



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

October 29, 2009

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

**SUBJECT: DUANE ARNOLD ENERGY CENTER NRC TRIENNIAL FIRE PROTECTION
BASELINE INSPECTION REPORT 05000331/2009006(DRS)**

Dear Mr. Costanzo:

On September 18, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed a triennial fire protection inspection at your Duane Arnold Energy Center. The enclosed report documents the inspection findings, which were discussed on September 18, 2009, and on October 6, 2009, with you and other members of your staff.

As a result of your intent to adopt the National Fire Protection Association Standard (NFPA) 805 Code, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition," as defined by Title 10, Code of Federal Regulations (CFR), Part 50, Section 48(c), the inspection was conducted in accordance with Inspection Procedure 71111.05TTP, "Fire Protection – NFPA 805 transition Period (Triennial)," dated May 9, 2006. The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, one NRC-identified finding of very low safety-significance was discovered that involved a violation of NRC requirements. The NRC-identified finding was not associated with a finding of high safety-significance (Red) and was entered into your corrective action program. The finding met only two of the four criteria established by Section A of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48) for a licensee in NFPA 805 transition, therefore, Enforcement Discretion is not being granted for this finding which will be cited in accordance with the NRC's Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission-Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Duane Arnold Energy Center.

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

Sincerely,

/RA/

Robert C. Daley, Chief
Engineering Branch 3
Division of Reactor Safety

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

Enclosure: Inspection Report 05000331/2009006
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000331/2009006

Licensee: FPL Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, Iowa

Dates: August 31 through September 18, 2009

Inspectors: Z. Falevits, Senior Reactor Inspector, Lead
G. Hausman, Senior Reactor Inspector
R. Winter, Reactor Inspector

Approved by: R. Daley, Chief
Engineering Branch 3
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000331/2009006; 08/31/2009 - 09/18/2009; Duane Arnold Energy Center; Routine Triennial Fire Protection Baseline Inspection.

This report covers an announced triennial fire protection baseline inspection. The inspection was conducted by Region III inspectors. Based on the results of this inspection, one NRC-identified finding was discovered that involved a violation of NRC requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety-significance and associated Non-Cited Violation (NCV) of Technical Specifications, Paragraph 5.4.1.d, for the failure to identify an adverse trend in performing fire watches required as compensatory measures to address identified fire protection impairments; including potential multiple spurious operations vulnerabilities and an unanalyzed condition in Appendix R analysis. Specifically, the licensee failed to implement requirements in Procedure PI-AA-01 that would have ensured the proper implementation of the Fire Protection Program in accordance with ACP 1412.4. The improper implementation of Procedure PI-AA-01 resulted in numerous instances in which the licensee failed to issue and implement Fire Watch Surveillances as required by ACP 1412.4, Section 3.1, Paragraph (7)(a). Upon discovery, the licensee initiated an Apparent Cause Evaluation after entering this finding into their corrective action program as CAP 069822.

The finding was determined to be more than minor because the finding was associated with the mitigating systems cornerstone attribute of protection against external factors (fire) and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to implement fire protection procedure requirements could have complicated plant safe shutdown in the event of a fire. The issue was of very low safety-significance based on the relatively short duration involved and that only one defense-in-depth element (barriers) was affected by the impairments for which the fire watches had been established. This violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution (PI&R) for the CAP component because the licensee's trending program failed to ensure that information from the CAP and other assessments in the aggregate are periodically trended and assessed to identify adverse trends. The Licensee's Apparent Cause Evaluation (ACE) 001984, dated September 23, 2009, attributed the apparent cause of the missed fire watches adverse trend to a programmatic failure in the licensee's trending program, which failed to assign the responsibility for reviewing potential adverse trend issues to a specific position or individual. Consequently, the licensee failed to identify the aggregate trend which was identified by the inspectors. (Example P1.(b)), (Section 1R05.11b).

B. Licensee-Identified Violations

No violations of significance were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (71111.05TTP)

Florida Power and Light (FPL) Energy, Duane Arnold Energy Center, in a letter to the United States Nuclear Regulatory Commission (NRC) dated July 11, 2006, committed to adopt the NFPA 805 Standard, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition," as defined by 10 CFR 50.48(c) for the Duane Arnold Energy Center. The NFPA 805 Standard establishes a comprehensive set of requirements for fire protection programs at nuclear power plants. The standard incorporated both deterministic and risk-informed, performance-based concepts. The deterministic aspects of the Standard are comparable to traditional requirements. However, the transition to a risk-informed, performance-based fire protection program requires an in-depth nuclear safety circuit analysis for equipment identified for nuclear safety functions such as safe shutdown. Because the conversion and licensing process to NFPA 805 Standard was expected to identify and address a variety of issues that were normally the subject of the triennial fire protection baseline inspection, the NRC modified the fire protection inspection program and Enforcement Policy for licensees in transition to NFPA 805. As a result, this inspection was conducted in accordance with Inspection Procedure (IP) 71111.05TTP, "Fire Protection - NFPA 805 Transition Period (Triennial)," dated May 9, 2006. Associated with the transition to NFPA 805, when a certain finding not associated with a finding of high safety-significance meets the four criteria established by Section A of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48), the violation would receive enforcement discretion in accordance with the NRC's Enforcement Policy.

The purpose of the fire protection triennial baseline inspection was to conduct a design-based, plant specific, risk-informed, onsite inspection of the licensee's fire protection program's defense-in-depth elements used to mitigate the consequences of a fire. The fire protection program shall extend the concept of defense-in-depth to fire protection in plant areas important to safety by:

- preventing fires from starting;
- rapidly detecting, controlling and extinguishing fires that do occur; and
- providing protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by fire suppression activities will not prevent the safe shutdown of the reactor plant.

The inspectors' evaluation focused on the design, operational status, and material condition of the reactor plant's fire protection program and post-fire safe shutdown systems. The objectives of the inspection were to assess whether the licensee had implemented a fire protection program that: (1) provided adequate controls for combustibles and ignition sources inside the plant; (2) provided adequate fire detection and suppression capability; (3) maintained passive fire protection features in good material condition; (4) established adequate compensatory measures for out-of-service,

degraded or inoperable fire protection equipment, systems or features; (5) ensured that procedures, equipment, fire barriers and systems exist so that the post-fire capability to safely shutdown the plant was ensured; (6) included feasible and reliable operator manual actions when appropriate to achieve safe shutdown; and (7) identified fire protection issues at an appropriate threshold and ensured these issues were entered into the licensee's PI&R program.

In addition, the inspectors' review and assessment focused on the licensee's post-fire safe shutdown systems for selected risk-significant fire areas. Inspector emphasis was placed on determining that the post-fire safe shutdown capability and the fire protection features were maintained free of fire damage to ensure that at least one post-fire safe shutdown success path was available. The inspection was performed in accordance with the NRC's regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The inspectors, with assistance from a Senior Reactor Analyst (SRA), used the licensee's Individual Plant Examination for External Events (IPEEE) to select several risk-significant areas for detailed inspection and review. Documents reviewed are listed in the Attachment to this report.

The fire areas and fire zones selected for review during this inspection are listed below and constituted four inspection samples as defined in IP 71111.05TTP.

<u>Fire Area</u>	<u>Fire Zone</u>	<u>Description</u>
RB3	03B	786' Reactor Building – South Hatch Area (ASD Area – 1C390 and 1B34 SD Panels, Procedure AOP-915)
RB3	03D	786' Reactor Building – MG Sets Room
TB1	08H	757' Turbine Building – 1G-31, "A" EDG Room East
PH2	016B	761' Pumphouse "A" RHRSW and ESW Pump Room

.1 Shutdown from Outside Main Control Room

a. Inspection Scope

The inspectors reviewed the functional requirements identified by the licensee as necessary for achieving and maintaining hot shutdown conditions to ensure that at least one post-fire safe shutdown success path was available in the event of fire in each of the selected fire areas and for alternative shutdown in the case of control room evacuation. The inspectors reviewed the plant systems required to achieve and maintain post-fire safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for each fire area selected for review. Specifically, the review was performed to determine the adequacy of the systems selected for reactivity control, reactor coolant inventory makeup, reactor heat removal, process monitoring, and support system functions. The review also included the fire safe shutdown analysis to ensure that all required components in the selected systems were included in the licensee's safe shutdown analysis.

The inspectors reviewed the licensee's post-fire safe shutdown analysis, normal and abnormal operating procedures, piping and instrumentation drawings, electrical

drawings, the updated final safety analysis report, and other supporting documents to verify that hot and cold shutdown could be achieved and maintained from outside the control room for fires that rely on shutdown from outside the control room. This review included verification that shutdown from outside the control room could be performed both with and without the availability of offsite power.

The inspectors also examined the operators' ability to perform the necessary manual actions for achieving safe shutdown by reviewing post-fire shutdown procedures, the accessibility of safe shutdown equipment, and the available time for performing the actions.

The inspectors reviewed the updated final safety analysis report and the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, technical specifications, safety evaluation reports, exemptions, and deviations) to determine the licensing basis.

b. Findings

No findings of significance were identified.

.2 Protection of Safe Shutdown Capabilities

a. Inspection Scope

For each of the selected fire areas, the inspectors reviewed the fire hazards analysis, safe shutdown analysis, and supporting drawings and documentation to verify that safe shutdown capabilities were properly protected.

The inspectors reviewed the licensee procedures and programs for the control of ignition sources and transient combustibles to assess their effectiveness in preventing fires and in controlling combustible loading within limits established in the fire hazards analysis. The inspectors performed plant walkdowns to verify that protective features were being properly maintained and administrative controls were being implemented.

The inspectors also reviewed the licensee's design control procedures to ensure that the process included appropriate reviews and controls to assess plant changes for any potential adverse impact on the fire protection program and/or post-fire safe shutdown analysis and procedures.

b. Findings

No findings of significance were identified.

.3 Passive Fire Protection

a. Inspection Scope

For the selected fire areas, the inspectors evaluated the adequacy of fire area barriers, penetration seals, fire doors, electrical raceway fire barriers, and fire rated electrical cables. The inspectors observed the material condition and configuration of the installed barriers, seals, doors, and cables. The inspectors reviewed approved construction

details and supporting fire tests. In addition, the inspectors reviewed license documentation, such as NRC safety evaluation reports, and deviations from NRC regulations and NFPA codes to verify that fire protection features met license commitments.

The inspectors walked down accessible portions of the selected fire areas to observe material condition and the adequacy of design of fire area boundaries (including walls, fire doors, and fire dampers) to ensure they were appropriate for the fire hazards in the area.

The inspectors reviewed the installation, repair, and qualification records for a sample of penetration seals to ensure the fill material was of the appropriate fire rating and that the installation met the engineering design.

b. Findings

No findings of significance were identified.

.4 Active Fire Protection

a. Inspection Scope

For the selected fire areas, the inspectors evaluated the adequacy of fire suppression and detection systems. The inspectors observed the material condition and configuration of the installed fire detection and suppression systems. The inspectors reviewed design documents and supporting calculations. In addition, the inspectors reviewed license basis documentation such as NRC safety evaluation reports, deviations from NRC regulations, and NFPA codes to verify that fire suppression and detection systems met license commitments.

b. Findings

No findings of significance were identified.

.5 Protection from Damage from Fire Suppression Activities

a. Inspection Scope

For the selected fire areas, the inspectors verified that redundant trains of systems required for hot shutdown would not be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems including the effects of flooding. The inspectors conducted walkdowns of each of the selected fire areas to assess conditions such as the adequacy and condition of floor drains, equipment elevations, and spray protection.

b. Findings

No findings of significance were identified.

.6 Alternative Shutdown Capability

a. Inspection Scope

The inspectors reviewed the licensee's systems required to achieve alternative safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions. The inspectors also focused on the adequacy of the systems to perform reactor pressure control, reactivity control, reactor coolant makeup, decay heat removal, process monitoring, and support system functions.

The inspectors conducted selected area walkdowns to determine if operators could reasonably be expected to perform the alternate safe shutdown procedure actions and that equipment labeling was consistent with the alternate safe shutdown procedure. The review also looked at operator training as well as consistency between the operations shutdown procedures and any associated administrative controls.

b. Findings

No findings of significance were identified.

.7 Circuit Analyses

a. Inspection Scope

In accordance with IP 71111.05TTP, "Fire Protection - NFPA 805 transition Period (Triennial)," dated May 9, 2006, this section of the IP was suspended for facilities in NFPA 805 transition.

b. Findings

No findings of significance were identified.

.8 Communications

a. Inspection Scope

The inspectors reviewed, on a sample bases, the adequacy of the communication system to support plant personnel in the performance of alternative safe shutdown functions and fire brigade duties. The inspectors verified that plant telephones, page systems, sound powered phones, and radios were available for use and maintained in working order. The inspectors reviewed the electrical power supplies and cable routing for these systems to verify that either the telephones or the radios would remain functional following a fire.

b. Findings

No findings of significance were identified.

.9 Emergency Lighting

a. Inspection Scope

The inspectors performed a plant walkdown of selected areas in which a sample of operator actions would be performed in the performance of alternative safe shutdown functions. As part of the walkdowns, the inspectors focused on the existence of sufficient emergency lighting for access and egress to areas and for performing necessary equipment operations. The locations and positioning of the emergency lights were observed during the walkdown and during review of manual actions implemented for the selected fire areas.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

a. Inspection Scope

The inspectors reviewed the licensee's procedures to determine whether repairs were required to achieve cold shutdown and to verify that dedicated repair procedures, equipment, and material to accomplish those repairs were available onsite. The inspectors also evaluated whether cold shutdown could be achieved within the required time using the licensee's procedures and repair methods. The inspectors also verified that equipment necessary to perform cold shutdown repairs was available onsite and properly staged.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The inspectors also conducted a review to verify that compensatory measures were in place for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g., detection and suppression systems, and equipment, passive fire barriers, pumps, valves or electrical devices providing safe shutdown functions or capabilities). The inspectors also conducted a review of the adequacy of short term compensatory measures to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

(1) Failure to Identify and Address an Adverse Trend in Performing Required Fire Watches

Introduction: The inspectors identified a Non-Cited Violation (NCV) of Technical Specification (TS) 5.4.1.d, having very low safety-significance (Green) involving the licensee's failure to ensure that written procedures be established, implemented, and

maintained. Specifically, the licensee failed to implement fire protection program Procedure ACP 1412.4, "Impairments to Fire Protection Systems," Revision 55, requirements, in that numerous required fire watches which were initiated as compensatory measures for identified fire protection impairments, including mitigation of potential spurious operation of safe shutdown (SSD) components, were not performed (were missed), in the 12 months prior to this inspection.

Description: The inspectors reviewed the licensee's compensatory measures initiated to address fire protection impairments identified by the licensee analyses of plant fire protection safe shutdown systems design. Some of the identified issues included potential multiple spurious operation vulnerabilities and an Appendix R SSD unanalyzed condition, in an event of a fire.

Procedure ACP 1412.4, "Impairments to Fire Protection Systems," provided guidance, requirements and administrative controls for maintaining the integrity of the fire protection systems including implementing fire watches as compensatory measures. The inspectors identified an adverse trend related to implementation of fire watches used as interim compensatory measures to address licensee identified fire protection impairments; including multiple spurious operation vulnerabilities. Specifically, from September 9, 2008, to September 1, 2009, corrective action program (CAPs) 060115, 060226, 061342, 063065, 065986, 068682 and 069415 were issued to document and address missed fire watches. The missed fire watches were contrary to the requirements of Procedure ACP 1412.4. In addition, from June 1, 2009 to September 1, 2009, the licensee initiated five Fire Protection Impairment Requests (FPIRs) to document multiple spurious operation vulnerabilities and one FPIR concerning an unanalyzed condition in the Appendix R SSD analysis. For example, the inspectors were concerned that the missed fire watch identified in CAP069415 defeated the compensatory measures put in place because of the discovery of potential multiple spurious operation vulnerabilities and discovery of an unanalyzed condition in the Appendix R SSD analysis. Also, the inspectors noted that similar issues related to missed fire watches were identified in CAP035462, dated March 29, 2005.

The licensee viewed the missed fire watch occurrences individually (narrow scope) and failed to identify and address the adverse trend and the causes that resulted in additional missed fire watches. The licensee's past evaluations attributed the missed fire watches mostly to poor communications, lack of resources and lack of management oversight.

The inspectors also identified that the licensee failed to perform a trend analysis and an extent of condition for this issue as required by Procedure PI-AA-01, "Corrective Action Program and Condition Reporting," Revision 1. The procedure stated, in part, that a successful corrective action program will be based on the effective implementation of 13 critical attributes. In addition, the procedure emphasized that significant conditions adverse to quality (SCAQ) represent a challenge to safe operations and require the engagement of the senior management team to ensure effective resolution and that Corrective Action Program data will be periodically reviewed in a systematic fashion to identify performance trends.

During the inspectors' review of the seven CAPs issued for missed fire watches, the inspectors determined that these CAPs, in some cases, identified individual FPIRs initiated for multiple fire areas. For example, CAP 069415, dated September 1, 2009, documented multiple FPIRs which delineated multiple fire zones requiring hourly fire

watches. This CAP identified 16 different fire zones requiring hourly fire watches as compensatory measures for impairments and multiple spurious operation vulnerabilities. Based on this review, the inspectors concluded, that the licensee has failed to implement three of the following critical attributes identified in Procedure PI AA-01 as follows: (1) the effective monitoring and management oversight, (2) the formal analysis and trending of data, and (3) that CAP data will be periodically reviewed in a systematic fashion to identify performance trends.

Analysis: The inspectors determined that failure to implement fire protection program procedure requirements to conduct fire watches as compensatory measures for identified impairments in lieu of meeting Appendix R requirements and the failure to implement critical attributes/requirements contained in Procedure PI-AA-01, "Corrective Action Program and Condition Reporting," Revision 1, to correct this trend of deficiencies was a performance deficiency. Specifically, these compensatory measures were initiated to address fire protection impairments, potential multiple spurious operation vulnerabilities and an unanalyzed condition in Appendix R SSD analysis. Some of these deficiencies were discovered during NFPA 805 transition. These compensatory measures put in place were designed to fulfill the fire protection program's concept of defense in depth to fire protection in plant areas important to safety by rapidly detecting, controlling and extinguishing fires that could occur.

The inspectors determined that the finding was more than minor because it was associated with the mitigating system cornerstone attribute of protection against external factors (fire) and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform the assigned compensatory measures (fire watches), and to identify the adverse trend concerning missed fire watches defeated the compensatory measures that the NRC relied upon for allowing discretion for circuit issues and vulnerabilities identified during licensee's NFPA 805 fire protection transition analysis, could have potentially compromised the ability to safely shutdown the plant in the event of a fire in any of the fire zones where the fire watches were missed.

In accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 3b the inspectors determined the finding degraded the fire protection defense-in-depth strategies. Therefore, screening under IMC 0609, Appendix F, "Fire Protection Significance Determination Process," was required. Due to the complexity associated with evaluating six separate instances under IMC 0609, Appendix F, the inspectors and a Senior Reactor Analysts, with the concurrence of regional management, chose to evaluate this issue using IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria." One of the seven instances, documented by CAP 065986, involved a fire door where fire watches had not been performed for approximately a week during which fire watches were required. However, the door was a supervised door. As such, the inspectors determined that the failure to perform fire watches in this instance was comparable to a "low" degradation which would screen to Green under IMC 0609, Appendix F. Of the six remaining instances identified where fire watches had not been completed, five of the instances were for one-hour durations, and one instance was for a three-hour duration, for a total of eight hours in duration. Based on the relatively short duration involved and that only one defense-in-depth element (barriers) was affected by the impairments for which the fire watches had been established, the inspectors determined that the issue was of very low safety-significance, i.e., Green.

A Senior Reactor Analyst has reviewed this significance evaluation and regional management has concurred with the significance evaluation.

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution (PI&R) for the CAP component because the licensee's trending program failed to ensure that information from the CAP and other assessments in the aggregate are periodically trended and assessed to identify adverse trends. The Licensee's Apparent Cause Evaluation (ACE) 001984, dated September 23, 2009, attributed the apparent cause of the missed fire watches adverse trend to a programmatic failure in the licensee's trending program, which failed to assign the responsibility for reviewing potential adverse trend issues to a specific position or individual. Consequently, the licensee failed to identify the aggregate trend which was identified by the inspectors. (Example P.1(b)).

Enforcement: Technical Specifications, Paragraph 5.4.1.d, required, in part, that written procedures shall be established, implemented and maintained covering Fire Protection Program Implementation. Procedure ACP 1412.4 is a written procedure implementing the fire protection program. Procedure ACP 1412.4, Section 3.1, Paragraph (7)(a) required that applicable Fire Watch Surveillances be issued continuously or hourly, as required. Procedure PI-AA-01, "Corrective Action Program and Condition Reporting," Revision 1, ensures that corrective actions are effectively implemented for concerns involving implementation of the fire protection program.

Contrary to the above, from September 9, 2008, through September 1, 2009, the licensee failed to implement requirements in Procedure PI-AA-01 that would have ensured the proper implementation of the Fire Protection Program in accordance with ACP 1412.4. Specifically, the improper implementation of Procedure PI-AA-01 resulted in numerous instances in which the licensee failed to issue and implement Fire Watch Surveillances as required by ACP 1412.4, Section 3.1, Paragraph (7)(a). The missed fire watches resulted in defeating the compensatory measures put in place to address licensee identified fire protection impairments; including potential multiple spurious operations vulnerabilities and an unanalyzed condition in Appendix R, SSD analysis.

The licensee has been transitioning to NFPA 805 and therefore the NRC-identified violation was evaluated in accordance with the criteria established by Section A of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48) for a licensee in NFPA 805 transition. The inspectors determined that for this violation: (1) the licensee would not have identified the violation during the scheduled transition to 10 CFR Part 50, Section 48(c); (2) the licensee had established adequate compensatory measures within a reasonable time frame following identification and would correct the violation as a result of completing the NFPA 805 transition; however, the missed fire watches would defeat these compensatory measures (3) the violation was not likely to have been previously identified by routine licensee efforts; and (4) the violation was not willful. Therefore, the inspectors concluded that the violation did not meet criteria (1) and criteria (2) of the four criteria established by Section A above and enforcement discretion does not apply. Because this violation was of very low safety-significance and it was entered into the licensee's corrective action program as CAP 069822, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000331/2009006-01).

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution (71152)

a. Inspection Scope

The inspector reviewed the licensee's corrective action program procedures and samples of corrective action documents to verify that the licensee was identifying issues related to the fire protection program at an appropriate threshold and entering them in the corrective action program. The inspectors reviewed selected samples of condition reports, design packages, and fire protection system non-conformance documents.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On September 18, 2009 and on October 6, 2009, the inspectors presented the inspection results to Mr. C. Costanzo and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report inputs discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

- M. Allen, NOS Supervisor
- S. Catron, Manager Licensing
- R. Cole, Performance Improvement Manager
- C. Costanzo, Site Vice President
- D. Curtland, Plant Manager
- J. Dubois, Engineering Programs Manager
- G. Ellis, Fire Protection Supervisor
- R. Hanson, Engineer (Appendix R)
- E. Harrison, Operations Support Staff
- S. Huebsch, Engineering Supervisor - NSSS/ECCS
- B. Kindred, Security Manager
- K. Kleinheinz, Maintenance Manager
- B. Klotz, NFPA 805 Project Manager
- M. Lingenfelter, Engineering Design Manager
- B. Murrell, Engineer/Analyst – Regulatory Affairs
- J. Parker, Fire Protection Instructor
- T. Pegg, System Engineer
- C. Schantz, Administration Specialist
- J. Shriver, Administration Specialist
- J. Schwertfeger, Security Operations Supervisor
- R. Sullivan, Fire Protection Coordinator (Fire Marshal) - Operations
- J. Swales, Engineering Supervisor - Mechanical Design
- L. Swenzinski, Engineer/Analyst – Regulatory Affairs
- P. Watkinson, Administration Specialist
- T. Weaver, System Engineer

Nuclear Regulatory Commission

- R. Orlikowski, Senior Resident Inspector
- R. Daley, Chief, Division of Reactor Safety, Engineering Branch 3

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000331/2009006-01	NCV	Failure to Identify and Address an Adverse Trend in Performing Required Fire Watches (Section 1R05.11b.(1))
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Discussed

None

LIST OF DOCUMENTS REVIEWED

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

CALCULATIONS

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
CAL-E08-006	AC Coordination (Selected Attachments)	0
CAL-E08-010	Analysis of the 120Vac AC Division 1 & II Instrument AC Electrical Power Distribution System and Uninterruptible AC Systems	0
CAL-E08-010, Attachment 1.3	Protective Device Coordination	0
CAL-E08-010, Attachment 2.3	Protective Device Coordination	0
CAL-M07-010	Calculation of Maximum Emergency Diesel Generator Room Temperature	June 14, 2007
CAL-E96-019	10CFR50 Appendix R III.G/III.L Assessment for Fire Area PH-2	2
CAL-E96-022	10CFR50 Appendix R III.G/III.L Assessment for Fire Area RB3	9
CAL-E96-024	10CFR50 Appendix R III.G/III.L Assessment for Fire Area TB1	7
CAL-292-M-003	Deluge System Calcs for Fire Zone 3-B	2
CAL-M79-011	Modification to DG Room Sprinkler Systems	September 2, 1979
CAL-M95-011	Hydraulic Calculation for Deluge System #8, MG Set Deluge Expansion	1
CAL-M95-012	Hydraulic Calculation for Deluge System #9, MG Set Deluge Expansion	1

CORRECTIVE ACTION PROGRAM (CAP) DOCUMENTS GENERATED DURING INSPECTION

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
CAP069183	NCAQ - PS3366A/B Equipment Names Do Not Match Function	August 21, 2009
CAP069240	Incorrect Drawing Reference on BECH-E112<031>	August 24, 2009
CAP069380	Question on Remote Shutdown Fuses	August 31, 2009

CORRECTIVE ACTION PROGRAM (CAP) DOCUMENTS GENERATED DURING INSPECTION

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
	Clearing During Transfer	
CAP069415	CAQ – Missed Firewatch	September 1, 2009
CAP069419	Drawing Error E134-018	September 2, 2009
CAP069435	NCAQ-Ambient Temperatures in the Diesel Generators' Rooms is Approximately 110°F	September 2, 2009
CAP069438	Drawing Error Bech-E111<008D>	September 2, 2009
CAP069458	NCAQ - Revisit IN2006-22 Evaluate Effect of USLD on Diesel Fueled Engines at DAEC	September 3, 2009
CAP069459	NCAQ - Does Appendix R Definition of Hot Shutdown Match Mode 3 in TS	September 3, 2009
CAP069482	CAQ - Full Scope of Fire Areas Not Added to CA051575	September 3, 2009
CAP069486	CAQ - NRC Question on the Sound Powered Phones	September 3, 2009
CAP069494	NCAQ - Fire Protection Engineering Database Cable Associations	September 4, 2009
CAP069495	NCAQ - Pyrotechnics Battery Terminal Looks Like It Needs Grease	September 4, 2009
CAP069556	CAQ - Documentation Providing Basis for Appendix R Repair Equipment	September 9, 2009
CAP069703	Individual Fell on DAC Stairs	September 15, 2009
CAP069707	Drawing Clarification BECH-E021	September 15, 2009
CAP069721	EMA A57391 Did Not Recognize Fire Protection/Appendix R Impact	September 16, 2009
CAP069724	AFP-07 and AFP-08 Are Not Consistent	September 16, 2009
CAP069733	Enhancement to AOP-913 Steps in RB4 and TB1 Tabs	September 16, 2009
CAP069809	CAL-M07-010 Uses Two Different Values for EDG Loading	September 17, 2009
CAP069822	Missed Fire Watch Trend	September 18, 2009
CAP070573	ACP 1412.4 Does Not Clearly Identify Requirements for Fire Watch Performance	October 16, 2009

CORRECTIVE ACTION PROGRAM (CAP) DOCUMENTS REVIEWED

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
CAP012139	TS-3270A/B (SBDG 1G-31 Electric Lube Oil HTR High Temp Trip) Need to Be Relocated	November 26, 2001
CAP027791	Enclosure Cover May Affect Calibration of Allen-Bradley Type 837 Temp Switches	June 11, 2003
CAP038446	Manual Operator Actions in Lieu of Thermolag Upgrade	October 19, 2005
CAP038918	TS-3270A Rest Point High Out of Limits	November 15, 2005
CAP040013	Jumper Not Available for AOP 915	January 26, 2006
CAP040320	Inadequate Documentation of 125Vdc Coordination	February 10, 2006
CAP040321	Jumper Not Readily Accessible for AOP 915 Actions	February 10, 2006
CAP052902	TS-3270A As-Found Setpoint Found Out-of-Tolerance During PWO 1139280	October 2, 2007
CAP054697	NCAQ – Establish Protocol for Cable Spreading Room Access with Cardox In-Service	January 9, 2008
CAP055349	CAQ – Rec'd Lube Oil Makeup Tank Level Low & Low-Low Alarms During SBDG Run	February 6, 2008
CAP056344	CAQ – CA048967 Identified 1G21/1G31 Lube Oil Temp Operate Below Setpoint of Instrument	March 15, 2008
CAP058355	CAQ – 1G-21 'B' SBDG Lube Oil Temperature High Out-of-Specification High	June 16, 2008
CAP058743	CAQ – EMA A80715 Should Have Updated Drawing M015-004	July 8, 2008
CAP060915	NCAQ – Focal Point – Cable Spreading Room Tagging	October 13, 2008
CAP067258	CAQ – ETAP Calc Issues Require Further Engineering Evaluation	May 15, 2009
OPR000380	CAQ – 1G-21 'B' SBDG Lube Oil Temperature High Out-of-Specification	June 16, 2008
CA044637	Analyze the S500 and S15 Diesel Fuel	December 4, 2006
CAP060115	CAQ – 0200 Firewatch Missed due to Security Computer Failure	September 9, 2008
CAP060228	CAQ – Firewatch on HPCI Room Missed for 1100 hour	September 13, 2008
CAP061342	CAQ – Missed Firewatch	October 27, 2008
CAP062253	NCAQ-Current Operator Manual Actions not Consistent with Conversion to NFPA-805	December 10, 2008

CORRECTIVE ACTION PROGRAM (CAP) DOCUMENTS REVIEWED

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
CAP063065	NCAQ – Missed Firewatches	January 21, 2009
CAP065324	During STP NS13F003RF Fire Dampers IV-FD-132 & IV-FD-135 were gravity not spring type – Appendix A is wrong	February 27, 2009
CAP065986	CAQ – Missed Fire Watch	March 21, 2009
CAP068682	CAQ – Missed Hourly Firewatch and FPLCO Entry During 1B9 Outage	July 27, 2009
CAP068464	NCAQ-NFPA-805 Project MSO vulnerabilities fire area CB1	July 16, 2009
CAP068465	NCAQ-NFPA-805 Project MSO vulnerabilities fire area CB2	July 16, 2009
CAP068466	NCAQ-NFPA-805 Project MSO vulnerabilities fire area CB3	July 16, 2009
CAP068467	NCAQ-NFPA-805 Project MSO vulnerabilities fire area RB1	July 16, 2009
CAP068469	NCAQ-NFPA-805 Project MSO vulnerabilities fire area RB3	July 16, 2009
CAP068470	NCAQ-NFPA-805 Project MSO vulnerabilities fire area RB4	July 16, 2009
CAP068471	NCAQ-NFPA-805 Project MSO vulnerabilities fire area TB1	July 16, 2009

DRAWINGS

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
BECH-E021	Schematic Meter & Relay Diagram 4.16 KV Bus 1A1 & Aux Transformer	29
BECH-E023	Schematic Meter & Relay Diagram 4.16 KV Essential SWGR 1A3 & 1A4	28
BECH-E104<003G>	4160 & 480 System Control and Protection	0
BECH-E111<008A>	Service Water Systems	4
BECH-E111<008B>	Service Water Systems	4
BECH-E121<042A>	Reactor Core Cooling Systems	5
BECH-E121<042B>	Reactor Core Cooling Systems	3
BECH-E121<042D>	Reactor Core Cooling Systems	4
BECH-E121<042E>	Reactor Core Cooling Systems	3
BECH-E121<045>	Reactor Core Cooling Systems	8
BECH-E121<046>	Reactor Core Cooling Systems	5
BECH-E121<055A>	Reactor Core Cooling Systems	2
BECH-E121<056A>	Reactor Core Cooling Systems	13
APED-E11-007<07>	Residual Heat Removal System	38
APED-E11-007<08>	Residual Heat Removal System	26
APED-C71-004<08>	Reactor Protection System	24

DRAWINGS

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
APED-C71-004<09>	Reactor Protection System	23
APED-C71-004<11>	Reactor Protection System	10
E134-009	Construction & Arrangement Remote Shutdown Panel A Panel 1C389	1
E134-010	Construction & Arrangement Remote Shutdown Panel B Panel 1C390	3
E134-011	Construction & Arrangement Remote Shutdown Panel C Panel 1C391	2
E134-012	Construction & Arrangement Remote Shutdown Panel D Panel 1C392	2
E134-018	Front View - Remote Shutdown Panel 1C388	4
E134-026	Nameplate List Remote Shutdown Panel 1C388	3
FHA-SLD-A000<01>	Safe Shutdown Analysis System Logic Diagram A0 Reactivity Control (SCRAM)	1
FHA-SLD-A000<02>	Safe Shutdown Analysis System Logic Diagram A0 Reactivity Control (SCRAM)	1
FHA-SLD-ASC<01>	Safe Shutdown Analysis System Logic Diagram Alternate Shutdown Capability	1
FHA-SLD-ASC<02>	Safe Shutdown Analysis System Logic Diagram Alternate Shutdown Capability	1
FHA-SLD-H002	Safe Shutdown Analysis System Logic Diagram H2 Div. 2 125/250V DC Power	1

MISCELLANEOUS

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
SA30004	Quick Hit Assessment	August 07, 2009
PDA-08-034	Fire Protection Assessment	November 18, 2008
SA041817	Focused Self-Assessment Fire Protection Program Report and Related CAPs	March 2006
PI-001	Appendix R Safe Shutdown Equipment by Fire Area	August 24, 2009
PI-002	Safe Shutdown Cable List Verification Reports	September 2, 2009
-----	Cable/Raceway/Fire Zone Relationships Reports for Selected Fire Areas	September 2, 2009
-----	Safe Shutdown Cable List for Selected Fire Zones	August 31, 2009
LDR-82-180	Duane Arnold Response to NRC Letter Dated April 20, 1982 Concerning Fire Protection and Alternate Shutdown	June 22, 1982

MISCELLANEOUS

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
CE006882	NCAQ-Current Operator Manual Actions not Consistent with Conversion to NFPA 805	December 15, 2008
Compensatory Measures	Operator Manual Actions and Multiple Spurious Operations Matrix	September 2, 2009
FHA-400	Fire Protection Program – Fire Hazards Analysis	10
FHA-500	Fire Protection Program – Post Fire Safe Shutdown Analysis	7
Workaround Compliance Assessment Report	Appendix R III.G/III.L Compliance Assessment Report – Fire Areas 03B, 03D, 08H and 16B	September 1, 2009
PI-002	Safe shutdown Cable List for Function Code D2 (and Associated Elect. Drawings)	September 16, 2009

PROCEDURES

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
ACP 103.10	Control of Time Critical Tasks	2
ACP 1201.2	Conduct of Systems / Plant Engineering	21
ACP 1203.53	Fire Protection	13
ACP 1406.10	Communication Systems	19
ACP 1412.4	Impairments to Fire Protection Systems	55
AOP 913	Abnormal Operating Procedure Fire	56
AOP 915	Abnormal Operating Procedure Shutdown Outside Control Room	39
DAEC Fire Plan Volume 1	Program	56
DAEC Fire Plan Volume 2	Fire Brigade Organization	45
ER-AA-201-2002	System Performance Monitoring	1
GMP-INST-04	General Maintenance Procedure Temperature Switch Field Calibration, Various Models	2
IPOI 4	Integrated Plant Operating Instruction Shutdown	98
IPOI 5	Integrated Plant Operating Instruction Reactor Scram	51
None	Instrument Trending Guideline DAEC	4
OP-024	Shutdown, EOP, Station Blackout Procedure and Equipment Inventory and Sound Powered Phone Test	49

PROCEDURES

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
PI-AA-01	Corrective Action Program and Condition Reporting	1
STP 3.0.0-01	Surveillance Test Procedure Instrument Checks	98
STP – NS13B015	Diesel Driven Fire Pump Periodic Pump Run	16
STP – NS13E002	Fire Hose Inspection, Hose Hydrostatic Test and Valve Functional Test	26
STP – NS13E004	Hose Trailer, Truck and Fire Brigade Inspection	48
STP – NS13F001	Fire Barrier Penetration Seal Inspection	13
STP – NS13F003	Fire Damper Internal Inspection and Functional Testing	20
STP – NS13F003RF	Group RF Fire Damper Internal Inspection and Functional Testing	1
CAP 1412.2	Control Of Combustibles	36

REFERENCES

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
AOP 915-1	Time Validation – Timing Record Sheet for JPM 295016-01, Transfer to 1C388	September 29, 2006
AOP 915-2	Time Validation – Timing Record Sheet for JPM 295016-02, Transfer to Satellite Remote Shutdown Panels	September 29, 2006
AOP 915-3	Time Validation – Timing Record Sheet for Time Validation of Notification Step	March 28, 2007
IN 8437	Information Notice - "Use of Lifted Leads and Jumpers During Maintenance and Testing"	May 10, 1984
LP# 2007C-05L	Lesson Plan for Licensed Operator Requal #50008	0
LP# 2009-03	Lesson Plan for Fire Brigade Requal #20005	1
Memorandum From Ellis To Anderson	Cable Measurement	September 17, 2009
None	DAEC Fire Protection Training Program Description	17
SD-324	Duane Arnold Energy Center System Description Standby Diesel Generator System	11
SEG 2007C-03S	AOP 913, Respond to a Fire	0
SEG 2007C-04S	AOP 915, Remote Shutdown	0

REFERENCES

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
SR 3.3.3.2.1	DAEC TS Surveillance Transfer Switch & Circuit Testing Requirements	Amendment 223
Table 1.1-1	DAEC TS Modes	Amendment 223
UFSAR/DAEC-1	Table 9.4-1 Area Temperature Requirements	13
AFP - 07	Reactor Bldg Laydown Area, Corridor and Waste Tank Area and Spent Resin Tank Room (EL 786'0")	28
AFP - 08	Standby Gas Treatment System and MG Set Rooms (EL 786')	24
AFP - 20	Aux Boiler Room, Emergency Diesel Generator Rooms and Generator Day Tank Room (EL 757'6")	29
AFP - 28	Pump House ESW/RHRSW Pump Rooms and Main Pump Room	29

VENDOR DOCUMENTS

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
C470DEM C.3	Standby Emergency Diesel Generating Unit – Colt Industries	36
C470DEM Vol. 2	Allen-Bradley Condition Sensing Selection Guide	August 1994

WORK ORDERS

<u>Number</u>	<u>Description or Title</u>	<u>Date or Revision</u>
1124944	1G-31 Electric Lube Oil HTR High Temp Trip	September 22, 2003
1132324	1G-31 Electric Lube Oil HTR High Temp Trip	November 15, 2005
1139280	1G-31 Electric Lube Oil HTR High Temp Trip	October 2, 2007
A39649	Battery Posts Show Signs of Corrosion, Needs to be cleaned	July 25, 1997
A43446	Batteries for FIV-1 Should be Replaced	March 13, 2000
A43447	Batteries for FIV-1 Should be Replaced	March 13, 2000

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AOP	Abnormal Operating Procedure
CAP	Corrective Action Program
CFR	Code of Federal Regulations
dc	Direct Current
FPIR	Fire Protection Impairment Request
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPEEE	Individual Plant Examination of External Events
IR	Inspection Report
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records
PI&R	Problem Identification and Resolution
SCAQ	Significant Conditions Adverse to Quality
SDP	Significance Determination Process
SRA	Senior Reactor Analyst
SSD	Safe Shutdown
UFSAR	Updated Final Safety Analysis Report

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Sincerely,

/RA/
Robert C. Daley, Chief
Engineering Branch 3
Division of Reactor Safety

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