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

January 6, 2011

Mr. Michael J. Pacilio
Site Vice-President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
4300 Winfield Road
Warrenville IL 60555

SUBJECT: BYRON STATION, UNITS 1 AND 2
TRIENNIAL FIRE PROTECTION INSPECTION REPORT
05000454/2010006; 05000455/2010006

Dear Mr. Pacilio:

On December 3, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed a triennial fire protection inspection at your Byron Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on November 5, 2010, with Mr. B. Adams and other members of your staff. The final results of the inspections were also discussed on December 3, 2010, with Mr. D. Enright, and other members of your staff.

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

Based on the results of this inspection, two NRC-identified findings of very low safety significance were identified. The findings involved a violation of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as a Non-Cited Violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy. Additionally, a licensee-identified violation is listed in Section 4OA7 of this report.

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

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.: 50-454; 50-455: 72-068
License No.: NPF-37; NPF-66

Enclosures:
1. Inspection Report 05000454/2010006(DRS); 05000455/2010006(DRS) w/Attachment: Supplemental Information
2. Phase III Significance Determination Evaluation for Failure to Provide Adequate Guidance in Safe-Shutdown Procedures

cc w/encl: Distribution via ListServ

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-454; 50-455; 72-068
License No:	NPF-37; NPF-66
Report No:	05000454/2010-006(DRS); 05000455/2010-006(DRS)
Licensee:	Exelon Generation Company, LLC
Facility:	Byron Station, Units 1 and 2
Location:	Byron, IL
Dates:	October 4, 2010 through December 03, 2010
Inspectors:	R. Langstaff, Senior Reactor Inspector, Lead A. Dahbur, Senior Reactor Inspector R. Winter, Reactor Inspector L. Kozak, Senior Reactor Analyst
Observers:	G. Gulla, Enforcement Specialist, OE N. Melly, Fire Protection Engineer, RES
Approved by:	R. Daley, Chief Engineering Branch 3 Division of Reactor Safety

Enclosure 1

SUMMARY OF FINDINGS

IR 05000454/2010006(DRS); 05000455/2010006(DRS); 10/04/2010 – 12/03/2010; Byron Station, Units 1 and 2; Routine Triennial Fire Protection Baseline Inspection.

This report covers an announced triennial fire protection baseline inspection. The inspection was conducted by Region III inspectors. Two Green findings were identified by the inspectors. The findings were considered Non-Cited Violations (NCVs) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, or 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. A finding of very low safety-significance and associated NCV of Technical Specification 5.4.1.c for Units 1 and 2 was identified by the inspectors for the licensee's failure to provide adequate guidance in safe shutdown procedures. Specifically, the licensee failed to provide adequate guidance to reenergize the 4 kiloVolt (kV) buses, which were required to power safe shutdown components to achieve hot shutdown in the event of a fire in Fire Zone 11.3-0. The licensee subsequently entered the issue into their corrective action program and initiated actions, which included recommendations to revise safe shutdown procedures to provide guidance for recovery actions to reenergize the required affected busses.

  The inspectors determined that this finding was more than minor because the failure to provide adequate procedural guidance to reenergize the 4 kV buses could have potentially compromised the ability to safely shutdown the plant in the event of a fire in Fire Zone 11.3-0. This finding was of very low safety significance (Green) based on a Phase III significance determination analysis. The finding did not have a cross-cutting aspect because it was not reflective of current performance. (Section 1R05.1R05.6.b(1))

- Green. A finding of very low safety significance and associated NCV of the Byron Station facility operating licensee conditions for fire protection was identified by the inspectors for the licensee's failure to periodically test samples of molded case circuit breakers (MCCBs) at the 125 Volt direct current (Vdc) level. The licensee subsequently entered the issue into their corrective action program and verified that sufficient design margin existed such that breaker coordination would not be adversely affected.

  The inspectors determined that this finding was more than minor because the failure to test the MCCBs would result in a failure to detect excessive set-point drift which impacted breaker coordination. This finding was of very low safety significance (Green) because the licensee verified that sufficient design margin existed such that breaker coordination would not be adversely affected. In addition, no failures of 125 Vdc MCCBs to trip due to set-point drift had been identified. The finding did not have a cross-cutting aspect because it was not reflective of current performance. (Section 1R05.1R05.6.b(2))

B. Licensee-Identified Violation

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

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection (71111.05T)

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;
- 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; and
- taking reasonable actions to mitigate postulated events that could potentially cause loss of large areas of power reactor facilities due to explosions or fires.

The inspectors' evaluation focused on the design, operational status, and material condition of the reactor plant's fire protection program, post-fire safe-shutdown systems and B.5.b mitigating strategies. 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 shut down 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 problem identification and resolution 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 inspectors' review and assessment also focused on the licensee's B.5.b related license conditions and the requirements of 10 CFR 50.54(hh)(2). Inspector emphasis was to ensure that the licensee could maintain or restore core cooling, containment, and spent fuel pool cooling capabilities utilizing the B.5.b mitigating strategies following a loss of large areas of power reactor facilities due to explosions or fires. Documents reviewed are listed in the Attachment to this report.

The fire areas and fire zones and B.5.b mitigating strategies selected for review during this inspection are listed below and in Section 1R05.11. The fire areas and fire zones and B.5.b mitigating strategies selected constitute four inspection samples and one inspection sample, respectively, as defined in Inspection Procedure 71111.05T.

Fire Zone	**Description**
3.2A-2	Unit 2, Non-Segregated Bus Duct Area
5.5-2	Unit 2, Auxiliary Electrical Equipment Room
11.3-0	Auxiliary Building, General Area, Elevation 364'-0"
11.3-2	Unit 2, Auxiliary Building, Containment Pipe Penetration, Elevation 364'-0"

.1 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

(1) Manual Actions Not Explicitly Approved

Introduction: An unresolved item (URI) was identified by the inspectors concerning manual actions which had not been explicitly approved by the NRC.

Description: The inspectors identified that the licensee took credit for a number of manual actions to compensate for not having a train free of fire damage in non-alternative fire zones. Although some manual actions were described either in a safety evaluation report (SER) or licensing correspondence which was used as a basis for NRC

approval in an SER, the majority of manual actions were not explicitly approved by the NRC. As an example, for Fire Zone 11.3-0, the safe shutdown analysis took credit for the following manual actions (not a full listing) to achieve a hot standby condition because one train would not be assured of being free of fire damage:

- Step 1 of Procedure BOP FR-1T10, "11.3-0; 364' Auxiliary Building General Area; 1D-17, 1D-40, 1S-59, 2S-54," directed operators to establish a flow path to the operating charging pump from the refueling water storage tank (RWST) because a hot short could cause a spurious closure of the volume control tank (VCT) outlet valve, part of the normal flowpath. If an alternate flowpath from the RWST is not established, spurious closure of the VCT outlet valve could result in a loss of suction to the operating charging pump and subsequent damage to the pump.

- Step 3 of Procedure BOP FR-1T10 directed operators to open eight breakers to prevent a fault from tripping an upstream breaker for a credited electrical bus. (See Section 1R05.6.b(1) for a related discussion.)

- Step 8 of Procedure BOP FR-1T10 directed operators to locally start the 1A and 2B essential service water (ESW) pumps because control cables for the pumps could be damaged due to fire.

- Step 11 of Procedure BOP FR-1T10 directed operators to verify ESW flow to the 2A charging pump. If ESW flow could not be verified, the procedure directed operators to stop the 2A charging and 2A auxiliary feedwater pumps until ESW flow could be restored. Step 21 of Procedure BOP FR-1T10 directed operators to locally open the power supply breaker for Motor Control Center 231X1 to allow local manual operation of Valve 2SX033, "ESW Pump 2A Discharge Crosstie Isolation Valve." Step 22 of Procedure BOP FR-1T10 directed operators to locally open Valve 2SX033 using its handwheel. The crosstie valve was needed to be open because Unit 2 Train "A" components (such as the 2A charging pump and 2A auxiliary feedwater pump) relied upon essential service water for cooling. However, the Train "A" essential service water pump could not be credited because its power cable was in the zone. Consequently, the Train "B" essential service water pump was needed to provide cooling water for the credited Train "A" loads. Valve 2SX033 could spuriously close because control cables went through the zone.

Procedures for a number of other non-alternative fire zones included similar manual actions. The inspectors noted that the licensee had informed the NRC of a number of manual actions as part of the licensing process. For example, by letter dated October 15, 1984, the licensee had identified a number of manual actions to address spurious operation of valves in response to Question 10.65. However, the majority of manual actions (including the examples listed above), were not explicitly identified during the licensing process and, as such, were not explicitly approved by the NRC.

Amendment 3 to the Byron Station Fire Protection Report listed a number of assumptions for the safe shutdown analysis. Assumption 3, listed in Section 2.4.1.5 of Amendment 3, stated:

> "For fires outside the control room, the operators are assumed to remain in the control room and to utilize the instruments and controls provided there to the greatest possible extent, in accordance with existing station procedures. When proper operation of equipment cannot be performed or confirmed from the control room, alternate procedures are utilized…"
>
> "Where the safe shutdown analysis shows that control cables from both redundant trains of equipment are located in the same fire zone, credit is taken for alternate shutdown via local operation of equipment as specified in various plant procedures…"

The inspectors noted that the licensee had used the term "alternate" to apply to procedures for fire zones other than those classified as alternative fire zones (i.e., other than the control room and the auxiliary electric equipment rooms).

NUREG-0876, "Safety Evaluation Report related to the operation of Byron Station, Units 1 and 2," documented the licensing basis approval by the NRC. Supplement 5 of NUREG-0876 relied upon Amendment 3 of the Byron Station Fire Protection Report for original licensing of Unit 1 for fire protection. Within the section titled "Safe Shutdown Capability," of Section 9.5.1.4 of NUREG-0876, Supplement 5, the following statements were made by the NRC:

> "Alternative shutdown capability in part, consists of local operation of equipment if the fire results in loss of redundant control capability. Local operations include local start and control of pumps and manual operation of valves and circuit breakers. For all local operation, accessibility of components and time restrictions were considered. These local operations are addressed in various plant procedures. Alternative shutdown capability also consists of utilization of diverse equipment as follows. To monitor reactor coolant hot leg temperature, the applicant ensured the availability of one of the following components, all of which provide an indication of hot leg temperature: reactor coolant wide range hot leg RTD's [resistance temperature detectors], core exit thermocouples, or heated junction thermocouples. Alternative shutdown capability also includes use of remote shutdown and instrument panels as discussed below."
>
> and
>
> "Based on the above, the staff concludes that the post-fire safe shutdown capability for Byron complies with the guidelines of SRP [Standard Review Plan] Section 9.5.1, Position C.6.b subject to the following condition: 'The applicant shall complete the analysis of spurious operation of the pressurizer PORV's [power operated relief valves] and fully implement any necessary modifications prior to exceeding 5 percent power.'"

The inspectors noted that sentences above describing local operation of equipment were located in the SER prior to the section titled "Alternative Shutdown Capability." Based on the assumptions listed in Amendment 3 of the Fire Protection Report and the above SER language, the licensee had made the interpretation that the NRC had provided a general approval for the use of manual actions for non-alternative fire zones in addition to approval for alternative shutdown fire zones.

The inspectors were not able to determine whether the SER language constituted a general approval of manual actions for non-alternative fire zones beyond those explicitly identified during licensing. This issue is a URI pending further review by NRC staff. (URI 05000454/2010006-01; 05000455/2010006-01, Manual Actions Not Explicitly Approved)

.2 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 the National Fire Protection Association (NFPA) standards 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.

.3 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 standards to verify that fire suppression and detection systems met license commitments.

b. Findings

No findings of significance were identified.

.4 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.

.5 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.

.6 Circuit Analyses

a. Inspection Scope

The inspectors reviewed the licensee's post-fire safe shutdown analysis to verify that the licensee had identified both required and associated circuits that may impact safe shutdown. On a sample basis, the inspectors verified that the cables of equipment required achieving and maintaining hot shutdown conditions, in the event of fire in the selected fire zones, had been properly identified. In addition, the inspectors verified that these cables had either been adequately protected from the potentially adverse effects of fire damage, mitigated with approved manual operator actions, or analyzed to show that fire-induced faults (e.g., hot shorts, open circuits, and shorts to ground) would not prevent safe shutdown. In order to accomplish this, the inspectors reviewed electrical schematics and cable routing data for power and control cables associated with each of the selected components.

In addition, the adequacy of circuit protective coordination for the safe shutdown systems' electrical power and instrumentation busses was evaluated. The inspectors also evaluated cable trays that contained both safe shutdown and non-safe shutdown cables for proper circuit protection to ensure that cables were protected by a proper protective device in order to preclude common enclosure concerns.

b. Findings

(1) Failure to Provide Adequate Guidance in Safe-Shutdown Procedures

Introduction: A finding of very low safety significance (Green) and associated NCV of Technical Specification 5.4.1.c for Units 1 and 2 was identified by the inspectors for the licensee's failure to provide adequate guidance in safe shutdown procedures. Specifically, the licensee failed to provide adequate guidance to reenergize the 4 kiloVolt (kV) buses which were required to power safe shutdown components to achieve hot shutdown in the event of a fire in Fire Zone 11.3-0.

Description: Section 2.4.2.80 "Auxiliary Building General Area, Elevation 364', (Fire Zone 11.3-0)" of the Fire Protection Report stated that power and control cables for the Division 21 containment spray (CS) and ESW pumps were present in Fire Zone 11.3-0, a non-alternative fire zone. The licensee took credit for manually opening the breakers associated with these loads and removing the control power fuses using station procedures upon detection of a design basis fire, as a precautionary measure, to protect the Division 21, 4 kV bus. These actions were incorporated into fire response Procedure BOP FR-1T10, "11.3-0, 364' Auxiliary Building General Area, 1D-17, 1D-40, 1S-59, 2S-54," Revision 4, and the control room annunciator response Procedure BAR 1PM09J-D1, "AUX 364, (1D-17 and 40)," Revision 6, for a fire in Auxiliary Building 364', general area. The guidance included opening and removing the control fuses for the affected breakers upon confirming that a severe fire existed in the area.

The 4 kV Bus 241, Division 21 was credited for supplying power for safe shutdown equipment (i.e., the 2A auxiliary feedwater pump and 2A charging pump) to safely shutdown the plant in the event of a fire in Fire Zone 11.3-0. The safe shutdown analysis determined that since the control and power cables for the 2A CS and 2A ESW pumps were located in the same zone, both cables could be potentially damaged. In the event that a 125 Vdc control cable for any of the above loads becoming faulted and a subsequent fault on the 4 kV power cable for the same load occurred, the breaker(s) may not trip to clear the fault. Therefore, the licensee provided guidance for preventive actions to prevent other damage and consequences.

The inspectors were concerned that if fire damage, as described above, occurred to control and power cables prior to successfully performing the steps referenced in the procedures, the upstream (bus main feeder breaker) could trip due to the 4 kV line fault and result in the loss of Bus 241, which provided power to other components (i.e., the 2A auxiliary feedwater pump and 2A charging pump) required for safe shutdown. Procedure BOP FR-1T10 did not provide adequate recovery actions to reenergize the 4 kV engineered safety features (ESF) buses. The inspectors also reviewed the electrical coordination between the main 125 Vdc feeder breaker and the control power fuses for the individual breaker and determined that adequate breaker/fuses coordination existed up to the maximum available fault current of 520 Amps. Adequate

coordination for the control power was necessary to ensure that the main bus feeder breaker would trip on any 4 kV fault to prevent the possibility of a secondary fire and or bus damage.

In response to the inspector concern regarding the potential loss of the required 4 kV bus in the event of a fire, the licensee stated that operators would enter Procedure 2BOA ELEC-3, "Loss of 4KV ESF Bus," Revision 104, to reenergize the required bus. Although Procedure 2BOA ELEC-3 was not referenced by fire response Procedure BOP FR-1T10, operator training would require operators to use Procedure BOA ELEC-3, which would take precedence over the fire response procedure if resources precluded parallel usage. The inspectors noted that Step 8 of Attachment "A" to Procedure 2BOA ELEC-3, which provided guidance for restoring Bus 241, required, in the event of the lockout alarms for the bus being lit, the initiation of troubleshooting and repairs to ensure that the bus was free from any faults. The inspectors determined that repair actions would not meet the licensing basis for the fire protection program for Byron Station, Units 1 and 2. Consequently, neither Procedure BOP FR-1T10 nor Procedure 2BOA ELEC-3 provided adequate guidance to reenergize the 4 kV ESF buses in the event of a fire in Fire Zone 11.3-0. The licensee entered this issue into their corrective action program as AR 01135837, "NRC FP Inspection Concern - 4kV Bus Restoration," dated November 4, 2010, and initiated actions which included a recommendation to revise Procedure BOP FR-1T10 and other applicable procedures to provide adequate guidance for recovery actions to reenergize a 4 KV ESF buses following a main feed breaker trip during a fire in Fire Zone 11.3-0.

Analysis: The inspectors determined that the licensee's failure to provide adequate guidance in safe shutdown procedures in the event of a fire was contrary to the Technical Specification 5.4.1.c and was a performance deficiency. Specifically, the licensee failed to provide adequate guidance to reenergize the 4 kV buses which were required to power safe shutdown components to achieve hot shutdown in the event of a fire in Fire Zone 11.3-0. The finding was determined to be 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 (i.e., core damage). Specifically, the failure to provide adequate procedural guidance to reenergize the 4 kV buses could have potentially compromised the ability to safely shutdown the plant in the event of a fire in Fire Zone 11.3-0.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase I – Initial Screening and Characterization of Findings," Tables 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. The inspectors performed a Phase 3 analysis outlined in Enclosure 2, "Phase III Significance Determination Evaluation for Failure to Provide Adequate Guidance in Safe-Shutdown Procedures." Based on the Phase III analysis, the inspectors determined the issue was of very low safety-significance (Green).

The inspectors determined there was no cross-cutting aspect associated with this finding because the deficiency was not reflective of licensee's current performance.

Specifically, the steps of interest in the procedure had existed more than three years (i.e., since prior to the last triennial fire protection inspection conducted) without revision or specific review.

Enforcement: Technical Specifications 5.4.1.c, for Units 1 and 2 required, in part, that written procedures be established, implemented and maintained covering fire protection program Implementation. Procedure BOP FR-1T10 was a written procedure which covered fire protection program implementation in that the procedure provided guidance to safely shutdown the plant in response to a fire in Fire Zone 11.3-0.

Contrary to the above, from initial licensing through November 4, 2010, the licensee failed to maintain written procedures covering fire protection program implementation. Specifically, Procedure BOP FR-1T10 was not maintained in that the procedure did not provide adequate guidance to safely shutdown the plant in response to a fire in Fire Zone 11.3-0. The procedure did not provide adequate guidance to restore 4 kV bus 241, required for safe shutdown, if the bus had become faulted due to a fire in Fire Zone 11.3-0. Because this violation was of a very low safety-significance and because it was entered into the licensee's corrective action program as AR 01135837, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC enforcement policy. (NCV 05000454/2010006-02; 05000455/2010006-02, Failure to Provide Adequate Guidance in Safe-Shutdown Procedures)

(2) Failure to Periodically Test 125 Vdc Molded Case Circuit Breakers

Introduction: A finding of very low safety significance (Green) and associated NCV of the Byron Station facility operating licensee conditions for fire protection was identified by the inspectors for the licensee's failure to periodically test samples of molded case circuit breakers (MCCBs) at the 125 Vdc level.

Description: Section 2.4.1.6.1 "Common Power Source Associated Circuits," of the fire protection report, stated that, for the majority of ESF power supplies, common power source associated circuits were addressed by providing coordinated circuit protection between the feed breakers for a supply and the load breakers fed by the supply. Section 2.4.1.6.1 also stated that calculations were available to demonstrate proper breaker coordination for these power supplies and that the coordinated circuit protection ensured that the power supply would provide sufficient current to a faulted load to clear the load breaker prior to affecting the power supply feed breaker. Based on this information, the inspectors determined that the licensee relied upon proper circuit breaker coordination to ensure that common power sources were not adversely affected by a fire.

Section 2.4.1.6.1 of the Fire Protection Report specified a number of provisions to ensure proper circuit breaker coordination would be maintained. As one of the provisions, Section 2.4.1.6.1 specified that MCCBs would be periodically manually exercised and inspected to ensure ease of operation. In addition, Section 2.4.1.6.1 stated that a sample of these breakers would be periodically tested to determine that breaker drift was within the allowed design criteria, and all the tests will be performed in accordance with an accepted industry testing program. The inspectors noted that the same requirements existed in Amendment 3 of the Fire Protection Report, dated June 1984, which was used as a basis for licensing Unit 1 for operation.

With regards to 125 Vdc MCCBs, the licensee stated that they had established and completed tasks in the preventive maintenance program to cycle all 125 Vdc breakers on a 6 year frequency. The inspectors noted that the licensee had also established and completed tasks in the preventive maintenance program to cycle, inspect and test the MCCBs at the 480 Vac voltage level, but did not perform trip testing of MCCBs at the 125 Vdc voltage level. The inspectors were concerned that because the licensee failed to periodically test a sample of the MCCBs at the 125 Vdc level, the licensee did not ensure that the feeder breaker for the safe shutdown common power sources would not trip prematurely in the event of a fire-induced fault of a cable connected to any of the load breakers. The failure to test a sample of the 125 Vdc MCCBs resulted in a lack of assurance that adequate electrical coordination was maintained as specified by design requirements.

In response to the inspectors' concerns, the licensee entered this issue into their corrective action program as AR 01147128, "NRC Identified Issue with Lack of 125 Vdc Breaker Testing." The licensee subsequently verified that adequate design margin existed between the upstream breakers and the downstream fuses associated with the control circuits for the 4 kV ESF Buses. The individual 125 Vdc control circuits at Bus 141 were protected by 30 ampere fuses, the upstream breaker was a General Electric (GE) fixed thermal magmatic 70 ampere type THED breaker. Calculation BYR 98-239 "Coordination Calculation for 125Vdc and 120 Vac Post Fire Safe Shutdown Circuits," showed that the maximum fault direct current available at Bus 141 for the control circuits was 520.9 amperes. The calculation also showed that the THED 70 ampere breaker coordinated with the downstream 30 ampere fuses up to a value of 630 amperes of fault current. The licensee also verified that the condition at Bus 141 bounded the remaining ESF buses. A review of industry experience by the licensee did not identify any issues with these type THED breakers. Therefore, the licensee concluded that based on the design margin between the maximum available fault current and the maximum coordinated fault current and industry experience with the THED breakers, it was expected that the breakers inverse-time or instantaneous trip characteristics would not drift out of tolerance such that fuse-breaker coordination would become a concern.

Analysis: The inspectors determined that the licensee's failure to periodically test samples of MCCBs at the 125 Vdc level was contrary to the Byron Station facility license condition associated with the fire protection program and was a performance deficiency. The finding was determined to be 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 (i.e., core damage). The inspectors determined that the finding, if left uncorrected, would become a more significant safety concern. Specifically, the failure to test the MCCBs would result in a failure to detect excessive set-point drift which impacted breaker coordination.

In accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase I - 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. The inspectors determined that the finding affected the post-fire safe shutdown finding category. The finding was determined to be a low degradation because the licensee verified that sufficient design

margin existed such that breaker coordination would not be adversely affected. In addition, no failures of 125 Vdc MCCBs to trip due to set-point drift had been identified. Consequently, the finding screened to Green based on Task 1.3.1, "Qualitative Screening for All Finding Categories," Question 1 of IMC 0609, Appendix F.

The inspectors did not identify a cross-cutting aspect associated with this finding because the deficiency was not reflective of the licensee's current performance. Specifically, although the same issue was previously identified by the NRC in 2001 at Braidwood Station, the sister station to Byron Station, the reviews conducted by the Byron Station engineering personnel at that time, were not indicative of current performance.

Enforcement: License Conditions 2.C.6 and 2.E of the Byron Station operating licenses, for Units 1 and 2, respectively, required, in part, that the licensee implement and maintain in effect all provisions of the fire protection program as described in the licensee's Fire Protection Report, and as approved in the SER through Supplement Number 8. Section 2.4.1.6.1 of the Byron Station Fire Protection Report stated, in part, that MCCBs will be periodically manually exercised and inspected to ensure ease of operation. In addition, a sample of these breakers will be periodically tested to determine that breaker drift is within the allowed design criteria, and all the tests will be performed in accordance with an accepted industry testing program.

Contrary to the above, from original licensing through December 3, 2010, the licensee did not implement and maintain in effect all provisions of the fire protection program as described in the licensee's Fire Protection Report. Specifically, the licensee failed to periodically test a sample of 125 Vdc MCCBs. Because this violation was of a very low safety-significance and because it was entered into the licensee's corrective action program as AR 01147128, this violation is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the NRC enforcement policy.
(NCV 05000454/2010006-03; 05000455/2010006-03, Failure to Periodically Test 125 Vdc Molded Case Circuit Breakers)

.7 Communications

a. Inspection Scope

The inspectors reviewed, on a sample basis, 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.

.8 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 walkdown, 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.

.9 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.

.10 Compensatory Measures

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

.11 B.5.b Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's preparedness to handle large fires or explosions by reviewing one or more mitigating strategies as identified below. This review ensured that the licensee continued to meet the requirements of their B.5.b related license conditions and 10 CFR 50.54(hh)(2) by determining that:

- Procedures were being maintained and adequate;
- Equipment was properly staged, maintained, and tested;
- Station personnel were knowledgeable and could implement the procedures; and
- Additionally, inspectors reviewed the storage, maintenance, and testing of B.5.b related equipment.

The inspectors reviewed the licensee's B.5.b related license conditions and evaluated selected mitigating strategies to ensure they remain feasible in light of operator training, maintenance/testing of necessary equipment and any plant modifications. In addition, the inspectors reviewed previous inspection reports for commitments made by the licensee to correct deficiencies identified during performance of Temporary Instruction (TI) 2515/171 or subsequent performances of these inspections.

The B.5.b mitigating strategies selected for review during this inspection are listed below. The off-site and on-site communications, notifications/ERO activation, initial operational response actions, and damage assessment activities identified in Table A.3-1 are evaluated each time due to the mitigation strategies' scenario selected.

NEI 06-12, Revision 2 Section	Licensee Strategy (Table)	Selected for Review
3.2.2	Off-site and On-site Communications (Table A.3-1)	Evaluated
3.2.3	Notifications/ERO Activation (Table A.3-1)	Evaluated
3.2.4	Initial Operational Response Actions (Table A.3-1)	Evaluated
3.2.5	Initial Damage Assessment (Table A.3-1)	Evaluated
3.3.4	Manually Depressurize SGs and Use Portable Pump (Table A.4-4)	Selected

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution (71152)

a. Inspection Scope

The inspectors 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

The inspectors presented the inspection results to Mr. B. Adams and to Mr. D. Enright and to other members of the licensee staff on November 5, 2010, and on December 3, 2010, respectively. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as a Non-Cited Violation (NCV).

- The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV. The licensee identified that the procedure for fire door surveillances, Procedure 0BMSR FP-9, "Fire Door Semi-Annual Inspection," Revision 14, permitted the individual performing the inspection to close the door to assist in latching the door which did not meet the intent of the licensee's code of record for fire doors, NFPA 80 - 1983, "Fire Doors and Windows." Code NFPA 80 - 1983 required closing mechanisms to be adjusted to overcome the resistance of the latch mechanism so that positive latching is achieved on each door operation. In addition, it was identified that an Exelon Corporate engineering change (EC 339805, "Fire Door Acceptance Criteria," Revision 0, provided non-conservative guidance with respect to inspection of fire doors. Both the Byron Station surveillance procedure and the corporate engineering change represented non-conservative changes in that fire doors with non-functioning door closing mechanisms may not be identified during surveillance inspections which could result in a significant degradation of fire zone boundaries. A significant degradation of fire area boundaries could result in a fire affecting more than one fire zone, which could adversely affect the ability to achieve and maintain safe shutdown in the event of

a fire. The changes were contrary to license conditions 2.C.6 and 2.E, for Units 1 and 2, respectively, which only permitted changes to the Fire Protection Program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe-shutdown in the event of a fire. The violation was of very low safety significance because no instances were identified where unmonitored fire doors would fail to close without assistance. The licensee entered this issue into their corrective action program as AR 01098016, "FP FASA Deficiency - Revision/Clarification of Proc Needed," dated August 4, 2010, and AR 01135777, "2002 Corp EC May Not Have Met Intent of NFPA 80," dated November 4, 2010.

Phase 3 Significance Determination Evaluation for
Failure to Provide Adequate Guidance in Safe-Shutdown Procedures

To evaluate the finding associated with the failure to provide adequate guidance in safe shutdown procedures, the inspectors, in conjunction with a Senior Reactor Analyst (SRA), performed a Phase III Evaluation. The finding is discussed in Section 1R05.6.b(1) of the report body. To support this evaluation, the licensee had identified which equipment faults could contribute towards tripping of the upstream 4 kiloVolt (kV) breaker, and where the associated cables were routed in the general areas of the auxiliary building. Three auxiliary building general area elevations (364 foot, 383 foot, and 401 foot elevations) were identified as having cable routings for which a fire could contribute towards the finding. The inspectors and the SRA performed walkdowns of the cable routings with licensee engineering personnel to identify potential fire scenarios.

The electrical cables at Byron Station were of thermoset composition. As such, the cables were not susceptible to self-ignited cable fires. In addition, the inspectors used the zones of influence associated with thermoset cables for screening purposes. The majority of cables were routed near the ceiling or at a substantive distance above the floor. As such, these cable locations were not susceptible to a floor-based fire from either transient combustibles or hot work and were screened from further consideration. However, a number of locations were identified where unprotected cable risers penetrated the floor and the cables would be subject to a floor-based fire. For floor-based fires, the inspectors used Attachment 4, "Fire Ignition Source Mapping Information: Fire Frequency, Counting Instructions, Applicable Fire Severity Characteristics, and Applicable Manual Fire Suppression Curves," of Inspection Manual Chapter (IMC) 609, Appendix F, "Fire Protection Significance Determination Process," for ignition frequencies. The inspectors used the medium likelihood ratings for both transient combustibles and hot work for the affected areas. In addition, one location was identified where the cables were routed directly over an electrical cabinet with 480 Volt motor control centers (MCCs).

Based on the walk downs, the inspectors were able to determine the area weighting factor, W, for the cable risers to be 0.021. The SRA determined appropriate conditional core damage probability (CCDP) values associated with loss of the affected 4 kV buses using the NRC Standardized Plant Analysis Risk (SPAR) model for Byron Station. The SPAR model used did not credit recent auxiliary feedwater system cross-tie modifications, which had been performed. As such, the SPAR model values used were more conservative than the actual plant configuration. The highest CCDP value for a 4 kV bus was 2.1×10^{-3} which was conservatively used for all affected buses for cable riser scenarios.

The inspectors considered the case where a floor-based fire near cable risers would affect the cables of interest and result in tripping of the upstream 4 kV bus. For this case, the fire was assumed to not spread and be limited to affecting only one 4 kV bus. The calculated results for this case were:

Scenario	Frequency	Area Weighting Factor	Conditional Core Damage Probability	Associated Core Damage Frequency
Transient Combustibles	1.7×10^{-4}	0.021	2.1×10^{-3}	7.5×10^{-9}/year
Hot Work	6.9×10^{-5}	0.021	2.1×10^{-3}	3.0×10^{-9}/year
Cable Riser CDF contribution due to one 4 kV bus affected				1.1×10^{-8}/year

The inspectors also considered the case where a fire near the cable risers results in the spread of fire to the other train thereby eliminating the safe shutdown path, i.e., CCDP = 1.0. The inspectors noted that this was a conservative consideration because although both trains were located in the same fire zone, there was greater than 10 feet of separation between the trains and the inspectors did not identify any cable propagation paths between trains during the walk downs. Using the techniques described in Appendix R, "Appendix for Chapter 11, Cable Fires," of NUREG/CR-6850, EPRI TR-1011989, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities: Detailed Methodology," Volume 2, the inspectors determined that the fire spread for thermoset cables would be less than 10 feet in two hours. The inspectors calculated probabilities of non-suppression based on two hours using the mean rate constants from Table 2.7.1, "Non-suppression Probability Values for Manual Fire Fighting Based on Fire Duration (Time to Damage after Detection) and Fire Type Category," of IMC 0609, Appendix F. The calculated results for this case were:

Scenario	Frequency	Area Weighting Factor	Probability of Non-Suppression	Associated Core Damage Frequency
Transient Combustibles	1.7×10^{-4}	0.021	7.3×10^{-8}	2.6×10^{-13}/year
Hot Work	6.9×10^{-5}	0.021	1.2×10^{-4}	1.7×10^{-10}/year
Cable Riser CDF contribution due to both divisions affected				1.7×10^{-10}/year

For the electrical cabinet with MCCs, the inspectors noted that the cabinet had 9 vertical sections. The inspectors obtained appropriate ignition frequencies from Attachment 4 of IMC 609, Appendix F. For the affected cables above the cabinet, the SRA determined that the CCDP was 1.8×10^{-4} for the loss of bus 142 using the NRC SPAR model as discussed above. The inspectors calculated the associated core damage frequencies as shown below.

Scenario	Frequency	Vertical Sections	Conditional Core Damage Probability	Associated Core Damage Frequency
Switchgear Cabinet - General Fault	5.5×10^{-5}	9	1.8×10^{-4}	8.9×10^{-8}/year
Switchgear Cabinet - Energetic Fault	4.7×10^{-6}	9	1.8×10^{-4}	7.6×10^{-9}/year
Electrical Cabinet contribution due to one 4 kV bus affected				9.7×10^{-8}/year

For the switchgear cabinet, the inspectors also considered potential scenarios where the safe shutdown path would be affected with the same considerations used for the cable risers. The calculated results for this case were:

Scenario	Frequency	Vertical Sections	Probability of Non-Suppression	Associated Core Damage Frequency
Switchgear Cabinet - General Fault	5.5×10^{-5}	9	8.0×10^{-7}	4.0×10^{-10}/year
Switchgear Cabinet - Energetic Fault	4.7×10^{-6}	9	2.2×10^{-3}	9.3×10^{-8}/year
Electrical Cabinet contribution due to both divisions affected				9.4×10^{-8}/year

Based on the above calculations, the inspectors determined the total core damage frequency contribution as follows:

Scenarios Considered	Core Damage Frequency Contribution
Cable Riser CDF contribution due to one 4 kV bus affected	1.1×10^{-8}/year
Cable Riser CDF contribution due to both divisions affected	1.7×10^{-10}/year
Electrical Cabinet contribution due to one 4 kV bus affected	9.7×10^{-8}/year
Electrical Cabinet contribution due to both divisions affected	9.4×10^{-8}/year
Total	2.0×10^{-7}/year

Based on the above calculations, the inspectors determined that the finding was of very low safety significance (i.e., Green) because the calculated value for core damage frequency, 2.0×10^{-7}/year, was below the 1.0×10^{-6}/year threshold for a more significant issue.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Enright, Site Vice-President
B. Adams, Plant Manager
A. Daniels, Manager, Nuclear Oversight Manager
C. Gayheart, Director, Operations
D. Gudger, Manager, Regulatory Assurance
V. Naschansky, Manager, Electrical Design

Nuclear Regulatory Commission

A. Boland, Director, Division of Reactor Safety
B. Bartlett, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000454/2010006-01; 05000455/2010006-01	URI	Manual Actions Not Explicitly Approved
05000454/2010006-02; 05000455/2010006-02	NCV	Failure to Provide Adequate Guidance in Safe-Shutdown Procedures
05000454/2010006-03; 05000455/2010006-03	NCV	Failure to Periodically Test 125 Vdc Molded Case Circuit Breakers

Closed

05000454/2010006-02; 05000455/2010006-02	NCV	Failure to Provide Adequate Guidance in Safe-Shutdown Procedures
05000454/2010006-03; 05000455/2010006-03	NCV	Failure to Periodically Test 125 Vdc Molded Case Circuit Breakers

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 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.

ANALYSES AND CALCULATIONS

Number	Description or Title	Date or Revision
BYR97-054	Low Pressure Carbon Dioxide Flow Calculations	9/14/1979
BYR97-098	Byron/Braidwood Station Stairwell and Hatch Protection Hydraulic Calculations	3
BYR98-239	Coordination Calculation for 125Vdc and 120 Vac Post Fire Safe Shutdown Circuits	0
PR 08-002	FDRP No. 23-033, "Fire Fighting Response at the River Screen House."	0

CONDITION REPORTS (CRs) ISSUED DURING INSPECTION

Number	Description or Title	Date or Revision
AR 01123495	2010 Fire Protection Triennial Inspection NRC Identified PAR	10/7/2010
AR 01124843	NRC Identified a Shortfall in BAP 1100-10T5	10/7/2010
AR 01129735	NRC Identified Shortfall - Fire Extinguisher at RSH	10/22/2010
AR 01132029	FP Triennial NRC Identified Issue	10/28/2010
AR 01135777	2002 Corp EC May Not Have Met Intent of NFPA 80	11/3/2010
AR 01135797	FP Triennial NRC Identified Issue	11/4/2010
AR 01135837	NRC FP Inspection Concern – 4KV Bus Restoration	11/4/2010
AR 01147128	NRC Identified Issue With Lack of 125 VDC Breaker Testing	12/1/2010

CONDITION REPORTS (CRs) REVIEWED DURING INSPECTION

Number	Description or Title	Date or Revision
AR 00810713	Byron Review of Braidwood IR No. 809865 and NRC FP Questions	8/25/2008
AR 00989821	Missed Fire Watch for Unit 2 DG Cable Tunnel	11/6/2009
AR 00995296	Offsite Drill for 2009	11/18/2009
AR 01004230	FASA for Fire Protection	12/11/2009
AR 01033456	1A DG Room Firewatch	2/21/2010
AR 01039107	Potential Emergent Firewatch Issue with Fire-Proofing - NRC	3/5/2010
AR 01098016	FP FASA Deficiency – Revision/Clarification of Proc	8/4/2010

CONDITION REPORTS (CRs) REVIEWED DURING INSPECTION

Number	Description or Title	Date or Revision
	Needed	
AR 01111806	Fire Watch not Documented	9/10/2010
AR 01116637	Wrong Fire Zone Inspected During Hourly Fire Watch	9/23/2010
AR 01121802	Missed Fire Watch Lessons Learned	10/4/2010
AR 01122751	Missed Fire Watches in the Past	10/6/2010

DRAWINGS

Number	Description or Title	Date or Revision
6E-0-3000E	Installation Notes for Category 1 Cable Trays	K
6E-0-3012	Cable Pans Routing Location, Auxiliary Building Plan Elevation 364'-0"	W
6E-0-3096	Cable Pan Section Cuts	AJ
6E-0-3252	Cable Pan Installation Details	BF
6E-0-4030FP01	Schematic Diagram Fire Pump 0A 0FP03A	M
6E-1-4030AF12	Schematic Diagram – Auxiliary Feedwater Pump 1B (Diesel Driven) Engine Startup Panel 1AF01J	AF
6E-1-403AF02	Schematic Diagram – Auxiliary Feedwater Pump 1B (Diesel Driven) 1AF01PB	AC
6E-2-4005A	Key Diagram – 4160 ESF SWGR Bus 241	E
6E-2-4030AF14	Schematic Diagram – Auxiliary Feedwater Pump 2A and 2B Discharge Test Valves 2AF004A & 2AF004B	K
A-219	Auxiliary Building Upper Basement Area 3 EL. 364'0"	BB
A-220	Auxiliary Building Upper Basement Area 3 EL. 364'0"	CG
A-319	Auxiliary Building Floor Plan Elevation 463'-5"	AR
A-676	Plumbing Auxiliary Building Floor Diagram	J
Figure 2.3-38	Cable Tray Installation EL. 364'0"	Amendment 6
Fire Zone 11.3-0	Pre-Fire Plan Unit 2, Auxiliary Building, Containment Pipe Penetration, El. 364'- 0"	1
Fire Zone 11.3-2	Pre-Fire Plan, Auxiliary Building, General Area, El. 364'- 0" (3 sheets)	0
Fire Zone 3.2-2	Pre-Fire Plan Unit 2, Non Segregated Bus Duct	0
Fire Zone 5.5-2	Pre-Fire Plan Unit 2, Auxiliary Electrical Equipment Room	0
M-42	Diagram of Essential Service Water	BA
M-52	Diagram of Fire Protection at Circulating Water Pumphouse	AG
M-603 sheet 101	Penetration Area Sprinkler Plan Drawings	C
M-603 sheet 93	Component Cooling Pump Area Sprinkler System	B
M-603 sheet 98	Hatch and Stairways Sprinkler System	C
VFPC-1JJ	Fire Protection System Area – 1JJ Component Cooling Pump Area	2

MODIFICATIONS

Number	Description or Title	Date or Revision
EC 351113	Evaluation of Abandonment of River Screen House Fire Protection Standpipes and Hose Stations	0
EC 368713	GL 86-10 Evaluation, Deviation from BTP CMEB 9.5-1 and Appendix R regarding fire fighting response at the River Screen House	0

PROCEDURES

Number	Description or Title	Date or Revision
0BMSR FP-9	Fire Door Semi-Annual Inspection	14
1BOA ELEC-5	Local Emergency Control of Safe Shutdown Equipment, Unit 1	101
2BOA ELEC-3	Loss of 4KV ESF Bus	104
2BOA PRI-5	Control Room Inaccessibility, Unit 2	109
BAP 320-1	Shift Staffing	19
BAR 0-37-A4	Unit 1 Area Fire	8
BAR 1PM09J-C20	RSH (1D-79)	2
BAR 1PM09J-D1	AUX 364, (1D-17 & 40)	6
BAR 1PM09J-D20	RSH (1S-52)	3
BHP 4200-33	Installation of Appendix R Emergency Cable	10
BOP CO3	Filling the Turbine Building Cardox Tank	9
BOP FR-1T10	364' Auxiliary Building General Area 1D-17, 1D-40, 1S-59, 2S-54	4
BOP FR-1T35	Fire Zones 5.5-1 & 5.5-2; Unit 1/Unit 2 Auxiliary Electrical Equipment Rooms; 1D-69/2D-69	4
EP-AA-122-1001-F-12	Drill & Exercise Observation Form performed February 27, 2008	C
MA-BY-EM-1-FP009	Low Pressure CO2 System Air Actuation	5
MA-BY-EM-1-FP009-011	Fire Protection Zones 3.2A-2, 2Z1 LCSR Suppression Zones 2S-43 Detection Zones 2D-49, 2D-50	0
OBMSR 3.10.g.7	TRM Fire Damper 18-Month Visual Inspection	11
OP-AA-201-003	Attachment 1 Fire Drill Record performed February 27, 2008	14
OP-AA-201-009	Control of Transient Combustible Material	11
OP-MW-201-007	Fire Protection System Impairment Control	7

SURVEILLANCES

Number	Description or Title	Date or Revision
0BVSR 10.g.6-1	Fire Barrier Penetration Visual Inspection 18 Month Surveillance	10
BHP 4200-112	Annual Testing of Particles of Combustion (POC) Smoke Detectors	13

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
CCDP	Conditional Core Damage Probability
CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
ESF	Engineered Safety Features
ESW	Essential Service Water
IMC	Inspection Manual Chapter
IR	Inspection Report
kV	KiloVolt
MCC	Motor Control Center
MCCB	Molded Case Circuit Breaker
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records
PORV	Power Operated Relief Valve
RTD	Resistance Temperature Detector
RWST	Refueling Water Storage Tank
SDP	Significance Determination Process
SER	Safety Evaluation Report
SPAR	Standardized Plant Analysis Risk
SRA	Senior Reactor Analyst
SRP	Standard Review Plan
URI	Unresolved Item
VCT	Volume Control Tank
Vdc	Volts Direct Current

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.: 50-454; 50-455; 72-068
License No.: NPF-37; NPF-66

Enclosures:
1. Inspection Report 05000454/2010006(DRS); 05000455/2010006(DRS) w/Attachment: Supplemental Information
2. Phase III Significance Determination Evaluation for Failure to Provide Adequate Guidance in Safe-Shutdown Procedures

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