Limerick 1
3Q/2012 Plant Inspection Findings

Initiating Events

Significance: G Sep 30, 2012
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Establish and Perform Adequate Preventive Maintenance on 480VAC Load Center Power Transformers
A self-revealing NCV of Limerick Technical Specification (TS) 6.8, "Procedures and Programs," was identified for failure to establish and perform adequate preventive maintenance (PM) activities to routinely inspect the 480 volt-alternating current (VAC) load center power transformers. As a result, Limerick experienced a transformer related fault that could have been prevented by PM which resulted in a manual reactor scram of Unit 1 on July 18, 2012. Corrective actions implemented by Limerick as a result of this transformer failure included advancing the thermography window installation schedule to align with each transformers feeder breaker trip test calibration. Limerick also performed thermography inspections on the other load center transformers and developed corrective actions (Issue Report (IR) 1355930 and 1390033) to reinstitute the clean and inspect PM on all load center transformers at an increased frequency of 8 years vice 20 years.
The finding was determined to be more than minor because it was associated with the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was determined to be of very low safety significance because the finding caused a reactor trip but not the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding was determined to have a cross-cutting aspect because, although the performance deficiency occurred more than three years ago, the performance characteristic associated with ineffective PM implementation continues to exist within Limerick's PM program and is indicative of present performance. The cross-cutting aspect associated with this performance deficiency is in the Resources component of the Human Performance area because the licensee did not ensure that personnel, equipment, procedures and other resources were adequate to assure long term plant safety through maintenance and the minimization of long-standing equipment issues [H.2 (a)]. (Section 4OA3.7)
Inspection Report# : 2012004 *(pdf)*

Mitigating Systems

Significance: G Sep 30, 2012
Identified By: NRC
Item Type: VIO Violation

Failure to Immediately Reduce Reactor Power per the Alarm Response Card Procedure
The inspectors identified a cited violation of very low safety significance (Green) of TS 6.8, “Procedures and Programs,” because Limerick operators did not adequately follow an alarm response procedure when responding to a MCR alarm on July 11, 2012. Specifically, the operators failed to immediately reduce power per the alarm response card (ARC) procedure, ARC-MCR-107-A2, ‘Turbine Control Valve / Stop Valve Scram Bypassed,’ after the MCR received the alarm condition. The operators decided to delay the immediate reduction in reactor power to validate the control room alarm indication. Overall, it took operators one hour and forty-nine minutes to commence reducing reactor power per procedure. This finding is being cited because not all of the criteria specified in Section 2.3.2.a of the NRC Enforcement Policy for a non-cited violation were satisfied in that Exelon failed to restore compliance within a reasonable amount of time after the violation was identified. Specifically, the violation was communicated to Exelon Management by the inspectors on August 22, 2012. However, this violation was not entered into the Exelon CAP, as IR 1429761, until October 22, 2012 and no interim corrective actions were identified until Standing Order 12-08 was issued on October 22, 2012 to provide operator guidance, 103 days after the initial event.
The finding was determined to be more than minor because it affected the human 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, it resulted in operators not reducing reactor power immediately as required for reactor protection. The inspectors determined this finding did affect a single RPS trip signal but did not affect the function of other redundant trips or diverse methods of reactor shutdown, did not involve control manipulations that unintentionally added positive reactivity, and did not result in a mismanagement of reactivity by operators. Therefore, the inspectors determined the finding to be of very low safety significance (Green). This finding had a cross-cutting aspect in the area of Human Performance, Work Practices, because operators did not follow procedures [H.4(b)]. (Section 1R15.2)
Inspection Report# : 2012004 *(pdf)*

Significance: G Sep 30, 2012
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to enter Technical Specifications in a Timely Manner
The inspectors identified a NCV of very low safety significance (Green) of TS 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," because Limerick operators did not enter the required TS action in a timely manner in response to an RPS instrumentation line failure. Specifically, following the main control room (MCR) receipt of the Unit 1 ‘Turbine Control Valve / Stop Valve Scram Bypassed’ alarm and equipment operator verification that the ‘C’ and ‘D’ channels of RPS circuitry were potentially bypassed indicating a possible loss of RPS function, action by the MCR operators to enter the applicable TS action statement was delayed by over an hour while RPS electrical prints were reviewed to verify inputs to the RPS circuitry. This issue was entered into Exelon’s CAP as IR 1387851 and an apparent cause evaluation was conducted.
The finding was determined to be more than minor because it is associated with the human performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, operators did not reduce thermal power within 15 minutes as required for reactor protection. The inspectors

determined this finding did affect a single RPS trip signal but did not affect the function of other redundant trips or diverse methods of reactor shutdown, did not involve control manipulations that unintentionally added positive reactivity, and did not result in a mismanagement of reactivity by operators. Therefore, the inspectors determined the finding to be of very low safety significance (Green). This finding had a cross-cutting aspect in the
5
Enclosure 2
area of Human Performance, Decision-Making, because operators did not use conservative assumptions in decision making and promptly apply readily available information contained in the ARC, TS Bases, and equipment operator reports to determine TS applicability for the alarm condition [H.1(b)]. (Section 1R15.1)
Inspection Report# : 2012004 *(pdf)*

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: 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

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

Last modified : November 30, 2012