

## Limerick 2

### 4Q/2013 Plant Inspection Findings

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#### Initiating Events

**Significance:** G Jun 30, 2013

Identified By: Self-Revealing

Item Type: FIN Finding

##### **Failure to Follow Partial Procedure Change Process**

A self-revealing Green finding of Technical Specification 6.8.1, "Administrative Controls-Procedures," was identified because Exelon personnel did not implement procedure use and adherence requirements when operators changed the scope of work for surveillance testing of main turbine stop and control valves. This resulted in a reactor protection system automatic scram on April 16, 2013. This issue was identified in the Exelon CAP as IRs 1503749 and 1525552

The failure of station operators to follow the partial procedure performance process during the performance of two TS required surveillances was a performance deficiency that was reasonably within Exelon's ability to foresee and correct and could have been prevented. The performance deficiency was also contrary to Exelon's procedure use and adherence requirements. This finding was more than minor because, if improper implementation of the partial procedure performance process is left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern such as a more severe plant transient or engineered safeguard system actuation or malfunction. Additionally, this issue is similar to example 4.b in IMC 0612, Appendix E, "Examples of Minor Issues," in that the procedural error resulted in a reactor scram or other transient. The finding was determined to be self-revealing because it was revealed through the receipt of a scram signal during performance of a surveillance test which required no active and deliberate observation by the licensee. The finding was determined to be of very low safety significance (Green) in accordance with Appendix G of IMC 0609, "Shutdown Operations Significance Determination Process," because the finding did not require a quantitative assessment. A quantitative assessment was not required because the finding did not cause a loss of thermal margin, a loss of inventory, or degrade the ability to add inventory to the reactor coolant system.

This finding had a cross-cutting aspect in the area of Human Performance, Decision Making, because Exelon did not ensure that personnel made safety-significant or risk significant decisions using a systematic process to ensure that safety is maintained [H.1(a)]. Specifically, the partial procedure performance process was not properly implemented which resulted in plant conditions that were improper for the next evolution. This resulted in a reactor protection system automatic scram on April 16, 2013. (Section 4OA3.1)

Inspection Report# : [2013003](#) (*pdf*)

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#### Mitigating Systems

**Significance:** G Sep 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

##### **Failure to Perform Technical Specification Surveillance Requirements on the Unit 2 Primary Containment**

### Instrument Gas System

The inspectors identified a Green NCV of Technical Specification (TS) 6.8.1.a, "Procedures and Programs," for Exelon's failure to implement surveillance test procedures specified for the Primary Containment Instrument Gas (PCIG) system as required by Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements." Specifically, Exelon's PCIG local leak rate procedures, ST-4-LLR-011-2 and ST-4-LLR-241-2, incorrectly credited the surveillance testing of the PCIG supply header 'B' check primary containment isolation valve (059-2005B) in ST-6-059-201-2 "PCIG Valve Test" which resulted in entry into TS 4.0.3 for a missed surveillance. Exelon's corrective actions included an extent of condition review and revising PCIG check valve surveillance testing to correct the crediting of the wrong check valves due to the successful completion of Local Leak Rate Testing (LLRT). Exelon has entered this issue into their CAP as IR 1554992 and 1569903.

The failure to perform the surveillance requirements specified for the PCIG system, specifically, incorrectly crediting the surveillance testing of PCIG check valve 059-2005B which resulted in a missed surveillance, is a performance deficiency. The performance deficiency was determined to be more than minor, because it adversely affected the Procedure Quality attribute of the Mitigating Systems cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Exelon failed to ensure that the PCIG system surveillance testing adequately tested and credited the successful completion of LLRT. The finding is of very low safety significance (Green) per IMC 0609, Appendix A, Exhibit 2 - "Mitigating Systems Screening Questions," because the PCIG system was determined to maintain its operability and functionality, does not represent a loss of system and/or function and does not represent an actual loss of function of a single train for greater than its TS allowed outage time. The inspectors determined that the finding had a cross-cutting aspect in the area of PI&R, CAP, because Exelon did not thoroughly evaluate problems such that resolutions address causes and extent of conditions, including properly classifying, prioritizing, fully evaluated, and that actions are taken to address safety issues in a timely manner, commensurate with their safety significance [P.1(c)]. Specifically, Exelon personnel did not adequately address, thoroughly evaluate, and prioritize IR 1498740 which documented potential deficiencies with Unit 2 PCIG check valve testing, in a timely manner. (Section 1R13)

Inspection Report# : [2013004](#) (pdf)

**Significance:** G Jun 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Identify and Correct a Condition Adverse to Quality Associated with Emergency Diesel Generator D24**

The inspectors identified a Green non-cited violation (NCV) of 10 Code of Federal Regulation (CFR) 50, Appendix B, Criterion XVI, "Corrective Action", because Exelon personnel did not identify and correct a condition adverse to quality associated with emergency diesel generator (EDG) D24 lubricating oil pipe fitting supports. This resulted in EDG D24 being in a degraded condition from November 2012 until the condition was corrected in May 2013. Exelon personnel entered this issue into the CAP as IRs 1507365, 1509125, 1511869, 1512745, 1526780, and 1528088.

The failure of Exelon personnel to identify and correct the degraded instrument line clamp and insert on EDG D24's lubricating oil supply pressure sensing line following the failure of a pipe fitting on November 13, 2012 is a performance deficiency that was reasonably within Exelon's ability to foresee and correct. The issue report (IR) written to document the issue (IR 1439284) was inappropriately classified as not a Critical Component Failure. This resulted in the issue receiving a lower level of investigation (work group evaluation versus an apparent cause or root cause evaluation). This NRC-identified finding was more than minor because it is associated with equipment performance and affected the Mitigating System cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating event to prevent undesirable consequences. The inspectors evaluated the finding using Appendix A, "The Significance Determination Process for Findings At-Power," to IMC 0609, "Significance Determination Process." Exelon personnel conducted vibration tested which determined that the pipe

fitting crack initiation and propagation occurred during engine slow start speed acceleration. This was based vibration data which showed two vibration peaks at speeds during the acceleration. Also, the crack did not propagate during normal speed operation based on the fact that the leak size did not increase during monthly testing on April 27, 2013. The inspectors determined this finding did not represent an actual loss of function of a single train for greater than its Technical Specification Allowed Outage Time. 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 Problem Identification and Resolution, Corrective Action Program, because Exelon personnel did not thoroughly evaluate the cause of the November 12, 2012 lubricating oil system pipe fitting crack such that the resolutions address causes and extent of conditions [P.1(c)]. Specifically, although failure analysis determined that the cause of the pipe fitting failure was due to high cycle fatigue a thorough investigation into all potential causes (e.g., excessive vibrations, missing pipe support) was not performed. This resulted in EDG D24 being inoperable for greater than the TS allowed outage time from November 13, 2012 until the condition was corrected on May 12, 2013. (Section 1R15)

Inspection Report# : [2013003](#) (*pdf*)

**Significance:**  May 24, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Fire Brigade Transportation**

The NRC identified a Green, Non-Cited Violation (NCV) of License Condition 2.C.(3) of the Limerick Generating Station operating license, in that Exelon did not provide adequate procedural guidance for transporting the fire brigade and equipment to the spray pond pump house. Specifically, the existing fire procedure had incorrect guidance which would have needlessly delayed the fire brigade response. In response to this issue, Exelon initiated IR 1511763 and took prompt action to revise the affected procedures.

The finding was more than minor because it negatively affected the protection against external factors (fire) attribute of the mitigating systems cornerstone as related to the objective of ensuring the reliability and availability of the Essential Service Water pumps and Residual Heat Removal Service Water pumps. The finding was determined to be of very low safety significance (Green) in accordance with Section D of Exhibit 2 in Appendix A of IMC 0609, "The Significance Determination Process for Findings at Power," because the fire brigade's response time was mitigated by other defense-in-depth elements such as: area combustible loading limits were not exceeded, installed fire detection systems were functional, and alternate means of safe shutdown were not impacted. The finding did not have a cross-cutting aspect because it was not indicative of current performance. (Section 1R05.03)

Inspection Report# : [2013007](#) (*pdf*)

**Significance:**  May 24, 2013

Identified By: NRC

Item Type: FIN Finding

#### **Failure to Establish Preventive Maintenance for Safe Shutdown Transfer/Isolation Switches**

The NRC identified a Green finding for the failure to establish a preventive maintenance strategy for fire safe shutdown transfer/isolation switches in accordance with the Exelon procedure ER-AA-200, Preventive Maintenance Program. As a result,

Exelon failed to ensure that the local control circuits for several 4KV breakers would be isolated from the effects of fire damage. In response to this issue, Exelon generated IR 01515025, and initiated actions to evaluate the switches and implement appropriate maintenance programs.

This finding was more than minor because it was associated with the protection against external factors (fire) attribute of the mitigating systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, by failing to establish a preventive maintenance strategy for fire safe shutdown transfer/isolation switches, Exelon did not ensure that the local control circuits for several 4KV breakers would be isolated from the effects of fire damage. The team determined that the finding was of very low safety significance (Green), based on IMC 0609, Appendix F, "Fire Protection Significance Determination Process," task number 1.3.1 because Exelon had demonstrated a reasonable expectation of functionality for these switches by recently testing comparable switches. The finding did not have a crosscutting aspect because it was not indicative of current performance. (Section 1R05.06)

Inspection Report# : [2013007](#) (*pdf*)

## Barrier Integrity

**Significance:**  Dec 31, 2013

Identified By: NRC

Item Type: FIN Finding

### **Failure to Properly Plan Work for Failed Airlock Door Magnetic Switch**

The inspectors identified a self-revealing finding (FIN) of very low safety significance (Green) was identified for Exelon's failure to appropriately prioritize work activities associated with a degraded Unit 2 magnetic switch for a secondary containment airlock door in accordance with Exelon procedure WC-AA-106, "Work Screening and Processing." This contributed to multiple airlock doors being opened simultaneously and resulted in a loss of reactor enclosure secondary containment integrity.

The failure of the station to properly prioritize the work order for the defective magnetic switch for the Unit 2 313' elevation reactor building-to-reactor building air supply room access airlock doors was a performance deficiency that was reasonably within Exelon's ability to foresee and correct and could have been prevented. This was caused by not performing a site impact review of reportability clarifications made by NUREG 1022, "Event Report Guidelines 10 CFR 50.72 and 50.73," Revision 3. The performance deficiency was also contrary to Exelon's procedure for work screening and processing. The finding was determined to be more than minor because it was associated with the Barrier Integrity cornerstone attribute of SSC and Barrier Performance (doors and instrumentation) and affected the cornerstone objective of providing reasonable assurance that physical design barriers (secondary containment) protect the public from radionuclide releases caused by accidents or events. Specifically, opening two reactor building airlock doors at the same time did not maintain reasonable assurance that the secondary containment would be capable of performing its safety function in the event of a reactor accident. The finding was determined to be self-revealing because it was revealed through the receipt of an alarm in the main control room which required no active and deliberate observation by Exelon personnel. The finding was determined to be of very low safety significance (Green) in accordance with Appendix A of IMC 0609, "Significance Determination Process (SDP) for Findings At-Power." Specifically, the finding only represents a degradation of the radiological barrier function provided for the SBGT system. Exelon entered the issue into the CAP as IR 1553563. Corrective actions performed or planned included

repairing the magnetic switch, verifying that the corrective maintenance backlog did not contain any other issues involving the airlock door indicating lights, developing a periodic routine test of the airlock door indicating circuits, and performing a site impact review of the changes made by NUREG 1022, Revision 3.

This finding had a cross-cutting aspect in the area of Human Performance, Resources, because Exelon did not ensure that resources were available to minimize preventative maintenance deferrals and ensure maintenance and engineering backlogs were low enough to ensure that safety is maintained [H.2(a)]. Specifically, Exelon deferred implementation of the work order several times over a three year period which resulted in secondary containment becoming inoperable on September 3, 2013.

Inspection Report# : [2013005](#) (*pdf*)

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## Emergency Preparedness

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## Occupational Radiation Safety

**Significance:**  Jun 30, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Adhere to Radiation Protection Procedures for Evacuation of the Unit 2 Upper Drywell in Preparation for Irradiated Component Moves**

The inspectors identified a self-revealing finding of very low safety significance associated with failure to comply with Technical Specification (TS) 6.8 procedures. Specifically, the inspectors identified that the licensee failed to implement radiation protection procedure requirements associated with clearance of personnel from the upper levels of the Unit 2 Reactor Drywell in preparation for removal and movement of irradiated core component from the Unit 2 reactor vessel. The licensee entered this issue into their corrective action plan (CAP) (IR 1495585).

The failure to adhere to Technical Specification required radiation protection procedures for personnel exposure control for irradiated core component movement is a performance deficiency. The performance deficiency was determined to be more than minor because it was related to the Programs and Process attribute of the Occupational Radiation Safety Cornerstone, and adversely affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation from radioactive material during routine reactor operation. Further, if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern if personnel were locked in the area and irradiated hardware dropped above their work location. The finding was not subject to traditional enforcement because it was not associated with a violation that impacted the regulatory process and did not contribute to actual safety consequences. The finding was assessed using IMC 0609, Appendix C, 2 Enclosure "Occupational Radiation Safety SDP," , dated August 19, 2008, and was determined to be of very low safety significance (Green) because it was not related to As-Low-As-Is-Reasonably-Achievable (ALARA), did not result in an overexposure or a substantial potential for overexposure, and did not compromise the licensee's ability to assess dose. This finding was associated with the Work Control aspect of the Human Performance cross-cutting component. Specifically, the licensee did not effectively coordinate this work activity by incorporating actions to address the impact of the work on different job activities, and the need for work groups to maintain interfaces and communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance (H.3 (b)). (Section 2RS1)

Inspection Report# : [2013003](#) (pdf)

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## Public Radiation Safety

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### 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.

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### Miscellaneous

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