UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

February 3, 2016

Mr. Bryan C. Hanson
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION – INTEGRATED INSPECTION REPORT 05000352/2015004 AND 05000353/2015004

Dear Mr. Hanson:

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station (LGS), Units 1 and 2. The enclosed report documents the inspection results, which were discussed on January 15, 2016 with Mr. R. Libra, Site Vice President, and other members of your staff.

NRC Inspectors examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. Further, inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at LGS. In addition, if you disagree with the cross-cutting aspect assigned to any finding, or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at LGS.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Daniel L. Schroeder, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 50-352 and 50-353
License Nos. NPF-39 and NPF-85

Enclosure:
Inspection Report 05000352/2015004
and 05000353/20YY004
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.:	50-352 and 50-353
License Nos.:	NPF-39 and NPF-85
Report No.:	05000352/2015004 and 05000353/2015004
Licensee:	Exelon Generation Company, LLC
Facility:	Limerick Generating Station, Units 1 & 2
Location:	Sanatoga, PA 19464
Dates:	October 1, 2015 through December 31, 2015
Inspectors:	S. Rutenkroger, PhD, Senior Resident Inspector M. Fannon, Resident Inspector B. Fuller, Senior Operations Engineer M. Patel, Operations Engineer M. Orr, Reactor Inspector
Approved By:	Daniel L. Schroeder, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY

IR 05000352/2015004, 05000353/2015004; 10/1/2015 – 12/31/15; Limerick Generating Station (LGS); Operability Determinations and Functionality Assessments.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified one non-cited violation of very low safety significance (Green and/or Severity Level IV). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process", dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, "Design Control," because Exelon did not properly store circuit breakers and ground trucks in accordance with the established design in order to maintain the seismic qualification of safety-related structures. Specifically, Exelon personnel attached stored circuit breakers and ground trucks to safety-related concrete block walls but did not evaluate the greater weight of circuit breakers, did not maintain the required separation distances, and did not attach all equipment to required attachment points. Exelon initiated issue report (IR) 2592543, removed all stored circuit breakers from the location, rearranged ground trucks to attach them only to designated wall anchors that maintained the required separation distance, and required refresher training of all operators and electrical maintenance personnel on proper spacing and restraint of circuit breakers and ground trucks.

  This finding is more than minor because it adversely affected the protection against external factors (seismic) attribute of the mitigating systems cornerstone to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the improper storage of the circuit breakers and ground trucks affected the seismic qualification of the concrete block walls separating the switchgear of the emergency diesel generators (EDG) which had potential to damage the block walls during a seismic event. Using IMC 0609, Appendix A, Exhibit 4, the inspectors determined that this finding was of very low safety significance (Green). Specifically, the inspectors determined that the performance deficiency only affected the seismic qualification of the concrete block wall, the loss of the concrete wall by itself would not necessarily cause an initiating event or degradation of the EDG system, and the finding did not involve the total loss of any safety function. Furthermore, the inspectors consulted a Senior Risk Analyst regarding the risk screening and determined that a failure of the walls would not necessarily result in the degradation or failure of the EDG systems. Specifically, for screening purposes, assuming total failure of the concrete masonry walls only introduces a potential of degraded performance since the switchgear are anchored to the concrete floor. As such, Exhibit 4 provides a reasonable basis for screening the finding as Green. The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because equipment operators did not follow the established work instructions (posted signs). [H.8] (Section 1R15)

Other Findings

A violation of very low safety significance that was identified by Exelon was reviewed by the inspectors. Corrective actions taken or planned by Exelon have been entered into Exelon's corrective action program. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On November 14, 2015, operators reduced power to 79 percent for a control rod pattern adjustment. Operators returned the unit to 100 percent power on November 15, 2015. On December 6, 2015, operators reduced power to 78 percent for a control rod pattern adjustment. Operators returned the unit to 100 percent power on December 6, 2015. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On October 9, 2015, operators reduced power to 78 percent due to a trip of the 'B' and 'C' circulating water pumps. Operators returned the unit to 100 percent power on October 10, 2015. On December 12, 2015, operators commenced a shutdown for a planned maintenance outage (2M52). The station reached operational condition 4 (cold shutdown) on December 14, 2015. Following the completion of maintenance activities, operators commenced a reactor startup on December 18, 2015. A reactor scram occurred during the startup on December 19, 2015 due to a reactor water level transient caused by the full opening of the main turbine bypass valves. Following the corrective actions for the reactor scram, operators commenced a reactor startup on December 19, 2015. Operators returned the unit to 100 percent power on December 21, 2015. The unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors reviewed Exelon's readiness for the onset of seasonal cold weather. The review focused on the site's EDGs. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications, control room logs, and the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Exelon personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Exelon's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed Exelon's preparations in advance of Hurricane Joaquin on October 3, 2015. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of the adverse weather conditions. The inspectors performed walkdowns of equipment that could be effected by high winds including the main transformer areas and the EDGs to verify that potential missile objects were secure. The inspectors verified that operator actions defined in Exelon's adverse weather procedure maintained the readiness of essential systems.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit common, 'A' control room emergency fresh air supply (CREFAS) during 'B' CREFAS planned maintenance on October 19, 2015
- Unit 2 reactor core isolation cooling (RCIC) during high pressure coolant injection (HPCI) planned maintenance on October 22, 2015
- Units 1 and 2 EDGs during the planned 201 safeguards bus outage on November 30, 2015
- Unit common, 101 safeguards bus during the planned 201 safeguards bus outage on December 1, 2015

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, technical specifications, work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Exelon staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On September 28 through October 2, 2015, the inspectors performed a complete system walkdown of accessible portions of the Unit 1 reactor enclosure recirculation system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries, environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. For identified degradation, the inspectors confirmed the degradation was appropriately managed by the applicable aging management program. Additionally, the inspectors reviewed a sample of related condition reports and work orders to ensure Exelon appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 5 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Exelon controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Fire area 27, common, control structure fan room, elevation 304’, on October 28, 2015
- Fire areas 35 and 36, Unit 1 core spray ‘A’ and ‘C’ pump rooms, elevation 177’, on November 3, 2015
- Fire areas 37 and 38, Unit 1 core spray ‘B’ and ‘D’ pump rooms, elevation 177’, on November 6, 2015

- Fire areas 58 and 59, Unit 2 core spray ‘B’ and ‘D’ pump rooms, elevation 177’, on December 2, 2015
- Fire areas 60 and 61, Unit 2 core spray ‘A’ and ‘C’ pump rooms, elevation 177’, on December 21, 2015

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 3 samples)

.1 Internal Flooding Review (2 samples)

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors review focused on the areas below. The inspectors verified the adequacy of equipment seals located below the flood line, floor and water penetration seals, water tight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers. It assessed the adequacy of operator actions that Exelon had identified as necessary to cope with flooding in this area and also reviewed the corrective action program to determine if Exelon was identifying and correcting problems associated with both flood mitigation features and site procedures for responding to flooding.

- Control enclosure, elevation 217’
- Unit 2 ‘B’ and ‘D’ residual heat removal (RHR) pump room area

b. Findings

No findings were identified.

.2 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors reviewed records for safety-related cables contained in manholes 103 and 104, which service emergency service water and residual heat removal service water, and inspected manhole 28 to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to note the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the Unit 1 'C' RHR motor oil cooler heat exchanger readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Exelon's commitments to NRC Generic Letter 89-13, "Service Water System Requirements Affecting Safety-Related Equipment." The inspectors observed actual performance tests for the heat exchanger and reviewed the results of previous inspections of the 'C' RHR motor oil cooler and similar heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff. The inspectors verified that Exelon initiated appropriate corrective actions for identified deficiencies.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11Q – 3 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training scenarios on October 27, 2015. The scenarios included a non-isolable reactor coolant system leak and an anticipated transient without scram. The scenarios were complicated by failures in the reactor protection, feedwater, safety relief valve, and main condenser systems. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classifications made by the shift manager and the technical specification action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room (2 samples)

a. Inspection Scope

The inspectors observed and reviewed licensed operator performance in the main control room during the performance of the following activities listed below. The inspectors observed infrequently performed test or evolution briefings and reactivity control briefings to verify that the briefings met the criteria specified in Exelon's Operations and Administrative Procedures. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

- Various, including Unit 1 daily surveillance activities, drywell floor drain sump and equipment drain tank surveillances, and Unit 2 HPCI pump, valve, and flow test and vacuum breaker test on October 23, 2015
- Unit 1 control rod pattern adjustment on November 15, 2015

b. Findings

No findings were identified.

.3 Licensed Operator Requalification (71111.11B – 1 sample)

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 10, and Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program."

Examination Results

The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, and "Operator Requalification Human Performance Significance Determination Process." The review verified that the failure rate (individual or crew) did not exceed 20%.

- The overall individual operator failure rate was 3.3%.
- The overall crew failure rate was 0.0%.

Written Examination Quality

The inspectors reviewed a sample of comprehensive written exams that facility staff administered to operators in October, November and December 2015.

Operating Test Quality

The inspectors reviewed operating tests (scenarios and job performance measures [JPMs]) associated with the on-site examination week.

Licensee Administration of Operating Tests

The inspectors observed facility training staff administer dynamic simulator exams and JPMs during the week of October 19, 2015. These observations included facility evaluations of crew and individual operator performance during the simulator exams and individual performance of JPMs.

Exam Security

The inspectors assessed whether facility staff properly safeguarded exam material, and whether test item repetition was excessive.

Remedial Training and Re-examinations

The inspectors reviewed remedial training packages and the associated re-exams for individual operators that failed the written portion of their 2014 “off-year” written test.

Conformance with License Conditions

License reactivation and license proficiency records were reviewed to ensure that Title 10 CFR 55.53 license conditions and applicable program requirements were met. The inspectors also reviewed a sample of records for requalification training attendance, and a sample of medical examinations for compliance with license conditions and NRC regulations.

Simulator Performance

Simulator performance and fidelity were reviewed for conformance to the reference plant control room. A sample of simulator deficiency reports was also reviewed to ensure facility staff addressed identified modeling problems.

Problem Identification and Resolution

The inspectors reviewed recent operating history documentation found in inspection reports, licensee event reports, the licensee’s corrective action program, NRC End of Cycle and Mid Cycle reports, and the most recent NRC plant issues matrix. The inspectors focused on events associated with operator errors that may have occurred due to possible training deficiencies.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)

a. Inspection Scope

The inspectors reviewed Unit 1 RCIC to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that Exelon

was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Exelon staff was reasonable. As applicable, for SSC classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSC to (a)(2). Additionally, the inspectors ensured that Exelon staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 2 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Exelon personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Exelon performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 2 HPCI vacuum tank condensate pump replacement on October 22, 2015
- Unit 2 RCIC planned system outage on December 2, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 7 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- IR 2563012, Unit 1 HPCI stop valve movement on December 30, 2015
- IR 2572083, Unit 2 RCIC vibrations on October 16, 2015

- IR 2575073, door 288N latch mechanism failed preventing door from fully closing on October 22, 2015
- IR 2576281, Unit 1 division 2 battery charger trouble alarm on October 24, 2015
- IR 2592543, 4 kilovolt (kV) breakers and ground trucks attached to block walls and stored improperly on November 25, 2015
- IR 2599542, pressure seal leak from the bottom head drain valve, HV-44-F100, to reactor water cleanup, identified on December 13, 2015
- IR 2600913, engineering change to maintain the bottom head drain valve, HV-44-F100, to reactor water cleanup closed, approved on December 17, 2015 (operator work-around)

The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to Exelon's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, such as in the case of operator workarounds (OWAs), the inspectors determined whether the measures in place would function as intended and were properly controlled by Exelon. Based on the review of the selected OWAs listed above, the inspectors verified that Exelon identified OWAs at an appropriate threshold and addressed them in a manner that effectively managed OWA-related adverse effects on operators and SSC.

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," because Exelon did not properly store circuit breakers and ground trucks in accordance with the established design in order to maintain the seismic qualification of safety-related structures. Specifically, Exelon personnel attached stored circuit breakers and ground trucks to safety-related concrete block walls but did not maintain the required separation distances, did not evaluate the full weight of the stored equipment, and did not attach all equipment to required attachment points.

Description. During a plant walkdown on November 25, 2015, the inspectors identified three circuit breakers grouped together in a row without meaningful separation attached to anchors in the concrete block wall separating the 4 kV switchgear rooms associated with emergency diesel generators 'D11' and 'D12.' In addition, the inspectors identified a ground truck anchored on the opposite side of the wall separated by approximately two feet laterally from the three breakers/ground trucks. Finally, in the 'D23' EDG switchgear room the inspectors identified a circuit breaker and ground truck adjacent to each other using a common wall anchor. In addition, the circuit breaker was attached to a cable conduit rather than a designated wall anchor.

The inspectors noted that signs in the switchgear rooms stated that a minimum of three feet of lateral separation must be maintained between breakers/ground trucks and that both sides of each wall must be taken into account for maintaining this separation. The inspectors questioned the operability of the concrete block walls since the configuration was not in compliance with the posted signs.

Exelon initiated IR 2592543, immediately rearranged the breakers/ground trucks to anchor and separate them in accordance with the posted signs, and required refresher training of all operators and electrical maintenance personnel on proper spacing and restraint of circuit breakers and ground trucks. In addition, when evaluating the condition Exelon identified that the design documentation considered the weight of anchored ground trucks but did not account for the greater weight of circuit breakers as allowed by the posted signs. Based on this information, Exelon removed all stored circuit breakers from the location.

The inspectors reviewed engineering change request (ECR) 94-07214 and calculation 22.2L-61. ECR 94-07214 evaluated ground trucks attached to the concrete block walls using wall anchors. The ECR required three feet minimum separation in order to maintain the seismic qualification of the walls (considering both sides of each wall) and required installation of the signs in order to enforce the requirement. In addition, calculation 22.2L-61 evaluated the structural and seismic adequacy of the concrete masonry walls and incorporated the results of ECR 94-07214. Both design documents evaluated and permitted ground trucks but did not address the greater weight of circuit breakers. Therefore, the inspectors determined that the seismic qualification of the EDG switchgear concrete block (masonry) walls was not maintained on November 25, 2015.

Analysis. The inspectors determined that the failure to properly store circuit breakers and ground trucks in accordance with the established design was reasonably within Exelon's ability to foresee and correct and should have been prevented and therefore was a performance deficiency. This finding is more than minor because it adversely affected the protection against external factors (seismic) attribute of the mitigating systems cornerstone to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the improper storage of the circuit breakers and ground trucks affected the seismic qualification of the concrete block walls separating the switchgear of the emergency diesel generators which had potential to damage the block walls during a seismic event.

Using IMC 0609, Appendix A, Exhibit 4, the inspectors determined that this finding was of very low safety significance (Green). Specifically, the inspectors determined that the performance deficiency only affected the seismic qualification of the concrete block wall, the loss of the concrete wall by itself would not necessarily cause an initiating event or degradation of the EDG system, and the finding did not involve the total loss of any safety function. Furthermore, the inspectors consulted a Senior Risk Analyst regarding the risk screening and determined that a failure of the walls would not necessarily result in the degradation or failure of the EDG systems. Specifically, for screening purposes, assuming total failure of the concrete masonry walls only introduces a potential of degraded performance since the switchgear are anchored to the concrete floor. As such, Exhibit 4 provides a reasonable basis for screening the finding as Green.

The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because equipment operators did not follow the established work instructions (posted signs). [H.8]

Enforcement. 10 CFR 50, Appendix B, Criterion III, requires, in part, that design changes, including field changes, shall be subject to design control measures commensurate with the original design and be approved by the responsible organization. Contrary to this, on November 25, 2015, field changes were not

subject to design control measures commensurate with the original design and were not approved by the responsible organization. Specifically, when equipment operators attached stored circuit breakers to safety-related concrete block walls, did not maintain three feet separation with attached stored ground trucks, and attached equipment to a cable conduit, a field change to the structure design was made without design control measures and approval by plant engineering. Exelon's corrective actions to restore compliance included relocating the circuit breakers to a different location and establishing a minimum of three feet separation between ground trucks attached only to wall anchors in the concrete block walls, including both sides of walls. Because this violation was of very low safety significance (Green) and Exelon entered this issue into their corrective action program (IR 2592543), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000352/2015004-01, Seismic Qualification of Safety Related Block Wall Not Maintained)**

1R18 Plant Modifications (71111.18 – 3 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

- Engineering Change Package LG 05-00023 – Battery Charger Summer Readiness Preparation

b. Findings

No findings were identified.

.2 Permanent Modifications (2 samples)

a. Inspection Scope

The inspectors evaluated a modification to the application of noble chemistry implemented by engineering change package LG 11-00514, "U2 On Line Noble Chem." The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including equipment and installation requirements, application restrictions and limitations, and operational considerations. The inspectors also observed injections in progress and interviewed chemistry, engineering, and operations personnel to ensure the online noble chemistry injections were reasonably controlled and performed.

The inspectors evaluated a modification to the 'D21' EDG by engineering change package LG 15-00213, "ECR for EDG Stainless Steel Tubing Upgrade (Unit 2)." The inspectors verified that the design bases, licensing bases, and performance capability

of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including material strength and seismic qualification, fatigue resistance, installation instructions, and testing and acceptance criteria. The inspectors also interviewed engineering personnel to ensure the tubing upgrade was reasonably controlled and performed.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 5 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Replacement of the Unit 2 HPCI vacuum tank condensate pump on October 23, 2015
- '1B1' battery charger repair on October 29, 2015
- 'D21' EDG system outage on November 23, 2015
- 201 safeguards bus and transformer planned outage and restoration on December 1, 2015
- Unit 2 RCIC vacuum breaker check valves on December 4, 2015

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 maintenance outage (2M52), conducted December 13 through December 21, 2015. The inspectors reviewed Exelon's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Fatigue management
- Tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Identification and resolution of problems related to outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied technical specifications, the UFSAR, and Exelon procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- ST-6-107-596-2, drywell floor drain sump/equipment drain tank surveillance test and log on October 21, 2015 (reactor coolant system leakage)
- ST-6-092-318-2, ‘D24’ EDG fast start operability and in-service test on December 3, 2015 (in-service test)
- ST-6-073-320-2, Unit 2 rod worth minimizer operability verification prior to startup on December 18, 2015
- ST-6-107-640-2, Unit 2 reactor vessel temperature and pressure monitoring during startup on December 20, 2015
- ST-6-092-316-2, ‘D22’ EDG fast start operability test on December 29, 2015

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Reactor Coolant System (RCS) Specific Activity and RCS Leak Rate (4 samples)

a. Inspection Scope

The inspectors reviewed LGS's submittal for the RCS specific activity and RCS leak rate performance indicators for both Unit 1 and Unit 2 for the period of October 1, 2014 through September 30, 2015. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements of RCS leakage, and compared that information to the data reported by the performance indicator.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index (2 samples)

a. Inspection Scope

The inspectors reviewed LGS's submittal of the Mitigating Systems Performance Index for the following systems for the period of October 1, 2014 through September 30, 2015:

- Unit 1 Cooling Water (MS10)
- Unit 2 Cooling Water (MS10)

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed LGS's operator narrative logs, condition reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 4 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, “Problem Identification and Resolution,” the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify Exelon entered issues into the corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program and periodically attended condition report screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Exelon performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, “Problem Identification and Resolution,” to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by LGS outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed the corrective action program database for the third and fourth quarters of 2015 to assess condition reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRC’s daily condition report review.

b. Findings and Observations

No findings were identified.

The review did not reveal any new trends that could indicate a more significant safety issue. The inspectors determined that Exelon personnel were identifying issues at a low threshold and entering issues into the corrective action program for resolution and appropriately prioritizing investigation reviews. The inspectors reviewed Exelon’s performance improvement actions and issues documented in the corrective action program during the semi-annual period relative to human performance. The inspectors noted enhanced observations and coaching by supervisors and managers of work activity in the field. The inspectors observed overall improved human performance during the period and determined that a potential declining trend in human performance was properly addressed.

The inspectors also reviewed condition reports pertaining to hand switches in the main control room. Typically, operators identify degraded performance of hand switches allowing timely replacement. However, not all switch failures within the semi-annual trend review were previously identified as degraded or otherwise repaired prior to failure in-service. The inspectors noted that these failures involved switches with plastic splines, for which Exelon manufactured aluminum splines for replacement. Although the failures of plastic splines were few relative to the total switch population, the inspectors observed that the population of switches could reasonably be divided into high and low risk significance categories and the high risk significant switches could reasonably be upgraded with aluminum splines proactively. By performing proactive replacements, Exelon could effectively eliminate potential hand switch failures due to failed splines. Exelon initiated action in IR 2523182 to evaluate proactive replacement of switches.

Based on the overall results of the semi-annual trend review, the inspectors determined that Exelon was appropriately identifying and entering issues into the corrective action program, adequately evaluating the issues, and properly identifying adverse trends before they became more safety significant problems.

.3 Annual Sample: HPCI Oil Low Pressure Alarm and Discharge Check Valve Leakby

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's work group evaluation and corrective actions associated with condition reports IR 02496518 and IR 02496668 which were written in response to an oil low pressure alarm and discharge check valve leakby during the Unit 2 HPCI comprehensive test on May 6, 2015.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon corrective action program and 10 CFR 50, Appendix B. In addition, the inspectors interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

Exelon determined the most probable cause of the oil low pressure alarm was that the temperature of the turbine oil was below values that typically exist when the system is in standby. The steam supply to the HPCI pump room ventilation system for heating had been isolated for the refueling outage. After maintenance, the oil pressure was set to the vendor recommended setting. This resulted in lower than desired oil pressures once the turbine was run.

Exelon determined the most probable cause of the discharge check valve leakby was that the check valve did not fully close when the turbine was tripped in response to the low oil pressure alarm. This was the result of the system alignment that existed at the time of the turbine trip. The normal alignment when shutting down the turbine is from

suppression pool to suppression pool. At the time of the turbine trip, the system was operating in the condensate storage tank (CST) to CST alignment per the test procedure. This resulted in the pressure on the downstream side of the discharge check valve dissipating rapidly to the CST and not aiding to fully seat the valve.

The inspectors reviewed Exelon's corrective actions to address the oil low pressure alarm and discharge check valve leakby. The inspectors determined Exelon conducted a thorough technical review of both issues. Corrective actions for the oil low pressure included adjusting the HPCI bearing oil pressures back into band and recommencing the HPCI comprehensive test, reviewing guidance relative to recommended turbine oil supply pressure bands with the intent to raise the upper limit to create margin when setting the oil pressures in cold or static conditions, and revising affected HPCI inspection and test procedures to incorporate broader oil supply pressure bands. Exelon determined that the performance of the HPCI discharge check valve was expected for the conditions that existed at the time of the turbine trip.

The inspectors concluded that Exelon's overall response to the HPCI oil low pressure and discharge check valve leakby was commensurate with the safety significance, was timely, and included appropriate compensatory measures.

.4 Annual Sample: 101 Safeguards Transformer Auto Voltage Controller Failure

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's apparent cause evaluation and corrective actions associated with condition report IR 02413346 which was written in response to the 101 safeguard transformer tap changer failing high on November 17, 2015.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon's corrective action program and 10 CFR 50, Appendix B. In addition, the inspectors interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

Exelon determined the most probable cause of the transformer tap changer auto voltage controller (AVC) failure was that two of the three 'Q1' transistor leads were broken. This transistor is located in the sensing filter portion of the comparator circuit. A drop in the output voltage would be sensed by the circuit and result in the increase in voltage. With the 'Q1' transistor leads broken, the increase in voltage would be maintained and result in the tap changer failing high. The cause of the broken leads is unknown. During

inspection of the AVC following the tap changer failure, it was identified that there were two broken connections to the 'Q1' transistor. The functionality of the AVC was verified prior to installation and as part of the post maintenance testing. This established that the AVC had been installed with the transistor leads connected.

The inspectors reviewed Exelon's corrective actions to address the 101 safeguard transformer tap changer failing high. The inspectors determined that Exelon conducted a thorough technical review of the tap changer AVC failure. Corrective actions included replacing the failed AVC, performing an extent of condition review for the 201 safeguard transformer, and determining a long term plan to upgrade the 101 and 201 safeguard transformer AVCs. The inspectors concluded that these actions were reasonable and appropriate for the failure condition.

The inspectors concluded that Exelon's overall response to the 101 safeguard transformer tap changer failing high was commensurate with the safety significance, was timely, and included appropriate compensatory measures.

.5 Annual Sample: Emergency Diesel Generator No. 'D14' (EDG 'D14') Cylinder Liner Jacket Cracks

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's evaluations and corrective actions associated with cracking of cylinder liner jackets on EDG 'D14.' Specifically, on August 22, 2014, one hour into a loaded run while restoring the 'D14' EDG from its two-year system outage window, a steady jacket water (JW) weepage was observed at the adaptor plate behind the fuel oil injection pump on the control side of No. 5 cylinder. Exelon entered the issue into the corrective action program as IR 01695646, "Cylinder #5 JW Leak." Similarly, 'D14' EDG cylinder liner JW leaks had previously been identified and entered into the corrective action program under IR 01466665 (#11 cylinder, January 24, 2013) and IR 01505063 (#12 cylinder, Apiril 22, 2013).

The inspectors assessed Exelon's problem identification threshold, extent of condition reviews, and the prioritization and timeliness of actions to evaluate whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate and met the requirements of their corrective action program. The inspectors reviewed maintenance procedures, applicable condition reports and associated documents, including an Equipment Apparent Cause Evaluation assigned under AR 01514746 for the aforementioned cylinders 11 and 12 leaks.

The inspectors reviewed Exelon's actions to address other possible or contributing causes, including JW chemistry, engine vibrations, and combustion pressures and temperatures, as the leaks had only occurred on the 'D14' EDG. The inspectors compared the actions taken to the requirements of Exelon's corrective action program and 10 CFR 50, Appendix B. The inspectors performed an extensive review of operational and surveillance test data and trending for all four Unit 1 EDGs ('D11,' 'D12,' 'D13,' and 'D14'). The parameters reviewed included JW and Air Cooler Coolant Pressures and also Scavenging Air Pressure to verify all engines were operating comparably and consistently without indications of degradation. The inspectors

reviewed trended data comparing the 'D13' and 'D14' EDG's Inlet and Outlet JW temperatures; Lube Oil Inlet and Outlet Temperatures; Lube Oil Header, Turbo, and Pump Discharge Pressures; Crankcase Vacuum; and Generator Winding and Stator Temperatures, to verify consistency in operations between the EDGs. Additionally, the inspectors interviewed engineering personnel to assess the effectiveness of the implemented corrective actions and performed numerous field walkdowns to assess the material condition of the EDGs.

b. Findings and Observations

No findings were identified.

The inspectors noted from a review of the documentation that the external JW leaks on the 'D14' EDG did not result in a challenge to the operability of the EDG, as the leakage did not exceed the allowable make-up rate or quantified operability limit of 0.5 oz/min. In each instance, external cracks were not visible and were evidenced only by the wetness or weepage observed during loaded runs. Non-destructive evaluation dye-penetrant tests on the external surface of the jackets during Exelon's extent of condition reviews identified two additional cylinder jackets on 'D14' (#6 and #9 cylinders) with cracks but there was no evidence of actual leakage. A loaded surveillance test run a few months after the 'D14' system outage window revealed a new weepage location at the 'D14' EDG #2 cylinder. Additionally, in December 2014, weepage was identified on the 'D13' EDG #8 cylinder (the only occurrence not on the 'D14').

Independent testing and failure analyses conducted by Fairbanks Morse and Exelon Power Labs on the cylinder/jacket assemblies found very similar failure symptoms, with all the cracks initiating on the inner wall, or wet side, of the jackets in areas of penetrations for the fuel injectors or air start check valve. The analyses reported that the cracks propagated through the jacket wall to the external surface due to cyclic fatigue over a period of about 11 years, however, cyclic fatigue was not the initiator of the cracks. Both Fairbanks Morse and Exelon Power Labs identified that corrosion-based pitting found under the protective coating applied in those penetration areas of the jackets was the initiator. Further investigation revealed another commonality in that all of the affected or cracking jackets, with only one exception, were from a manufactured material lot of April 13, 2001. The exception was from a lot dated June 28, 2001.

It was noted that in 2005, Fairbanks Morse performed a design change to the cylinder liners that included radius changes around those penetrations to reduce stress risers along with shot peening to improve the resistance to fatigue failures, corrosion fatigue, stress corrosion, and erosion caused by cavitation. With that in mind, Exelon has proactively removed and replaced all pre-2005 cylinder liners and jacket assemblies.

The inspectors confirmed that Exelon LGS staff is continuing investigation and monitoring through water and material chemistry, comparing operating conditions and parameters, vibration monitoring, and discussions with the original equipment manufacturer and vendors, corporate experts and engine Owner's Groups. However, it was noted that a Part 21 has not yet been initiated as all parties are not convinced that the manufacturing material lots of 2001 is the sole cause for the cracking at this time.

The inspectors concluded that Exelon's documentation contained a thorough compilation of appropriate information, actions and records, including, but not limited to; leak rate limitations, operability determinations, extent of condition investigations, reviews of operating experience, maintenance and testing, results of the non-destructive evaluation dye-penetrant tests along with various technical reviews and correspondence with personnel from the original equipment manufacturer, Fairbanks Morse.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 7 samples)

.1 Plant Events

a. Inspection Scope

For the plant events listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that Exelon made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed Exelon's follow-up actions related to the events to assure that Exelon implemented appropriate corrective actions commensurate with their safety significance.

- Unit 2 SCRAM during pressurization following startup from the planned maintenance outage on December 19, 2015

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000353/2014-007-00: Condition that Could Have Prevented the Fulfillment of the Reactor Enclosure Secondary Containment Integrity Safety Function

(Closed) LER 05000353/2015-003-00: Condition that Could Have Prevented the Fulfillment of the Reactor Enclosure Secondary Containment Integrity Safety Function

(Closed) LER 05000353/2015-006-00: Condition that Could Have Prevented Fulfillment of the Reactor Enclosure Secondary Containment Integrity Safety Function

The events on December 11, 2014, June 3, 2015, and November 20, 2015, were each reported as a condition that could have prevented the fulfillment of a safety function of structures or systems needed to control the release of radioactive material. TS 3.6.5.1.1, "Reactor Enclosure Secondary Containment Integrity," Surveillance Requirement 4.6.5.1.1.b, requires at least one door in each access to the reactor enclosure be closed. The events were caused by human performance errors which resulted in inadvertently opening of both airlock doors simultaneously. In each case, the airlock doors were re-closed within 10 seconds, well within the Limiting Condition for Operation 3.6.5.1.1 action time limit of four hours. As a result, a violation of plant TS did not occur.

Although there was a performance deficiency associated with each event, the inspectors determined the issues to be minor. To prevent a breach of secondary containment, each reactor enclosure airlock is equipped with a door open indicating light which are used to locally verify the door status. If both doors are opened simultaneously, a local alarm is actuated. If both doors remain open for greater than 10 seconds, an alarm for each set of airlock doors is actuated in the main control room. Per alarm response procedure, an operator would be dispatched to the airlock door to check the status of the doors and to close them if they were open. LGS post loss of coolant accident dose calculations do not credit reactor enclosure secondary containment integrity for mitigation of on-site and off-site doses for the first 15.5 minutes of the event. Based on this information, the inspectors concluded that the performance deficiencies were minor because they: 1) could not reasonably be viewed as a precursor to a significant event; 2) would not have the potential to lead to a more significant to a more significant safety concern if left uncorrected; and 3) would not have adversely affected the reactor enclosure secondary containment's ability to protect the public from radionuclide releases. The LERs are closed.

.3 (Closed) LER 05000353/2015-002-00: Valid Manual Actuation of the Reactor Protection System While Shutdown

On April 13, 2015, LGS operators inserted a manual scram as part of the planned shutdown for the Unit 2 refueling outage (2R13). Operators attempted to reset the scram in accordance with procedures, but the 'B' channel of the reactor protection system was unable to be reset. When the scram was unable to be reset, the operators initiated a second manual scram in accordance with procedures. Exelon reported the second manual scram to the NRC since it was not part of the pre-planned sequence. The inability of the 'B' channel of the reactor protection system to reset was due to a failed relay in the logic of the '2H' intermediate range monitor. The inspectors determined that the relay failure only affected the capability to reset the SCRAM. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

.4 (Closed) LER 05000353/2015-004-00: Valid Manual Actuation of the Primary Containment Isolation System

On June 21, 2015, the Unit 2 reactor enclosure ventilation system tripped which resulted in a low delta pressure condition in reactor enclosure secondary containment. Operators entered Technical Specification Action 3.6.5.1.1, "Reactor Enclosure Secondary Containment Integrity," due to not maintaining reactor enclosure differential pressure greater than .25 inches of vacuum water gauge. Operators initiated a manual initiation of the secondary containment isolation system in accordance with alarm response procedures which restored differential pressure in accordance with technical specifications. The cause of the spurious trip of the reactor enclosure ventilation system was a reactor enclosure equipment compartment exhaust system flow transmitter output drift to a value less than the low flow trip setpoint. The inspectors reviewed the issue and determined that the issue was of minor risk significance because operators responded to the condition in accordance with plant procedures to restore secondary containment differential pressure into technical specification compliance and there was

no adverse consequence as a result of their actions. Exelon implemented a temporary configuration change to defeat the reactor enclosure equipment compartment exhaust system low flow trip in order to restore the reactor enclosure ventilation system to service. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

.5 (Closed) LER 05000352/2015-002-00: Condition Prohibited by Technical Specifications Due to Standby Gas Treatment System Subsystem Inoperable

On August 27, 2015, the Unit 1 standby gas treatment system (SGTS) differential pressure control instrument failed off-scale high. LGS operators declared Unit 1 SGTS operable, but degraded, since SGTS would actuate and drawdown the Unit 1 reactor enclosure differential pressure to greater than the required 0.25 inches of vacuum water gauge. Exelon replaced the instrument on September 4, 2015. Subsequently, Exelon determined that Technical Specification 3.6.5.1.1 Reactor Enclosure Secondary Containment Integrity Surveillance Requirement 4.6.5.1.1.c.2, requires operating one SGTS subsystem for one hour maintaining greater than or equal to 0.25 inches of vacuum water gauge in the reactor enclosure at a flowrate not exceeding 2500 cfm. Since the degraded differential pressure control instrument would result in the flowrate exceeding the 2500 cfm limit during a reactor enclosure drawdown, Exelon determined that firm evidence existed that 'B' SGTS was inoperable from 2:39 am, August 27, 2015, to 8:50 pm, September 4, 2015, approximately a total time of 8 days 18 hours. Technical Specification 3.6.5.3 Standby Gas Treatment System, Action a, requires restoration of the inoperable SGTS subsystem within 7 days. Therefore, this event involved a condition prohibited by Technical Specifications. The enforcement aspects of this issue are discussed in Section 4OA7. The inspectors did not identify any new issues in the review of this LER. This LER is closed.

4OA6 Meetings, Including Exit

On January 15, 2016, the inspectors presented the inspection results to Mr. R. Libra, Site Vice President, and other members of the LGS staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by Exelon and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a non-cited violation.

Technical Specification 3.6.5.3, “Standby Gas Treatment System – Common System,” requires with one SGTS subsystem, restore the inoperable subsystem to operable status within 7 days, or be in at least hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours. Contrary to Technical Specification 3.6.5.3, SGTS subsystem ‘B’ was inoperable for Unit 1 from August 27, 2015, to September 4, 2015, for a time of 8 days 18 hours, and Exelon did not place Unit 1 in hot shutdown or cold shutdown. Exelon entered this issue into the corrective action program as IR 2517538. The inspectors evaluated this finding using IMC 0609.04, “Initial Characterization of Findings,” and IMC 0609, Appendix A, Exhibit 3, “Barrier Integrity Screening Questions.” The inspectors determined that the finding was of very low safety significance (Green) because the finding only represented a degradation of the radiological barrier function of the SGTS. In addition, the inoperable condition would have resulted in a flowrate exceeding the analyzed 2500 cfm with a differential pressure greater than the minimum 0.25 inches of vacuum water gauge. However, the condition did not represent a larger pathway through secondary containment and SGTS retained radiological filtering capability.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

R. Libra, Site Vice President
D. Lewis, Plant Manager
M. Gillin, Director of Operations
F. Sturniolo , Director of Engineering
D. Palena, Director of Maintenance
J. Hunter, Director of Work Management
K. Kemper, Security Manager
R. Dickinson, Manager, Regulatory Assurance
R. Ruffe, Training Director
H. Weissinger, Shift Operations Superintendent
A. Hightower, Emergency Preparedness Manager
G. Budock, Regulatory Assurance Engineer
D. Molteni, Manager Operations Training
M. DiRado, Manager, Engineering Programs
D. Merchant, Radiation Protection Manager
C. Gerdes, Manager, Chemistry, Environmental and Radioactive Waste
B. Bielecki, Assistant Director of Engineering
J. Debrossse, Principal Chemist
J. Durskin, Radiation Protection Engineer
M. Klick, Site, PI Manger
D. Oltmans, Chemistry Staff
D. Wahl, Chemistry Staff
T. Kan, Licensed Operator Requalification Training Lead
S. Gamble, Senior Regulatory Engineer
C. Fritz, Operations Shift Supervisor
M. McGill, Engineer
E. Kriner, Electrical Equipment Component Specialist
N. Lampe, EDG Systems Engineer
H. Weissinger, Shift Operations Superintendent
C. Fritz, Operations Shift Supervisor

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000352/2015004-01	NCV	Seismic Qualification of Safety Related Block Wall Not Maintained (Section 1R15)

Opened
None

Closed

05000353/2014-007-00	LER	Condition That Could Have Prevented the Fulfillment of the Reactor Enclosure Secondary Containment Integrity Safety Function (Section 4OA3.2)
05000353/2015-003-00	LER	Condition That Could Have Prevented the Fulfillment of the Reactor Enclosure Secondary Containment Integrity Safety Function (Section 4OA3.2)
05000353/2015-006-00	LER	Condition That Could Have Prevented the Fulfillment of the Reactor Enclosure Secondary Containment Integrity Safety Function (Section 4OA3.2)
05000353/2015-002-00	LER	Valid Manual Actuation of the Reactor Protection System While Shutdown (Section 4OA3.3)
05000353/2015-004-00	LER	Valid Manual Actuation of the Primary Containment Isolation System (Section 4OA3.4)
05000352/2015-002-00	LER	Condition Prohibited by Technical Specifications Due to Standby Gas Treatment System Subsystem Inoperable (Section 4OA3.5)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
GP-7, Cold Weather Preparation and Operation, Revision 49
OP-AA-108-111-1001, Sever Weather and Natural Disaster Guidelines, Revision 13
SE-9, Preparation for Sever Weather, Revision 38
SE-9-7, Expected High Winds, Tornado, Hurricane or Site Flooding, Revision 0
SE-14, Snow, Revision 20
WC-AA-107, Seasonal Readiness, Revision 16

Maintenance Orders/Work Orders
A2013412 A2022369 C0257955 C0259041

Section 1R04: Equipment Alignment

Procedures
2S49.1.A (COL), Valve Alignment to Assure Availability of the RCIC System, Revision 14
ARC-MCR-120 F4, 201 Safeguard Bus Undervoltage, Revision 1
S49.1.A, Normal RCIC Line-Up for Automatic Operation, Revision 25
S76.8.B, Appx 1, Initiation of U1 RE Secondary Containment ‘B’ Isolation Signal and Restoration of PCIG Hard Card, Revision 1

S91.1.K, Energizing the 201 Safeguard Transformer, Revision 16
S91.1.J, Energizing the 101 Safeguard Transformer, Revision 16
S92.6.A, Transfer of a 4kV Safeguard Bus from 101 Safeguard Feed to 201 Safeguard Feed and Vice Versa, Revision 19
SE-2, Toxic Gas/Chlorine, Revision 24
ST-6-078-301-0, A CREFAS Monthly Operability Test, Revision 17
ST-2-078-301-0, A CREFAS Functional Test, Revision 11

Condition Reports

2530571	2536292	2542176	2545044	2552379	2553726
2561409	2563872	2564052	2565933	2574447	2593672
2561135					

Drawings
706101, Assy. Flow Switch Model 12-64-4 & 4R., 120 Vac, 10 A, 60 Hz, 24 Vdc, 2 A Res. Cont., 120 Vac Input, Revision 0
8031-M-76, Sheet 5, P&ID Reactor Enclosure and Refueling Area HVAC (Unit 1 and Common), Revision 41
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M-76FD, Sheet 4, Functional Description Reactor Enclosure – HVAC, Revision 9

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C0258898 C0258966

Miscellaneous
FSL-076-194A, Reac Bldg Recirc Sys, 12/1/14
M-76-48, Reactor Enclosure Post LOCA Relative Humidity Transient Analysis, Revision 2

Section 1R05: Fire Protection

Procedures
F-A-619, Pre-Fire Plan Common, Control Structure Fan Room, Revision 7
F-R-110, Pre-Fire Plan, Unit 1 Core Spray Pump Room A, Revision 8
F-R-113, Pre-Fire Plan, Unit 1 Core Spray Pump Room C, Revision 8
F-R-114, Pre-Fire Plan, Unit 1 Core Spray Pump Room D, Revision 10
F-R-117, Pre-Fire Plan, Unit 1 Core Spray Pump Room B, Revision 9
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WO R1194822

Section 1R06: Flood Protection Measures

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0S68.8.A, Alignment of Plant Floor Drains and Valves, Revision 4
ARC-MCR-215 G5, 2B-2D RHR Pump Room Flood, Revision 2
OP-LG-108-103-1102, Limerick Generating Station Unit 2 Locked Valve List, Revision 12
SE-4, Flood, Revision 7
SE-4-1, Reactor Enclosure Flooding, Revision 9
S61.0.C, Radioactive Drain Procedure, Revision 12
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8031-M-68, Sheet 1, P&ID Plant Waste Water Effluent (Common), Revision 28
8031-M-68, Sheet 2, P&ID Plant Waste Water Effluent (Common), Revision 23
A-307, Sheet 1, Architectural; Air / Steam / Fire & Water Boundaries Floor Plan El. 217'-0" Unit 1, Revision 31
A-307, Sheet 2, Architectural; Air / Steam / Fire & Water Boundaries Floor Plan El. 217'-0" Unit 2, Revision 13
B-130-VC-00001, Moderate Energy Pipe Break (MEPB/MELB) Analysis Report, Revision 4
B-130-VC-00002, Summary of Requirements for Flooding Prevention Relative to L.G.S. Units 1 and 2, Revision 4
M-508, Plumbing and Drainage Turbine Building No. 1 Floor Plan El. 217'-0", Revision 31
M-523, Plumbing and Drainage Turbine Building No. 2 Floor Plan El. 217'-0", Revision 26

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ECR 10-00461, Safety Related Electrical Manhole Drainage System, Revision 2
NPB-13, Moderate Energy Line Break Analysis – Compartment Flooding Methodology, Revision 2
NPB-14, Moderate Energy Line Break Analysis for Reactor Enclosure; Control Structure; SPPS; D.G. Enclosure, Etc., Revision 7

Section 1R07: Heat Sink Performance

Procedures
ER-AA-340, GL 89-13 Program Implementing Procedure, Revision 7
ER-AA-340-1002, Service Water Heat Exchanger Inspection Guide, Revision 6
RT-2-011-398-1, Unit 1C RHR Motor Oil Cooler Heat Transfer Test, Revision 10

Section 1R11: Licensed Operator Requalification Program

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GP-5, Steady State Operations, Revision 174
GP-5 Appendix 2, Planned Reactor Maneuvering without Shutdown, Revision 83
OP-LG-102-106, Operator Response Time Program at Limerick Station, Revision 5
OP-AA-103-102, Watch-Standing Practices, Revision 14
OP-AA-104-101, Communications, Revision 3
OP-AA-105-102, NRC Active License Maintenance, Revision 11
S55.9.A, Routine Inspection of HPCI System, Revision 42
ST-6-055-230-2, HPCI Pump, Valve, and Flow Test, Revision 75

ST-4-055-953-2, HPCI Vacuum Breaker Test, Revision 11
ST-6-107-590-1, Daily Surveillance Log/Opcons 1,2,3, Revision 173
ST-6-107-596-1, Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/Opcons 1,2,3, Revision 28
T-100, SCRAM/SCRAM Recovery, Revision 17
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T-101 Bases, RPV Control – Bases, Revision 22
TQ-AA-150, Operator Training Programs, Revision 12
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TQ-AA-201, Exam Security and Administration, Revision 16
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1581582-02	1591206-04	1620364-04	1632632-04	1647668-02	1665643-03
1679897-04	2541774-02	2539836-02	2520732-06	2516721-02	2485951-08
2059986-02	2430417-03	2454927-03			

Job Performance Measures

LOJPM2270	LOJPM2271	LOJPM3002	LOJPM3058
LOJPM3095	LOJPM3130	LOJPM3150	LOJPM3208
LOJPM3217	LOJPM3519	LOJPM3523	LOJPM3766

Comprehensive Written Exam

LLOR1406 A	LLOR1406 B	LLOR1406 C	LLOR1506-2 SRO

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7.03, Closure of All Main Steam Isolation Valves at Rated Power, 11/4/14 & 6/24/15
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7.08, Maximum Size Reactor Coolant System Rupture Combined With Loss of All OffsitePower, 11/4/14 & 6/24/15
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Condition Reports

1592309	1636988	1659640	1697541	1698998	2420386
2472816	2581409				

Maintenance Orders/Work Orders
C0242288
C0250657

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2582634

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WC-AA-101-1006, On-Line Risk Management and Assessment, Revision 1

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OP-AA-108-115, Operability Determinations, Revision 15
OP-AA-108-115-1002, Supplemental Consideration for On-Shift Immediate Operability Determinations, Revision 3
S44.7.D, Reactor Water Cleanup Pump *A Post SCRAM Restoration, Revision 9
SP-S-071, Fuel Pool Cooling Alternate Decay Heat Removal Demonstration, Revision 0
ST-6-049-230-2, RCIC Pump, Valve and Flow Test, Revision 75
ST-6-055-230-1, HPCI Pump, Valve and Flow Test, Revision 80
ST-6-095-905-1, Unit 1 Safeguard Battery Weekly Inspection, Revision 20
T-100 Bases, SCRAM/SCRAM Recovery – Bases, Revision 16

Condition Reports

1344540	1542786	2561094	2563012	2566856	2572083
2572180	2574068	2576281	2578175	2575073	2572129
2592543	2599542	2600913			

Maintenance Orders/Work Orders
M2020930

Drawings
8031-ISI-M-44, Sheet 3, ASME Section XI Boundary P&ID Reactor Water Clean-up (Unit 2), Revision 4
A-011-00247, Sheet 1, Steamtight Doors 204 and 288, Revision 8
P-107-B-00115, Sheet 1, 4” Pressure Seal Bolted Yoke Gate Valve, Revision 5

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C0259626

Miscellaneous
22.2L-61, Block Wall Re-evaluation Wall 756.35 (ACI), Revision 5
IOM-FPSM-03-12, Pressure Seal Valves Installation and Operation Manual
LG 94-07214, 4 kV Ground Truck Anchoring Required, Revision 1
LR 13-0223-LR-001, Letter Report – Limerick Generating Station Unit 1 – Effect of Increased Reactor Water Cleanup Flow Rates on Flow Accelerated Corrosion Wear Rates – Final, 4/17/13
TC 15-0419-0, Allow Operation of HV-44-*F105 with Indicated Drain Flow As Described in Precaution 3.7 with No Isolation Signal, 12/13/15

Section 1R18: Plant Modifications

Procedures
S95.1.D, Installation/Removal of the Spare Battery Charger, Revision 3
TC 15-0341-0, Installation/Removal of the Spare Battery Charger, 10/28/15

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2477966 2478216 2479001 2484136 2479539 2513898
2539899

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ECR LG 05-00023, Battery Charger Summer Readiness Preparation, Revision 1
6900E.15, 125/250VDC System Fuse Selection and Coordination, Under Voltage Relay Setting and Safeguard Short Circuit Calculation, Revision 13
ECR 15-00213
IR 01693030-49/CY-LG-120-500/501/502, On-Line Noble Chem (OLNC) Injection Process, Revision 0
LG 11-00514, U2 On Line Noble Chem, Revision 2
LG 12-00433, U1 On Line Noble Chem, Revision 0

Section 1R19: Post-Maintenance Testing

Procedures
M-020-002, Fairbanks Morse Opposed Piston Diesel Engine Examination and General Maintenance, Revision 12
M-600-004, Replacement of EQ Solenoid Valves (Generic), Revision 7
S55.9.A, Routine Inspection of the HPCI System, Revision 42
ST-4-049-952-2, RCIC Vacuum Breaker Test, Revision 9
ST-6-055-230-2, HPCI Pump, Valve and Flow Test, Revision 75
ST-6-095-905-1, Unit 1 Safeguard Battery Weekly Inspection, Revision 20
ST-6-107-594-1, Weekly Surveillance Log, Revision 80
ST-6-107-594-2, Weekly Surveillance Log, Revision 68
ST-6-092-315-2, D21 Diesel Generator Fast Start Operability Test Run, Revision 55

Condition Reports
2555887 2568417 2575739 2576241 2561094 2572180
2576281 2590619 2590791 2590894

Maintenance Orders/Work Orders

A1232621	A1235351	A2015182	C0259181	C0258018	C0258424
C0258737	M2020930	R1142949	R1254307	R1265801	R1280328
R1281401	R1329952				

Section 1R20: Refueling and Other Outage Activities

Procedures
GP-2, Normal Plant Startup, Revision 159

Condition Reports:

2598308	2599542	2599547	2600382	2600465	2600913
2602485	2602522	2602550	2602594	2602602	2602631
2602637	2602641	2602856			

Section 1R22: Surveillance Testing

Procedures
OP-AA-108-111, Adverse Condition Monitoring and Contingency Planning, Revision 10
ST-6-073-320-2, Rod Worth Minimizer Operability Verification, Revision 15
ST-6-092-316-2, D22 Diesel Generator Fast Start Operability Test Run, Revision 53
ST-6-092-318-2, D24 Diesel Generator Fast Start Operability Test Run, Revision 53
ST-6-107-590-2, Daily Surveillance Log/Opcon 1,2,3, Revision 138
ST-6-107-596-2, Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/Opcon 1,2,3, Revision 32
ST-6-107-640-2, Rx Vessel Temperature and Pressure Monitoring, Revision 37

Condition Reports

2521974	2542173	2576419	2605108	2605412

Miscellaneous
Unit 2 Drywell Unidentified Leakage Trend Cycle 14
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Section 4OA1: Performance Indicator Verification

Miscellaneous
Control Room Logs
RCS Specific Activity from October 2014 – October 2015
RCS LR Data binder
RHRSW and ESW MSPI Data Binder from October 1, 2014 to September 30, 2015

Section 4OA2: Problem Identification and Resolution

Procedures
M-020-010, Standby Diesel Generator Cylinder Liner Replacement, Revision 14
ST-6-055-231-2, HPCI Pump Comprehensive Test, Revision 5
ST-6-092-113-1, D13 Diesel Generator 24 Hour Endurance Test, Revision 41
ST-6-092-114-1, D14 Diesel Generator 24 Hour Endurance Test, Revision 38
ST-6-092-313-1, D13 Diesel Generator Slow Start Operability Test Run, Revision 102

ST-6-092-314-1, D14 Diesel Generator Slow Start Operability Test Run, Revision 100
ST-6-092-317-1, D13 Diesel Generator Fast Start Operability Test Run, Revision 55
ST-6-092-318-1, D14 Diesel Generator Fast Start Operability Test Run, Revision 55

Condition Reports

1465658	1466665	1505063	1514746	1695646	2409382
2413346	2413816	2414215	2422756	2434295	2465675
2496518	2496668	2510799	2518886	2525193	2525512
2525731	2526002	2526018	2527241	2527528	2527913
2530129	2530573	2531573	2532098	2535335	2535338
2535341	2538101	2539585	2539817	2539836	2539896
2539920	2540097	2540133	2540280	2541834	2542187
2542690	2544786	2550101	2550237	2551084	2551509
2551879	2551881	2551892	2551892	2552044	2552694
2558957	2567106	2575747	2581293	2582634	2583426
2584458	2584610	2590366	2591953	2592543	

Maintenance Orders/Work Orders
C0248045 C0254895 R1295800

Completed Surveillance Tests
ST-6-092-113-1, D13 Diesel Generator 24 Hour Endurance Test, performed 3/2009 through 9/2015
ST-6-092-114-1, D14 Diesel Generator 24 Hour Endurance Test, performed 3/2009 through 9/2015
ST-6-092-313-1, D13 Diesel Generator Slow Start Operability Test Run, performed 3/2009 through 9/2015
ST-6-092-314-1, D14 Diesel Generator Slow Start Operability Test Run, performed 3/2009 through 9/2015
ST-6-092-317-1, D13 Diesel Generator Fast Start Operability Test Run, performed 3/2009 through 9/2015
ST-6-092-318-1, D14 Diesel Generator Fast Start Operability Test Run, performed 3/2009 through 9/2015

Miscellaneous
ECR 14-00324
ENB015927P, Fairbanks Engine Report – Evaluation of a Cracked OP Engine Cylinder Liner and Water Jacket

Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

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GP-9 (I), Unit 1 Reactor Enclosure Secondary Containment Integrity (Zone I), Revision 39
GP-9 (II), Unit 2 Reactor Enclosure Secondary Containment Integrity (Zone II), Revision 25
GP-11, Reactor Protection System – SCRAM Reset, Revision 27
GP-11, Reactor Protection System – SCRAM Reset, Revision 28
ON-111, Loss of Secondary Containment, Revision 17
ST-6-076-310-2, SGTS Reactor Enclosure Secondary Containment Integrity Test, Revision 19
ST-2-074-641-2, Intermediate Range Monitor Functional Test IRM H, Revision 12
ST-2-074-641-2, Intermediate Range Monitor Functional Test IRM H, Revision 13
T-103, Secondary Containment Control SCC/T, SCC/RAD, SCC/L, Revision 22
T-103 Bases, Secondary Containment Control – Bases, Revision 23

Condition Reports:

1553563	2441928	2452447	2453676	2463784	2469194
2474838	2477454	2477495	2477955	2478881	2479284
2483972	2484558	2487708	2490770	2494041	2517538
2517538	2521353	2521613	2524882	2536213	2546756
2555896	2565245	2572656	2578943	2580811	2582722
2587904	2590366	2590572	2591388	2591777	2592127
2602594	2602637				

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E-686, Sheet 17, Schematic Diagram HVAC Miscellaneous Safeguard Instrumentation 1 & 2 Units & Common, Revision 3

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C0234223 C0257085 C0257683

Miscellaneous

ECR LG 12-00024, U2 Implement Installation of Digital EHC (DEHC), Revision 0

LGS DEHC Data, Historical Operator Event Review, 12/19/15

LM-0646, Re-analysis of Loss of Coolant Accident (LOCA) Using Alternative Source Terms, Revision 4

MAT 12.00024, Unit 2 Digital EHC (DEHC) Modification Acceptance Test, Approved 5/26/15

N-00E-317-0100, Sheet 24, Software Requirements Specification for the Interface of the Unit 2 Digital EHC (DEHC) System to the Plant Monitoring System at Limerick Generating Station, Revision 0

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
AVC	auto voltage controller
CFR	*Code of Federal Regulations*
CREFAS	control room emergency fresh air supply
CST	condensate storage tank
ECR	engineering change request
EDG	emergency diesel generator
HPCI	high pressure coolant injection
IMC	Inspection Manual Chapter
IR	Issue Report
JPM	job performance measure
JW	jacket water
kV	kilovolt
LER	licensee event report
LGS	Limerick Generating Station
NCV	Noncited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OWAs	operator workarounds
RCIC	reactor core isolation cooling
RCS	Reactor Coolant System
RHR	residual heat removal
SGTS	standby gas treatment system
SSC	structure, system, and component
UFSAR	Updated Final Safety Analysis Report