



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

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

January 5, 2016

Mr. David Hamilton  
Site Vice President  
FirstEnergy Nuclear Operating Company  
Perry Nuclear Power Plant  
P. O. Box 97, 10 Center Road, A-PY-A290  
Perry, OH 44081-0097

**SUBJECT: PERRY NUCLEAR POWER PLANT - TRIENNIAL FIRE PROTECTION  
INSPECTION REPORT 05000440/2015008**

Dear Mr. Hamilton:

On October 23, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed a triennial fire protection inspection at your Perry Nuclear Power Plant. The enclosed inspection report documents the inspection results, which were discussed on December 29, 2015, with Mr. N. Conicella, 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.

NRC inspectors documented four findings of very low safety significance (Green) in this report. These findings were determined to involve violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your Corrective Action Program, the NRC is treating the issues as Non-Cited Violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of the 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 copies to the Regional Administrator, Region III; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Perry Nuclear Power Plant.

In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Perry Nuclear Power Plant.

D. Hamilton

-2-

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is 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 Nos. 50-440  
License Nos. NPF-58

Enclosure:  
Inspection Report 05000440/2015008  
w/Attachment: Supplemental Information

cc: Distribution via LISTSERV®

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-440  
License No: NPF-58

Report No: 05000440/2015008

Licensee: FirstEnergy Nuclear Operating Company

Facility: Perry Nuclear Power Plant

Location: North Perry, Ohio

Dates: September 22 through October 23, 2015

Inspectors: A. Dahbur, Senior Reactor Inspector  
G. Hausman, Senior Reactor Inspector  
D. Szwarc, Senior Reactor Inspector, Lead  
R. Winter, Reactor Inspector

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

Enclosure

## Table of Contents

|  |    |
|--|----|
| <b>Table of Contents</b> .....   | 2  |
| SUMMARY .....  | 2  |
| REPORT DETAILS .....   | 4  |
| 1.    REACTOR SAFETY.....  | 4  |
| 1R05    Fire Protection (71111.05T).....                               | 4  |
| .1    Protection of Safe Shutdown Capabilities.....                    | 5  |
| .2    Passive Fire Protection .....                                    | 8  |
| .3    Active Fire Protection .....                                     | 11 |
| .4    Protection from Damage from Fire Suppression Activities.....     | 11 |
| .5    Alternative Shutdown Capability.....                             | 11 |
| .6    Circuit Analyses .....   | 12 |
| .7    Communications .....   | 15 |
| .8    Emergency Lighting .....   | 15 |
| .9    Cold Shutdown Repairs.....                                       | 15 |
| .10   Compensatory Measures .....                                      | 16 |
| .11   Review and Documentation of Fire Protection Program Changes..... | 18 |
| .12   Control of Transient Combustibles and Ignition Sources .....     | 18 |
| .13   B.5.b Inspection Activities .....                                | 18 |
| 4.    OTHER ACTIVITIES .....   | 19 |
| 4OA2    Identification and Resolution of Problems (71152) .....        | 19 |
| 4OA6    Management Meetings.....                                       | 20 |
| .1    Exit Meeting Summary .....                                       | 20 |
| .2    Interim Exit Meetings.....                                       | 20 |
| SUPPLEMENTAL INFORMATION.....  | 1  |
| KEY POINTS OF CONTACT .....  | 1  |
| LIST OF ITEMS OPENED, CLOSED AND DISCUSSED.....                        | 1  |
| LIST OF DOCUMENTS REVIEWED .....                                       | 2  |
| LIST OF ACRONYMS USED .....  | 7  |

## SUMMARY

Inspection Report 05000440/2015008; 09/22/2015 – 10/23/2015; Perry Nuclear Power Plant; Routine Triennial Fire Protection Baseline Inspection.

This report covers an announced triennial fire protection baseline inspection. The inspection was conducted by Region III inspectors. Four findings were identified by the inspectors. The findings were considered Non-Cited Violations (NCVs) of U.S. Nuclear Regulatory Commission (NRC) regulations. The significance of most findings is indicated by their color (i.e. Greater than Green, or Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated April 29, 2015. Cross-cutting aspects were determined using IMC 0310, "Aspects Within the Cross Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

### Cornerstone: Initiating Events

- Green. The inspectors identified a finding of very low safety significance and an associated NCV of Technical Specifications (TS) Section 5.4.1.a for the licensee's failure to perform fire watches in two fire areas for a non-functional fire barrier. Specifically, the licensee failed to perform fire watches as required by Section 16.D(1)a.(1) of Attachment 3 to procedure PAP-1910, "Fire Protection Program." The licensee entered the issue into their Corrective Action Program (CAP), and added the two fire areas to the fire watch list.

The inspectors determined that the performance deficiency was more than minor because the finding, if left uncorrected, would become a more significant safety concern. Specifically, by failing to perform fire watches the licensee may not have been able to identify transient combustible materials that could have impacted the unprotected circuits associated with this deficiency in the event of a fire. This finding was of very low safety significance because it only impacted one train of equipment important to safety. This finding has a cross-cutting aspect in the area of Human Performance, Documentation because the licensee did not create and maintain complete, accurate, and up-to-date documentation. Specifically, when the licensee developed the fire watch list they did not include all impacted fire zones as listed in the initial impairment.

[H.7] (Section 1R05.10b)

### Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance (Green), and associated NCV of license condition 2.C(6) for the licensee's failure to ensure that systems, structures, and components necessary to achieve and maintain hot shutdown conditions were free of fire damage. Specifically, the licensee did not ensure that circuits associated with the emergency closed cooling (ECC) heat exchanger 'A' temperature control valve 1P42-F665A were free of fire damage for a fire in the control room and instead relied on lifting leads and replacing fuses to take manual control of the valve. The licensee entered the issue into their CAP, and credited the existing repair activities in the procedure.

The inspectors determined that the performance deficiency was more than minor because a fire in the control room could result in the licensee losing the ability to remotely control the ECC heat exchanger 'A' temperature control valve and needing to take manual control of the valve. The finding was of very low safety significance because it did not affect the ability to reach and maintain a stable plant condition within the first 24 hours of a fire event. The finding did not have a cross-cutting aspect associated with it because it was not reflective of current performance. (Section 1R05.1b)

- Green. The inspectors identified a finding of very low safety significance (Green), and an associated NCV of license condition 2.C(6) for the licensee's failure to adequately implement and maintain surveillance procedures and work processes associated with fire barrier and penetration seal inspections. Specifically, the licensee failed to perform fire barrier penetration seal inspections for 42 penetration seals at least once per 15 years (plus an additional 25 percent grace period) as required by the Fire Protection Program. The licensee entered the issue into their CAP, and will inspect the accessible portions of the barriers and will perform a full inspection at the next available opportunity.

The inspectors determined that the performance deficiency was more than minor because the licensee's failure to inspect the fire barrier penetrations could result in not identifying degraded seals which could affect their ability to prevent a fire from spreading from one fire area to another. The finding was of very low safety significance because the failure to inspect a portion of fire barrier penetration seals did not impact the plant's ability to reach and maintain safe shutdown. The finding has a cross-cutting aspect in the area of Human Performance, Work Management because the licensee improperly closed a notification to track the inspection of fire barrier penetrations without creating a work order. [H.5] (Section 1R05.2b)

- Green. The inspectors identified a finding of very low safety significance (Green), and an associated NCV of TS Section 5.4.1.a for the licensee's failure to have adequate procedural guidance in their fire response procedure. Specifically, Procedure ONI-P54, "Fire," Revision 19 did not list all the fire areas where a potential fire induced spurious carbon dioxide (CO<sub>2</sub>) initiation in the emergency diesel generator (EDG) room could occur. The licensee entered this issue into their CAP, and established hourly fire watches for the affected areas.

The inspectors determined that the performance deficiency was more than minor because a fire in any of the affected fire zones could damage circuits for the nonsafety-related CO<sub>2</sub> systems for the EDG rooms causing a potential spurious CO<sub>2</sub> initiation in the diesel rooms and affecting the operation of the ventilation fans and dampers in the diesel rooms. The finding was of very low safety significance because it did not affect the ability to reach and maintain a stable plant condition within the first 24 hours of a fire event. The finding did not have a cross-cutting aspect associated with it because it was not reflective of current performance. (Section 1R05.6b)

## 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 Title 10, *Code of Federal Regulations* (CFR), Part 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 zones and B.5.b mitigating strategies selected for review during this inspection are listed below and in Section 1R05.13. The fire zones selected constituted five inspection samples and the B.5.b mitigating strategy selected constituted one inspection sample, respectively, as defined in Inspection Procedure 71111.05T.

| Fire Zone | Description                              |
|-----------|--|
| 1AB-3b    | Auxiliary Building Elevation 620' 6"     |
| 1CC-2b    | Control Complex NW Corner Elevation 599' |
| 1CC-3a    | Division 2 Switchgear Room               |
| 1CC-4e    | Division 1 Cable Spreading Room          |
| 1DG-1c    | Division 1 Diesel Generator Room         |

.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 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

Failure to Ensure that Systems, Structures, and Components Necessary to Achieve and Maintain Hot Shutdown Conditions were Free of Fire Damage without Repair Actions

Introduction: The inspectors identified a finding of very low safety significance (Green), and an associated Non-Cited Violation (NCV) of license condition 2.C(6) for the licensee's failure to ensure that systems, structures, and components necessary to achieve and maintain hot shutdown conditions were free of fire damage. Specifically, the licensee did not ensure that circuits associated with the emergency closed cooling (ECC) heat exchanger 'A' temperature control valve 1P42-F665A were free of fire damage for a fire in the control room and instead relied on lifting leads and replacing fuses to take manual control of the valve.

Description: While reviewing procedure IOI-11, "Shutdown from Outside Control Room," Revision 33 the inspectors identified several repair activities that the operators would perform as a result of a fire leading to shutdown of the plant from outside of the control room. Step 4.3 of Attachment 20, "Control Room Isolation," to the procedure directed operators to lift and tape wires and replace fuses associated with ECC heat exchanger 'A' temperature control valve 1P42-F665A. This valve was listed in Table 3.10-6 of calculation SSC-001, "Appendix R Evaluation: Safe Shutdown Capabilities Report," Revision 5 as being necessary for hot shutdown in the event of a control room fire.

The licensee considers the control room (fire zone CC-5a) as an alternate shutdown area and therefore the requirements of Appendix R, Section III.G.3 and III.L apply. Section 9A.6, "Point-by-Point Comparison" to Appendix R, Section III.G requirements of the Updated Safety Analysis Report (USAR) states that the plant complies with Appendix R, Section III.G requirements. Section III.L.3 of 10 CFR Part 50, Appendix R, states, in part, that alternative shutdown capability shall be independent of the specific fire area and that procedures shall be in effect to implement this capability. The licensee did not ensure that the alternative shutdown capability was independent of the fire area and instead credited repair activities to achieve and maintain hot shutdown. Those repair activities are not allowed by the regulation. The NRC specified in Section 5.4.1 of Regulatory Guide 1.189, "Fire Protection for Nuclear Power Plants," Revision 2 that, "post-fire repairs cannot be credited for achieving and maintaining hot shutdown."

Once the concern was identified the licensee entered the issue into their Corrective Action Program (CAP) as Condition Report (CR)-2015-13299, "2015 NRC Fire Protection Inspection – Potential Non-Conformance with Appendix R due to Hot Shutdown Repairs for Valve 1P42F0665A," dated October 5, 2015. As a compensatory measure the licensee credited the existing repair activities listed in the procedure. The inspectors verified that the licensee had the tools and replacement parts available to perform the repair activities.

Analysis: The inspectors determined that the licensee's failure to ensure that circuits that were required for alternative shutdown capability were free of fire damage during a control room fire and, therefore, were not independent of the specific fire area was contrary to the licensee's approved Fire Protection Program, and was a performance deficiency. Specifically, the licensee did not ensure that circuits associated with the ECC heat exchanger 'A' temperature control valve were free of fire damage for a fire in the control room and instead relied on lifting leads and replacing fuses to take manual control of the valve.

The performance deficiency was determined to be more than minor because the finding was associated with the Mitigating Systems Cornerstone attribute of Protection Against External Factors (Fire), and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, a fire in the control room could result in the licensee losing the ability to remotely control the ECC heat exchanger 'A' temperature control valve and needing to take manual control of the valve.

In accordance with Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," Attachment 0609.04, "Initial Characterization of Findings," Table 2 the inspectors determined the finding affected the Mitigating Systems cornerstone. The finding degraded fire protection defense-in-depth strategies, and the inspectors determined, using Table 3, that it could be evaluated using Appendix F, "Fire Protection SDP."

The inspectors determined that the finding impacted the ability to achieve safe shutdown and, assigned the finding to the category of 1.4.5 Post-fire Safe Shutdown using Table 1 in IMC 0609, Appendix F, Attachment 1, "Part 1: Fire Protection SDP Phase 1 Worksheet," dated September 20, 2013. The inspectors answered "no" to Question 1.4.5-B, "Does the fire finding affect the ability to reach and maintain a stable plant condition within the first 24 hours of a fire event?" in Task 1.4.5 of IMC 0609,

Appendix F. The repair actions already in place in procedure IOI-11, while not allowed by Appendix R, were determined to be a viable compensatory measure that would allow the plant to reach and maintain a stable plant condition. Therefore, the inspectors determined that the finding screened as having very low safety significance (Green).

The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of current performance. The licensee's last opportunity to identify this issue was in 2009 following the NRC's issuance of a similar violation.

Enforcement: License condition 2.C(6) requires the licensee to implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report (FSAR), as amended, and as approved through Safety Evaluation Report (NUREG-0887) dated May 1982 and Supplements Numbers 1 through 10. Section 9A.6, "Point-by-Point Comparison to Appendix R, Section III.G Requirements," of the USAR states that, "The provision of separation, barriers, fire detection, and fire suppression is in accordance with these requirements."

Appendix R, Section III.G.3 requires, in part, that alternative of dedicated shutdown capability and its associated circuits, independent of cables, systems, or components in the area, room, or zone under consideration should be provided where the protection of systems whose function is required for hot shutdown does not satisfy the requirement of paragraph G.2 of this section.

Compliance with 10 CFR Part 50, Appendix R, Section III.L is considered necessary in order to satisfy the requirements of 10 CFR Part 50, Appendix R, Section III.G. Section III.L of 10 CFR Part 50, Appendix R, specifies implementation of alternative of dedicated shutdown capability required by Section III.G.3 of 10 CFR Part 50, Appendix R. Section III.L.3 of 10 CFR Part 50, Appendix R, states, in part, that alternative shutdown capability shall be independent of the specific fire area and that procedures shall be in effect to implement this capability. The control room (fire zone 1CC-5a) was a fire area, which required alternative of dedicated shutdown capability.

Contrary to the above, as of November 23, 2015, the licensee failed to maintain in effect all provisions of the approved Fire Protection Program. Specifically, the licensee failed to ensure that circuits that were required for alternative shutdown capability were not free of fire damage during a control room fire and, therefore, were not independent of the specific fire area. The licensee's procedure IOI-11, "Shutdown from Outside Control Room," Revision 33, inappropriately directed operators to lift leads and replace fuses for the ECC heat exchanger 'A' temperature control valve, which are considered to be repair activities, in order to achieve and maintain hot shutdown.

This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was of very low safety significance, and was entered into the licensee's CAP as CR-2015-13299. The licensee credited the repair activity as an interim compensatory action and implemented an hourly fire watch. (NCV 05000440/2015008-01, Failure to Ensure that Systems, Structures, and Components Necessary to Achieve and Maintain Hot Shutdown Conditions were Free of Fire Damage without Repair Actions).

## .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 U.S. Nuclear Regulatory Commission( 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

#### Failure to Inspect Penetration Seals Within the Required Time Frequency

Introduction: The inspectors identified a finding of very low safety significance (Green), and an associated NCV of license condition 2.C(6) for the licensee's failure to adequately implement and maintain surveillance procedures and work processes associated with fire barrier and penetration seal inspections. Specifically, the licensee failed to perform fire barrier penetration seal inspections for 42 penetration seals at least once per 15 years (plus an additional 25 percent grace period) as required by the Fire Protection Program.

Description: Section 9.5.1.4 of the USAR stated the Fire Protection Program had a minimum inspection and testing frequency for components including penetration seals with the minimum inspection and testing frequency and the acceptable performance criteria described in administrative procedures. It further stated that the inspections and tests are prepared and conducted in accordance with the plant surveillance program for non-safety systems.

The licensee's procedure PAP-1910, "Fire Protection Program," Revision 32, contained the requirements for degraded fire protection conditions. Attachment 3, "Fire Protection Functional Specifications," Section 16.E.3.b of the procedure required, "Performing a visual inspection of 10 percent of each type of penetration seal." Section 16 also contained a note stating, "Specific criteria for determining functionality shall be as stated in the applicable Periodic Test Instruction." Procedure PTI-P54-P0056, "Penetration Seal Visual Inspection" required that each penetration seal will be inspected at least once per 15 years (allowing an additional 25 percent grace period).

During the inspection the inspectors requested records of fire barrier penetration inspections. While providing the response the licensee determined that 42 penetrations were not inspected as required by procedures PAP-1910 and PTI-P54-P0056 since 1996. The grace period for performing the inspections had expired in August 2015. The licensee had scheduled to inspect these penetration seals in 2013, but could not do so as they were located in inaccessible areas of the plant during operation due to radiation dose concerns. At that time the licensee referenced a notification to inspect these penetrations during the next outage. However, the licensee inappropriately closed the notification without creating an order to perform the inspections during the next outage.

The 42 penetration seals form a defense in depth to preclude fire in one fire zone from spreading into an adjacent fire zone. Further investigation on the seals revealed that two seals were covered in concrete, four seals were canister type penetrations with sealant inside of welded ends, and one seal was a pipe penetration. The remaining penetrations are Branch Technical Position 9.5-1 penetrations for building separation (of fire Zones) and were not credited for Safe Shutdown. Some of the 42 penetration seals are listed as Fire Safe Shutdown, and separate safety related areas or prevent exposure to safe shutdown or safety-related areas.

The licensee reviewed the historical performance of fire barrier penetration seals over the past 15 years and determined that of approximately 4,160 penetrations that were inspected during that time only two failures were identified due to degradation. The failed penetrations seals did not include any of the 42 missed penetration seals.

The licensee entered the issue into their CAP as CR-2015-12952, "2015 NRC Fire Protection Inspection – Barrier Penetration Inspections," dated September 30, 2015, and CR-2015-14855, "2015 NRC Fire Protection Inspection – Fire Barrier Penetrations Were Not Inspected as Required by PAP-1910," dated October 30, 2015. The licensee reviewed records in their Fire Expert Software to verify that there were no open transient combustible or hot work permits in the immediate area of the 42 penetration seals. The licensee will inspect the accessible portions of the barriers and will perform a full inspection at the next available opportunity. In addition, the Operations department will take administrative measures to avoid approving hot work or transient combustible permits for the affected areas.

Analysis: The inspectors determined that the licensee's failure to perform fire barrier penetration seal inspections was a performance deficiency and was contrary to the Fire Protection Program's requirement of inspection within every 15 years. Specifically, the licensee failed to perform fire barrier penetration seal inspections for 42 penetration seals at least once per 15 years (plus an additional 25 percent grace period).

The performance deficiency was determined to be more than minor because the finding was associated with the Mitigating Systems cornerstone attribute of Protection Against External Factors (Fire) and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee's failure to inspect the fire barrier penetrations could result in not identifying degraded seals which could affect their ability to prevent a fire from spreading from one fire area to another.

In accordance with IMC 0609, "SDP," Attachment 0609.04, "Initial Characterization of Findings," Table 2 the inspectors determined the finding affected the Mitigating Systems cornerstone. The finding degraded fire protection defense-in-depth strategies, and the inspectors determined, using Table 3, that it could be evaluated using Appendix F, "Fire Protection SDP."

The inspectors screened the finding using IMC 0609, Appendix F, Attachment 1, "Part 1: Fire Protection SDP Phase 1 Worksheet," dated September 20, 2013. The inspectors answered "yes" to Question 1.3.1, "Is the reactor able to reach and maintain safe shutdown (either hot or cold) condition?" in Task 1.3.1 of IMC 0609, Appendix F. The failure to inspect a portion of fire barrier penetration seals did not impact the plant's ability to reach and maintain safe shutdown. Even if some of the penetration seals were in a degraded condition they would likely provide some level of protection against fire spread. In addition, the historical performance of the penetration seal inspections shows a very low failure rate (2 failures out of 4,160 penetrations over the past 15 years). Therefore, the inspectors determined that the finding screened as having very low safety significance (Green).

The finding has a crosscutting aspect in the area of Human Performance, Work Management because the licensee did not implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority for fire penetration seal inspections. Specifically, the licensee improperly closed a notification to track the inspection of fire barrier penetrations without creating a work order. [H.5]

Enforcement: License condition 2.C(6) requires the licensee to implement and maintain in effect all provisions of the approved fire protection program as described in the FSAR, as amended, and as approved through Safety Evaluation Report (NUREG-0887) dated May 1982, and Supplement Numbers 1 through 10. Section 9A of the USAR described the approved fire protection program. Section 9.5.1.4 of the USAR stated the Fire Protection Program had a minimum inspection and testing frequency for components including penetration seals with the minimum inspection and testing frequency and the acceptable performance criteria described in administrative procedures. It further stated that the inspections and tests are prepared and conducted in accordance with the Plant Surveillance Program for non-safety systems. Procedure PTI-P54-P0056, "Penetration Seal Visual Inspection" required that each penetration seal will be inspected at least once per 15 years (allowing an additional 25 percent grace period).

Contrary to the above, since August, 2015, the licensee failed to implement and maintain in effect all provisions of the approved Fire Protection Program. Specifically, the licensee failed to perform fire barrier penetration seal inspections for 42 penetration seals at least once per 15 years. The licensee had last completed inspections of these seals in 1996, and the grace period for performing these inspections expired in August 2015.

This violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy because it was of very low safety significance and was entered into the licensee's CAP as CR-2015-14855. The licensee will inspect the accessible portions of the barriers and will perform a full inspection at the next available opportunity. (NCV 05000440/2015008-02, Failure to Inspect Penetration Seals Within the Required Time Frequency)

### .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.

The team observed an unannounced fire drill simulating a fire in the fuel oil pump house. The team observed fire brigade members fight a simulated fire. The team verified that the licensee identified problems, openly discussed them in a self-critical manner at the drill debrief, and identified appropriate corrective actions.

#### b. Findings

No findings 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 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 were identified

6. Circuit Analyses

a. Inspection Scope

The inspectors verified that the licensee performed a post-fire safe shutdown analysis for the selected fire areas and the analysis appropriately identified the structures, systems, and components important to achieving and maintaining safe shutdown. Additionally, the inspectors verified that the licensee's analysis ensured that necessary electrical circuits were properly protected and that circuits that could adversely impact safe shutdown due to hot shorts, shorts to ground, or other failures were identified, evaluated, and dispositioned to ensure spurious actuations would not prevent safe shutdown.

The inspectors' review considered fire and cable attributes, potential undesirable consequences, and common power supply/bus concerns. Specific items included the credibility of the fire threat, cable insulation attributes, cable failure modes, and actuations resulting in flow diversion or loss of coolant events.

The inspectors also reviewed cable raceway drawings for a sample of components required for post-fire safe shutdown to verify that cables were routed as described in the cable routing matrices.

The inspectors reviewed circuit breaker coordination studies to ensure equipment needed to conduct post-fire safe shutdown activities would not be impacted due to a lack of coordination. Additionally, the inspectors reviewed a sample of circuit breaker maintenance records to verify that circuit breakers for components required for post-fire safe shutdown were properly maintained in accordance with procedural requirements.

The inspectors verified for cables that are important to safe shutdown, but not part of the success path, and that do not meet the separation/protection requirements of Section III.G.2 of 10 CFR 50, Appendix R, that the circuit analysis considered the cable failure modes. In addition, the inspectors have verified that the licensee has either (1) determined that there is not a credible fire scenario (through fire modeling), (2) implemented feasible and reliable manual actions to assure safe shutdown capability, or (3) performed a circuit fault analysis demonstrating no potential impact on safe shutdown capability exists.

b. Findings

Failure to Provide Adequate Guidance to Override Spurious CO<sub>2</sub> Initiation Signal in the Diesel Generator Rooms

Introduction: The inspectors identified a finding of very low safety significance (Green), and an associated NCV of Technical Specifications (TS) Section 5.4.1.a for the licensee's failure to have adequate procedural guidance in their fire response procedure. Specifically, Procedure ONI-P54, "Fire," Revision 19, did not list all the fire areas where a potential fire induced spurious carbon dioxide (CO<sub>2</sub>) initiation in the emergency diesel generator (EDG) room could occur.

Description: The licensee identified in condition report CR-2009-60080 that circuits for the non-safety CO<sub>2</sub> suppression systems for the diesel generator rooms were located in fire zones 1CC-4a (division 2 cable spreading room), 1CC-4e (division 1 cable spreading room), 1CC-638/654 (control complex 638 elevation Corridor), and DG-1d (diesel generator building corridor). These circuits could be impacted by a fire in any of these fire zones, resulting in the shutdown of any/all of the three diesel generator room ventilation systems. In addition, a fire in zone DG-1d could also result in an inadvertent actuation of the CO<sub>2</sub> system in the diesel generator rooms. The licensee revised the Safe Shutdown Capability (SSC) Report, SSC-001, Revision 5 and credited the use of a manual override of the ventilation trip for maintaining a method of achieving safe shutdown free of fire damage. The SSC Report indicated that plant procedures have been modified to inform the operators that, for a fire in either of these zones, the CO<sub>2</sub> signal may have to be overridden to run the diesel generators.

The inspectors reviewed Procedure ONI-P54 and noticed that Attachment 1, Section 9, contained a note stating that a fire in the diesel building hallway could cause a spurious CO<sub>2</sub> initiation in the diesel rooms. The inspectors determined that the procedure failed to include all of the fire zones that have the potential to cause a spurious initiation CO<sub>2</sub> signal that could result in shutdown of any/all of the diesel generator room ventilation systems. The note in the procedure only referred to fire zone DG-1d and not to fire zones 1CC-4a, 1CC-4e, or 1CC-638/654. The guidance in Procedure ONI-P54 indicated that if the CO<sub>2</sub> initiation was spurious then refer to Procedure SOI-M43, "Diesel Generator Building Ventilation System." Step 7.3.1 of SOI-M43, Revision 13, stated to, "CONFIRM that the Fire Brigade Leader concurs with starting the room ventilation."

The inspectors were concerned because this action required contacting the Fire Brigade Leader during firefighting activities in one of the four affected zones. These actions could take time to complete, while in the meantime the EDG continue running with no room ventilation. Neither the operations procedures nor the SSC Report specified a time required to complete these actions. The operation of the EDGs and associated components in their rooms could be negatively impacted as a result of higher temperatures due to the ventilation system not operating. The licensee did not have a formal analysis to support the operation of the EDGs with no ventilation in the rooms.

Upon discovery, the licensee entered this issue into their CAP as CR- 2015-13910, "ONI-P54 Note Revision," dated October 14, 2015, and CR-2015-14456, "Less than Adequate Procedural Guidance for Actions Required to Mitigate a Spurious Diesel Generator Ventilation Trip," dated October 22, 2015. The licensee established hourly fire watches for the affected areas and issued a standing order to expeditiously determine if a CO<sub>2</sub> actuation in the EDG rooms is spurious. This would allow for a quicker restart of the ventilation system.

Analysis: The inspectors determined that the licensee's failure to have adequate procedure guidance in the fire response procedure was contrary to TS Section 5.4.1.a, and a performance deficiency. Specifically, Procedure ONI-P54 failed to identify the potential of a spurious CO<sub>2</sub> initiation in the EDG rooms that could occur in the event of a fire in either of fire zones 1CC-4a, 1CC-4e, or 1CC-638/654.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Protection Against External Events (Fire), and affected the cornerstone objective of ensuring the availability,

reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, a fire in any of the above fire zones could damage circuits for the nonsafety-related CO<sub>2</sub> systems for the EDG rooms causing a potential spurious CO<sub>2</sub> initiation in the diesel rooms and affecting the operation of the ventilation fans and dampers in the diesel rooms. The lack of adequate procedural guidance to override the CO<sub>2</sub> signal in the event of a fire in any of these zones and restart the ventilation fans in the diesel rooms could potentially impair the operation of the EDGs and affect shutdown of the plant.

In accordance with IMC 0609, "SDP," Attachment 0609.04, "Initial Characterization of Findings," Table 2 the inspectors determined the finding affected the Mitigating Systems Cornerstone. The finding degraded fire protection defense-in-depth strategies, and the inspectors determined, using Table 3, that it could be evaluated using Appendix F, "Fire Protection SDP."

The inspectors determined that the finding impacted the ability to achieve safe shutdown and assigned the finding to the category of 1.4.5 Post-fire Safe Shutdown using Table 1 in IMC 0609, Appendix F, Attachment 1, "Part 1: Fire Protection SDP Phase 1 Worksheet," dated September 20, 2013. The inspectors answered "no" to Question 1.4.5-B, "Does the fire finding affect the ability to reach and maintain a stable plant condition within the first 24 hours of a fire event?" in Task 1.4.5 of IMC 0609, Appendix F. The licensee had other procedural guidance for restarting the EDG rooms' ventilation systems that they could eventually use to restart the ventilation fans. In addition, the licensee had operating experience that showed that the EDGs could operate for a period of time without ventilation. Therefore, the inspectors determined that the finding screened as having very low safety significance (Green).

The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance. The licensee revised Procedure ONI-P54, which failed to identify all of the affected fire zones that could potentially cause spurious CO<sub>2</sub> initiation in the diesel rooms, and incorporated the Safe Shutdown Analysis findings in 2010.

Enforcement: Technical Specifications Section 5.4.1.a states, in part, that "written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." NRC Regulatory Guide 1.33, Appendix A, Section 6 addresses "Procedures for Combating Emergencies and Other Significant Events," and Section 6.v, addresses "Plant Fires." Procedure ONI-P54, "Fire," Revision 19, was the implementing procedure for responding to a fire event in the plant. Section 9.0 of Attachment 1 in Procedure ONI-P54 contained a note stating that, "A fire in the diesel building hallway could cause a spurious CO<sub>2</sub> initiation in the diesel rooms." The licensee determined in their SSC Report that a fire in three other fire zones (1CC-4a, 1CC-4e, and 1CC-638/654) could also cause a spurious CO<sub>2</sub> initiation in the diesel rooms.

Contrary to the above, from 2010 through November 23, 2015, the licensee failed to maintain fire response Procedure ONI-P54 as required per TS Section 5.4.1.a. Specifically, Section 9.0 of Attachment 1 in Procedure ONI-P54 failed to include guidance that a fire in fire zones 1CC-4a, 1CC-4e, or 1CC-638/654 could also potentially cause a spurious CO<sub>2</sub> initiation in the EDG rooms and that the CO<sub>2</sub> signal may have to be overridden in order to operate the ventilation fans in the diesel generator rooms.

This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was of very low safety significance and was entered into the licensee's CAP as CR-2015-13910 and CR-2015-14456. The licensee established hourly fire watches for the affected areas as a compensatory measure and planned to implement procedure changes. (NCV 05000440/2015008-03, Failure to Provide Adequate Guidance to Override Spurious CO<sub>2</sub> Initiation Signal in the Diesel Generator Rooms).

.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 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 walkdowns, the inspectors focused on the existence of sufficient emergency lighting for access and egress to areas and for performing necessary equipment operations. The locations and positioning of the emergency lights were observed during the walkdown and during review of manual actions implemented for the selected fire areas.

b. Findings

No findings 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 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 of the adequacy of short term compensatory measures to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

Failure to Perform Fire Watches

Introduction: The inspectors identified a finding of very low safety significance (Green), and an associated NCV of TS Section 5.4.1.a for the licensee's failure to perform fire watches in two fire areas for a non-functional fire barrier. Specifically, the licensee failed to perform fire watches as required by Section 16.D(1)a.(1) of Attachment 3 to procedure PAP-1910, "Fire Protection Program."

Description: The licensee identified a potential for a secondary fire to occur as a result of unfused direct current (DC) control circuits associated with various components. The licensee identified this concern in condition report CR-2014-10704, "Potential to Cause Secondary Fire Due to Unfused DC Circuits (LER 2014-003)," dated June 19, 2014. The components impacted by this condition were the turbine emergency bearing oil pump, turbine emergency seal oil pump, and the reactor feed pump turbine 'A' and 'B' emergency lube oil pumps. The circuits for these component were routed from the components to other areas of the plant. These areas comprised 14 fire zones in the plant.

The licensee's procedure PAP-1910, "Fire Protection Program," Revision 32, contained the requirements for degraded fire protection conditions. Attachment 3, "Fire\ Protection Functional Specifications," Section 16, "Fire Rated Assemblies" of the procedure specified actions to be taken if fire rated assemblies were not functional. Section 16.D(1) stated that if, "Any Appendix R or BTP [Branch Technical Position] 9.5-1 Fire Rated Assembly is not functional," then Section 16.D(1)a.(1) stated that, "If functional Detection Exists on at least one side of the barrier, establish an hourly firewatch patrol on one side of the affected barrier." The licensee generated impairment I-O-15-300761, and listed the fire zones where the circuits for the impacted components were routed. The impairment stated that, "Hourly firewatch to be performed to ensure there is no fire in any of the listed fire zones."

When the licensee added the impacted fire zones to the fire watch list they did not include the control room (fire zone CC-5a), and the control complex 599 foot elevation (fire zone CC-2a). These two fire zones were listed as affected zones in impairment I-O-15-300761. The control room is continuously manned and transient

combustibles and hot work activities are strictly controlled. In addition, any fire in the control room should be readily detected by the operators. The control complex 599 foot elevation area had separation of redundant trains of safe shutdown in accordance with 10 CFR Part 50, Appendix R, Section III.G.2 requirements. As a result, a potential fire in that area would impact one train of safe shutdown components and allow for the safe shutdown of the plant using the other train.

The licensee documented this issue in their CAP as CR-2015-13491, "2015 NRC Fire Protection Inspection – Fire Watch for Impairment I-O-15-300761," dated October 7, 2015. The licensee added the two areas to the fire watch list.

Analysis: The inspectors determined that the licensee's failure to establish fire watches in two fire areas was contrary to Procedure PAP-1910 and was a performance deficiency. Specifically, the licensee failed to perform fire watches as required by Section 16.D(1)a.(1) of Attachment 3 of the procedure in two fire areas that had a non-functional fire barrier.

The performance deficiency was determined to be more than minor because the finding, if left uncorrected, would become a more significant safety concern. Specifically, by failing to perform fire watches the licensee may not have been able to identify transient combustible materials that could have impacted the unprotected circuits associated with this deficiency in the event of a fire. The inspectors concluded this finding was associated with the Initiating Events cornerstone.

In accordance with IMC 0609, "SDP," Attachment 0609.04, "Initial Characterization of Findings," Table 2 the inspectors determined the finding affected the Initiating Events cornerstone. The finding degraded fire protection defense-in-depth strategies, and the inspectors determined, using Table 3, that it could be evaluated using Appendix F, "Fire Protection SDP."

The inspectors assigned the finding to the category of 1.4.1 Fire Prevention and Administrative Controls using Table 1 in IMC 0609, Appendix F, Attachment 1, "Part 1: Fire Protection SDP Phase 1 Worksheet," dated September 20, 2013. The inspectors answered "yes" to Question 1.4.1-B, "Would the impact of the fire finding be limited to no more than one train/division of equipment important to safety?" in Task 1.4.1 of IMC 0609, Appendix F. The required fire watches were not performed in the control room and the control complex 599 foot elevation. The control room is continuously manned and a fire in the control complex 599 foot elevation would not impact both safe shutdown trains. Therefore, the inspectors determined that the finding screened as having very low safety significance (Green)

This finding has a cross-cutting aspect in the area of Human Performance, Documentation because the licensee did not create and maintain complete, accurate, and up-to-date documentation. Specifically, when the licensee developed the fire watch list they did not include all impacted fire zones as listed in the initial impairment. [H.7]

Enforcement: Technical Specifications Section 5.4.1.a states, in part, that "written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." NRC Regulatory Guide 1.33, Appendix A, Section 1 addresses "Administrative Procedures," and Section 1.1, addresses "Plant Fire Protection Program." Procedure PAP-1910, Attachment 3, Step 16.D.1 states that if, "Any Appendix R or

BTP 9.5-1 Fire Rated Assembly is not functional, then Step 16.D.1.a(1) states, "If functional Detection Exists on at least one side of the barrier, establish an hourly firewatch patrol on one side of the affected barrier."

Contrary to the above, from June 19, 2014, until October 7, 2015, the licensee failed to implement Step 16.D.1.a.(1) of procedure PAP-1910. Specifically, the licensee failed to establish an hourly fire watch in two fire zones where a fire rated assembly was not functional.

This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was of very low safety significance, and was entered into the licensee's CAP as CR-2015-13491 and the licensee added the two areas to the fire watch list. (NCV 05000440/2015008-04, Failure to Perform Fire Watches).

.11 Review and Documentation of Fire Protection Program Changes

a. Inspection Scope

The inspectors reviewed changes to the approved Fire Protection Program to verify that the changes did not constitute an adverse effect on the ability to safely shutdown. The inspectors also reviewed the licensee's design control procedures to ensure that the process included appropriate reviews and controls to assess plant changes for any potential adverse impact on the fire protection program and/or post-fire safe shutdown analysis and procedures.

b. Findings

No findings were identified.

.12 Control of Transient Combustibles and Ignition Sources

a. Inspection Scope

The inspectors reviewed the licensee's 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. A sample of hot work and transient combustible control permits were also reviewed. The inspectors performed plant walkdowns to verify that transient combustibles and ignition sources were being implemented in accordance with the administrative controls.

b. Findings

No findings were identified.

.13 B.5.b Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's preparedness to handle large fires or explosions by reviewing selected mitigating strategies. 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 2515/171 or subsequent performances of these inspections.

The B.5.b mitigating strategies selected for review during this inspection are listed below. The offsite and onsite communications, notifications/emergency response organization activation, initial operational response actions and damage assessment activities identified in Table A.3 1 of Nuclear Energy Institute 06-12, “B.5.b Phase II and III Submittal Guidance,” Revision 2 are evaluated each time due to the mitigation strategies’ scenario selected.

|   |  |
|---|--|
| <b>NEI 06-12,<br/>Revision 2,<br/>Section</b> | <b>Licensee Strategy (Table)</b>             |
| 2.3.2   | Spent Fuel Pool External Spray (Table A.2-3) |

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

4OA2 Identification and Resolution of Problems (71152)

a. Inspection Scope

The inspectors reviewed the licensee’s CAP 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 CAP. The inspectors reviewed selected samples of condition reports, design packages, and fire protection system non-conformance documents.

b. Findings

No findings were identified.

#### 4OA6 Management Meetings

##### .1 Exit Meeting Summary

On December 29, 2015, the inspectors presented the inspection results to Mr. N. Conicella, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

##### .2 Interim Exit Meetings

On October 23 and November 23, 2015, the inspectors presented the inspection results to Mr. E. Harkness, and other members of the licensee staff.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

R. Briggs, Design Electrical Engineering Supervisor  
N. Conicella, Regulatory Compliance Manager  
D. Hamilton, Site Operations Director  
E. Harkness, Site Vice-President  
D. Lockwood, Regulatory Compliance Engineer  
D. Reeves, Site Engineering Director  
L. Zerr, Regulatory Compliance Supervisor

#### U.S. Nuclear Regulatory Commission

M. Marshfield, Senior Resident Inspector  
J. Nance, Resident Inspector

### LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

#### Opened and Closed

|                     |     |  |
|---------------------|-----|--|
| 05000440/2015008-01 | NCV | Failure to Ensure that Systems, Structures, and Components Necessary to Achieve and Maintain Hot Shutdown Conditions were Free of Fire Damage without Repair Actions (Section 1R05.1b) |
| 05000440/2015008-02 | NCV | Failure to Inspect Penetration Seals Within the Required Time Frequency (Section 1R05.2b)  |
| 05000440/2015008-03 | NCV | Failure to Provide Adequate Guidance to Override Spurious CO2 Initiation Signal in the Diesel Generator Rooms (Section 1R05.6b)  |
| 05000440/2015008-04 | NCV | Failure to Perform Fire Watches (Section 1R05.10b)   |

#### 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.

### **CALCULATIONS**

| <b><u>Number</u></b> | <b><u>Description or Title</u></b>                                       | <b><u>Rev.</u></b> |
|----------------------|--|--------------------|
| P54-24               | Calculation of Combustible Loading and Allowable Limits for Fire Loading | 4                  |
| SSC-001              | Appendix R Evaluation: Safe Shutdown Capabilities Report                 | 5                  |

### **CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED DURING INSPECTION**

| <b><u>Number</u></b> | <b><u>Description or Title</u></b>  | <b><u>Date</u></b> |
|----------------------|---|--------------------|
| 2015-12498           | 2015 NRC Fire Protection Inspection – Inadequate Engineering Evaluation in EER 600854859 Regarding Combustible Loading                              | 09/23/15           |
| 2015-12500           | 2015 NRC Fire Protection Inspection – B5B Cell Phone and Satellite Phone Batteries Have No Replacement Plan.  | 09/23/15           |
| 2015-12502           | 2015 NRC Fire Protection Inspection – House Keeping Issues Identified in NCC Heat Exchanger Room on Control Complex 599'                            | 09/23/15           |
| 2015-12507           | 2015 NRC Fire Protection Inspection – Access Panel Door in West Wall of NCC Pump Room Found Open  | 09/23/15           |
| 2015-12528           | 2015 NRC Fire Protection Inspection – Un-permitted Transient Combustibles on IB 599'  | 09/24/15           |
| 2015-12533           | 2015 NRC Fire Protection Inspection - Portable Dose Rate Monitor Not Functional   | 09/24/15           |
| 2015-12543           | 2015 NRC Fire Protection Inspection – OAI-1901 Procedure Implementation Issues  | 09/24/15           |
| 2015-12590           | 2015 NRC Fire Protection Inspection – Scaffold Inspection Greater than 2 Years Old  | 09/25/15           |
| 2015-12890           | 2015 NRC Fire Protection Inspection – Combustible Loading Concern in CC-620 Hallway; Fire Area 2CC-3e (Corridor Outside RCA Key Card Door)          | 09/29/15           |
| 2015-12899           | 2015 NRC Fire Protection Inspection – Lack of Procedural Restrictions Regarding Godwin and Champion Pump Unavailability                             | 09/29/15           |
| 2015-12920           | 2015 NRC Fire Protection Inspection – Inconsistent Documentation of B.5.b Equipment Issues/Deficiencies in the Corrective Action Program            | 09/29/15           |
| 2015-12952           | 2015 NRC Fire Protection Inspection – Barrier Penetration Inspections   | 09/30/15           |
| 2015-13080           | 2015 NRC Fire Protection Inspection – Inadequate OE Review of Information Notice 2013-09, Compressed Flammable Gas Cylinders and Associated Hazards | 10/01/15           |
| 2015-13184           | 2015 NRC Fire Protection Inspection – Calculation P54-024 Not Aligned with Actual Configuration   | 10/02/15           |

**CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED DURING INSPECTION**

| <b><u>Number</u></b> | <b><u>Description or Title</u></b>   | <b><u>Date</u></b> |
|----------------------|--|--------------------|
| 2015-13299           | 2015 NRC Fire Protection Inspection – Potential Non-Conformance with Appendix R due to Hot Shutdown Repairs for Valve 1P42F0665A                           | 10/05/15           |
| 2015-13474           | 2015 NRC Fire Protection Inspection: NRC Concerns during Triennial Fire Inspection Activities  | 10/07/15           |
| 2015-13491           | 2015 NRC Fire Protection Inspection – Fire Watch for Impairment I-O-15-300761  | 10/07/15           |
| 2015-13507           | 2015 NRC Fire Protection Inspection – Incorrect Procedure Revisions in Control Copy Binder   | 10/06/15           |
| 2015-13598           | 2015 NRC Fire Protection Inspection - Procedure Enhancement to FSG 50.2 Identified During Walkdown   | 10/06/15           |
| 2015-13787           | 2015 NRC Fire Protection Inspection – Champion Pump Maintenance and Operation Not Aligned with Vendor Recommendations or NORM-ER-3406                      | 10/13/15           |
| 2015-13788           | 2015 NRC Fire Protection Inspection - Incorrect Information in B.5.b (Godwin) Pump Annual Vendor Maintenance Work Orders                                   | 10/13/15           |
| 2015-13790           | 2015 NRC Fire Protection Inspection – Enhancement Opportunities for Godwin and Champion Pumps Use, Storage and Off-site Transport                          | 10/13/15           |
| 2015-13796           | 2015 NRC Fire Protection Inspection – Affected Calculation Not Updated with a Change to the Safe Shutdown Capabilities Report (SSC-001) Strategy.          | 10/13/15           |
| 2015-13797           | 2015 NRC Fire Protection Inspection – Potential Fuse Coordination Issue with Three Valves with Remote Shutdown Panel Controls.                             | 10/13/15           |
| 2015-13910           | 2015 NRC Fire Protection Inspection – ONI-P54 Note Revision  | 10/14/15           |
| 2015-14177           | 2015 NRC Fire Protection Inspection – Penetration ECC3462 Procedural Compliance Concern  | 10/19/15           |
| 2015-14190           | 2015 NRC Fire Protection Inspection – Drawings and USAR Figure Update  | 10/19/15           |
| 2015-14456           | 2015 NRC Fire Protection Inspection – Less Than Adequate Procedural Guidance for Actions Required to Mitigate a Spurious Diesel Generator Ventilation Trip | 10/22/15           |
| 2015-14457           | 2015 NRC Fire Protection Inspection – Items Found Above Ceiling in CC-599' Mens Locker Room  | 10/22/15           |
| 2015-14855           | 2015 NRC Fire Protection Inspection – Fire Barrier Penetrations Were Not Inspected as Required by PAP-1910   | 10/30/15           |

**CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED**

| <b><u>Number</u></b> | <b><u>Description or Title</u></b>                                     | <b><u>Date</u></b> |
|----------------------|--|--------------------|
| 2004-01446           | Ineffective Corrective Action PEN. Seals not Included in PTI-P54-P0056 | 03/23/04           |
| 2008-42297           | NRC Inspection – Initial Response Communication Walkdown Results       | 06/24/08           |
| 2008-42459           | NRC Inspection – Manual Operation of RCIC Strategy Enhancements        | 06/26/08           |

**CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED**

| <b><u>Number</u></b> | <b><u>Description or Title</u></b>   | <b><u>Date</u></b> |
|----------------------|--|--------------------|
| 2008-42461           | NRC Inspection – Enhancement to DC Power Supplies for Depress Strategy                               | 06/26/08           |
| 2010-86672           | Slight CO2 Leak Noted During ISLT Under WO 200201338   | 12/16/10           |
| 2011-94818           | Degraded Drywell Fire Penetration Seal   | 05/14/11           |
| 2011-94872           | Penetration Configuration does not Match Drawing   | 05/16/11           |
| 2014-10704           | Potential to Cause Secondary Fire Due to Unfused DC Circuits (LER 2014-003)                          | 06/19/14           |
| 2014-17587           | License Renewal – Degraded Fire Barrier Penetration Seals and Closures                               | 11/25/14           |
| 2015-07157           | 2015 Pre-NRC Fire Protection Assessment – Safe Shutdown Lights                                       | 05/15/15           |
| 2015-09342           | No Posted Transient Combustible Permit   | 07/09/15           |
| 2015-09383           | Fire Protection program Unacceptable Performance – 1 <sup>st</sup> Half 2015                         | 07/10/15           |
| 2015-09807           | Prompt Operability Determination for Division 2 Diesel Generator Room Excessive Maximum Temperatures | 07/23/15           |

**DRAWINGS**

| <b><u>Number</u></b> | <b><u>Description or Title</u></b>  | <b><u>Rev.</u></b> |
|----------------------|---|--------------------|
| 17-936               | Control Complex & Intermediate BLDG Cable Spreading Area Division 1                                     | 1                  |
| 17-936               | Control Complex Sprinklers EL 599' 0"   | 4                  |
| 201-0146-00003       | Electrical Fire Barrier Details Tray and Conduit  | L                  |
| 206-0044-00000       | Electrical One Line Diagram, Non-Class 1E 480V Bus XF1A   | TT                 |
| 214-0122-00000       | Electrical Cable Tray Layout Control Complex – West Elevation 599'                                      | R                  |
| 215-0121-00501       | Conduit Layout Control Complex – East Elevation 599'  | JJ                 |
| 218-0106-00000       | Electrical Off Site Communications Schematic  | L                  |
| 218-0107-00000       | Electrical Communications Radio Antenna System Schematic  | H                  |
| 218-0108-00000       | Electrical Communications Radio Heliacx Runs, Splitters, and Antenna                                    | K                  |
| 220-0834-00000       | Electrical Panel Details Lighting Panel R71P136   | N                  |
| D-214-121            | Electrical Cable Tray Layout Control Complex – East – Elevation 599'                                    | T                  |
| E-023-007            | Fire Protection Evaluation Units 1 and 2 Control Complex Plan EL 599' 0"                                | M                  |
| E-023-011            | Fire Protection Evaluation Units 1 and 2 Control Complex and Diesel Generator Buildings Plan EL 620' 6" | L                  |
| E-023-019            | Fire Protection Evaluation Units 1 and 2 Control Complex Plan EL 654' 6" and 678' 6"                    | 15                 |

**ENGINEERING CHANGE PACKAGE**

| <b><u>Number</u></b> | <b><u>Description or Title</u></b>           | <b><u>Date</u></b> |
|----------------------|--|--------------------|
| 00-8052              | Architectural Changes – 599' Control Complex | 10/02/04           |

## PROCEDURES

| <u>Number</u>                   | <u>Description or Title</u>                            | <u>Date or Rev.</u> |
|---------------------------------|--|---------------------|
| EPI-B1                          | Emergency Notification System                          | 25                  |
| FPI-A-T03                       | Champion Fire Pump Operator Instructions               | 5                   |
| FPI-A-T04                       | Godwin Pump Operator Instructions                      | 3                   |
| FPI-OCC                         | Pre-Fire Plan Pages 5, 6, 9, 10, 15, 16, 25, 26 33, 34 | 9                   |
| FSG 50.1                        | Fuel Pool Fill Using Fire Main or Portable Pump        | 1                   |
| FSG 50.2                        | Fuel Pool Spray Using Fire Main or Portable Pump       | 1                   |
| IOI-11                          | Shutdown From Outside Control Room                     | 32                  |
| IOI-11                          | Shutdown From Outside Control Room                     | 33                  |
| IOI-12                          | Maintaining Cold Shutdown                              | 15                  |
| NOP-LP-2001                     | Corrective Action Program                              | 36                  |
| NOP-SS-3100                     | Document Control Program                               | 3                   |
| OAI-1901                        | Emergency Management Overview                          | 3                   |
| ONI-C61                         | Evacuation of the Control Room                         | 9                   |
| ONI-E12-2                       | Loss of Decay Heat Removal                             | 33                  |
| ONI-P54                         | Fire   | 19                  |
| PAP-1910                        | Fire Protection Program                                | 32                  |
| PYBP-ERS-0003,<br>Attachment 14 | Jump Pack Cabinet Checklist                            | 14                  |
| TP-1C61-P-001                   | Remote Shutdown System Preoperational Test             | 05/02/85            |
| ARI-H13-P800-0001               | Heating Ventilation and Air Conditioning Control Panel | 7                   |

## VENDOR DOCUMENTS

| <u>Number</u> | <u>Description or Title</u>   | <u>Date</u> |
|---------------|---|-------------|
| —             | EXIDE Lightguard Emergency Lighting   | 1983        |
| —             | W.S. Darley & Co. Champion Pump Model PSE1500<br>Performance Specification Data | 12/14/01    |
| GEK-75616B    | Remote Shutdown System - Operation and<br>Maintenance                           | 02/1985     |
| GPASL.024905  | Godwin Pump Model HL5M Dri-Prime Performance<br>Specification Data              | 2003 - 2005 |

## WORK ORDERS

| <u>Number</u> | <u>Description or Title</u>                                | <u>Date</u> |
|---------------|--|-------------|
| 200296748     | Portable Fire Pump Annual Maintenance (Champion)           | 10/12/09    |
| 200342692     | Portable Fire Pump Annual Maintenance (Godwin)             | 09/25/09    |
| 200393644     | Functional Test PY-0R71 Lighting Group 3 (APP R)           | 05/05/15    |
| 200417146     | PY-1R71 Lighting and Receptacle System Repl & Func<br>Test | 12/02/13    |
| 200483488     | Operational Check on Godwin HL5M Pump 2                    | 01/25/15    |
| 200485866     | (18M) Penetration Seal Visual Inspection                   | 09/17/13    |
| 200536039     | Functional Test PY-0R71 Lighting Group 2 (APP R)           | 08/11/15    |
| 200553945     | Send Pump to Off-Site Vendor (Godwin)                      | 09/25/09    |
| 200554942     | Functional Test PY-0R71 Lighting Group 4                   | 07/30/15    |

**WORK ORDERS**

---

| <b><u>Number</u></b> | <b><u>Description or Title</u></b>                                 | <b><u>Date</u></b> |
|----------------------|--|--------------------|
| 200554944            | Function Test PY-0R71 Lighting Group 1                             | 12/23/14           |
| 200577316            | (18M) Penetration Seal Visual Inspection                           | 05/06/15           |
| 200587238            | Operational Check on Godwin HL5M Pump 2                            | 07/18/15           |
| 200608976            | Inspection of B.5.b Related Equipment                              | 08/17/15           |
| 200626364            | Fire Detection Instrumentation Functional Test for SDP<br>H51-P928 | 06/12/15           |

## LIST OF ACRONYMS USED

|                 |  |
|-----------------|--|
| ADAMS           | Agencywide Document Access Management System |
| BTP             | Branch Technical Position                    |
| CAP             | Corrective Action Program                    |
| CFR             | <i>Code of Federal Regulations</i>           |
| CO <sub>2</sub> | Carbon Dioxide                               |
| DC              | Direct Current                               |
| ECC             | Emergency Core Cooling                       |
| EDG             | Emergency Diesel Generator                   |
| FSAR            | Final Safety Analysis Report                 |
| IMC             | Inspection Manual Chapter                    |
| NCV             | Non-Cited Violation                          |
| NFPA            | National Fire Protection Association         |
| NRC             | U.S. Nuclear Regulatory Commission           |
| PARS            | Publicly Available Records                   |
| SDP             | Significance Determination Process           |
| SRV             | Safety Relief Valve                          |
| SSC             | Safe Shutdown Capability                     |
| TS              | Technical Specifications                     |
| USAR            | Updated Safety Analysis Report               |

D. Hamilton

-2-

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is 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 Nos. 50-440  
License Nos. NPF-58

Enclosure:  
Inspection Report 05000440/2015008  
w/Attachment: Supplemental Information

cc: Distribution via LISTSERV®

DISTRIBUTION:

Kimyata MorganButler  
RidsNrrPMPerry Resource  
RidsNrrDorLp3-2 Resource  
RidsNrrDirslrib Resource  
Cynthia Pederson  
Darrell Roberts  
Richard Skokowski  
Allan Barker  
Carole Ariano  
Linda Linn  
DRPIII  
DRSIII  
Jim Clay  
Carmen Olteanu

[ROPreports.Resource@nrc.gov](mailto:ROPreports.Resource@nrc.gov)

ADAMS Accession Number ML16005A548

Publicly Available     Non-Publicly Available     Sensitive     Non-Sensitive

To receive a copy of this document, indicate in the concurrence box "C" = Copy without attach/encl "E" = Copy with attach/encl "N" = No copy

|        |            |          |      |      |
|--------|------------|----------|------|------|
| OFFICE | RIII       | RIII     | RIII | RIII |
| NAME   | DSzwarc:cl | RDaley   |      |      |
| DATE   | 01/05/16   | 01/05/16 |      |      |

**OFFICIAL RECORD COPY**