Limerick 1
4Q/2011 Plant Inspection Findings

Initiating Events

Significance: G Sep 30, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Test Equipment Interference Resulting in Reactor Scram
A Green, self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion XI, “Test Control,” occurred when Exelon did not adequately assess the potential impacts of test equipment on turbine trip circuitry. This resulted in an automatic reactor scram of Unit 1 when the main turbine high reactor water level trip relay inadvertently energized during a surveillance test on June 3, 2011. This test is a quarterly surveillance, designed to verify proper operation of the Digital Feed Water Level Control System (DFWLCS) which initiates a turbine trip on high reactor level. The DFWLCS has a 1 out of 2 twice logic to energize the trip relay, so each channel is tested separately to eliminate the possibility of inadvertent actuation. As an additional precaution, the surveillance procedure contains steps for the technician to verify the other channels are free of closed trip contacts prior to beginning the test. Exelon used a Simpson 260 Volt/Ohm Meter (VOM) to perform this verification by demonstrating a nominal voltage difference between each side of the contact and station ground. During this verification step, Exelon inadvertently established a direct current loop from station ground, to the floating battery ground from the 125V power supply, to the trip circuit. This completed the circuit, energized the main turbine high reactor water level trip relay, which tripped the main turbine and caused the reactor to scram. Exelon revised the test procedure to change the requirements for test instrumentation to prevent this from recurring and entered the issue into the corrective action program as IR 1224283.

The inspectors determined that the performance deficiency was more than minor in accordance with IMC 0612, Appendix B, “Issue Screening,” because it was associated with the Equipment Performance attribute of the Initiating Events cornerstone and affected the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operation. Specifically, by not considering the impact of maintenance and test equipment (M&TE) during multiple revisions of the surveillance procedure, Exelon failed to recognize a vulnerability which could lead to a plant transient. In accordance with IMC 0609, Attachment 4, “Phase 1 - Initial Screen and Characterization of Findings,” the finding was determined to be of very low safety significance (Green) 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. The inspectors determined that this performance deficiency did not reflect current performance, as the last revision to the surveillance procedure that affected M&TE requirements was greater than three years ago. As a result, the inspectors did not assign a cross-cutting aspect to this finding. (Section 4OA3.5)

Inspection Report# : 2011004 *(pdf)*

Mitigating Systems

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

Significance: G Mar 31, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Address Repeat TS Response Time Test Failures (Section 4OA2.2)
The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action Program," because Exelon did not adequately evaluate and correct a condition adverse to quality regarding repeat failures of a Technical Specification (TS) surveillance test (ST). Specifically, on July 13, 2010, Exelon generated issue report (IR) 1091132 to document that ST-2-041-909-2, the Unit 2 Main Seam Line (MSL) Flow – High Response Time Test, had failed its past two performances. In both instances, in October 2008 and July 2010, multiple response time values exceeded the TS requirements, and Exelon had to replace several relays to bring the values back into compliance. After the 2008 failure Exelon performed an apparent cause evaluation (ACE) and generated one corrective action (CA) and several action items (ACITs) to address the causes. Following the 2010 failure, Exelon did not evaluate the repeat failure or generate any additional actions. The inspectors determined that the CA and ACITs from 2008 did not thoroughly address the MSL Flow - High test failure, and the repeat test failure in 2010 was an opportunity for Exelon to re-evaluate the issue and pursue more appropriate and timely corrective actions. Exelon's failure to evaluate and correct a condition adverse to quality regarding repeat failures of a TS surveillance test was determined to be a performance deficiency (PD).

The PD was determined to be more than minor because it was associated with the System, Structure, and Component & Barrier Performance attribute of the Reactor Safety - Barrier Integrity cornerstone. The PD adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was determined to be of very low safety significance (Green) in accordance with Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," because it did not represent an actual open pathway in the physical integrity of reactor containment. The inspectors determined this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Exelon did not thoroughly evaluate the repeat MSL response time test failures to ensure the underlying causes were identified and resolved. [P.1(c)] (Section 40A2.2)

Inspection Report# : 2011002 *(pdf)*

Emergency Preparedness

Significance: SL-IV 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).

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).

Inspection Report# : 2011503 *(pdf)*

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the cover letters to security inspection reports may be viewed.

Miscellaneous

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