

Limerick 2

4Q/2016 Plant Inspection Findings

Initiating Events

Significance: G Sep 30, 2016

Identified By: Self-Revealing

Item Type: FIN Finding

Inadequate Design Control of Plant Processing Computer Modification

A self-revealing finding of very low safety significance (Green) was identified when Exelon did not implement their engineering design control procedures during the plant processing computer (PPC) modification. Specifically, procedure CC-AA-103-1003, "Owner's Acceptance Review of External Engineering Technical Products," requires that effects on other plant systems have been addressed, and procedure CC-AA-107-1001, "Post Modification Acceptance Testing," section 4.4.3, states that the testing boundary should encompass not only the equipment modified, but also any components whose operation may have been altered by the modification. The PPC modification had a wiring design error that resulted in the trip of both reactor recirculation pumps (RRPs) which required a manual reactor scram of Unit 2. In response to this issue, Exelon initiated IR 2676712, investigated the cause of the scram, fixed the wiring design error, performed a root cause evaluation, and performed an extent of condition review.

This issue is more than minor because it adversely affected the design control attribute of the initiating events cornerstone to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the PPC modification process had a wiring design error that resulted in the trip of both RRP's which required a manual reactor scram of Unit 2. The issue was evaluated in accordance with IMC 0609, Appendix A, "Significance Determination Process for Findings At-Power," using Exhibit 1, "Initiating Events Screening Questions," Section B, "Transient initiators." The finding was determined to be of very low safety significance (Green) because the finding did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Challenge the Unknown, because LGS staff did not stop when faced with uncertain conditions, and risks were not evaluated and managed before proceeding. Specifically, Exelon did not stop and reevaluate the risks and effects on plant systems when changes were made to the PPC design modification package. [H.11] (Section 4OA3)

Inspection Report# : [2016003](#) (*pdf*)

Significance: G Mar 31, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Main Turbine Digital Electrohydraulic Control System Modification Failed to Revise the Plant Startup Procedure

A self-revealing Green NCV of LGS Unit 2 technical specification 6.8.1 was identified because Exelon failed to maintain a plant startup procedure. Specifically, the implementing procedure for normal plant startup from hot shutdown or cold shutdown to rated power was not maintained when a modification to the Unit 2 turbine electrohydraulic control system was performed and required changes to the plant startup procedure were not identified and implemented. Exelon initiated issue report (IR) 2602637, revised the startup procedure to properly incorporate the software changes made at the factory acceptance test, validated the software changes that were made were technically

correct, trained all operators on the new procedural changes, and reviewed operating procedures for extent of condition.

This finding is more than minor because it is associated with the procedure quality attribute of the initiating events cornerstone and affected the objective to limit the likelihood of events that upset plant stability during power operations. Specifically, the procedure directed actions intended in the software for rapid reactor depressurization that resulted in a reactor trip. Using IMC 0609, "Significance Determination Process," Appendix A, Exhibit 1, "Initiating Events Screening Questions," the inspectors determined that this finding was of very low safety significance (Green) because the finding did not cause both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Specifically, although the finding caused a Level 8 trip of the feedwater pumps followed by a reactor trip, the rate of water injection from the condensate pumps was sufficient when the reactor was tripped to safely shutdown and operators were able to reset the feedwater pumps. The inspectors determined that this finding has a cross-cutting in the area of Human Performance, Change Management, because leaders did not use a systematic process for implementing the modification so that nuclear safety remained the overriding priority. [H.3] (Section 40A3)

Inspection Report# : [2016001](#) (*pdf*)

Mitigating Systems

Significance:  Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Work Staging and Housekeeping Walkdowns During Pre-Outage Preparations

The inspectors identified a Green NCV of technical specification 6.8.1 for Exelon's failure to properly control, store, and stage material in accordance with station procedures within Class I buildings during refueling outage preparation. Specifically, Exelon personnel did not secure numerous rolling carts staged in both units, did not secure welding blankets in the common pipe tunnel to prevent blocking floor drains, and did not properly build scaffolds to include engineering approval for scaffold procedure deviations. In addition, Exelon's housekeeping and material condition program did not identify and resolve these conditions through the corrective action process during a time of increased activities in the plant. Exelon restrained the carts and other rolling equipment, removed the weld blankets, and removed, reworked, and evaluated scaffolding.

This finding is more than minor because it adversely affected the protection against external factors (flood and seismic hazards) attribute of the mitigating systems cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the loose unattended welding blankets would have blocked the pipe tunnel floor drains during an analyzed internal flooding event which would result in structural failures if not identified and corrected by operations personnel; the unrestrained carts would translate and rotate during a seismic event which could potentially impact safety related equipment and challenge the function or barrier; and the scaffold clearance and attachment issues could potentially cause impact with ductwork, cable trays, hangers, and structural supports during a seismic event. In addition, the performance deficiency is similar to the more-than-minor example described in IMC 0612, Appendix E, example 4.A, in that Exelon routinely failed to perform engineering evaluations on similar issues. Using IMC 0609, Appendix A, Exhibit 2, the inspectors determined that this finding was of very low safety significance (Green). Specifically, the finding is a deficiency affecting the design or qualification of mitigating structures, systems, and components, and the actual functions of the structures, systems, and components were maintained. The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Training, because the organization did not provide sufficient training to

maintain a knowledgeable workforce with respect to proper material handling and storage, awareness of flood hazards and floor drains, and scaffolding requirements. [H.9]

Inspection Report# : [2016001](#) (pdf)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Significance:  Mar 31, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Entry Into A High Radiation Area Without Radiological Briefing and Complying With The RWP

A self-revealing Green NCV of LGS Unit 1 technical specification 6.12.1 was identified involving improper entry of two workers into the Unit 1 reactor drywell on

March 22, 2016. Specifically, the workers entered the drywell, an area controlled as a Locked High Radiation Area, without obtaining the required access radiological conditions briefing. Further, one of the two workers entered under the control of an RWP that did not authorize access into High Radiation Areas. Exelon initiated IR 2644005, restricted the workers from further radiological controlled area access, re-configured the access area, conducted an extent of condition and human performance review, issued a site communication, and performed a staff stand down.

This finding is more than minor because it is associated with the programs and process attribute of the Occupational Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure adequate protection of workers from radiation exposure.

In addition, this example is similar to example 6.h of IMC 0612, Appendix E. Specifically, the workers did not receive a brief and did not review surveys prior to entering a work area with radiation levels that exceeded 100 mrem/hr at 30 cm. Using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined the finding was of very low safety significance (Green) because: 1) it was not an as low as is reasonably achievable (ALARA) finding, 2) there was no overexposure, 3) there was no substantial potential for an overexposure, and 4) the ability to assess dose was not compromised. The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because the individuals failed to follow verbal work instructions. [H.8] (Section 2RS1)

Inspection Report# : [2016001](#) (pdf)

Public Radiation Safety

Significance: G Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Implement Procedures for Control of Potentially Contaminated Clean Systems

The inspectors identified a Green NCV of technical specification 6.8.1 because Exelon failed to implement procedure CY-AA-170-210, "Potentially Contaminated System Control Program," for the evaluation and control of potentially cross-contaminated systems. Specifically, Exelon did not implement CY-AA-170-210 for the evaluation and control of a potentially cross-contaminated system when samples collected from the Unit 2 service air system, a non-contaminated system, indicated the potential presence of contamination on June 16, 2015. Exelon entered this issue into the corrective action program (IR 2556568), restricted use of the service air system, conducted a 10 CFR 50.59 screening and radiological evaluation of the system, conducted bounding radiation dose analyses for both occupational workers and members of the public, conducted an extent of condition review, decontaminated the system, and subsequently modified operation of the service air system to preclude re-contamination.

This finding is more-than-minor because it is associated with the program and process attributes of the occupational and public radiation safety cornerstones and adversely affected both cornerstone objectives to ensure adequate protection of worker and public health and safety from exposure to radioactive material. Specifically, during the time the service air system was contaminated but not recognized as such and not restricted in use, the potential existed to inadvertently contaminate workers and release radioactive material to the environment. Using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that this finding was of

very low safety significance (Green) because the finding did not involve an as low as is reasonably achievable (ALARA) issue, was not an overexposure, did not result in a substantial potential for an overexposure, and did not compromise the ability to assess dose. In addition, using IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process," the inspectors determined that the issue did not involve a substantial failure to implement the effluent release program and did not result in public doses exceeding 10 CFR 50, Appendix I or 10 CFR 20.1301 (e) and thus was of very low safety significance (Green). The inspectors determined this finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Resolution, because Exelon did not take effective corrective actions when service air system issues were identified. [P.3] (Section 4OA3)

Inspection Report# : [2016001](#) (*pdf*)

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

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