

December 11, 2006

Mr. Gary Van Middlesworth
Vice-President
Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324-9785

SUBJECT: DUANE ARNOLD ENERGY CENTER
NRC TRIENNIAL FIRE PROTECTION BASELINE INSPECTION
INSPECTION REPORT 05000331/2006014(DRS)

Dear Mr. Van Middlesworth:

On November 15, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Duane Arnold Energy Center facility. The enclosed inspection report documents the inspection results, which were discussed at the end of the on-site activities on September 29, 2006, with Mr. J. Bjorseth and other members of your staff. A re-exit meeting was held by telephone at the conclusion of the inspection on November 15, 2006, with S. Catron.

The inspection examined activities conducted under your license as they relate to safety and to 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.

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 to 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, no findings of significance were identified.

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

Sincerely,

/RA/

Julio F. Lara, Chief
Engineering Branch 3
Division of Reactor Safety

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

Enclosure: Inspection Report 05000331/2006014
w/Attachment: Supplemental Information

cc w/encl: J. Stall, Senior Vice President, Nuclear and Chief
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R. Kundalkar, Vice President, Nuclear Engineering
J. Bjorseth, Site Director
D. Curtland, Plant Manager
S. Catron, Manager, Regulatory Affairs
Chairman, Linn County Board of Supervisors
D. McGhee, State Liaison Officer

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U.S. NUCLEAR REGULATORY COMMISSION
REGION III

Docket No.: 50-331
License No.: DRP-49

Report No: 05000331/2006014(DRS)

Licensee: Florida Power and Light Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, Iowa 52324-9785

Dates: September 11 through November 15, 2006

Inspectors: R. Langstaff, Senior Reactor Inspector, Lead
C. Moore, Operations Engineer
D. Schrum, Reactor Inspector
D. Szwarc, Reactor Inspector

Approved by: Julio F. Lara, Chief
Engineering Branch 3
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000331/2006014(DRS); 09/11/06 - 11/15/06; 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. 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 3, dated July 2000.

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

No findings of significance were identified.

Cornerstone: Mitigating Systems

No findings of significance were identified.

B. Licensee-Identified Violations

No findings of significance were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection (71111.05TTP)

Florida Power and Light Energy Duane Arnold, LLC, the licensee, in letters to the U. S. Nuclear Regulatory Commission (NRC) dated November 30, 2005, and July 11, 2006 (ADAMS Accession Numbers ML053460342 and ML062060317, respectively) , committed 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 10 CFR 50.48(c) for the Duane Arnold Energy Center (DAEC). The NFPA 805 code establishes a comprehensive set of requirements for fire protection programs at nuclear power plants. The code incorporated both deterministic and risk-informed, performance-based concepts. The deterministic aspects of the code 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 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 IP 71111.05TTP, "Fire Protection - NFPA 805 Transition Period (Triennial)," dated May 9, 2006. Associated with the transition to NFPA 805, when a circuit-related 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 this inspection was to review the Duane Arnold Energy Center (DAEC) Fire Protection Program for selected risk-significant fire areas. 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 team used the DAEC Individual Plant Examination for External Events to choose several risk-significant areas for detailed inspection and review. The fire zones chosen for review during this inspection constituted six-inspection samples which were:

<u>Fire Area/Zones</u>	<u>Description</u>
07A	Turbine Building - Reactor Feed Pump Area
07B	Turbine Building - 1A2, Lower Switchgear Room

<u>Fire Area/Zones</u>	<u>Description</u>
07C	Turbine Building - Turbine Lube Oil Tank Area
07E	Turbine Building - Condensate Pump Area
08F	Turbine Building - 1G-21, "B" EDG Room (West)
08G	Turbine Building - "B" EDG Day Tank Room

For each of these fire zones, the inspection focused on the fire protection features, the systems and equipment necessary to achieve and maintain safe shutdown conditions, determination of license commitments, and changes to the Fire Protection Program.

.1 Shutdown from Outside Main Control Room

Title 10 CFR Part 50, Appendix R, Section III.G.1, required that structures, systems, and components that were necessary to achieve and maintain post-fire safe shutdown from outside the main control room be protected by fire protection features, such that, one train of systems necessary to achieve and maintain hot shutdown conditions was free of fire damage; and systems necessary to achieve and maintain cold shutdown could be repaired within 72-hours.

a. Inspection Scope

The team 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 team 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 team reviewed the Safe Shutdown Analysis, licensee operating procedures, piping and instrumentation drawings, electrical drawings, the DAEC Updated Final Safety Analysis Report (UFSAR) 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. This review included verification that shutdown from outside the control room could be performed both with and without the availability of offsite power.

The team also reviewed the operators' ability to perform the necessary manual actions for achieving safe shutdown by reviewing procedures, the accessibility of safe shutdown equipment, and the available time for performing the actions.

The team reviewed the DAEC UFSAR 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

Title 10 CFR Part 50, Appendix R, Section III.G.1, required the licensee to provide fire protection features that were capable of limiting fire damage to systems, structures, and components important to safe shutdown. The systems, structures, and components that were necessary to achieve and maintain post-fire safe shutdown were required to be protected by fire protection features that were capable of limiting fire damage to the systems, structures, and components so that:

- one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) was free of fire damage; and
- systems necessary to achieve and maintain cold shutdown from either the control room or emergency control station(s) could be repaired within 72-hours.

Specific design features for ensuring this capability were specified by 10 CFR Part 50, Appendix R, Section III.G.2.

a. Inspection Scope

The team reviewed the fire hazards analysis, safe shutdown analysis and supporting drawings and documentation to verify that safe shutdown capabilities were properly protected. Under the NFPA 805 transition period inspection period, the team were to validate 1 to 3 nonconformances identified in the licensee's transitional assessment of their fire areas. At the time of this inspection, no fire areas had been assessed by the licensee.

The team 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 team performed plant walk-downs to verify that protective features were being properly maintained and administrative controls were being implemented.

The team 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

Branch Technical Position APCS 9.5-1, Section IV.B.1, "General Guidelines for Plant Protection Building Design," Section IV.B.3, "Cable Construction, Cable Trays and Penetrations," and Section IV.D.2, "Control Room," identified the requirements for the licensee's FP passive features.

a. Inspection Scope

For the selected fire areas, the team evaluated the adequacy of fire area barriers, penetration seals, fire doors, electrical raceway fire barriers, and fire rated electrical cables. The team observed the material condition and configuration of the installed barriers, seals, doors, and cables. The team compared the as-installed configurations to the approved construction details and supporting fire tests. In addition, the team reviewed license documentation, such as NRC Safety Evaluation Reports, and deviations from NRC regulations and the NFPA codes to verify that fire protection features met license commitments.

The team 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 team 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

b.1 Surveillances and Compensatory Measures For Appendix 'A' Fire Barriers

Introduction: The team identified an unresolved item relating to surveillances of and compensatory measures for fire barriers. Specifically, the licensee was not conducting surveillances of nor requiring compensatory measures for impairment of fire barriers for the diesel generator rooms. The fire barriers for the diesel generator rooms were explicitly credited in the DAEC fire protection Safety Evaluation Report.

Description: The team identified that many fire protection barriers, including fire doors, were not included in the licensee's fire protection surveillance program and operational requirements (i.e., compensatory measure requirements) for fire protection. Upon further review and discussion with licensee personnel, the team determined that the licensee had removed a number fire barriers from the fire protection surveillance program during the 1990's.

On June 30, 1994, the licensee initiated UFSAR Change 94-20 to change the fire protection description in the UFSAR. The UFSAR, at that time, contained the fire protection equipment operability requirements (which had previously been relocated from Technical Specifications). The UFSAR change modified the equipment operability requirements for fire rated assemblies from:

- “1. All fire barrier penetration seals protecting safety-related areas shall be intact.
2. All fire doors protecting safety related areas shall be functional.
3. Fire protection raceway wrap and structural steel fireproofing shall be intact.”

to:

- “1. All fire barrier penetration seals protecting areas containing safety related equipment required for safe plant shutdown shall be intact.
2. All fire doors protecting areas containing safety related equipment required for safe plant shutdown shall be functional.
3. Fire protection raceway wrap and structural protecting safety related systems required for safe shutdown steel fireproofing shall be intact.”

This change effectively excluded fire barriers which did not separate redundant divisions of safe shutdown equipment from fire protection operability requirements. Although the change had the effect of significantly reducing the scope of which fire barriers had operability requirements with associated compensatory and surveillance requirements, the licensee had, at the time, considered the change “editorial” and no 10 CFR 50.59 safety evaluation, screening, or commensurate evaluation was performed for the change. An internal memorandum, Memorandum NG-94-0841, “Clarification of Penetration Seal Inspection Basis,” dated February 25, 1994, appeared to have been used as a basis for the change. During this inspection, the licensee initiated CAP044512, “UFSAR Change Request 94-20 does not contain adequate 50.59 basis,” concerning this issue.

The changes made by UFSAR Change 94-20 continued to be reflected in fire protection operability requirements which were in place during this inspection. Volume 1 of the Fire Plan, revision 53, specified Limiting Condition for Operation 12.1.F.1 for “All fire barriers required for Appendix R safe shutdown shall be operable,” which limited applicability to those fire barriers which separated redundant divisions of equipment for safe shutdown purposes. For example, the implementing procedure, procedure ACP 1412.4, “Impairments to Fire Protection Systems,” revision 43 (in effect at the time of the inspection) specified that no fire watch was required if the fire doors to the diesel generator rooms were impaired.

By letter NG-94-2243, dated July 19, 1994, the licensee informed the NRC that they intended to retract their commitment to Branch Technical Position APCSB 9.5-1, Appendix ‘A,’ dated August 23, 1976. The letter stated, in part:

“We determined that several commitments for fire barriers and emergency lighting made in response to Appendix A are obviated by those elements of the fire protection program related to Appendix R. We therefore are retracting our previous commitments to Appendix A for the following elements:

- Three-hour rated fire barriers surrounding the Control Room, Cable Spreading Room, Switchgear Rooms, Battery Rooms, Main Turbine Oil Storage Area, Emergency Diesel Generator Rooms, Diesel Fuel Day Tank Rooms, Safety-Related Pump Areas, Heater Boiler Rooms, Stairwells, Radwaste Building and building exterior walls.
- Emergency Lighting for safety-related areas.

Instead of those Appendix A commitments, the determination of areas requiring three-hour rated fire barriers and emergency lighting is based on the safe shutdown analysis performed to comply with Appendix R.”

The letter did not request a review by the NRC of the licensee’s intent to retract their previous commitment. The team was not able to identify any records indicating that the NRC had performed a review of and responded to the July 19, 1994 letter.

The licensee used Safety Evaluation 95-03, “Safety Evaluation to Support [Design Document Change] DDC-3151, Revision of FHA-800 to Supersede Appendix ‘A’ Requirements with Appendix ‘R’ Requirements,” dated December 18, 1996, as a basis for revising Section FHA-800 of the Fire Hazards Analysis with respect to the requirement of Branch Technical Position 9.5-1, Appendix ‘A’. The DAEC was committed to meet many of the requirements Branch Technical Position 9.5-1, Appendix ‘A,’ dated August 23, 1976. The evaluation stated that the Branch Technical Position 9.5-1, Appendix ‘A,’ commitments were superseded by 10 CFR Part 50, Appendix R. The evaluation specifically identified, in part, the following commitments for fire barriers as having been superseded:

- 3-hour barriers surrounding the control room
- 3-hour barriers surrounding the cable spreading room
- 3-hour barriers surrounding the switchgear rooms
- 3-hour barriers surrounding the station battery rooms
- 3-hour barriers surrounding the emergency diesel generator areas
- 3-hour barriers surrounding safety related pump areas

The team disagreed with the evaluation conclusion that many of the Branch Technical Position 9.5-1, Appendix ‘A’ commitments had been superseded. The team noted that many of the Branch Technical Position 9.5-1, Appendix “A” commitments provided general protection against fires consistent with designing and locating structures, systems, and components important to safety to minimize the probability and effect of fires and explosions. As such, the team determined that the Branch Technical Position

9.5-1, Appendix 'A' commitments were for meeting 10 CFR Part 50, Appendix A, General Design Criteria 3, rather than for specifically meeting 10 CFR Part 50, Appendix R. In addition, the team noted Section 9.5.1, "Fire Protection Program," revision 4, of NUREG-0800, "Standard Review Plan," which the NRC used as a basis for review of post-1979 plants (for which 10 CFR Part 50, Appendix R, does not apply) contained many regulatory positions comparable to those of outlined in Appendix A of Branch Technical Position 9.5-1 for which the licensee was committed to for DAEC. Consequently, the team concluded that the 10 CFR Part 50, Appendix R, requirements supplemented, rather than superseded, many of the Branch Technical Position 9.5-1, Appendix 'A' commitments.

For example, with respect to the fire barriers for the diesel generator rooms, Position F.9 of Appendix A to Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976," stated "Diesel generators should be separated from each other and other areas of the plant by fire barriers having a minimum fire resistance rating of three hours." By letter dated January 18, 1977, the licensee committed to the NRC that DAEC complied with this NRC position and specifically noted that the diesel generators were separated from each other and other plant areas by three hour fire barriers and Class A fire doors. The team noted that the NRC adopted a similar position for review of post-1979 plants in NUREG-0800. In addition, Section 5.15.4 of the June 1, 1978 Safety Evaluation Report referenced by the facility fire protection license condition noted that both the diesel generator and diesel day tank rooms were enclosed in 3-hour rated construction and that the fire doors into these areas were Class A 3-hour rated doors.

Revision 1 of FHA-800, "Branch Technical Position APCSB 9.5-1 Appendix A Commitment Cross-Reference Index," which existed prior to the changes of DDC 3151 reflected the above commitment by stating that the diesel generator rooms were separated from each other and other plant areas by 3-hour rated fire barriers with Class A fire doors. Revision 2 of FHA-800, which implemented DDC 3151, limited the commitment by stating "Barrier commitments in this document superseded by Appendix R requirements. Reference Safety Evaluation 95-03."

With respect to surveillance and inspection of fire barriers, Section 4.9 of the June 1, 1978 Safety Evaluation Report stated that appropriate controls will be provided to assure the effectiveness of fire doors protecting safety-related areas. The Safety Evaluation Report specifically stated that fire doors would be inspected semiannually to verify that self-closing mechanisms and latches were in good working order. In addition, Safety Evaluation Report Supplement dated February 10, 1981 stated that based on licensee's commitment to meet the "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance" guidelines, the licensee's administrative controls were found to be acceptable. The Quality Assurance section of the "Nuclear Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance" guidelines transmitted to the licensee by letter dated August 8, 1977, the quality assurance program should assure that the requirements for design, procurement, installation, testing, and administrative controls for the fire protection program for safety related areas approved by NRC are satisfied. Paragraph 4.0.h of the "Nuclear Plant Fire Protection Functional Responsibilities, Administrative

Controls, and Quality Assurance” guidelines Quality Assurance section specified periodic inspection of materials subject to degradation such as fire stops, seals, and fire retardant coatings to assure these items have not deteriorated or been damaged.

The team noted that revision 6, effective September 16, 1996, of surveillance procedure NS13F002, “Fire Door and Frame Inspection,” included doors numbered 130 and 131, which were the doors to the diesel generator rooms in the turbine building. Revision 17 of surveillance procedure NS13F002, which was in effect at the time of the inspection, did not include doors 130 and 131. The team noted that there had been a significant reduction in the number of doors surveilled. Revision 6 of surveillance procedure NS13F002 required surveillance of over 140 doors. By comparison, revision 7 of surveillance procedure NS13F002, effective September 24, 1997, which implemented DDC 3151 only required surveillance of 52 doors and did not include surveillance of doors numbered 130 and 131. The team further noted that revision 17 of surveillance procedure NS13F002 in effect during this inspection required surveillance of less than 40 doors. Doors 130 and 131 had been last inspected in August 1996. With respect to fire barriers, the team noted that revision 10 of surveillance procedure NS13F001, “Fire Barrier Penetration Seal Inspection,” the revision in effect during this inspection, did not include the walls for the diesel generator rooms. The fire seals in the walls for the diesel generator rooms were last inspected in September 1992.

The team noted that the changes made by DDC 3151 with respect to which fire barriers were in the fire protection program were made without a thorough evaluation. Specifically, safety evaluation 95-03 did not address the licensing basis for individual features affected and did not show how an equivalent level of fire protection would be provided for individual features affected. For example, for the diesel generator room fire doors and fire barriers, safety evaluation 95-03 provided no discussion nor evaluation of how Position F.9 of Appendix A to Branch Technical Position APCS 9.5-1 would be satisfied nor how the diesel generators would continue to be protected against fire hazards from outside their respective diesel generator rooms.

By license amendment 190, dated November 23, 1992, the NRC added the standard fire protection program license condition endorsed by Generic Letter 86-10, “Implementation of Fire Protection Requirements,” to the DAEC license. The standard fire protection program license condition permitted the licensee to make changes to approved fire protection program without prior approval of the NRC only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. In discussions with the licensee, the licensee believed that the changes made to remove Appendix A barriers from the fire protection program during the 1990’s were acceptable under their licensee condition. The team noted that while the standard fire protection license condition permitted the licensee to make changes to their fire protection program, the license condition did not relieve the licensee of the requirement to meet 10 CFR 50.48, “Fire Protection.” 10 CFR 50.48(a) required each operating nuclear power plant to have a fire protection plan which satisfied General Design Criteria 3, “Fire Protection,” of 10 CFR Part 50, Appendix A. General Design Criteria 3 specified that structures, systems, and components important to safety be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. The NRC position with respect to changes

which could be made under the licensee condition was discussed in Generic Letter 86-10. Generic Letter 86-10 specifically stated that “The licensee may alter specific features of the approved program provided: (a) such changes do not otherwise involve a change in a license condition or technical specification...; and (b) such changes do not result in failure to complete the fire protection program as approved by the Commission.” In addition, Generic Letter 86-10 also specified that “...the licensee shall maintain, in auditable form, a current record of all such changes, including an analysis of the effects of the change on the fire protection program.” The team noted that the changes made by DDC-3151 may have been beyond the scope of those permitted by the license condition in that the changes could be considered a failure to complete the fire protection program as approved by the NRC. In addition, the team noted that the licensee had not provided an analysis of the effects of the changes on the fire protection program.

In October 2005, the licensee recognized that many fire barriers had been inappropriately removed from the fire protection program. The licensee initiated CAP038444, “Maintenance of Fire Protection SER Credited Barriers,” dated October 19, 2005 to effect corrective actions. In CAP038444, the licensee specifically referred to Letter NG-94-2443 and noted that the affected walls were specifically required by the approved fire protection program and were required to be maintained by the station operating license condition for fire protection. CAP038444 further noted that the change could be considered to have adversely affected post fire safe shutdown capability as the failure to maintain the penetration seals and other material condition issues could have allowed the fire to propagate beyond that evaluated in the original Safety Evaluation Report. However, the corrective actions outlined in the corrective action for CAP038444 (i.e., CA041423, “Revise Fire Plan to Require Maintenance of Appendix A Barriers,” dated November 16, 2005, were limited. Specifically, CA041423 specified revision of the fire plan administrative controls to add requirements to maintain Appendix A barriers. However, CA041423 specifically stated that no surveillance or compensatory measures were required. The team noted that no justification was provided as to why the licensee believed no surveillance or compensatory measures were required.

The team considered the issue of not including Appendix A barriers in the fire protection surveillance program and operability requirements to be an unresolved item pending further NRC review of the applicability of the license condition to the changes which had been made. (Unresolved Item 05000331/2006014-01)

.4 Active Fire Protection

Branch Technical Position APCS 9.5-1, Section IV.C.1, “Fire Detection,” Section IV.C.3, “Water Sprinkler and Hose Standpipe Systems,” Section IV.C.5, “Carbon Dioxide Suppression Systems,” and Section IV.D.2, “Control Room,” identified the requirements for the licensee’s fire protection active features.

a. Inspection Scope

For the selected fire areas, the team evaluated the adequacy of fire suppression and detection systems. The team observed the material condition and configuration of the installed fire detection and suppression systems. The team reviewed design documents and supporting calculations. In addition, the team reviewed license basis documentation, such as NRC Safety Evaluation Reports, and deviations from NRC regulations and the 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

Title 10 CFR Part 50, Appendix A, Criterion 3, "Fire Protection," required that firefighting systems shall be designed to minimize the adverse effects of fires on systems, structures, and components important to safety and to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these systems, structures, and components.

a. Inspection Scope

For the selected fire areas, the team 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 team 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

Title 10 CFR Part 50, Appendix R, Section III.G.1, required that systems, structures, and components important to safe shutdown be provided with fire protection features capable of limiting fire damage to ensure that one train of systems necessary to achieve and maintain hot shutdown conditions was free of fire damage. Options for providing this level of fire protection were delineated in 10 CFR Part 50, Appendix R, Section III.G.2. Where the protection of systems whose function was required for hot shutdown did not satisfy 10 CFR Part 50, Appendix R, Section III.G.2, an alternative or dedicated shutdown capability independent of the area under consideration was required to be provided. Additionally, alternative or dedicated shutdown capability must be able to achieve and maintain hot standby conditions and achieve cold shutdown conditions within 72-hours and maintain cold shutdown conditions thereafter. During the post-fire safe shutdown, the reactor coolant process variables must remain within those

predicted for a loss of normal ac power, and the fission product boundary integrity must not be affected (i.e., no fuel clad damage, rupture of any primary coolant boundary, or rupture of the containment boundary).

a. Inspection Scope

No inspection was performed in this area because none of the fire areas selected for this inspection required alternative safe shutdown capability. Alternative safe shutdown capability was verified during the previous triennial fire protection inspection documented in NRC Inspection Report 05000331/2003002 (DRS) (ADAMS accession number ML031430217).

b. Findings

No findings of significance were identified.

.7 Circuit Analyses

a. Inspection Scope

In accordance with Inspection Procedure 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

Branch Technical Position APCS 9.5-1, required that emergency communication equipment be provided. For a fire in an alternative shutdown fire area, control room evacuation may be required and a shutdown is performed from outside the control room. Radio communications are relied upon to coordinate the shutdown of both units and for fire fighting.

a. Inspection Scope

The team 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.

b. Findings

No findings of significance were identified.

.9 Emergency Lighting

Title 10 CFR Part 50, Appendix R, Section III.J., required that emergency lighting units with at least an eight-hour battery power supply be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

a. Inspection Scope

The team performed a plant walkdown of areas in which a sample of the actions would be performed as described in procedure AOP 913, "Fire." As part of the walkdowns, the team focused on the existence of sufficient emergency lighting for access and egress to areas and for performing necessary equipment operations.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

Title 10 CFR Part 50, Appendix R, Section III.G.1.b, required that equipment and systems comprising the means to achieve and maintain cold shutdown conditions should not be damaged by fire; or the fire damage to such equipment and systems should be limited so that the systems can be made operable and cold shutdown achieved within 72-hours. Materials for such repairs shall be readily available onsite and procedures shall be in effect to implement such repairs.

a. Inspection Scope

The team 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 on-site. The team also evaluated whether cold shutdown could be achieved within the required time using the licensee's procedures and repair methods.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team 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 team also conducted a review on the adequacy of short term compensatory measures to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

An unresolved item pertaining to compensatory measures was identified and is discussed in Section 1R05.3.b.1.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed the 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 team reviewed selected samples of condition reports, work orders, design packages, and fire protection system non-conformance documents.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting

On September 29, 2006, at the conclusion of the on-site inspection activities, the team presented preliminary inspection results to Mr. J. Bjorseth and other members of licensee management. On November 15, 2006, at the conclusion of the inspection, the lead inspector presented the inspection results to Mr. S. Catron. The team asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

J. Bjorseth, Site Director
D. Curtland, Plant Manager
D. Blair, Assistant Manager, Operations
S. Catron, Manager, Licensing
G. Ellis, Program Owner, Fire Protection
K. Kleinheinz, Manager, Programs Engineering
J. Kuehl, Supervisor, Programs Engineering
J. Lang, Staff Engineer, Corporate Engineering
G. Rushworth, Manager, Operations

NRC

R. Orlikowski, Senior Resident Inspector
R. Baker, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Open

05000331/2006014-01 URI Surveillances and Compensatory Measures for Appendix
'A' Fire Barriers

Closed and 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 team reviewed the documents in their entirety, but rather, that selected sections of 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.

Fire Protection Program Documents

Fire Plan - Volume 1; Program; Revision 53

Fire Plan - Volume 2; Fire Brigade Organization; Revision 38

FHA-200; Fire Protection Program Licensing Basis; Revision 15

FHA-300; Fire Protection System Requirements; Revision 14

FHA-500; Post Fire Safe Shutdown Analysis; Revision 5

FHA-600; Fire Hazards Analysis; Revision 7

FHA-800; Branch Technical Position APCS 9.5-1 Appendix A Commitment Cross-Reference Index; Revision 1

FHA-800; Branch Technical Position APCS 9.5-1 Appendix A Commitment Cross-Reference Index; Revision 2

Corrective Action Documents

CA041423; Revise the Fire Plan to Require Maintenance of Appendix A Barriers; dated November 11, 2005.

CA041819; Ability to complete AOP301.1 (SBO) Attachment 1 in 30 minutes not verified; dated January 5, 2006

CA041819; Ability to complete AOP301.1 (SBO) Attachment 1 in 30 minutes not verified; dated January 5, 2006

CA043042; Create a Timed Operator Action Program; dated May 10, 2006

CA043046; Failure to Meet Ventilation Time Requirements of AOP301.0; dated May 10, 2006

CA043052; Failure to Meet Ventilation Time Requirements of AOP301.1; dated May 10, 2006

CA043054; Validate AOP's Containing Time Critical Operator Actions; dated May 10, 2006

CA044089; Validate UFSAR Time Critical Actions; dated September 26, 2006

CAP037408; Design/Licensing basis concerns with Sprinkler 1 (turbine lube oil tank area); dated August 5, 2005

CAP038444; Maintenance of Fire Protection SER Credited Barriers; dated October 19, 2005.

CAP039362; Time Critical Operator Actions Credited in Licensing Basis; dated December 15, 2005

CAP041379; Failure to Meet Ventilation Time Requirements of AOP 301.0; dated April 5, 2006

Corrective Action Documents Initiated as a Result of Inspection

CA044089; Validate UFSAR Time Critical Actions; dated September 26, 2006

CA044116; Failure to Meet Ventilation Time Requirements of AOP301.0; dated September 28, 2006

CAP044170; Fire Extinguisher over pressurized; dated September 12, 2006

CAP044191; Documentation discrepancy in FHA-800; dated September 13, 2006

CAP044195; NRC Letter to DAEC RE: Offsite Fire Department Training; dated September 13, 2006

CAP044201; Inaccurate Description in FHA-400 of Turbine Lube Oil Piping in "B" EDG Room; dated September 13, 2006

CAP044204; Surveillance of 1VFD037 and 1VFD311 not completed in 2003; dated September 13, 2006

CAP044225; PWR 14334 Fire Plan Revision 39 Inadequately Evaluated; dated September 14, 2006

CAP044226; Fire Hose Testing; dated September 14, 2006

CAP044244; EDG Room Sprinkler Head Setpoint Selection not Well Documented; dated September 15, 2006

CAP044249; Sprinkler System #16 Calculation Needs Revision; dated September 15, 2006

CAP044300; Lube oil potential not identified in combustible loading; September 18, 2006

CAP044470; East EDG Day Tank Room Thermal Detector Sprinkler Temperature Rating Discrepancy; dated September 26; 2006

CAP044473; UFSAR Section 15.3.3.1 Appendix R Safe Shutdown-Time Critical Operator Action; dated September 26, 2006

CAP044475; Diesel Maximum Room Temperature Calculation Requires Revision; dated September 26, 2006

CAP044512; UFSAR Change Request 94-20 does not contain adequate 50.59 basis; dated September 28, 2006

Correspondence

NG-94-0841; Clarification of Penetratino Seal Inspection Basis; dated February 25, 1994

NG-94-2443; Revision to DAEC Commitments on Fire Protection; dated July 19, 1994

Drawings

M107-001<1>; Fire & Smoke Detection System Sh.1; Revision 11

Engineering Evaluations

FPE-B06-006: Evaluation of Fire Barrier Between Fire Zones 08F and 08H; Revision 1

FPE-S02-001; Fire Detection Code Compliance Evaluation for Fire Plan Required and Fire PRA Higher Risk Areas; Revision 3

SE 95-03; Safety Evaluation to Support DDC-3151, Revision of FHA-800 to Supersede Appendix 'A' Requirements with Appendix 'R' Requirements; dated December 18, 1996

VC-2-15: Ventilation of the Stand By Diesel Generators; dated November 26, 1972

Licensee Assessments

PDA-06-012; Fire Protection Assessment; dated August 2, 2006

SA041814; Perform FSA of the Fire Protection Program; dated January 5, 2006

Modifications

ECP-1787; Abandon In Place Fire Damper 1V-FD-034; Revision 0

Procedures

ACP 103.10; Control of Time Critical Tasks; Revision 0

ACP 1203.70; Time Critical Operator Responses; Revision 0

ACP 1412.4; Impairments to Fire Protection Systems; Revision 43

AOP 913; Fire; Revision 47

AOP 915; Shutdown Outside Control Room; Revision 31

FPDI 21; NEIL Fire Barrier Inspection; Revision 0

STP NS13F001; Fire Barrier Penetration Seal Inspection, Revision 10

STP NS13F002; Fire Door and Frame Inspection; Revision 6

STP NS13F002; Fire Door and Frame Inspection; Revision 7

STP NS13F002; Fire Door and Frame Inspection; Revision 17

Updated Final Safety Analysis Report Change Requests

94-20; dated August 12, 1994

LIST OF ACRONYMS USED

ADAMS	Agency-Wide Document Access and Management System
DAEC	Duane Arnold Energy Center
DDC	Design Document Change
DPR	Demonstration Power Reactor
CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
LLC	Limited Liability Company
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records
UFSAR	Updated Final Safety Analysis Report