President
D. Curtland, Plant General Manager
G. Young, Nuclear Oversight Manager
S. Catron, Licensing Manager
B. Murrell, Licensing Engineer Analyst
K. Kleinheinz, Engineering Director
B. Kindred, Security Manager
B. Simmons, Training Manager
G. Pry, Operations Director
G. Rushworth, Assistant Operations Manager
P. Giroir, Operations Support Manager
R. Porter, Chemistry & Radiation Protection Manager
M. Davis, Emergency Preparedness Manager
M. Lingenfelter, Design Engineering Manager
R. Wheaton, Maintenance Director
M. Heermann, Radwaste Shipper
J. Karrick, General Supervisor Radiation Protection
R. Schlueter, Health Physics Foreman ALARA Coordinator
W. Render, Instructor, DAEC Operator Training
F. Lucas, Design Engineer
K. Furman, Manager, Safety & Health
G. Young, NOS Manager
C. Bauer, Licensing Operator Requalification Supervisor

Nuclear Regulatory Commission

K. Feintuch, Project Manager, NRR
K. Riemer, Chief, Reactor Projects Branch 2
R. Walton, Operator Licensing Inspector

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000331/2010004-01	NCV	Surveillance Test Procedure did not Include Appropriate Acceptance Criteria (1R22.b(1))
05000331/2010004-02	NCV	Condition Adverse to Quality not Promptly Identified and Corrected (1R22.b(2))
05000331/2010004-03	NCV	Completeness and Accuracy of Information (1R11.8b(1))
05000331/2010004-04	FIN	ANSI Standards for Licensed Operators not Met (1R11.8.b(1))
05000331/2010004-05	URI	Use of Continuous Positive Airway Pressure Device (1R11.8.b(2))
05000331/2010004-06	URI	Water Intrusion into Cable Vaults Containing Safety-Related Cables (4OA2.4)

Closed

05000331/2010004-01	NCV	Surveillance Test Procedure did not Include Appropriate Acceptance Criteria (1R22.b(1))
05000331/2010004-02	NCV	Condition Adverse to Quality not Promptly Identified and Corrected (1R22.b(2))
05000331/2010004-03	NCV	Completeness and Accuracy of Information (1R11.8.b(1))
05000331/2010004-04	FIN	ANSI Standards for Licensed Operators not Met (1R11.8.b(1))
05000331 2010-003-00	LER	Unplanned Manual Reactor Scram due to Increasing Turbine Vibrations (4OA3.1)

Discussed

None.

LIST OF DOCUMENTS REVIEWED

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

Section 1R04

OI 152A4; HPCI System Control Panel Lineup; Revision 3
OI 152A2; HPCI System Valve Lineup and Checklist; Revision 16
OI 152A1; HPCI System Electrical Lineup; Revision 3
OI 454A2; A ESW System Valve Lineup and Checklist; Revision 10
OI 170A1; SBTG System Electrical Lineup; Revision 8
OI 170A4; 'B' SBTG System Valve Lineup and Checklist; Revision 2
OI 170A6; 'B' SBTG System Control Panel Lineup; Revision 3
CR 572245; Clearance Walkdown Issues Not Resolved Prior to Hanging Tags
CR 572675; TT5805A Found Out of Tolerance
OI 150A2; RCIC System Valve Lineup and Checklist; Revision 12

Section 1R05

Fire Plan, Volume 1, Program; Revision 57
WO 1363327; Smoke Test Week 1
FPR-10-7267; Fire Protection Impairment Request for Cable Spreading Room
Hourly Fire Watch Surveillance Checklist from August 3, 2010 through August 5, 2010 for Cable Spreading Room
AFP 25; Control Building Cable Spreading Room; Revision 26
AFP 34; Radwaste Building Drum Filling, Storage, and Shipping El. 757'6"; Revision 26
AFP 35; Radwaste Treatment and Access Area El. 773'6"; Revision 25
AFP 36; Radwaste Building Precoat and Access Area El. 786'0", Control Room and HVAC Equipment Room; Revision 26
AFP 14; North Turbine Building Basement Reactor Feed Pump Area and Turbine Lube Oil Tank Area; Revision 30
AFP 16; Condensate Pump Area 734'-0"; Revision 25
AFP 13; Refueling Floor El. 855'-0"; Revision 26
Administrative Control Procedure (ACP) 1412.4; Impairments to the Fire Protection Systems; Revision 57

Section 1R06

DBD-W10-001; Design Basis Document for River Water Supply System; Revision 6

Section 1R11

ACP 110.1; Conduct of Operations; Revision 24
Integrated Plant Operating Instruction 5; Reactor Scram; Revisions 54, 55, and 55A
Abnormal Operating Procedure (AOP) 901; Earthquake; Revision 18
Emergency Operating Procedure 1; [Reactor Pressure Vessel] Control; Revision 16
Emergency Operating Procedure 2; Primary Containment Control; Revision 15
DAEC Emergency Action Level Notification Form; NOTE 5; Revision 13

Emergency Plan Implementing Procedure 1.1; Determination of Emergency Action Levels; Revision 28
 Emergency Plan Implementing Procedure Form EAL-01; Emergency Action Level Matrix – Hot Modes; Revision 8
 Duane Arnold Energy Center Integrated Inspection Report 05000331/2008005
 Licensed Operator Requalification Training Program, 50008; Revision 20
 Licensed Operator Requalification Program Examinations, 1835; Revision 12
 Licensed Operator Requalification 2-Year Plan 2009 -2010, January 2009
 NRC Exam Security Requirements, 1836; Revision 6
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 Simulator Review Committee Meeting Minutes, 1st Quarter 2010
 Simulator Review Committee Meeting Minutes, 2nd Quarter 2010
 Remediation Packages, 2010 Biennial ESG and JPM Exam (2)
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 CAP 072595; NCAQ - INPO 2009 Plant Evaluation - Performance Deficiency Training – Preconditioning and Unrealistic Situation Concerns; January 25, 2010
 CAP 073491; SCAQ - Potential INPO ATV Team Identified Finding in Accreditation Objective 5 (Conduct of Training and Trainee evaluation); February 28, 2010
 CAP 065924; Data Discovered on Computer Monitor in Simulator; March 19, 2009
 CE007285; Condition Evaluation: Data Discovered on Computer Monitor in Simulator; March 19, 2009
 CAP 067103; Simulator Performance Metrics Indicate Areas for Attention; May 7, 2009
 CE007428; Condition Evaluation: Simulator Performance Metrics Indicate Areas for Attention for CAP 067103; May 7, 2009
 CAP 067117; NCAQ-DAEC Simulator does not have a full set of controlled ICs; May 8, 2009
 CA052401; Condition Evaluation for CAP067117, NCAQ-DAEC Simulator does not have a full set of controlled ICs, May 8, 2009
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 DAEC Functional Failure and Unavailability Data for RHR system; July, 2007 through September, 2010
 CAP 052776; CAQ – Potential Motor-Operated Valve Stroke Delay Times are Not Accounted For
 CAP 049132; RHR Heat Exchanger ‘A’ Inlet Valve, MO-2029, Failed While Cycling for STP
 CAP 053931; CAQ – LPCI Loop Select STP Relay Failure
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WO 40035820; HPCI Flow Controller
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WO 40040029; 8” EBB-14 Blind Flange on HPCI Side of Aux Boiler to HPCI Connection
STP 3.5.1-05; HPCI System Operability Test; Revision 49
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CAP 061576; CAQ – During B ESW STP Found Cooling Flow to 1VAC015B at 13.4 GPM
CR 576548; ‘B’ ESW Flow was Lower than Expected

CR 567240; 1VAC015B Flow Found Less than Required
CR 578386; Past Operability Evaluation for B RCIC Room Cooler Low Flow
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CR 581169; UFSAR Table 9.2-1 Contains Wrong Value for RCIC Flow Rate
CR 576584; NRC Question on ESW Operability Test NS540002
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CAP 068933; Contaminated Area Routine Surveys and Duties Not Completed as Scheduled
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CR 572678; A Portion of LOR 2010 'D' Cycle Dynamic in FMS OBS Notes

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NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 6
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MSPI Unreliability Index Derivation Report for HPCI System; July 2009 through June 2010
MSPI Unavailability Index Derivation Report for HPCI; July 2009 through June 2010
NRC PI Data Calculation, Review and Approval Packages for MSPI Heat Removal (RCIC)
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MSPI Unavailability Index Derivation Report for Heat Removal System; July 2009 through
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Adverse Condition Monitoring and Contingency Plan; TSC [Technical Support Center]
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BECH-E305; Turbine Generator Building Area 2 Conduit & Trays Above Elevation 734'-0";
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CR 573648; Inspection of 1MH109 and MH206
CR 577166; Inspection of 1MH109 & MH206
CR 577749; 9/2/10 – Inspection Results for MH206/1MH109
CAP 068274; NCAQ- Electrical Switchgear/MCC Water Intrusion Walkdown Results

CAP 070149; CAQ – Water Intrusion Causes Unexpected Alarm: Aux Trans to 1A1 Brkr 1A101 Trip
CAP 070228; CAQ – Transformer Duct Leakage
CAP 070736; CAQ – Water Coming up through conduit around cables for 1P089C in 1A210
CAP 071552; NCAQ – Aggregate Rev. of CAPs Related to water intrusion into manholes containing safety-related cables
CAP 072907; CAQ – NRC Findings with Cross-Cutting Aspects – P.1.d
CAP 073813; NCAQ – Water Found in MH206. Approximately 30 inches
CAP 074488; CAQ – Water Found in MH206 and MH114-cables were not in contact with water
CR 579006; Water Appears to Remain Behind Door 112 in the TB Vault
CAP 070938; CAQ – Water found in Manholes MH206 and 1MH109
CR 582215; Potential Water Filled Conduits containing Safety-Related Cables
CAP 068540; NCAQ – Water is Seeping into the Turbine Building Cable Chase Behind Door 112
PI-AA-204; Condition Identification and Screening Process; Revision 10
CR 573099; MRC [Management Review Committee] Not Held Due to Not Meeting Quorum

Section 4OA3

CR 566977; Open Flame in Panel 1C004

LIST OF ACRONYMS USED

AC	Alternating Current
ACP	Administrative Control Procedure
ADAMS	Agencywide Document Access Management System
AFP	Area Fire Plan
ALARA	As-Low-As-Is-Reasonably-Achievable
ANSI/ANS	American National Standards Institute/American Nuclear Society
AOP	Abnormal Operating Procedure
CAP	Corrective Action Program
CAQ	Condition Adverse to Quality
CBC	Control Building Chiller
CE	Condition Evaluation
CFR	Code of Federal Regulations
CPAP	Continuous Positive Airway Pressure
CR	Condition Report
CS	Core Spray
DAEC	Duane Arnold Energy Center
DRP	Division of Reactor Projects
ESW	Emergency Service Water
GPM	Gallons Per Minute
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
IMC	Inspection Manual Chapter
IN	Information Notice
IOD	Immediate Operability Determination
IP	Inspection Procedure
IR	Inspection Report
JPM	Job Performance Measure
LER	Licensee Event Report
LORT	Licensed Operator Requalification Training
LPCI	Low Pressure Coolant Injection
MSPI	Mitigating Systems Performance Index
NCAQ	Non-Conditions Adverse to Quality
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NWCR	Northwest Corner Room
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records System
PD	Performance Deficiency
PI	Performance Indicator
PI&R	Problem Identification & Resolution
RCE	Root Cause Evaluation
RCIC	Reactor Core Isolation Cooling
RETS	Radiological Effluent Technical Specifications
RFO	Refueling Outage
RHR	Residual Heat Removal
RWP	Radiation Work Permit
RWS	River Water Supply
SAT	Systems Approach to Training

SBDG	Standby Diesel Generator
SBGT	Standby Gas Treatment
SBLC	Standby Liquid Control
STP	Surveillance Test Procedure
TAR	Technical Assessment for Reportability
TB	Turbine Building
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VHRA	Very High Radiation Area
WPG	Work Planning Guideline
WO	Work Order

C. Costanzo

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Sincerely,

/RA/

Kenneth Riemer, Chief
Branch 2
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