Calvert Cliffs 1
1Q/2016 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance: G Dec 31, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Implement Procedures for the Control of Hazard Barriers During Maintenance
•Green. The inspectors identified a Green NCV of Technical Specification (TS) 5.4.1.a for Exelon's failure to implement procedures as required by Regulatory Guide (RG) 1.33, Appendix A, Section 1, "Administrative Procedures," during replacement of the 11 service water (SRW) pump motor, resulting in the SRW pump room door, a high energy line break (HELB) barrier, being impaired. This rendered the safety-related equipment protected by the HELB barrier inoperable. The inspectors determined that the failure to properly implement Exelon procedures EN-1-135, "Control of Barriers," Revision 00202, and CC-AA-201, "Plant Barrier Control Program," Revision 11, was a performance deficiency that was reasonably within Exelon's ability to foresee and prevent. Upon identification, Exelon staff entered this issue into their corrective action program (CAP) as issue report (IR) 2586773. Exelon's immediate corrective actions included halting of impairing hazard barriers without considering the degraded barrier's effect on equipment operability.

The inspectors reviewed IMC 0612, Appendix B, "Issue Screening," and determined the performance deficiency was more than minor because it adversely affected the equipment performance attribute of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Exelon's actions in blocking open the HELB barrier resulted in a condition where structures, systems, and components (SSCs) necessary to mitigate the effects of a HELB may not have functioned as required; therefore, the reliability of these protected SSCs was adversely impacted. In accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," issued on June 19, 2012, and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," issued on June 19, 2012, the inspectors determined that a detailed risk evaluation was necessary to disposition the significance of this finding because the finding represented a loss of the SRW system. A regional Senior Reactor Analyst (SRA) performed a detailed risk evaluation using an exposure interval of 10 minutes as the maximum time the condition was allowed in the plant. Using these inputs yielded an initiating event frequency of 4E-9/year. From discussions with the inspectors, the analyst confirmed a list of affected equipment. The analyst bounded the scenario by assuming all mitigating equipment would be lost which gave a maximum change in core damage frequency of 4E-9/year. Since the bounded change in core damage frequency was less than 1E-6, the finding was determined to be of very low safety significance (Green). The inspectors determined that the finding had a cross-cutting aspect in the area of Human Performance, Work Management, because Exelon did not implement a process of planning, controlling, and executing work activities such that nuclear safety was the overriding priority. Specifically, Exelon's process for planning and controlling maintenance did not identify the applicability of Exelon procedure CC-AA-201. [H.5] (Section 1R04)

Inspection Report# : 2015004 *(pdf)*

Significance: G Dec 31, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
AFAS Channel Inoperable due to Valve Miss-position
•Green. The inspectors documented a self-revealing Green NCV of TS 5.4.1.a for Exelon's failure to implement procedures as required by RG 1.33, Appendix A, Section 8, "Procedures for Control of Metering and Testing Equipment and for Surveillance Tests, Procedures, and Calibrations," during maintenance which resulted in a manual isolation valve (1HVFW-1804) being incorrectly placed in the closed position. This human performance error isolated the number 12 steam generator (SG) wide range level transmitter (1LT1124C) and subsequently rendered the auxiliary feedwater actuation system (AFAS) sensor channel ZF inoperable for 33 hours and 39 minutes, a condition prohibited by TS 3.3.4, "Engineered Safety Features Actuation System (ESFAS) Instrumentation." The inspectors determined that the failure to properly implement procedure STP M-525AT-1 and place 1HVFW-1804 in its required position was a performance deficiency that was reasonably within Exelon's ability to foresee and prevent. Upon identification, Exelon staff entered this issue into their CAP as condition report (CR)-2014-003320. Exelon's immediate corrective action was to enter TS 3.3.4.A, to determine and correct the cause, and to retest the system for proper operation.

The inspectors reviewed IMC 0612, Appendix B, "Issue Screening," and determined the issue is more than minor because it adversely affected the configuration control attribute of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Exelon operated with manual isolation valve, 1HVFW-1804 closed which resulted in the inoperability of the AFAS sensor channel ZF for approximately 33 hours and 39 minutes. In accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," issued on June 19, 2012, and IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions," issued on June 19, 2012, the inspectors determined that a detailed risk evaluation was necessary to disposition the significance of this finding because the finding represented an actual loss of function of at least a single train of AFAS for greater than its TS allowed outage time. A regional SRA performed a detailed risk evaluation. The finding was determined to be of very low safety significance (Green) because the redundant AFAS sensor was operable and functional to ensure actuation of the system if it had been required, therefore there was no loss of the system function. Additionally, the unit was in Mode 3 with very low decay heat levels during the time the ZF sensor channel was determined to be inoperable and plant procedures exist to manually start the AFW system if failure of automatic actuation were to occur. The inspectors determined that the finding has a cross-cutting aspect in the area of Human Performance, Challenge the Unknown, because Exelon did not stop when faced with an uncertain condition about the position of 1HVFW-1804. Specifically, personnel conducting the second verification did not appropriately question the position of isolation valve 1HVFW-1804 because of the higher experience level of the personnel conducting the first verification. [H.11] (Section 4OA3)

Inspection Report# : 2015004 *(pdf)*

Significance: G Dec 02, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Inadequate Verification of Offsite Power Operability Limit
The team identified a finding of very low safety significance involving a non-cited violation of Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," because Exelon did not ensure the operability of offsite power in design calculations. The team found that the voltage calculation performed by Exelon used non-quantified conservatism in the calculation in order to conclude offsite power was operable; however, the team did not find conservatisms in the calculation. Additionally, the team found non-conservative assumptions in the calculation resulting in the team questioning whether offsite power was operable.

The team determined that the non-conservative assumptions, in design basis calculations used to evaluate operability limit for offsite power was a performance deficiency. Specifically, the team found the analysis to demonstrate the operability of the Class 1E AC distribution system did not verify that vital buses would remain connected to the preferred offsite power source during design basis events. The performance deficiency was determined to be more than minor because it was similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, Example 3j, because the failure to perform these evaluations resulted in a reasonable doubt on the operability of the offsite power supply. Additionally, the performance deficiency was associated with the Mitigating Systems Cornerstone attribute of Design Control and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated the finding in accordance with Inspection Manual Chapter (IMC) 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power, Exhibit 2 – Mitigating Systems Screening Questions," and determined that the finding was of very low safety significance (Green) because the finding was a design deficiency that did not result in the loss of operability or functionality. The team did not identify a cross-cutting aspect with this finding because it did not represent current performance. The inadequate calculation was developed outside of the timeframe that reflected current performance.
Inspection Report# : 2015007 *(pdf)*

Significance: G Dec 02, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Verify AC Equipment Operability at Design Loading and Voltage Levels
The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," because Exelon failed to verify, in design basis calculations, that all required Class 1E AC components would perform their safety functions during design basis events. Specifically, the team found multiple examples where Exelon failed to ensure AC equipment operability and functionality at maximum postulated loading levels and minimum allowable voltage levels.

The team determined that the failure to verify that all required Class 1E AC components would perform their safety functions during design basis events was a performance deficiency. The performance deficiency was determined to be more than minor because it was similar to IMC 0612, "Power Reactor Inspection Reports," Appendix E, Example 3j, because the failure to perform these evaluations resulted in a reasonable doubt on the operability of the offsite power supply. Additionally, the performance deficiency was associated with the Mitigating Systems Cornerstone attribute of Design Control, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated the finding in accordance with Inspection Manual Chapter (IMC) 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power, Exhibit 2 – Mitigating Systems Screening Questions," and determined that the finding was of very low safety significance (Green) because the finding was a design deficiency that did not result in the loss of operability or functionality. The team did not identify a cross-cutting aspect with this finding because it did not represent current performance. The inadequate calculation was developed outside of the timeframe that reflected current performance.
Inspection Report# : 2015007 *(pdf)*

Significance: G Oct 09, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Untimely Actions to Test or Inspect DFO Check Valves Relied on for Safety
Green. The inspectors identified a Green NCV of Title 10 of the Code of Federal Regulations (10 CFR) 50, Appendix B, Criterion XVI, "Corrective Action," because Exelon did not assure that conditions adverse to quality were

promptly corrected. Specifically, from November 2012, until October 28, 2015, Exelon did not ensure that diesel fuel oil (DFO) transfer system header check valves DFO-146 and DFO-148 were properly tested or inspected to ensure they would perform their safety function. This issue was previously documented as a NCV of 10 CFR 50, Appendix B, Criterion XI, "Test Control," in inspection report 05000317, 318/2013003.

The inspectors determined that not promptly correcting a condition adverse to quality previously documented in an NCV was a performance deficiency that was within Exelon's ability to foresee and prevent. This finding is more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affects the cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the safety function of DFO-146 and DFO-148, to close on the failure of a fuel oil storage tank to prevent draining the unaffected tank had never been verified though test or inspection since initial plant construction; therefore, reasonable doubt exists whether the valves remained capable of performing that function. The inspectors evaluated the significance of this finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that this finding was of very low safety significance (Green) because the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather event. The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance Procedure Adherence because Exelon staff did not follow station processes, procedures, and work instructions. Specifically, Exelon staff did not ensure corrective action due date extensions and cancellations were justified, evaluated for adverse consequences, and presented to the Management Review Committee (MRC) as required by station procedures. As a result, corrective actions to restore compliance were not completed in a timely manner. [H.8]

Inspection Report# : 2015010 *(pdf)*

Significance: G Sep 30, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Establish and Maintain Procedures for the Operation of the Diesel Fuel Oil System
•Green. The inspectors identified a Green NCV of Technical Specification (TS) 5.4.1.a for Exelon's failure to adequately establish and maintain procedures as required by Regulatory Guide (RG) 1.33, Appendix A, Section 3, "Procedures for Startup, Operation, and Shutdown of Safety-Related PWR Systems." The inspectors determined that Exelon's failure to adequately establish and maintain a procedure for the operation of the diesel fuel oil (DFO) supply system was a performance deficiency. Exelon entered this issue into their corrective action program (CAP) as issue report (IR) 02541107. Exelon's immediate corrective actions included halting of opening of 0-DFO-108, 21 Fuel Oil Storage Tank (FOST) to Auxiliary Boilers Isolation, and initiating an evaluation to determine the seismic adequacy of the piping downstream of 0-DFO-108.

The inspectors reviewed IMC 0612, Appendix B, "Issue Screening," and determined the issue is more than minor because it adversely affected the protection against external factors attribute of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to adequately establish and maintain procedure Operating Instruction (OI)-21D, "Fuel Oil Storage and Supply," Revision 10, for the operation of the DFO supply system resulted in the alignment of the safety-related 21 FOST to non-safety-related/non-seismically qualified piping thus rendering the 21 FOST inoperable. In accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," issued on June 19, 2012, and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," and Exhibit 4, "External Events Screening Questions," issued on June 19, 2012, the inspectors determined that a detailed risk evaluation was necessary to disposition the significance of this finding because the loss of the 21 FOST would degrade two or more trains of a

multi-train system or function. A regional Senior Reactor Analyst (SRA) performed a detailed risk evaluation and determined the finding to be of very low safety significance (Green). The inspectors determined that the finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience, because Exelon failed to adequately evaluate relevant external operating experience. Specifically, Exelon failed to evaluate for systems where non-seismically qualified piping could be connected to safety-related tanks as was described in Information Notice (IN) 2012-01, "Seismic Considerations – Principally Issues Involving Tanks." [P.5]. (Section 1R15)

Inspection Report# : 2015003 *(pdf)*

Significance: G Jun 30, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Inadequate Maintenance Instructions for Replacement of the Units 1 and 2 Containment Air Cooler Starters
•Green. The inspectors identified a Green NCV of Title 10 of the Code of Federal Regulations (10 CFR) 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to include appropriate quantitative acceptance criteria for determining the auxiliary contacts and mechanical interlocks were properly installed and adjusted when the Units 1 and 2 containment air coolers (CAC) starters and contactors were replaced during plant modifications. The starter and contactors with associated mechanical interlocks and auxiliary contacts provide the necessary electrical coordination to shift the CACs from fast to slow speed during a safety injection actuation signal (SIAS). The starter and contactor replacements occurred from July 2002 to July 2004. The inspectors determined that Exelon's failure to include appropriate quantitative acceptance criteria for determining the auxiliary contacts and mechanical interlocks were properly installed and adjusted when the Units 1 and 2 CAC starters and contactors were replaced during plant modifications is a performance deficiency. Exelon entered this issue into their corrective action program (CAP) as IR02408755, completed an apparent cause evaluation (ACE), and completed corrective action work orders (WO) to adjust all associated starters and contactors auxiliary contacts.

The inspectors reviewed IMC 0612, Appendix B, "Issue Screening," and determined the issue is more than minor because it is associated with the Mitigating Systems cornerstone attribute of design control and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Initial Characterization of Findings," issued on June 19, 2012, and IMC 0609, Appendix A, "The Significance Determination Process for Findings At Power," Exhibit 2, "Mitigating Systems Screenings Questions," issued on June 19, 2012, and determined a detailed risk evaluation was required for the actual loss of function of the 13 CAC for greater than its technical specification (TS) allowed outage time. A regional Senior Reactor Analyst performed a detailed risk evaluation using the Calvert Cliffs Standardized Plant Analysis Risk (SPAR) Model for Calvert Cliffs Unit 1, Version 8.27, for internal events and determined the finding to be of very low safety significance (Green). The inspectors determined that the finding did not have a cross-cutting aspect because the issue was not indicative of current licensee performance. (Section 4OA2.1)

Inspection Report# : 2015002 *(pdf)*

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Significance: G Jun 30, 2015
Identified By: NRC
Item Type: NCV Non-Cited Violation
Failure to Properly Ship Category 2 Radioactive Material - Quantity of Concern
•Green. The inspectors identified a Green NCV of 10 CFR 71.5, “Transportation of Licensed Material,” and CFR 172, Subpart I, “Safety and Security Plans.” Specifically, Exelon personnel shipped a Category 2 radioactive material quantity of concern (RAM-QC) on public highways to a waste processor without adhering to a transportation security plan. Prior to shipment, Exelon’s staff failed to recognize that the quantity of radioactive material met the definition RAM-QC. The inspectors determined that Exelon’s failure to ship material as a Category 2 RAM-QC was a performance deficiency. Exelon entered this issue into their CAP as IR02481678 and corrective actions included revising the shipping procedure to reflect the appropriate Department of Transportation requirements for shipment of Category 2 radioactive material. Additionally, Exelon implemented a formal process for reviewing pending regulatory changes for impacts to operations and support activities by the implementation of Exelon Procedure LS-AA-110, “Commitment Management,” Revision 10, in September 2014.

The inspectors reviewed IMC 0612, Appendix B, “Issue Screening,” and determined the issue is more than minor because it is associated with the program and process attribute of the Public Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. In accordance with IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process," issued on February 12, 2008, the inspectors determined the finding to be of very low safety significance (Green) because Exelon had an issue involving transportation of radioactive material, but it did not involve: (1) a radiation limit that was exceeded; (2) a breach of package during transport; (3) a certificate of compliance issue; (4) a low level burial ground nonconformance; or (5) a failure to make notifications or provide emergency information. The inspectors determined that the finding did not have a cross-cutting aspect because the issue was not indicative of current licensee performance because Exelon successfully implemented its transportation security plan in shipping three Category 2 RAM-QC packages in 2014. (Section 2RS8)

Inspection Report# : 2015002 *(pdf)*

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the cover letters to security inspection reports may be viewed.

Miscellaneous

Significance: N/A Oct 09, 2015
Identified By: NRC
Item Type: FIN Finding
Biennel PI&R Overall Assessment
The inspectors concluded that Exelon Generating Company, LLC (Exelon) was generally effective in identifying, evaluating, and resolving problems. Exelon personnel identified problems, entered them into the CAP at a low threshold, and prioritized issues commensurate with their safety significance. In most cases, Exelon appropriately screened issues for operability and reportability, and performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. The inspectors also determined that Exelon typically implemented corrective actions to address the problems identified in the CAP in a timely manner. However, the inspectors identified one violation of NRC requirements in the area of timely and effective corrective actions.

The inspectors concluded that, in general, Exelon adequately identified, reviewed, and applied relevant industry operating experience to Calvert Cliffs' operations. In addition, based on those items selected for review, the inspectors determined that Exelon's self-assessments and audits were thorough.

Based on the interviews the inspectors conducted over the course of the inspection, observations of plant activities, and reviews of individual CAP and Employee Concerns Program issues, the inspectors did not identify any indications that site personnel were unwilling to raise safety issues nor did they identify any conditions that could have had a negative impact on the site's safety conscious work environment.

Inspection Report# : 2015010 *(pdf)*

Last modified : July 11, 2016