Limerick 2
2Q/2012 Plant Inspection Findings

Initiating Events

Significance: G Sep 30, 2011
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Provide Adequate Restoration Instructions for Turbine Control Valve Online Maintenance
A Green, self-revealing finding was identified because Exelon did not provide adequate instructions for restoration of the Limerick Unit 2 number three turbine control valve (CV #3) following maintenance. During a fill and vent activity of the electro-hydraulic control (EHC) supply line for CV #3, a void in the system piping resulted in a low pressure condition at the next-in-series control valve, CV #1. The pressure drop actuated a relayed emergency trip system (RETS) pressure switch, generating a reactor protection system (RPS) 'B' side half scram signal. Combined with an 'A' side half scram signal that was previously inserted into RPS due to the CV #3 being maintained closed, an automatic reactor scram resulted.

The inspectors determined that Exelon's failure to provide adequate instructions for restoration of CV #3 from maintenance was a performance deficiency. The issue was more than minor because it was associated with the Procedure Quality attribute of the Initiating Events cornerstone, and it affected the cornerstone objective of limiting the likelihood of events that upset plant stability. Specifically, on May 29, 2011, Limerick Unit 2 experienced an automatic reactor scram during restoration of turbine CV #3 from maintenance. The restoration instructions in the work order (WO) did not provide sufficient guidance to address the presence of a large air void in the EHC system that had the potential to cause EHC pressure fluctuations and resulted in a reactor scram. The finding was determined to be of very low safety significance (Green) in accordance with IMC 0609 Attachment 4, "Phase 1- Initial Screen and Characterization of Findings," because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. This finding had a cross-cutting aspect in the area of Human Performance, Decision-Making, because Exelon did not use a systematic process to make a risk-significant decision when faced with uncertain or unexpected plant conditions. Specifically, Exelon did not recognize the potential risk of the CV #3 EHC fill and vent restoration activity, and they failed to conduct a thorough technical review of the restoration plan. [H.1.(a)] (Section 4OA3.3)

Inspection Report# : 2011004 *(pdf)*

Mitigating Systems

Significance: G Jun 30, 2012
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Conduct Timely Corrective Actions to Replace Age Degraded Relays
The inspectors identified a Green NCV of 10 Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion XVI, "Corrective Action," because Exelon failed to conduct timely corrective actions to preclude repetition of a condition adverse to quality involving the replacement of age degraded direct current motor operated valve (DC MOV) relays. Specifically, Exelon experienced multiple failures of ARD type relays that were known to be susceptible to age-related degradation once past their vendor recommended lifetime. Exelon's equipment apparent cause evaluations (EACEs) for the most recent ARD relay failures failed to prioritize the replacement of these relays which led the preventative maintenance (PM) for the relay replacement to be scheduled as much as 8 years past their vendor recommended lifetime and contributed to the March 2012 relay failure. In addition to the untimely corrective actions,

the licensee's extent of condition performed as part of the 2010 EACE was too narrowly focused, contributing to their failure to recognize and address all the relays that were susceptible to age-related failures. Exelon identified the narrowly focused EOC as part of their 2012 EACE and has entered both issues in their corrective action program (CAP) for resolution (AR 1380603, AR 1380605 and ACIT 1341695-14).

The inspectors determined that the failure to implement timely corrective actions was a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was determined to be of very low safety significance (Green) using Attachment 4 to IMC 0609, "Significance Determination Process," because the incomplete corrective actions did not result in an actual loss of safety function. The finding has a cross cutting aspect in the corrective action component of the problem identification and resolution area because the licensee did not thoroughly evaluate problems such that the resolutions address causes and extent of conditions, as necessary, including properly classifying, prioritizing, and evaluating for operability and reportability conditions adverse to quality. [P.1(c)] (Section 1R13)

Inspection Report# : 2012003 *(pdf)*

Significance: G Dec 31, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Corrective Actions for a Previous NRC Finding for Programmatic Deficiencies in the Preventive Maintenance Program
The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to implement adequate corrective actions for a previous NRC identified finding. The previous finding involved a failure to perform adequate preventive maintenance (PM) on an emergency diesel generator (EDG) due to site engineers not being fully aware of new PM requirements developed by Exelon corporate. The lack of proper PM led to a failure of the diesel in May 2010. In response to the previous finding, Limerick performed an apparent cause evaluation (ACE) and developed actions to address the causes and extent of condition. However, the inspectors identified that the actions were not properly implemented, and, as a result, the deficiency identified by the inspectors was not fully resolved. Exelon entered the issue in the Corrective Action Program (CAP) for resolution.

The inspectors determined that the failure to implement adequate corrective actions for a previous NRC-identified finding was a performance deficiency. The issue is more than minor because, if left uncorrected, it could become a more significant safety concern. Specifically, the issues identified by the inspectors impacted Limerick's ability to establish and implement appropriate PM for equipment relied on for safe operation of the plant. Until the issues are fully resolved, Limerick continues to be vulnerable to gaps in their PM program. This issue potentially affects all sites in the Exelon fleet. The finding was determined to be of very low safety significance (Green) using Attachment 4 to IMC 0609, "Significance Determination Process," because the incomplete corrective actions did not result in an actual loss of safety function.

This finding has a cross-cutting aspect I the area of Problem Identification and Resolution, Corrective Action Program, because Exelon failed to implement appropriate corrective actions for a previous NRC identified finding in timely manner. [P.1(d)] (Section 1R19)

Inspection Report# : 2011005 *(pdf)*

Significance: W Dec 08, 2011
Identified By: NRC
Item Type: VIO Violation
Failure of Feedwater MOV Resulting in RCIC Inoperability for Longer than Allowed by Technical Specifications (Final Significance Determination)
A self-revealing White finding and violation of Technical Specification (TS) 3.7.3, "Reactor Core Isolation Cooling System and TS 3.6.3, "Primary Containment Isolation Valves," was identified. The inspectors determined that the

failure by Exelon to ensure sufficient technical guidance was contained in operating procedures to: 1) ensure that a Main Feedwater system (FW) motor-operated valve (MOV) could close against expected system differential pressures and 2) prevent operators from attempting to close FW MOVs out of sequence resulting in differential pressures for which they are not designed; is a performance deficiency. This resulted in the Reactor Core Isolation Cooling system (RCIC) and a Primary Containment Isolation Valve (PCIV) being inoperable from April 23 to May 23, 2011, due to FW MOVs HV-041-209B and HV-041-210 failing to fully shut. As a result, both safety related systems were inoperable for greater than their Technical Specification allowed outage times. Specifically, operations procedures did not contain adequate technical guidance to ensure that operations personnel operated HV-041-209 A&B and HV-041-210 in the proper sequence to remain within valve design limitations. This resulted in the HV-041-209B and HV-041-210 valves failing to fully close on April 22, 2011, although they indicated closed in the Main Control Room. Upon identification, Limerick operations staff fully closed the valves restoring RCIC and PCIV operability, entered the issue into the CAP as issue report 1219476 and conducted a cause evaluation. Subsequent corrective actions included an extent-of-condition review, revisions to the operating procedure, and revisions to maintenance and testing procedures.

The inspectors determined that this finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, operating procedures, maintenance and testing were not adequately implemented to ensure that the design capability of HV-041-209B and HV-041-210 to close against expected system differential pressures was maintained. The finding was evaluated using NRC Inspection Manual Chapter 0609 Appendix A, “User Guidance for Significance Determination of Reactor Inspection Findings for At-Power Situations.” Phase I, II, and III evaluations were conducted. The NRC total estimated ?CDF in this preliminary assessment is Low E-6/yr (WHITE) and the NRC total estimated Large Early Release Frequency (?LERF) in this preliminary assessment is 3.6E-9/yr (GREEN). The inspectors also determined that this issue has a cross-cutting aspect in the area of Human Performance, Resources, because Exelon did not ensure long term plant safety by maintaining design margins and minimizing preventive maintenance deferrals [H.2. (a)]. Specifically, design limitations of the HV-041-209 A & B valves were not adequately captured in the procedural guidance, which contributed to the operators continuing on in the procedures for securing the FW long path recirculation line up when problems with the HV-041-210 valve were encountered. Additionally preventive maintenance activities which could potentially have prevented this issue were deferred without an appropriate evaluation. (Section 4OA2.2)

Inspection Report# : 2011009 *(pdf)*

Significance: G Nov 04, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Verify Alternate AC Source Capability to Recover from Station Blackout
The team identified a non-cited violation of 10 CFR 50.63, “Loss of All Alternating Current (AC) Power,” because Exelon did not demonstrate that the alternate AC (AAC) source could provide acceptable capability to withstand a station blackout (SBO) within the analyzed coping timeline. Specifically, Exelon’s evaluation of the Limerick Generating Station’s excess emergency diesel generator (EDG) capacity did not analyze the effects of the loss of an operating emergency service water (ESW) pump following a single failure on the non-blacked out unit. The loss of the ESW pump would result in loss of cooling to one of the three credited EDGs and a subsequent high temperature trip of the EDG. The team determined the time delay to reset this trip had not been evaluated and that Exelon had not performed the timed test required by 10 CFR 50.63 to show that actions required to provide power to the blacked-out unit from the AAC could be performed within the analysis requirements. As a result, the team concluded that Exelon did not demonstrate that the AAC source would have the required availability and capability within the analyzed timeline. Exelon entered the issue into their corrective action program for evaluation and resolution.

This issue was more than minor because it is associated with the design control attribute of the Mitigating Systems cornerstone 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 determined the finding was of very low safety significance because it was a design or qualification deficiency confirmed not to result in a loss of functionality. The finding had a cross-cutting aspect in the area in the area of Problem Identification and Resolution,

Corrective Action Program Component, because Exelon did not thoroughly evaluate problems such that resolutions address causes and extent of conditions and did not conduct effectiveness reviews to ensure problems are resolved. Specifically, Exelon's recent safety evaluation did not evaluate problems associated with a loss of an EDG due to a high temperature condition and the impact on the SBO AAC power source availability. (IMC 0310, Aspect P.1(c)) (1R17.1b)

Inspection Report# : 2011007 *(pdf)*

Barrier Integrity

Emergency Preparedness

Significance: G Aug 19, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
(Traditional Enforcement) Changes to EAL Basis Decreased the Effectiveness of the Plan without Prior NRC Approval
The inspector identified a finding of very low safety significance involving a Severity Level IV NCV of 10 CFR 50.54 (q) for failing to obtain prior approval for an emergency plan change which decreased the effectiveness of the plan. Specifically, the licensee modified the Emergency Action Level (EAL) Basis in EAL HU6, Revision 13, which indefinitely extended the start of the 15-minute emergency classification clock beyond a credible notification that a fire is occurring or indication of a valid fire detection system alarm. This change decreased the effectiveness of the emergency plan by reducing the capability to perform a risk significant planning function in a timely manner.
The violation affected the NRC's ability to perform its regulatory function because it involved implementing a change that decreased the effectiveness of the emergency plan without NRC approval. Therefore, this issue was evaluated using Traditional Enforcement. The NRC determined that a Severity Level IV violation was appropriate due to the reduction of the capability to perform a risk significant planning standard function in a timely manner. The licensee entered this issue into its corrective action program and revised the EAL basis to restore compliance.
The finding was more than minor using IMC 0612, because it is associated with the emergency preparedness cornerstone attribute of procedure quality for EAL and emergency plan changes, and it adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Therefore, the performance deficiency was a finding. Using IMC 0609, Appendix B, the inspector determined that the finding had a very low safety significance because the finding is a failure to comply with 10 CFR 50.54(q) involving the risk significant planning standard 50.47(b)(4), which, in this case, met the example of a Green finding because it involved one Unusual Event classification (EAL HU6).
Due to the age of this issue, it was not determined to be reflective of current licensee performance and therefore a cross-cutting aspect was not assigned to this finding.

Inspection Report# : 2011503 *(pdf)*

Significance: G Aug 19, 2011
Identified By: NRC
Item Type: FIN Finding
Changes to EAL Basis Decreased the Effectiveness of the Plan without Prior NRC Approval
The inspector identified a finding of very low safety significance involving a Severity Level IV NCV of 10 CFR 50.54 (q) for failing to obtain prior approval for an emergency plan change which decreased the effectiveness of the plan. Specifically, the licensee modified the Emergency Action Level (EAL) Basis in EAL HU6, Revision 13, which

indefinitely extended the start of the 15-minute emergency classification clock beyond a credible notification that a fire is occurring or indication of a valid fire detection system alarm. This change decreased the effectiveness of the emergency plan by reducing the capability to perform a risk significant planning function in a timely manner.
The violation affected the NRC's ability to perform its regulatory function because it involved implementing a change that decreased the effectiveness of the emergency plan without NRC approval. Therefore, this issue was evaluated using Traditional Enforcement. The NRC determined that a Severity Level IV violation was appropriate due to the reduction of the capability to perform a risk significant planning standard function in a timely manner. The licensee entered this issue into its corrective action program and revised the EAL basis to restore compliance.
The finding was more than minor using IMC 0612, because it is associated with the emergency preparedness cornerstone attribute of procedure quality for EAL and emergency plan changes, and it adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Therefore, the performance deficiency was a finding.
Using IMC 0609, Appendix B, the inspector determined that the finding had a very low safety significance because the finding is a failure to comply with 10 CFR 50.54(q) involving the risk significant planning standard 50.47(b)(4), which, in this case, met the example of a Green finding because it involved one Unusual Event classification (EAL HU6).
Due to the age of this issue, it was not determined to be reflective of current licensee performance and therefore a cross-cutting aspect was not assigned to this finding.

Inspection Report# : 2011503 *(pdf)*

Occupational Radiation Safety

Significance: N/A Mar 31, 2012
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Make a 10CFR 50.72(b)(2)(xi) Notification
The inspectors identified a Severity Level (SL) IV NCV of 10 Code of Federal Regulations (CFR) 50.72(b)(2)(xi) because the NRC Operations Center was not notified via the Emergency Notification System (ENS) within four hours of a reportable event related to the health and safety of the public and protection of the environment for which notification to other government agencies was made. Exelon did make a courtesy notification to the NRC resident inspection staff. However, Exelon did not formally report, to the NRC Operations Center, the notification of other government agencies regarding an abnormal radioactive liquid release, from the Limerick Generating Station common cooling tower blow down line on March 19, 2012. Inspectors performed system walkdowns and conducted an event follow-up inspection on March 20, 2012 to assess the impacts of the overflow event.
This deficiency was evaluated using the traditional enforcement process since the failure to make a required report could adversely impact the NRC's ability to carry out its regulatory mission. The deficiency was evaluated using the criteria contained in Section 6.9(d)(9) of the NRC's Enforcement Policy and determined to meet the criteria for disposition as a SL IV NCV.
Exelon took immediate corrective actions pertaining to the abnormal release, including suspension of effluent releases via the cooling tower blow down line and initiation of actions to evaluate the cause and preclude recurrence, as well as the conduct of public dose calculations. Additionally, upon identification by the NRC that the issue was reportable, Exelon subsequently reported the event to the NRC Operations Center on April 11, 2012. Exelon also entered this issue into its corrective action program (IR 1347829).
This violation involved a failure to make a required report to the NRC and is considered to impact the regulatory process. Such violations are dispositioned using the traditional enforcement process instead of the Significance Determination Process. Using the Enforcement Policy Section 6.9, "lnaccurate and Incomplete Information or Failure to Make a Required Report," example (d)(9), which states, "A licensee fails to make a report required by 10 CFR 50.72 or 10 CFR 50.73," the NRC determined that this violation is more than minor and categorized as a SL lV violation. Because this violation involves the traditional enforcement

process with no underlying technical violation that would be considered more than minor in accordance with IMC 0612, a cross-cutting aspect is not assigned to this violation.
(Section 4OA3)
Inspection Report# : 2012002 *(pdf)*

Public Radiation Safety

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 Jun 15, 2012
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to submit an LER revision for conditions Prohibited by TS associated with the HPCI and RCIC Systems
SL-IV: The inspectors identified a Severity Level (SL) IV non-cited violation (NCV) of 10 CFR Part 50.73, “Licensee Event Report [LER] System,” because violations of Technical Specifications (TS) 3.5.1 and 3.0.3 for the condition of the high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) systems being simultaneously inoperable were not reported to the NRC within 60 days of discovery. After this was identified by the inspectors, the issue was entered into Exelon’s CAP as IR 1377559.

The inspectors determined that the failure to revise LER 05000353/2011-003-00 within 60 days of initial issuance on July 21, 2011 to include the violations of TS 3.5.1 and 3.0.3 in accordance with 10 CFR Part 50.73 was a performance deficiency that was reasonably within Exelon’s ability to foresee and correct, and should have been prevented. Because the issue impacted the regulatory process, in that a violation of Technical Specifications was not reported to the NRC within the required timeframe, and delayed the NRC’s opportunity to review the matter in its completion, the inspectors evaluated this performance deficiency in accordance with the traditional enforcement process. Using example 6.9.d.9 from the NRC Enforcement Policy, the inspectors determined the performance deficiency was a SL IV violation, because Exelon personnel did not make a report required by 10 CFR Part 50.73. In accordance with Inspection Manual Chapter (IMC) 0612, Appendix B, traditional enforcement issues are not assigned cross-cutting aspects. The significance of the associated performance deficiency was screened against the ROP per the guidance of IMC 0612, Appendix B, and the inspectors determined it to be minor because it was not similar to Appendix E examples, was not a precursor to a significant event, did not cause a PI to exceed a threshold, did not adversely affect cornerstone objectives, and if left uncorrected would not have lead to a more significant safety concern. As such, no ROP finding was identified and no cross-cutting aspect was assigned. (Section 4OA4)
Inspection Report# : 2012008 *(pdf)*

Last modified : September 12, 2012