

## Limerick 2

### 4Q/2015 Plant Inspection Findings

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## Initiating Events

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## Mitigating Systems

**Significance:** G Sep 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Inadequate Preventive Maintenance of the HPCI System Motor Control Center**

A self-revealing Green NCV of Technical Specification (TS) 6.8.1.a, "Procedures and Programs," was identified because Exelon failed to adequately implement a preventive maintenance (PM) task for the 2DB-1-14 High Pressure Coolant Injection (HPCI) Direct Current (DC) Motor Control Center (MCC) cubicle. The root cause from a fire in the HPCI DC MCC on April 5, 2015 was determined to be that the administrative guidance to change the PM task in 1995 did not ensure all the work that was previously performed was now performed on the revised PM task. This led to the PM "M-095-002, 250 VDC Westinghouse MCU Maintenance, Revision 6" not being performed on the auxiliary compartment of the 2DB-1-14 cubicle. The cause of the fire, the 1A Timetactor, was located in the auxiliary compartment and would have been inspected and cleaned as a part of this PM.

This issue is more than minor because it was associated with the procedures quality attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, maintenance procedure M-095-002, 250 VDC Westinghouse MCU Maintenance, Revision 6, was not performed on both compartments of the 2DB-1-14 cubicle that led to the fire in the HPCI DC MCC which had the potential to affect HPCI system operation. Using IMC 0609, "Significance Determination Process, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that this finding was of very low safety significance (Green) because the finding was not a deficiency affecting the design or qualification of the HPCI system and the system maintained operability and functionality. Specifically, the affected portions of the HPCI system were a part of the HPCI vacuum tank condensate pump which is not required to ensure operability or functionality. The inspectors determined that the finding did not have a cross-cutting aspect because the PM task change did not occur within the last three years, and the inspectors did not conclude that the causal factors represented present Exelon performance. (Section 4OA3)

Inspection Report# : [2015003](#) (*pdf*)

**Significance:** G Jul 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Verify Adequacy of EDG Voltage to Start Safety Related Motors**

The team identified a finding of very low safety significance involving a non-cited violation (NCV) of the 10 CFR Part 50, Appendix B, Criterion III, "Design Control," in that Exelon did not verify and assure in design basis calculations, that adequate voltage would be available for starting Class 1E accident mitigating motors when the safeguards buses are powered by the emergency diesel generators (EDG). Specifically, in the calculation performed to

evaluate voltage available to individual motors when they are powered by the EDGs, Exelon assumed that the generator output voltage would be 4285 Volts, alternating current (Vac), rather than the minimum voltage allowed by station technical specifications (4160 Vac). Additionally, the electrical ratings of loads powered by the EDG were not adjusted for the maximum frequency allowed by station technical specifications (61.2 hertz (Hz)). As a result, the starting voltage for some of the safety-related motors would not have been acceptable under EDG generator voltage and frequency limiting conditions. In response, Exelon entered the issue into their corrective action program and performed evaluation that determined that EDG actual test results demonstrated the EDGs to be operable. The team review of the evaluation determined it to be reasonable. This finding was more than minor because it was similar to Example 3.j of NRC IMC 0612, Appendix E, and was 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 deficiency confirmed not to result in a loss of safety-related motor operability or functionality. The team determined this finding had a cross-cutting aspect in the area of Problem Identification and Resolution (Identification, Aspect P.1), because during a calculation revision in 2014, Exelon did not recognize that the limits of voltage and frequency allowed by the station technical specifications affected the calculation results and, therefore, did not completely and accurately identify the issue and revise the calculation in accordance with the station's corrective action program requirements.

Inspection Report# : [2015007](#) (pdf)

**Significance:**  Jul 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Failure to Verify Adequate Voltage Available for DC Equipment**

The team identified a finding of very low safety significance involving a non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," in that Exelon's design control measures did not verify the adequacy of the design regarding adequate direct current voltage (Vdc). Specifically, Exelon did not ensure that adequate voltage existed to emergency diesel generator (EDG) relays and output breaker spring charging motors. Additionally, the team determined that the overall impact to voltage drop calculations was not adequately assessed when the temporary battery cart is used. Following identification of the issue, Exelon entered it into their corrective action program and evaluated the operability of the batteries, concluding that the affected DC components would function at the current battery capacities. The team's review of the evaluation determined it to be reasonable. The finding was more than minor because it was similar to Example 3.j of NRC IMC 0612, Appendix E, and was associated with the Design Control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure 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 deficiency affecting the safety-related batteries that did not result in the loss of operability or functionality. The team determined this finding had a cross-cutting aspect in the area of Human Performance, (Documentation, Aspect H.7) because the battery sizing calculation was revised on March 15, 2014, which provided an opportunity to identify the inaccuracies of the battery calculations.

Inspection Report# : [2015007](#) (pdf)

**Significance:**  Mar 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Fire Safe Shutdown Diesel Generator Maintenance Program Did Not Account for Cold Temperatures due to Inadequate Specification for Fuel Oil Cloud Point**

The inspectors identified an NCV of LGS Units 1 and 2 operating license condition 2.C(3), Fire Protection, because Exelon did not implement and maintain in effect all provisions of the NRC approved fire protection program. Specifically, Exelon did not implement and maintain a maintenance program to ensure the operability of the fire safe

shutdown diesel (FSSD) generator by not ensuring a fuel oil supply specified or protected for typical winter cold temperatures. Exelon's corrective actions included adding a fuel oil additive (modifiers which inhibit wax crystal growth) to improve low temperature flow and pour characteristics at a time when ambient temperatures were greater than the cloud point and initiating condition report IR 2463216.

This finding is more than minor because it adversely affected the protection against external factors (fire) attribute of the mitigating systems cornerstone to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to ensure the cloud point of the diesel fuel oil was below the temperature of the surrounding air would impact the reliable operation of the equipment during low temperature conditions. Using IMC 0609, Appendix F, "Fire Protection Significance Determination Process," the inspectors determined that this finding was of very low safety significance (Green) because the finding did not impact the ability of LGS Units 1 and 2 to achieve safe shutdown. Specifically, the cloud point of diesel fuel delivered onsite by the vendor was substantially lower than Exelon's specification, unavailability of the FSSD generator would not by itself prevent LGS from reaching and maintaining safe shutdown, and the need for powered ventilation given a loss of normal HVAC during cold weather would be less than during hot weather. The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Resources, because Exelon did not ensure that cold weather preparedness procedures were adequate to support nuclear safety. Specifically, Exelon relied upon the cold weather procedures to establish reliable equipment operation during cold temperatures, but the procedures did not address diesel fuel cloud point for equipment stored and/or operated outdoors [H.1]. (Section 1R15)

Inspection Report# : [2015001](#) (pdf)

**Significance:**  Mar 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Startup Procedure Considered High Pressure Coolant Injection Operable With High Reactor Water Level Trip Actuated**

The inspectors identified an NCV of Title 10 of the Code of Federal Regulations (10 CFR), Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Exelon prescribed a procedure affecting quality with instructions which were not appropriate to the circumstances. Specifically, procedure GP-2, "Normal Plant Startup," contained a note that stated high pressure coolant injection (HPCI) systems have been determined operable by engineering evaluation with a high level trip setpoint actuated. The inspectors determined that the note was inconsistent with Units 1 and 2 technical specifications (TS) and was not supported by an adequate engineering basis. Exelon's corrective actions included briefing staff to ensure HPCI system operability is appropriately assessed when implementing GP-2, initiating condition report IR 2464416, completing a procedure revision to reference an interim evaluation contained in the condition report, and initiating an action to complete an engineering evaluation.

This finding is more than minor because it is associated with the procedure quality attribute of the mitigating systems cornerstone and affected the objective to ensure the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, procedure GP-2 stated that the HPCI system was operable with a Level 8 trip present without the ability to automatically actuate upon a high drywell pressure without an engineering evaluation which was inconsistent with the existing safety analysis performed at normal operating reactor pressure and temperature. Using IMC 0609, "Significance Determination Process," Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that this finding was of very low safety significance (Green) because the finding did not represent an actual loss of the HPCI system or function to inject high pressure emergency core cooling water. Specifically, the note in GP-2 allowed considering the HPCI system operable at normal operating reactor pressures with the HPCI system tripped. However, the HPCI system was not tripped at normal operating reactor pressures.

The inspectors determined that the finding did not have cross-cutting aspect because the procedure development

performance deficiency did not occur within the last three years, and the inspectors did not conclude that the causal factors represented present Exelon performance. (Section 1R20)

Inspection Report# : [2015001](#) (*pdf*)

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## Barrier Integrity

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## Emergency Preparedness

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## Occupational Radiation Safety

**Significance:**  Sep 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Inadequate Procedure for RWCU Backwashing Operations**

A self-revealing Green NCV of Technical Specification (TS) 6.8.1.a, “Procedures and Programs,” occurred because Exelon failed to establish, implement, and maintain an adequate procedure for the control of radioactivity and limiting personnel exposure during operation of a solid radioactive waste system. Specifically, the procedure for the conduct of reactor water cleanup (RWCU) filter media backwashing and collection was inadequate to ensure a sufficient receiving tank volume prior to transferring waste media. On June 28, 2015, this resulted in the overflow of a Unit 2 RWCU collection tank and back up of the reactor building floor drain system, causing high levels of radioactive contamination in accessible portions of the Unit 2 reactor building, and resulting in radioactive contamination of personnel. Exelon controlled access, decontaminated affected areas and personnel, conducted bounding dose assessments, performed extent of condition reviews, and revised affected procedures to address the issue. Exelon placed this issue into the corrective action program as issue report (IR) 2520732.

This issue is more-than-minor because if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, the failure to effectively control and manage radioactive material could result in significant unplanned, unintended occupational radiation exposure of workers. 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 reasonable 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. The inspectors determined this finding has a cross-cutting aspect in the area of Human Performance, Avoiding Complacency, because Exelon did not recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes, and therefore did not implement appropriate error reduction tools. Specifically, Exelon operated the backwash receiving tank (BWRT) to routinely accept high level alarms with associated potential for system overflow. Consequently, although this mode of operation of the system was longstanding, the issue reflects present performance [H.12]. (Section 2RS1)

Inspection Report# : [2015003](#) (*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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