

## Limerick 1

### 4Q/2013 Plant Inspection Findings

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#### Initiating Events

**Significance:** G Sep 30, 2013

Identified By: Self-Revealing

Item Type: FIN Finding

##### **Inadequate and Untimely Corrective Actions Associated With the Unit 1 Instrument Air System**

A self-revealing finding of very low safety significance was identified for Exelon's failure to take adequate and timely corrective actions to address the inadvertent depressurization of the Unit 1 Instrument Air (IA) headers. This led to a repeat depressurization of the Unit 1 IA headers when the service air compressor tripped on July 7, 2013, causing the operators to enter ON-119, "Loss of Instrument Air," and reduce reactor power by 20 percent until IA header pressure could be restored and maintained. Exelon's corrective actions for this issue included replacing all of the IA dryer pre-filters, creating an activity to perform dryer performance monitoring prior to any IA maintenance outage, and recalibrating all of the IA dryer pre-filter differential pressure (D/P) switches. Exelon was also in the process of evaluating a replacement component for the IA dryer D/P switches and investigating the effectiveness of the prioritization of their maintenance backlog strategy. Exelon has entered this issue into their corrective action program (CAP) as Issue Report (IR) 1569901.

Exelon's corrective actions to address the inadvertent depressurization of the Unit 1 IA headers on October 9, 2012, were ineffective and untimely, representing a performance deficiency that was within their ability to foresee and correct. This performance deficiency was determined to be more than minor because it affected the Equipment Performance attribute of the Initiating Events cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, unnecessary transients on the IA header increase the likelihood of a loss of IA, an unplanned down power or a potential rapid plant shutdown due to plant instability. The finding is of very low safety significance (Green) per IMC 0609, Appendix A, Exhibit 1 - Initiating Events Screening Questions, because it did not involve the complete or partial loss of a support system that contributes to the likelihood of, or cause, an initiating event and affected mitigation equipment. The finding had a cross-cutting aspect in the area of Human Performance, Resources, because Exelon did not ensure that personnel, equipment, procedures, and other resources were adequate to assure nuclear safety. Specifically, Exelon did not adequately maintain engineering and maintenance backlogs to support safety, which led to IRs (1426043 and 1426045) to check the operation of the Unit 1 IA dryer pre-filter D/P switches not being performed in a timely manner [H.2(a)]. Exelon did not complete work associated with these IRs and failed to utilize internal operating experience concerning the creation of a time-based preventative maintenance (PM) in order to replace the pre-filters and functionally check the D/P switches prior to conducting maintenance. (Section 1R04) Inspection Report# : [2013004](#) (*pdf*)

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#### Mitigating Systems

**Significance:** G Sep 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Correct a Condition Adverse to Quality associated with Defective Material Being Reinstalled into a Safety - Related System**

The inspectors identified a Green NCV of Title 10 of the Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion XVI, "Corrective Action," associated with Exelon staff's failure to correct a condition adverse to quality (CAQ) associated with defective material being reinstalled into a safety-related system after the component failed. Specifically, Exelon's corrective actions to address the defective material issues in both Apparent Cause Evaluation (ACE) IR 900755 and Equipment Apparent Cause Evaluation (EACE) IR 1365093 did not prevent the installation of a previously failed circuit board into a safety-related system. This circuit board ultimately failed again, causing operators to declare the Redundant Reactivity Control System (RRCS) inoperable. Exelon's corrective actions included revising procedural guidance for RRCS channel-checks, utilizing an alert system for continuous performance monitoring of all RRCS system parameters, conducting an extent of cause for all existing RRCS out-of-band log entries, revising the maintenance strategy to use new RRCS cards and a time-directed PM to replace failed or old cards and benchmarking the industry maintenance strategy for RRCS. Exelon is also revising material receipt procedures, training all warehouse personnel on the receipt inspection process and performing extent of conditions of all other repairable stock codes. Exelon has entered this issue into their CAP as IR 1569907.

The inspectors determined that Exelon's corrective actions to address a CAQ associated with defective material issues in both ACE IR 900755 and EACE IR 1365093, was a performance deficiency that was within their ability to foresee and correct, and should have been prevented. The performance deficiency was determined to be more than minor because it affected the Procedure Quality and Human Performance attributes of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Further, if left uncorrected, the performance deficiency could have the potential to lead to a more significant safety concern. The performance deficiency was also similar to IMC 0612, Appendix E, example 4.g, in that Exelon's corrective actions were inadequate and failed to correct a CAQ. The finding is of very low safety significance (Green) per IMC 0609, Appendix A, Exhibit 2 - "Mitigating Systems Screening Questions," because RRCS 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 finding had a cross-cutting aspect in the area of PI&R, CAP, because Exelon did not take the appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with the safety significance [P.1(d)]. Specifically, Exelon did not take appropriate corrective actions to address the use of new RRCS circuit boards and did not ensure the corrective actions for the D23 Emergency Diesel Generator (EDG) rectifier failure would ensure all failed components that are sent to the vendor for analysis and sent back to the site with no failure mode were evaluated by engineering prior to re-installation. (Section 1R15)

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

**Significance:**  Mar 31, 2013

Identified By: NRC

Item Type: FIN Finding

**Failure to Adequately Assess Battery Charger Operability in a Timely Manner**

The inspectors identified a Finding (FIN) of very low safety significance (Green) for the failure to adequately assess the operability of multiple safeguard battery chargers in a timely manner after an issue report (IR) was generated for battery charger testing concerns. Specifically, although the IR documented as-found current limit settings for safeguard battery chargers that were below Technical Specification (TS) minimum values, the operability basis documented that no operability concern existed because the battery chargers had passed their most recent TS surveillance tests and no explanation for the unexpected test results was given. Following questions from the inspectors regarding the operability bases of the battery chargers, Exelon staff performed an in-depth operability determination which factored in battery charger maintenance history, preventive maintenance practices, past operating experience, and vendor input. Exelon personnel entered this issue into their corrective action plan (CAP) as

IR1486275 and plan to perform an evaluation to address the shortcomings in the initial operability determination.

The performance deficiency was more than minor because it was associated with the Human Performance attribute of the Mitigation 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 (i.e., core damage). This finding was also similar to examples 3.j and 3.k of IMC 0612, Appendix E. Specifically, in the absence of any further engineering evaluation, there was reasonable doubt of operability of multiple safeguard battery chargers at power operations. This finding was evaluated in accordance with NRC IMC 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings,” and determined to be of very low safety significance (Green) because the finding does not affect the operability of the system, does not represent a loss of system and/or function, and does not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time.

The inspectors determined the finding has a crosscutting aspect in Human Performance, Decision-Making, because Exelon personnel did not make a safety-significant decision using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure that safety was maintained. Specifically, Exelon personnel did not adequately assess the operability of multiple safeguard battery chargers in a timely manner after an IR was generated for battery charger testing concerns that called into question the operability of safeguard battery chargers [H.1(a)]. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement.

Inspection Report# : [2013002](#) (*pdf*)

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## **Barrier Integrity**

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

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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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