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

November 3, 2015

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 05000352/2015003 AND 05000353/2015003, AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION REPORT 07200065/2015001

Dear Mr. Hanson:

On September 30, 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 October 9, 2015 with Mr. D. Lewis, Plant Manager, 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 Traditional Enforcement Severity Level IV violation and two findings of very low safety significance (Green) in this report. The two findings involved violations of NRC requirements. 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 non-cited violations 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 Agency wide 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/

Fred L. Bower III, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 50-352, 50-353, and 72-065
License Nos. NPF-39 and NPF-85

Enclosure:
Inspection Report 05000352/2015003,
05000353/2015003, and 07200065/2015001
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, 50-353, and 72-065
License Nos.:	NPF-39 and NPF-85
Report No.:	05000352/2015003, 05000353/2015003, and 07200065/2015001
Licensee:	Exelon Generation Company, LLC
Facility:	Limerick Generating Station, Units 1 & 2
Location:	Sanatoga, PA 19464
Dates:	July 1, 2015 through September 30, 2015
Inspectors:	S. Rutenkroger, PhD, Senior Resident Inspector M. Fannon, Resident Inspector L. Cline, Senior Project Engineer S. Garry, Senior Health Physicist S. Hammann, Senior Health Physicist J. Nicholson, Senior Health Physicist R. Nimitz, Senior Health Physicist J. Ayala, Reactor Inspector B. Bollinger, Health Physicist N. Floyd, Reactor Inspector
Approved By:	Fred L. Bower III, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY

IR 05000352/2015003, 05000353/2015003, and 07200062/2015001; 7/01/2015 – 9/30/15; Limerick Generating Station (LGS) Units 1 and 2; Radiological Hazard Assessment and Exposure Controls, Follow-Up of Events and Notices of Enforcement Discretion, and Other Activities.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified three non-cited violations, all of which were 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. A self-revealing Green NCV of TS 6.8.1.a, "Procedures and Programs," occurred when Exelon inadequately maintained and implemented a preventive maintenance (PM) task for the 2DB-1-14 high pressure coolant injection (HPCI) direct current (DC) motor control center (MCC) cubicle. Specifically, PM procedure M-095-002, "250 VDC Westinghouse MCU Maintenance," Revision 6, was performed on the main compartment but was not performed on the auxiliary compartment of the 2DB-1-14 MCC cubicle. Subsequently, the '1A' timetactor failed due to lack of cleaning and inspection, which led to a fire in the HPCI DC MCC. Exelon's corrective actions included initiating issue report (IR) 2480166, replacing the affected components, and revising the PM task to perform future preventive maintenance on both the main and auxiliary compartments of the 2DB-1-14 cubicle. Exelon also conducted immediate extent of condition reviews and scheduled further reviews to ensure no similar conditions exist.

  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, PM procedure M-095-002, "250 VDC Westinghouse MCU Maintenance," Revision 6, was not performed on both compartments of the 2DB-1-14 cubicle and caused the fire in the HPCI DC MCC that 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 that 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)

Cornerstone: Occupational Radiation Safety

- Green. 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)

Other Findings

- Severity Level IV. A self-revealing Severity Level IV NCV of 10 CFR 72.150, "Instructions, Procedures, and Drawings," occurred when Exelon did not properly control water level in dry shielded canister (DSC)-26 on July 7, 2015. Specifically, procedure OU-LG-641, "Transport and Loading of Transfer Cask and Dry Shielded Canister," did not provide adequate direction to shut the discharge valve after a partial drain down of water inventory was completed and, as a result, an additional 231 gallons was removed from the DSC. Exelon staff generated IR 2525512, completed a prompt investigation report, and revised procedure OU-LG-641 to include a step to close the discharge valve (DV-1).

  The inspectors determined that Exelon did not have adequate instructions and procedures in accordance with 10 CFR 72.150 to ensure that DV-1 was closed after the partial drain down of water during decontamination of DSC-26 on July 7, 2015. As a result, the top of the fuel assemblies were exposed to a helium/air mixture and dose rates at the top of the DSC were greater than expected. Because the issue involved independent spent fuel storage installation (ISFSI) operations, consistent with the guidance in Section 2.2 of the NRC

Enforcement Policy, the inspectors evaluated this performance deficiency in accordance with the traditional enforcement process. The inspectors determined that the violation was a Severity Level IV violation in accordance with the NRC Enforcement Policy (Example 6.3.d). Because the violation involved the traditional enforcement process and was not associated with ISFSI support programs conducted under a 10 CFR 50 license, the inspectors did not assign a cross-cutting aspect to this violation. (Section 4OA5)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On September 11, 2015, operators reduced power to 62 percent to clean the condenser water boxes. Operators returned the unit to 100 percent power the following day. 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 September 5, 2015, operators reduced power to 64 percent to perform reactor feedwater pump maintenance. Operators returned the unit to 100 percent power on September 7, 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

1R04 Equipment Alignment

Partial System Walkdowns (71111.04Q – 2 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- '1B' suppression pool cooling and spray during '1A' suppression pool cooling and spray inoperability due to a broken hand switch on July 16, 2015
- '1A' residual heat removal (RHR) equipment alignment walkdown during a '1B' RHR surveillance test on August 7, 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 updated final safety analysis report (UFSAR), technical specifications (TS), 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.

1R05 Fire Protection

.1 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 10, Unit 2 Class 1E battery rooms, elevation 239', on July 14, 2015
- Fire area 11, Unit 2 Class 1E battery rooms, elevation 239', on July 14, 2015
- Fire area 2, common 13.2 kilovolt switchgear room, elevation 217', on August 5, 2015
- Fire area 28, common, standby gas treatment area rooms, elevation 332' and 350', on September 4, 2015
- Fire area 83, D21 diesel generator and fuel oil-lube oil tank room, elevation 217', on September 15, 2015

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed two fire drill scenarios conducted on September 10, 2015, at the live fire training facility. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Exelon personnel identified deficiencies, openly discussed them in a self-critical manner at the critique, and took appropriate corrective actions as required. The inspectors evaluated the following specific attributes of the drill:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Exelon's fire-fighting strategies.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the RHR heat exchangers' readiness and availability to perform their safety functions. The inspectors reviewed the design basis for the components and verified Exelon's commitments to NRC Generic Letter 89-13, "Service Water System Requirements Affecting Safety-Related Equipment." The inspectors reviewed completed surveillance tests and the updated minimum service water flow calculation to verify the reduced flow would still be capable of removing the design basis heat load. The inspectors discussed recent results with engineering staff. The inspectors verified that Exelon initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchangers did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

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

Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed a licensed operator simulator training scenario on July 20, 2015. The scenario included an anticipated transient without scram and a non-isolable reactor coolant system leak. The scenario was complicated by a loss of the 'A' and 'C' service water pumps, a Digital Electro-hydraulic Control transmitter failure, and Reactor Recirculation Pump seal failures. 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 (TS) 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.

1R12 Maintenance Effectiveness (71111.12Q – 5 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component 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 structure, system, or component 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 structures, systems, and components classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these structures, systems, and components 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.

- Unit 1 snubbers
- Unit 2 snubbers
- Unit 1 redundant reactivity control system (RRCS)
- Unit 2 RRCS
- Unit 2 'D21' emergency diesel generator (EDG) air start system

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13Q – 5 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 1 'A' RHR heat exchanger residual heat removal service water (RHRSW) outlet valve hand switch failed on July 16, 2015
- 'D22' EDG failure to start on July 29, 2015

- Unit 1 Division 1 RRCS power supply ‘A18-PS5’ replacement on August 5 and 6, 2015
- Unit 2 HPCI vacuum breaker check valve replacement on August 7, 2015
- Unit 1 reactor core isolation cooling (RCIC) vacuum breaker testing on September 21, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15Q – 6 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 2529262, Unit 1 ‘D’ core spray pump discharge check valve lever arm locking pin was found to be not installed on July 16, 2015
- IR 2529284, Unit 1 ‘A’ RHR heat exchanger RHRSW outlet valve hand switch failed on July 16, 2015
- IR 2534144, ‘D22’ EDG failed to start during surveillance testing on July 29, 2015
- IR 2542598, ‘D21’ EDG failed to start during surveillance testing on August 17, 2015
- IR 2559398, low battery pilot cell voltage on September 24, 2015
- IR 2543848, ‘B’ RHRSW pump total developed head in the alert range on August 15, 2015

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 TS 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, the inspectors determined whether the measures in place would function as intended and were properly controlled by Exelon.

b. Findings

No findings were identified.

1R18 Plant Modifications

Permanent Modifications (71111.18Q – 2 samples)

a. Inspection Scope

The inspectors evaluated the two permanent plant modifications listed below to determine whether the modifications affected the safety functions of systems. The

inspectors reviewed the 10 CFR 50.59 documentation and post-modification testing results, as applicable, and interviewed engineering and operations personnel. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification.

- Engineering Change Request 15-00087, spray pond pump house seismic monitor (XRSH-VA-107) replacement with digital upgrade on July 29, 2015
- Engineering Change Request 13-00166, changes to RHRSW minimum flows to the RHR heat exchangers on September 23, 2015

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19Q – 6 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 points were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- A1992191, replacement of the spray pond pump house seismic monitor on July 30, 2015
- C0258424, replacement of the ‘D21’ EDG ‘4A’ relay and air start solenoid on August 18, 2015
- IR 2555104, ‘2A’ and ‘2B’ instrument gas compressors trouble alarms and receiver low pressure alarms on September 16, 2015
- R1302045, ‘1A’ RHR motor oil cooler flush on September 30, 2015
- Unit 1 RRCS power supply ‘A18-PS5’ replacement on August 6, 2015
- Unit 2, steam leak detection division 3 power supply replacement on August 14, 2015

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22Q – 1 sample)

a. Inspection Scope

The inspectors observed performance of a surveillance test and reviewed test data of the selected risk-significant system to assess whether test results satisfied TS, the UFSAR, and Exelon procedure requirements. The inspectors verified that test

acceptance criteria were clear, the test demonstrated operational readiness and was consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, the test was performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that the equipment was capable of performing the required safety function. The inspectors reviewed the following surveillance test:

- ST-6-055-230-2, Unit 2 HPCI pump, valve, and flow inservice test (IST) on July 17, 2015

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06Q – 3 samples)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of three routine Exelon emergency drills on July 19, July 27, and August 3, 2015, to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Exelon staff in order to evaluate Exelon's critique and to verify whether the Exelon staff was properly identifying weaknesses and entering them into the corrective action program.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

a. Inspection Scope

The inspectors reviewed Exelon's performance in assessing and controlling radiological hazards in the workplace. The inspectors used the criteria in 10 CFR 20, applicable Regulatory Guides, TS, and applicable Exelon procedures for determining compliance.

Inspection Planning

The inspectors reviewed performance indicators for the occupational exposure cornerstone, available radiation protection (RP) program audits, and RP operational occurrences since the last inspection.

Radiological Hazard Assessment

The inspectors reviewed changes to plant operations since the last inspection to identify any changes resulting in a new or significant radiological hazard. As part of this review, the inspectors also conducted walk-downs of the facility to review ambient radiological conditions.

Instructions to Workers

The inspectors reviewed exposure control methods including electronic personal dosimeter (EPD) alarm set-points and EPD alarm occurrences.

Contamination and Radioactive Material Control

The inspectors reviewed changes in radiological source term and potential impacts on radiation detection instrumentation including typical detection sensitivity. The inspectors reviewed procedures to verify alarm response guidance, that instrumentation was used at its typical sensitivity, and that appropriate alarm set-points were being used for contamination monitoring for personnel and material release. The inspectors reviewed national tracked source accountability and leak checking of selected sources.

Risk-Significant High Radiation Area and Very High Radiation Area Controls

The inspectors toured the facility and reviewed controls and procedures for access control of high radiation areas and very high radiation areas. The inspectors also discussed any program changes in this area with cognizant radiological controls personnel

Radiation Worker Performance and RP Technician Proficiency

The inspectors reviewed radiological problem reports since the last inspection that attributed the cause of the event to human performance error.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified at an appropriate threshold and were properly addressed for resolution.

b. Findings

Introduction. A self-revealing Green NCV of TS 6.8.1.a, “Procedures and Programs,” occurred when Exelon failed to establish, implement, and maintain an adequate procedure for control of radioactivity and limiting personnel exposure during operation

of a solid radioactive waste system. Specifically, the procedure for the conduct of back-washing and collection of RWCU filter demineralizer media was inadequate to ensure a sufficient receiving tank volume existed prior to transferring waste media. On June 28, 2015, this resulted in the overflow of a Unit 2 RWCU collection tank. This overflow backed up the reactor building floor drain system, caused high levels of radioactive contamination in accessible portions of the Unit 2 reactor building, and resulted in radioactive contamination of personnel.

Description. On June 28, 2015, Exelon conducted backwashing of its '2B' RWCU filter demineralizer. The filter demineralizer is used to filter and demineralize the reactor water until the filter media is spent. The spent filter media is periodically "back-washed" to allow replacement with new media. The used filter media is then back-washed with water into a backwash receiving tank (BWRT) for subsequent processing and disposal. The BWRT is air-sparged which allows transfer of the used media to a phase-separator tank for removal of excess water and ultimate disposal of the used filter-demineralizer media as radioactive waste.

During the back-wash operation, Exelon uses procedure 545.8.A, "Regeneration of Reactor water Cleanup System Filter Demineralizer," Revision 61, to provide guidance to operators conducting this operation to control level within the BWRT and ensure controlled transfers of the used media. Exelon's review of this procedure identified that the procedure contained no guidance for the maximum allowable height (residual level) of material within the BWRT to ensure adequate volume (margin) in the tank to receive a full backwash of the used media from the RWCU filter demineralizers without overflowing. Consequently, there was no high level of assurance that the radioactive spent filter demineralizer media would not overflow the tank. The operators frequently received an expected BWRT high level alarm during the operation. At the time of the backwash on June 28, 2015, operators had been briefed to expect a high alarm. Notwithstanding, the margin from the tank level at high alarm (where the tank level alarms) to the exact level of the tank overflow generally was not known. Exelon's subsequent review determined the overflow line was approximately 9 inches above the high alarm. Consequently, a potential existed to overflow the tank depending on the time lag between the high level alarm being recognized and the transfer of material being terminated, particularly during air sparging of the BWRT for transfer.

On June 28, 2015, operators backwashed the '2B' RWCU filter-demineralizer. The high level alarm annunciated in the Radwaste Control Room, and the tank overflowed to the floor drain system of the Unit 2 Reactor Building. Exelon concluded that the media likely overflowed the tank via the overflow line during the five minute air mix (sparge) operation. This overflow resulted in the backup of the floor drain into an accessible "clean" hallway of Unit 2. Contamination survey results were 1200 mrad/hr per 100 square centimeters and 20 mR/hr. The unexpected contamination of the reactor building resulted in the contamination of two individuals, one of whom had shoe contamination of 65 mrad/hr. The contamination was tracked around multiple floors and areas of the radiological controlled portions of the facility accessible to personnel in street clothing. Exelon conducted bounding dose calculations attributable to the contamination and controlled and decontaminated affected areas.

Exelon's evaluation concluded the lack of an adequate procedure for the control of backwashing operations was the most probable cause of the overflow. The procedure was determined to be inadequate for an undetermined period of time. Exelon suspended resin backwash operations until the affected procedures were revised to ensure tank level was less than or equal to 3.0 ft. prior to backwashing. Further, Exelon identified other radioactive waste systems that exhibited similar tank level concerns and initiated actions to correct those as part of its extent of condition reviews and corrective actions. The inspectors' review of this procedure confirmed the procedure contained no guidance as to verification of margin or level to prevent tank overflow. The inspectors determined that the issue had limited safety consequence since the overflow occurred on backshift with limited personnel accessing the areas.

Analysis. The inspectors determined that the failure to establish an adequate procedure for backwashing of filter demineralizers was 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 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 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 implement appropriate error reduction tools. Specifically, Exelon operated the BWRT in such a manner that operators routinely accepted high level alarms and the potential for system overflow. Consequently, although this mode of operation of this system was longstanding, the issue reflected current performance. [H.12]

Enforcement. TS 6.8.1.a, "Procedures and Programs," requires in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide (RG) 1.33, Revision 2, February 1978. Section 7 of RG 1.33, Revision 2, Appendix A, requires that the procedures for control of radioactivity and limiting personnel exposure during operation of its solid radioactive waste system. Contrary to this requirement, the procedure for the conduct of resin backwashing operations of the RWCU filter demineralizers was inadequately established in that it did not provide guidance to ensure sufficient available tank volume prior to backwashing of spent media to the BWRT. The procedure was determined to be inadequate for an undetermined period of time. Exelon's corrective actions to restore compliance included revising the procedure to ensure tank level was less than or equal to 3.0 ft. prior to backwashing. Because this violation was of very low safety significance (Green) and was entered into Exelon's corrective action program (IR 2520732), the violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy AR2520732. **(NCV 05000353/2015003-01, Inadequate Procedure for RWCU Backwashing Operations)**

2RS2 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

a. Inspection Scope

During September 14 - 17, 2015, the inspectors assessed performance with respect to maintaining occupational individual and collective radiation exposures as low ALARA. The inspectors used the requirements in 10CFR 20, applicable Regulatory Guides, and Exelon's TSs and procedures for determining compliance.

Inspection Planning

The inspectors reviewed site-specific trends in collective exposures against industry average values, changes in the radioactive source term, and procedures associated with maintaining occupational exposures ALARA including processes used to estimate and track exposures.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with ALARA planning and controls were being identified by Exelon at an appropriate threshold and were properly addressed for resolution.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample)

a. Inspection Scope

During September 14 - 17, 2015, the inspectors verified that various potential in-plant airborne sources were being controlled consistent with ALARA principles and the use of respiratory protection devices, as appropriate. The inspectors used the requirements in 10CFR 20, the guidance in applicable Regulatory Guides, and Exelon's TSs and procedures for determining compliance.

Inspection Planning

The inspectors reviewed reported performance indicators to identify any related to unintended dose resulting from personnel intakes of radioactive material and also reviewed RP operational occurrences.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were being identified at an appropriate threshold and properly addressed for resolution.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04 – 1 sample)

a. Inspection Scope

During September 14 - 17, 2015, the inspectors evaluated the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10CFR 20, the guidance in various Regulatory Guides, and requirements in Exelon's TSs and procedures for determining compliance.

Inspection Planning

The inspectors reviewed issuance/use of external dosimetry, and assessments of external and internal dose and reviewed use of National Voluntary Laboratory Accreditation Program (NVLAP) dosimetry.

External Dosimetry and Special Dosimetric Situations

The inspectors reviewed EPDs to determine the use of a "correction factor" to address the response of the EPD as compared to the dosimeter of legal record. The inspectors also reviewed use of NVLAP accredited neutron dosimetry and dose monitoring.

Routine Bioassay (In Vivo)

The inspectors reviewed dose evaluations from internally deposited radionuclides using whole body count measurements.

Problem Identification and Resolution

The inspectors assessed whether problems associated with occupational dose assessment were identified at an appropriate threshold, were placed in the corrective action program, and whether corrective actions, for a selected sample of problems, were appropriate.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

a. Inspection Scope

During September 14 - 17, 2015, the inspectors reviewed the accuracy and operability of radiation monitoring instruments that were used to protect occupational workers and for effluent monitoring. The inspectors used the requirements in 10 CFR 20; the guidance in applicable Regulatory Guides; and Exelon's TSs, offsite dose calculation manual (ODCM), and procedures for determining compliance.

Inspection Planning

The inspectors reviewed assessments of the radiation monitoring program since the last inspection including evaluations of offsite calibration services.

Calibration and Testing

The inspectors reviewed recent source term assessment to assess whether calibration and check sources used were representative of the types and energies of radiation encountered. The inspectors reviewed calibration and functional testing of the liquid radioactive effluent monitor including alarm set points.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring instrumentation were being identified by Exelon at an appropriate threshold and properly addressed for resolution.

b. Findings

No findings were identified.

Cornerstone: Public Radiation Safety

2RS7 Radiological Environmental Monitoring Program (REMP) (71124.07 – 1 sample)

a. Inspection Scope

During the period July 3 - 16, 2015, the inspectors reviewed the REMP to validate the effectiveness of the radioactive gaseous and liquid effluent release program. The inspectors used the requirements in 10 CFR 20; 40 CFR 190; 10 CFR 50 Appendix I; and the site's TSs, ODCM, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the LGS 2013 and 2014 annual radiological environmental and effluent monitoring reports; REMP program audits; ODCM changes; land use census; and inter-laboratory comparison program results.

Onsite Inspection

The inspectors reviewed and observed the following items:

- Sample collection, monitoring, and dose measurement stations (e.g., environmental dosimeter, air monitoring, vegetation, drinking water, milk)
- Calibration and maintenance records for air sample and dosimetry measurement equipment
- Environmental sampling of the effluent release pathways specified in the ODCM
- Meteorological tower and meteorological data readouts
- Meteorological instrument operability status and calibration results
- Missed and/or anomalous environmental samples identified, resolved, and reported in the annual radioactive environmental monitoring report
- Positive environmental sample assessment results
- The groundwater monitoring program as it applies to selected potential leaking structures, systems, or components.

- 10 CFR 50.75(g) records of leaks, spills, and remediation since the previous inspection
- Changes to the ODCM due to changes to the land use census, long-term meteorological conditions, and/or modifications to the environmental sample stations
- Environmental sample laboratory analysis results and measurement detection sensitivities
- Results of the laboratory quality control program audit and the inter-and intra-laboratory comparison program results

Identification and Resolution of Problems

The inspectors evaluated whether problems associated with the REMP were identified at an appropriate threshold and properly addressed in Exelon's corrective action program.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams, Unplanned Power Changes, and Unplanned Scrams with Complications (4 samples)

a. Inspection Scope

The inspectors reviewed LGS's submittals for the following Initiating Events Cornerstone performance indicators for the period of July 1, 2014, through June 30, 2015.

- Unit 1 Unplanned Scrams
- Unit 2 Unplanned Scrams
- Unit 1 Unplanned Scrams with Complications
- Unit 2 Unplanned Scrams with Complications

To determine the accuracy of the performance indicators (PI) data reported during those periods, inspectors used definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Report Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed LGS' operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, IR's, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

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 System Performance Index (MSPI) for Unit 1 and Unit 2 RHR for the period of July 1, 2014, through June 30, 2015. To determine the accuracy of the PI 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, IR's, MSPI derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

During the period September 14 - 17, 2015, the inspectors sampled Exelon submittals for the occupational radiological occurrences PI for the period of July 1, 2014, through June 30, 2015. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute 99-02, Revision 7, to determine the accuracy of the PI data reported during those periods. The inspectors discussed this area with RP staff; reviewed EPD accumulated dose alarms, radiation work permit dose reports, and dose assignments; and conducted independent walk-downs of various locked high and very high radiation area entrances.

b. Findings

No findings were identified.

.4 Radiological Effluent TS/ODCM Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

During the period September 14 - 17, 2015, the inspectors sampled Exelon submittals for the radiological effluent TS/ODCM radiological effluent occurrences PI for the period of July 1, 2014, through June 30, 2015. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute 99-02, Revision 7, to determine if the PI data was reported properly during this period. The inspectors reviewed public dose assessments for the PI; Exelon's issue report database; gaseous and liquid effluent summary data; and off-site dose calculations for the past four quarters.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 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 Annual Sample: Increased Failure Rate of Mechanical Snubbers on High Acceleration

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's apparent cause evaluation and corrective actions associated with IR 01648831, "1R15 Unusually High Failure Rate of Snubbers on High Acceleration." Specifically, the failure rate of mechanical snubbers, PSA-10 size, functionally tested during the Limerick Unit 1 spring 2014 refueling outage exceeded the normally observed failure rate from previous outages. Their failures occurred during the acceleration activation portion of the functional test, and resulted in a sample expansion to test additional snubbers. A snubber is a support item designed to protect plant piping or equipment at the instance of shock occurrence (i.e. earthquake or transient loading) while at other times allowing unrestricted movement through its normal range (i.e. thermal expansion).

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's staff were 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 Exelon's corrective action program and the requirements of 10 CFR 50, Appendix B. The inspectors also interviewed engineering personnel to discuss the results of the cause evaluation and to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

Exelon staff determined the apparent cause of the increased failure rate of mechanical snubbers being tested was due to separation of the grease that was used to lubricate the internal parts of a mechanical snubber. Specifically, oil separated out of the grease, then migrated to an area of the snubber that relies on friction to function, which allowed the parts to slip and resulted in high acceleration values during testing. Exelon staff further determined that the grease used to lubricate the snubbers, designated as NRRG-2, replaced the original grease, designated as NRRG-159, and a comparison of the grease properties indicated that the NRRG-2 grease has an oil separation rate that is twice the rate of the NRRG-159 grease. In addition, Exelon staff determined there were two contributing causes: 1) prolonged exposure to high temperature environments can cause grease degradation, and 2) snubbers were potentially over-greased.

The inspectors concluded that Exelon staff conducted an appropriate review to identify the likely causes of the high acceleration test results. The inspectors also concluded that Exelon staff identified the extent of condition, which included all sizes of mechanical snubbers in both Limerick Units 1 and 2. Immediate corrective actions included a replacement of all snubbers that failed to meet the test acceptance criteria and an evaluation of the attached piping systems for any adverse impacts. Exelon staff implemented further correction actions, which included a revision to the receipt inspection for new lots of grease to ensure it meets the specification requirements for NRRG-2; enhancement to snubber rebuild procedures to ensure the grease is properly mixed prior to use and to document as-found grease conditions; evaluation to look for an alternative grease with less separation; update the snubber database with new service life dates based on recent test results; revision to snubber installation procedure to require functional testing of new snubbers from warehouse prior to installation to ensure they are operable; and witness rebuilding of snubbers to confirm that the rebuild vendor is not over-greasing the internal parts.

The inspectors reviewed a sample of test failure evaluations to verify that Exelon staff evaluated the impact of the snubber condition on the attached piping systems. The inspectors noted that there was no impact to the piping for any of the degraded or failed snubbers. The inspectors also reviewed a sample of snubber condition reports from the Unit 2 outage in spring 2015 and did not observe similar snubber functional test failures with regards to high acceleration activation values. The inspectors determined Exelon's overall response to the issue was commensurate with the safety significance, was timely, and included appropriate compensatory actions. The inspectors concluded that actions completed were reasonable to correct the problem and prevent reoccurrence.

.3 Annual Sample: ODCM Change Justification

a. Inspection Scope

The inspectors conducted a review of Exelon's corrective actions associated with a performance deficiency that involved a failure to conduct an adequate safety evaluation for changes made to the ODCM as required by TS. This Green NCV (05000352(353)/2014002-01) was previously identified in NRC Integrated Inspection Report (IR) 05000352(353)/2014002 (ADAMS accession no. ML14127A496).

b. Findings and Observations

No findings were identified.

Exelon promptly placed this issue into the corrective action program, conducted an evaluation as to cause, implemented corrective actions in a timely manner commensurate with safety significance, conducted an enhanced safety evaluation of the issue, and revised both the ODCM and the alarm response card to address NRC identified deficiencies for the affected monitor. Exelon's extent of condition review of recent ODCM changes to validate adequacy found that additional information to some changes (three) was warranted, although the changes were determined to be valid; Exelon later provided further documentation. The inspectors determined that no invalid changes were identified. Exelon also revised the procedure for making changes to the ODCM to better define the guidance for what constituted an administrative change versus a technical change requiring a full technical evaluation for adequacy.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 1 sample)

(Closed) Licensee Event Report (LER) 05000353/2015-001-00: Condition That Could Have Prevented Fulfillment of the High Pressure Coolant Injection (HPCI) System Safety Function

a. Inspection Scope

On April 5, 2015, while operating at 82 percent power during end-of-cycle coast down, operators observed fire from the auxiliary cabinet adjacent to the cubicle for the HPCI Vacuum Tank Condensate Pump Motor. The shift management declared an Alert due to visible damage to safety system equipment contained in the reactor enclosure. The cause of the fire was a failure of the '1A' timetactor auxiliary contact to reposition after the designed delay time. Exelon submitted an LER pursuant to the requirements of 10 CFR 50.73 (a)(2)(v)(D) for a condition that could have prevented the fulfillment of the safety function of the structures or systems needed to mitigate the consequences of an accident. The inspectors identified a finding during the review of the LER. This LER is closed.

b. Findings

Introduction. A self-revealing Green NCV of TS 6.8.1.a, "Procedures and Programs," occurred when Exelon inadequately maintained and implemented a PM task for the 2DB-1-14 HPCI DC MCC cubicle. Specifically, PM procedure M-095-002, "250 VDC Westinghouse MCU Maintenance," Revision 6, was performed on the main compartment but was not performed on the auxiliary compartment of the 2DB-1-14 cubicle. Subsequently, the '1A' timetactor failed due to lack of cleaning and inspection, which led to a fire in the HPCI DC MCC.

Description. On April 5, 2015, station operators observed a fire in the auxiliary compartment of the 2DB-1-14 cubicle for the Unit 2 HPCI Vacuum Tank Condensate Pump. An Alert was declared by the Shift Manager under EAL 'HA3' for a fire affecting the operability of plant safety systems.

Exelon performed a root cause evaluation (RCE) to determine the cause of the fire and establish corrective actions to prevent reoccurrence. The RCE determined that the fire occurred because the '1A' timetactor failed to reposition after the designed time delay. This caused its starting resistors to overheat and ignite the wiring insulation in the MCC. Failure analysis of the '1A' timetactor concluded the timetactor failed to reposition due to contaminants on the contacts located between the stationary and movable armatures. PM procedure M-095-002, "250 VDC Westinghouse MCU Maintenance," Revision 6, is used to perform cleaning and inspection of the 2DB-1-14 cubicle. Exelon's RCE identified the PM for the cubicle 2DB-1-14 is only performed in one of the two compartments. The adjacent compartment with the '1A' timetactor was not previously included in the maintenance activities.

Exelon's RCE found that on February 10, 1995, the PM task was changed from removing and cleaning all the cubicles in the MCC during a refueling outage to cleaning some during the refueling outage and cleaning some during a non-outage time. Each cubicle with a component record list (CRL) identifier was given a work order activity to perform the PM work. The cubicle for 2DB-1-14 has one CRL identification number even though the cubicle is located in two compartments. The PM task has a six year periodicity, and the maintenance has been performed multiple times on the compartment with the CRL identification number, but not on the adjacent compartment.

Exelon's corrective actions included initiating condition report IR 2480166, replacing the affected components by the overheating and fire damage, and revising the PM task to perform the preventive maintenance on both the main and auxiliary compartments of the 2DB-1-14 cubicle. Exelon also conducted immediate extent of condition reviews and scheduled further reviews to ensure no similar conditions exist. The inspectors reviewed Exelon's RCE, discussed the issue with plant staff, and verified the corrective actions were commensurate with the safety significance.

The inspectors concluded this issue was not representative of current performance because the process used in 1995 to change PM tasks and generate work order activities was less defined than the procedures currently used at LGS. The current processes for implementing task changes are through the scope change process or the major revision process. If the PM change was processed as a scope change today, the system manager would be involved in the change. Also, when the PM change is processed as a major revision, a peer review of the work order and a plant walkdown is required.

Analysis. The inspectors determined that the failure to perform PM task M-095-002 for the compartment containing the '1A' timetactor 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 was associated with the procedure quality attribute of the Mitigating Systems Cornerstone and affected the objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, PM Task M-095-002 was not performed on both compartments of the 2DB-1-14 cubicle due to inadequate instructions, which led to the fire in the HPCI DC MCC that had the potential to affect HPCI system operation.

Using IMC 0609, 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 only affected portions of the HPCI system were associated with the HPCI vacuum tank condensate pump that is not required to ensure operability or functionality.

The inspectors determined that the finding did not have a cross-cutting aspect because the change to the PM that failed to retain the auxiliary compartments of the 2DB-1-14 cubicle did not occur within the last three years, and the inspectors did not conclude that the causal factors represented present Exelon performance.

Enforcement. TS 6.8.1.a, “Procedures and Programs,” requires in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide (RG) 1.33, Revision 2, February 1978. Section 9.a of RG 1.33, Revision 2, Appendix A, requires that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures appropriate to the circumstances. Contrary to this, Exelon inadequately maintained and implemented written procedures appropriate to the circumstances to preplan and perform maintenance that affected the performance of safety-related equipment. Specifically, on February 10, 1995, a PM task change was performed that removed portions of PM M-095-002, “250 VDC Westinghouse MCU Maintenance,” Revision 6, applicable to the auxiliary compartment of the 2DB-1-14 cubicle. Subsequently, the ‘1A’ timetactor, located in the auxiliary compartment, failed due to lack of cleaning and inspection, which led to a fire in the HPCI DC MCC. Exelon replaced the components affected by the fire and performed the PM. Because this violation was of very low safety significance (Green) and was entered into Exelon’s corrective action program (IR 2480166), the violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy **(NCV 05000353/2015003-02, Inadequate Preventive Maintenance of the HPCI System Motor Control Center)**.

4OA5 Other Activities

.1 Operation of an ISFSI at Operating Plants (IP 60855 and 60855.1)

a. Inspection Scope

On July 13 - 17, 20 - 24, 27 - 29, and 31, 2015, the inspectors observed and evaluated Exelon’s loading of DSC-26 and DSC-33, the second and third canisters to be loaded during the current ISFSI dry cask campaign. The inspectors reviewed Exelon’s activities associated with the loading of DSC-26 and DSC-33. The inspectors also reviewed Exelon’s activities related to long-term operation and monitoring of the ISFSI. The inspectors verified compliance with the certificate of compliance (CoC), TS, regulations, and station procedures.

The inspectors observed loading of fuel assemblies into DSC-33 and the heavy load movement of the transfer cask (TC) and the loaded DSC from the spent fuel pool to the cask processing area. The inspectors also observed DSC processing operations including: installation of the DSC inner top cover, removal of the annulus seal,

installation of the automated welding system**,** welding, non-destructive weld examinations, draining, vacuum drying, helium backfill, and surveying. The inspectors observed the down-ending of the TC/DSC for DSC-26 and alignment of the TC/DSC with the horizontal storage module (HSM) for insertion for DSC-33. During performance of these activities, the inspectors verified that procedure use, communication, and coordination of ISFSI activities met Exelon's established standards and requirements.

The inspectors reviewed Exelon's program associated with fuel characterization and selection for storage. The inspectors reviewed the fuel selection package for the first, second, and third casks loaded during the current campaign, including alternate fuel assemblies, to verify that Exelon was loading fuel in accordance with the CoC, TS, and procedures. The inspectors reviewed recordings made of the fuel assemblies loaded into the first cask, DSC-25, to ensure the loading was in accordance with Exelon's loading plan.

The inspectors observed radiation protection technicians as they provided job coverage for the cask loading workers. The inspectors reviewed survey data maps and radiological records from the DSC loading to confirm that radiation survey levels measured were within limits specified by the TS and consistent with values specified in the final safety analysis report.

The inspectors performed a walk-down of the heavy haul path and toured the ISFSI pad to assess the material condition of the pad and the HSMs. The inspectors also verified that transient combustibles were not being stored on the haul path, ISFSI pad or in the vicinity of the HSMs. The inspectors also confirmed that transient combustible material entry onto the ISFSI pad was controlled in accordance with procedures.

The inspectors reviewed actions taken by Exelon on July 7, 2015 when 231 gallons of water was inadvertently drained from DSC-26 (IR 2524980 and IR 2525512). The inspectors also reviewed information provided by Transnuclear to ensure fuel cladding temperature limits were not exceeded and that fuel oxidation did not occur. The inspectors reviewed changes made to procedure OU-LG-641 to verify that the changes were properly evaluated and made in accordance with Exelon's process prior to processing DSC-33, the next cask loaded during the campaign.

The inspectors reviewed corrective action reports and the associated follow-up actions that were generated since Exelon's last loading campaign to ensure that issues were entered into the corrective action program, prioritized, and evaluated commensurate with their safety significance.

b. Findings

Introduction. A self-revealing Severity Level IV NCV of 10 CFR 72.150 occurred when Exelon did not properly control water level in DSC-26 on July 7, 2015. Specifically, procedure OU-LG-641 did not provide adequate direction to shut the discharge valve after a partial drain down of water inventory was completed, and as a result an additional 231 gallons was removed from the DSC.

Description. On July 7, 2015, ISFSI loading operations were occurring on the refuel floor. DSC-26 was loaded with spent fuel, the shield plug was in place on top of the canister, and the cask was in the cask processing area on the refuel floor for

decontamination and processing. At approximately, 12:00 am on July 8, 2015, the radiation protection technician monitoring the cask identified an increase in dose rates and notified the fuel floor supervisor. The fuel floor supervisor determined that water was draining from the cask due to a siphon effect that was created when the pump was stopped, helium purge was reduced and DV-1 was left open after a 25 gallon drain down of the DSC water level in accordance with procedure OU-LG-641. Exelon personnel were directed to close DV-1 and restored the helium purge.

Prior to performing decontamination of the DSC, procedure OU-LG-641 directed the removal of 25 gallons from the DSC to avoid water expansion coming through the siphon port and to reduce the potential for the top of the shield plug to become contaminated. While draining the DSC the helium purge is maintained at approximately 80 scfh. The procedure directed Exelon personnel to stop the pump when the flow meter reached 25 gallons and reduce the helium purge to 10 scfh.

Exelon determined that an additional 231 gallons of water, over a 90 minute period, was drained from inside the DSC. As a result, the top of the fuel assemblies were exposed to a helium/air mixture and dose rates at the top of the DSC were greater than expected. The inspectors reviewed Exelon's evaluation for fuel oxidation and fuel cladding temperatures limits and determined that there was reasonable assurance that the fuel cladding was not damaged as a result of the temporary exposure to an oxidizing environment.

Prior to resuming ISFSI operations, Exelon completed a prompt investigation report and implemented the following correction actions: (1) performed a human performance review board investigation; (2) conducted a "stand-down" with all reactor services to discuss expectations regarding use of "Stop Work Criteria" and the circumstances and consequences of the draining event; (3) an observation matrix was developed for the remaining 2015 DSC activities for managers to observe key process steps; and (4) revised procedure OU-LG-641, to include a step to close DV-1.

Analysis. The inspectors determined that Exelon did not have adequate instructions and procedures, in accordance with 10 CFR 72.150, to ensure that DV-1 was closed after a partial drain down of water during decontamination of DSC-26 on July 7, 2015. As a result, the top of the fuel assemblies were exposed to a helium/air mixture and dose rates at the top of the DSC were greater than expected. Because the issue involved ISFSI operations, consistent with the guidance in Section 2.2 of the NRC Enforcement Policy, the inspectors evaluated this performance deficiency in accordance with the traditional enforcement process. The inspectors determined that the violation was a Severity Level IV violation in accordance with the NRC Enforcement Policy (Example 6.3.d). Because the violation involved the traditional enforcement process and was not associated with ISFSI support programs conducted under a 10 CFR 50 license, the inspectors did not assign a cross-cutting aspect to this violation.

Enforcement. 10 CFR 72.150 states, in part, that the certificate holder shall prescribe activities affecting quality by documented instructions or procedures of a type appropriate to the circumstance and shall require that these instructions or procedures be followed. Contrary to the above, Exelon did not prescribe activities affecting quality by documented instructions or procedures of a type appropriate to the circumstance. On July 7, 2015, Exelon procedure OU-LG-641 did not provide adequate direction to shut the DV-1 after the partial drain down of water inventory which resulted in an

inadvertent drain down of the DSC. However, because the violation was of very low safety significance (Severity Level IV) and was entered into Exelon's Corrective Action Program as IR 2524980 and IR 2525512, this violation is being treated as an NCV consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 07200065/2015001-01, Inadequate Procedure led to Inadvertent Drain Down of DSC**)

.2 Temporary Instruction 2515/190 – Inspection of the Proposed Interim Actions Associated with Near-Term Task Force Recommendation 2.1 Flooding Hazard Evaluations

a. Inspection Scope:

The inspectors performed activities to independently verify the assumptions from the calculations Exelon used to support its conclusion that no interim actions were required. The activities performed were directed based on questions provided by the NRC staff that reviewed Exelon's near-term task force recommendation 2.1 flood hazard re-evaluation submittal. The results of the inspection were provided to the associated NRC staff in separate correspondence.

The specific activities performed included:

- The inspectors reviewed Technical Evaluation 01550669-36 focusing on the calculation assumptions including equipment configuration in the rooms and flow paths for water from the outside areas into the room.
- Accompanied by Exelon staff, the inspectors conducted walkdowns of the EDG rooms and the area directly outside the doors that provide access to these rooms. The inspectors verified the location of safety-related equipment and equipment important to safety in each of the rooms. They identified the location and sizes for room penetrations, the roof configuration for the building that houses the EDGs and its impact on the amount of precipitation run off, the location, size and configuration of the diesel pits, and the configuration and size of the doors that provide access to each of the rooms.
- The inspectors reviewed preventative maintenance plans for roof drains and diesel pit drains and identified the discharge location for drains potentially affected by a local intense precipitation event.
- The inspectors reviewed site procedures for response to flooding events and identified when and if access to the rooms would be required during an event.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 9, 2015, the inspectors presented the inspection results to Mr. D. Lewis, Plant Manager, and other members of the Exelon staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

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
D. Doran, Director of Engineering
F. Sturniolo, 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
J. Broillet, 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
W. Bianco, Reactor Services Senior Technical Specialist
C. Box, PCI Supervisor
J. Commiskey, ALARA Engineer
B. Day, DSC Engineer
J. Dougherty, DSC Program Manager
W. Emberger, Shift Supervisor
M. George, Fuel Handling Supervisor
M. Kern, Radiation Protection Technician
L. Korbeil, Acting Reactor Engineering Manager
J. McBee, Fuel Floor Reactor Services Supervisor
J. Nelson, Dry Cask Storage Training Coordinator
D. Page, Lead Radiation Protection Supervisor
L. Schiendelman, Lead Maintenance Technician
K. Slough, Mechanical Design Engineering Manager
I. Smith, PCI onsite Manager
T. Tonkinson, Reactor Services Manager

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000353/2015003-01	NCV	Inadequate Procedure for RWCU Backwashing Operations (Section 2RS1)
05000353/2015003-02	NCV	Inadequate Preventive Maintenance of the HPCI System Motor Control Center (Section 40A3)
07200065/2015001-01	NCV	Inadequate Procedure led to Inadvertent Drain Down of DSC (Section 40A5)

Opened

None.

Closed

05000353/2015-001-00	LER	Condition That Could Have Prevented Fulfillment of the High Pressure Coolant Injection (HPCI) System Safety Function (Section 40A3)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

1S51.1.A (COL-1) Equipment Alignment for Automatic Operation of the RHR System in the LPCI Mode – "A" Subsystem, Revision 19

Section 1R05: Fire Protection

Procedures

F-A-336, Pre-Fire Plan Common, 13.2 kilovolt Switchgear Room, Revision 14
F-A-426, Pre-Fire Plan Common, Unit 2 Class 1E Battery 426 and 454, Revision 9
F-A-427, Pre-Fire Plan Common, Unit 2 Class 1E Battery Room 427, Revision 10
F-A-624, Pre-Fire Plan Common, Standby Gas Treatment Area Rooms 624 and 625, Revision 7
F-D-315A, Pre-Fire Plan, D21 Diesel Generator and Fuel Oil-Lube Oil Tank Rooms 315A and 316A, Revision 9
OP-AA-201-003, Fire Drill Performance, Revision 14

Section 1R07: Heat Sink Performance

Procedures

RT-1-012-390-0, RHR Heat Exchanger Heat Transfer Performance Computation Test, Revision 8 (performed 2/12/12)
ST-6-012-2, B Loop RHRSW Pump, Valve & Flow Test, Revision 64 (performed 5/12/12)

Maintenance Orders/Work Orders
R1091777 R1162876 R1219732

Drawings
8031-M-12, Residual Heat Removal Service Water (Common), Revision 62

Miscellaneous
DBD L-S-04, Residual Heat Removal Service Water System, Revision 11
DBD L-S-04, Residual Heat Removal Service Water System, Revision 12
DBD L-S-09, Residual Heat Removal System, Revision 19
ECR LG-13-00166, Generate ECR for Changes to RHRSW Min Flows to RHR Hx's, Revision 000
LM-0640, RHR Heat Exchanger Min. RHRSW Flows/Fouling Factor/Tube Plugging Limits for Shutdown Cooling, Revision 03
LM-0638, RHR Heat Exchanger Min. RHRSW Flow / Structural Evaluation for the Plugging – Suppression Pool Cooling Service, Revision 04
LG2013S027, ECR for Changes to RHRSW Min Flows to RHR Hx's, Revision 0

Section 1R12: Maintenance Effectiveness

Procedures
ER-AA-310, Implementation of the Maintenance Rule, Revision 9
ER-AA-310-1001, Maintenance Rule – Scoping, Revision 4
ER-AA-310-1004, Maintenance Rule – Performance Monitoring, Revision 13
ER-AA-310-1005, Maintenance Rule - Dispositioning Between (a)(1) and (a)(2), Revision 7
ER-AA-330-010, Snubber Functional Testing, Revision 5
M-200-053, Limerick Generating Station Snubber Functional Testing, Revision 2

Condition Reports

0352071	1239365	1260638	1327740	1332858	1336039
1339412	1342445	1365093	1365446	1365678	1365680
1376415	1390268	1416183	1420428	1430901	1466666
1477686	1493552	1495358	1496178	1496636	1497800
1510281	1510841	1512769	1520555	1525135	1526975
1529197	1529206	1529743	1529748	1529750	1529753
1536579	1545332	1546800	1547366	1548613	1549169
1549475	1552981	1553040	1553284	1563210	1563290
1564222	1569907	1573005	1576005	1580119	1588958
1601062	1602838	1608169	1608170	1615882	1623134
1626656	1629684	1631086	1632298	1638526	1638978
1639617	1639670	1640898	1642413	1642992	1642994
1643136	1646501	1647883	1650567	1651574	1652550
1656762	1660097	1660153	1660485	1663881	1668595
1672825	1680398	1688791	1691200	1696684	1696834
1697147	2130180	2383860	2384080	2387899	2395580
2410266	2429485	2430692	2434870	2435451	2448575
2450873	2459937	2485533	2487324	2487474	2487601
2487729	2490517	2496194	2503831	2505860	2506979
2531326	2534144	2537221	2542598	2542727	2543040
2543620					

Maintenance Orders/Work Orders
A1726229 A2011584 C0258424 C0258425

Drawings
8031-M-1-C22-P001-E-096, Isolator Assignment and Spares, Revision 4
8031-M-1-C22-P001-E-097, Bay B Power Distribution; Channel A, B and STS, Revision 5
8031-M-1-C22-P001-E-098, Bay B Power Distribution; Channel A and B, Revision 4
8031-M-1-C22-P001-E-099, Bay B Power Monitor Channel A, B and STS, Revision 4
8031-M-1-C22-P001-E-100, Bay B & C AC Power Distribution & Panel Grounding, Revision 4
8031-M-1-C22-P001-E-101, Isolator Bay A Power Distribution Channel A, Revision 4
8031-M-1-C22-P001-E-102, Isolator Bay A Power Distribution Channel B, Revision 4
8031-M-1-C22-P001-E-103, Isolator Bay C Power Distribution Channel A & B, Revision 3
8031-M-1-C22-P001-E-104, Bay C Power Distribution Channel A Analog Isolator, Revision 3
8031-M-1-C22-P001-E-105, Isolator Bay C Power Distribution Channel B, Revision 3
8031-M-1-C22-P001-E-106, Isolator Bay C Power Distribution Channel A and B, Revision 3
8031-M-48, Sheet 1, Pipping and Instrument Diagram Standby Liquid Control (Unit 1), Revision 30
914E361, Power Supply Module, Revision 4
M-071-00048
M-1-C41-1040-E-002, Sheet 1, Elementary Diagram Stand-By Liquid Control System, Revision 29

Work Order
C0257267

Miscellaneous
Maintenance Rule System Basis Document for System 103A Snubbers
Maintenance Rule System Basis Document, 036E, Redundant Reactivity Control System, 8/11/15

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
1S49.1.A, Valve Alignment to Assure Availability of the RCIC System, Revision 17
OP-AA-108-117, Protected Equipment Program, Revision 4
ST-4-049-952-1, RCIC Vacuum Breaker Test, Revision 9
WC-AA-101-1006, On-Line Risk Management and Assessment, Revision 1

Condition Reports
2534144

Drawing
CPVB-M-49, Primary Containment Pipe & Valve Boundary Reactor Core Isolation Cooling (Unit 1), Revision 1
E51-1040-E-053, Sheet 1, Schematic HV-049-1F008 RCIC Steam Line Outboard PCIV Outboard, Revision 2
E51-1040-E-054, Sheet 1, Schematic HV-049-1F080 RCIC Turbine Exhaust Line Vacuum Breaker PCIV Outboard, Revision 2
M-1-E51-1040-E-001, Sheet 1, Elementary Diagram Reactor Core Isolation, Revision 64
M-1-E51-1040-E-002, Sheet 1, Elementary Diagram Reactor Core Isolation, Revision 20

Miscellaneous
Operations Protected Equipment Log 7/29/2015
Operations Protected Equipment Log 8/7/2015

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
OP-AA-108-115, Operability Determinations (CM-1), Revision 15
S95.9.F, Performance of Battery Equalization, Revision 29
ST-6-012-232-0, B Loop RHRSW Pump, Valve & Flow Test, Revision 70
ST-6-092-311-2, D21 Diesel Generator Slow Start Operability Test Run, Revision 83
ST-6-095-916-1, Div II 125/250 VDC 1B1D101/1B2D101 Safeguard Battery Monthly Inspection, Revision 10
TC 15-0279-0, 8/12/15

Condition Reports

0437503	0762240	1197028	1202661	1220097	2485668
2518312	2523182	2529262	2529284	2534144	2538760
2539394	2542598	2542727	2543040	2543620	2559398
2560499	2560695				

Maintenance Orders/Work Orders

A1726229	A2011584	C0258424	C0258425

Drawings
M-071-00048
M-71-65, Sheet 30, Control Schematic D22 Diesel Generator, Revision 2
M-71-65, Sheet 32, Control Schematic D22 Diesel Generator, Revision 1
M-71-147, Sheet 1, Schematic – Power Chassis, Revision 21

Work Orders

R1327722	C0257267

Miscellaneous
LER 05000352/1990-011-00, The 'B' ESW System Loop was Inoperable Due to a Partially Stuck Open 'B' ESW Pump Discharge Check Valve Resulting from a Personnel Error during Maintenance, 5/21/1990
Mod. No. 87-5539-1, 7/14/89
Operation Logs on 8/17/2015, 8/18/2015, and 8/19/2015
Vendor Manual RS-1476, Section 12-800, Station Battery Vented Cell Installation & Operating Instructions

Section 1R18: Plant Modifications

Procedures
RT-1-012-390-0, RHR Heat Exchanger Heat Transfer Performance Computation Test, Revision 8 (performed 2/12/12)
ST-6-012-2, B Loop RHRSW Pump, Valve & Flow Test, Revision 64 (performed 5/12/12)

Condition Reports
1630891 2451530 2465169 2481081

Maintenance Orders/Work Orders
R1091777 R1162876 R1219732

Drawings
8031-M-12, Residual Heat Removal Service Water (Common), Revision 62

Miscellaneous
DBD L-S-04, Residual Heat Removal Service Water System, Revision 11
DBD L-S-04, Residual Heat Removal Service Water System, Revision 12
DBD L-S-09, Residual Heat Removal System, Revision 19
ECR 13-00166
ECR 15-00087
LG2013S027, ECR for Changes to RHRSW Min Flows to RHR Hx's, Revision 0
LM-0640, RHR Heat Exchanger Min. RHRSW Flows/Fouling Factor/Tube Plugging Limits for Shutdown Cooling, Revision 03
LM-0638, RHR Heat Exchanger Min. RHRSW Flow / Structural Evaluation for the Plugging – Suppression Pool Cooling Service, Revision 04

Section 1R19: Post-Maintenance Testing

Procedures
S59.1.A, Placing Primary Containment Instrument Gas in Normal Operation, Revision 25
S59.2.A, Shutdown of Both Primary Containment Instrument Gas Compressors, Revision 18
ST-2-025-406-2, NSSSS-NUMAC Steam Leak Detection – TURB ENC AMB T, OUTBRD MSIV AMB T, RCIC AMB T, and RCIC DT – Division 3 Calibration/Functional Test (TIS-025-201C), Revision 8
ST-2-036-413-0, Seismic Monitoring – Triaxial Time – History Accelerometer/Recorder Calibration/Functional Test (XRSH-VA-107), Revision 20
ST-6-051-231-1, A RHR Pump, Valve and Flow Test, Revision 82
ST-6-092-311-2, D21 Diesel Generator Slow Start Operability Test Run, Revision 83
ST-6-107-590-2

Condition Reports
1630891 2451530 2465169 2481081 2538119 2541686
2542598 2542727 2543040 2543620 2555104

Maintenance Orders/Work Orders
A1726229 A1980843 A1989251 A1992191 A2011584 A2014926
C0258424 C0258425 M2014926 R1302045

Work Orders
M2002316 C0258391

Miscellaneous
Evaluation of Test Results, ST-2-025-406-2, 8/14/15
M-0011, Sheet 0002, Piping and Instrument Diagram Emergency Service Water, Revision 92
Operation Logs on 8/17/2015, 8/18/2015, and 8/19/2015

Section 1R22: Surveillance Testing

Procedures
ST-6-055-230-2, HPCI Pump, Valve and Flow Test, Revision 74

Condition Reports
2529722 2529960 2530129

Maintenance Orders/Work Orders
R1319812

Section 2RS01: Access Control to Radiologically Significant Areas

Procedures:
RP-AA-401-1003, Revision 2, Contamination Control Best Practice Applications
RP-AA-403, Revision 7, Administration of the Radiation Work Permit Program
RP-AA-460, Revision 26, Controls for High and Locked High Radiation Areas
RP-AB-460-1002, Revision 1, Locked High Radiation Area Control Following Start-up RP-AA-503, Revision 10, Unconditional Release Survey Method
RP-AA-605, Revision 6, 10 CFR 61 Program
RP-AA-1010, Revision 1, LGS-13-002, Rev 1, Justification of Small Article Monitor (SAM) Alarm Set Point
ST-0-107-493, Revision 15, Periodic By-product Material Leak Test and Investigation
RP-AA-700 1240, Revision 4, Operation and Calibration of the Canberra ARGOS-5 Personnel Contamination Monitor

Miscellaneous:
LGS-15-002, Revision 0, Attachment 1, Canberra Argos-5 A/B Plant Mix Beta Sensitivity
Performance Indicator Summary Data
Source Term assessment

Section 2RS02: Occupational ALARA Planning and Controls

Procedures:
CY-AB-120, Revision 11, BWR Shutdown Chemistry
CY-LG-120-1301, Revision 8, Outage Cobalt Limits
CY-LG-120-1101, Revision 31, Primary Chemistry Sampling and Analysis Scheduling
OU-AA-101, Revision 22, Refuel Outage Management
RP-AB-461, Revision 0, Access Controls during Irradiated Core Component Movement
RP-AB-F-04, Revision 0, Access Controls during Irradiated Component Movement at Limerick

Miscellaneous:
Radiological Risk Management Matrix
Station Daily Updates (various)
Station ALARA Summary
Source Term Control Plans and Actions
Various ALARA Plans

Section 2RS03: In-plant Airborne Radioactivity Control and Mitigation

Miscellaneous:
Recent Source Term Assessment

Section 2RS04: Occupational Dose Assessment

Procedures
RP-AA-250, Revision 6, External Dose Assessment from Contamination

Miscellaneous:
NVLAP Personnel Monitoring Device Approval
Source Term Assessment

Section 2RS05: Radiation Monitoring Instrumentation

Procedures
CY-AA-170-000, Revision 6, Radioactive Effluent and Environmental Programs
CY-AA-170-3100, Revision 4, Offsite Dose Calculation Manual
ST-2-063-400, Revision 21, Radioactive Liquid Effluent Monitoring Calibration and Functional Test
ST-2-063-600, Revision 19, Radioactive Liquid Effluent Monitoring-Liquid Radioactive Effluent Line Functional Test
ST-5-061, Revision 49, Radwaste Discharge Permit

Miscellaneous:
Audit NOSA-Lim-14-04, Chemistry, Radwaste, Effluent Environmental Monitoring
Check-in 2447818
FASA 1624183
Recent Source term Assessment
Whole body counter Manual

Section 2RSO7: Radiological Environmental Monitoring Program

Procedures:
CY-AA-130-201, Radiochemistry Quality Control, Revision 3
CY-AA-130-201-F-08, NRC Radiochemical Acceptance Criteria for Split Samples, Revision 0
CY-AA-170-000, Radioactive Effluent and Environmental Monitoring Programs, Revision 6
EN-LG-408-4160, RGPP Reference Material for Limerick Generating Station, Revision 4
RP-AA-228, 10 CFR 75(g) and 10 CFR 72.30(f) Documentation Requirements, Revision 2
RT-0-100-990-0, Annual 10 CFR 50.75(g) and 10 CFR 72.30(d) Report (2014), Revision 0
ST-5-036-802-0, Calibration of Primary Meteorological Tower Sensors (Wind Speed, Wind Direction, Temperature, Rain, Dew Point), Revision 4
ST-5-036-802-0, Calibration of Secondary Meteorological Tower Sensors, Revision 3
ST-5-104-800-0, Limerick Generating Station Dose Commitment to Member of the Public, Revision 12

Miscellaneous:
Air sample orifice calibration data (269325, 26993426)
Audit NOSA-Lim-14-04, Chemistry, Radwaste, Effluent Environmental Monitoring
Check-in 2447818
Environmental Dosimeter Performance Data (2014, 2nd QTR)
FASA 1624183
Meteorological Monthly and Annual Reports
Offsite Dose Calculation Manual Revision 26, 27, 28
Source Term Assessment
Teledyne Brown Annual Audit 2014
Tree Inspection Program (Meteorological Tower), May 29, 2015

Section 4OA1: Performance Indicator Verification

Procedures
LS-AA-2200, Mitigating System Performance Index Data Acquisition and Reporting, Revision 5
NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 7

Condition Reports
1679101 1687470 2160180 2416934 2439994 2458005
2487060 2509493

Miscellaneous
MSPI Data
Operation Narrative Logs

Section 4OA2: Problem Identification and Resolution

Procedures
ER-AA-310-1005, Maintenance Rule - Dispositioning Between (a)(1) and (a)(2), Revision 7
ER-AA-330-010, Snubber Functional Testing, Revision 5
M-200-043, Limerick Generating Station Small Snubber Removal and Installation, Revision 10
M-200-053, Limerick Generating Station Snubber Functional Testing, Revision 2
M-C-700-321, Overhaul of Size 1, 3, and 10 Mechanical Snubbers, Revision 3
PI-AA-125, Corrective Action Program Procedure, Revision 2
ST-1-103-300-1, 24 Month Snubber Functional Test Program, Revision 5
ST-1-103-990-1, Snubber Service Life Monitoring, Revision 5

Condition Reports
1640240 1640898 1643136 1648831 1660485 2472930
2488637 249039

Miscellaneous
Annual Radioactive Effluent and Environmental Reports 2013-2014
Apparent Cause Investigation Report titled "1R15 Unusually High Failure Rate of Snubbers on High Acceleration," dated May 30, 2014
Electronic Dosimetry Records
ER-LG-330-1001, ISI Program Plan, Revision 10
ER-LG-330-1002, ISI Augmented Inspection Program, Revision 4
Personnel Dose Information including Dose Assessments
Public Dose Calculations
Unit 1 Snubber Service Life Monitoring Technical Evaluation, dated September 26, 2014

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

Condition Reports
2480166 2513730 2513735 2513738

Miscellaneous
Operation Logs on 4/5/2015

Section 4OA5: Other Activities

Procedures
HU-AA-101, Attachment 4, Stop Work Criteria, Revision 9
NF-AA-621, Classification of Fuel Assemblies for Dry Storage, Revision 3
NF-AA-622, Fuel Selection and Documentation for Dry Cask Loading, Revision 1
NF-AA-622-1000, Fuel Characterization for Dry Storage, Revision 3
NF-AB-625, Fuel Assembly Inspections for Dry Cask Storage, Revision 1
OU-AB-4001, BWR Fuel and Core Components Handling Practices, Revision 9
OU-LG-626, Fuel Loading/Unloading of a Dry Shielded Canister, Revision 0
OU-LG-640, Preparation for an Independent Spent Fuel Storage Campaign, Revision 1
OU-LG-641, Transport and Loading of Transfer Cask and Dry Shielded Canister, Revision 3
OU-LG-641, Transport and Loading of Transfer Cask and Dry Shielded Canister, Revision 5
OU-LG-641, Transport and Loading of Transfer Cask and Dry Shielded Canister, Revision 6
OU-LG-643, Transport of Loaded Transfer Cask and Dry Shielded Canister to Transfer Trailer, to ISFSI, and Alignment/Insertion into the Horizontal Storage Module, Revision 4
OU-LG-645, MMC Dry Shielded Canister Welding, Vacuum Drying, and Helium Fill, Revision 6
OU-LG-646, Demobilization from an Independent Spent Fuel Storage Campaign, Revision 0
RP-AA-460, Controls for High and Locked High Radiation Areas, Revision 26

Condition Reports
1532642 1579714 1674230 2393749 2411781 2482432
2511326 2515229 2524980 2525512 2528567 2530654
2531490 2531573 2532098

Calculations
EC 0000399843, Eval Fuel, Dry Fuel Storage Characterization, Classification, and Cask Loader Update

Miscellaneous
72.48 Screening/Evaluation LGI-2015S001
72.48 Screening/Evaluation LGI-2015S005
Areva, Certificate of Conformance, DSC Serial Number EXELON-61BTH-1-D-2-033
Areva Letter, dated October 23, 2014, Response to Exelon IR # 02393749
Areva Letter, dated July 14, 2015, Response to Exelon IR # 2525512
Check-In Self-Assessment, Limerick 2015 Spent Fuel Loading Campaign (SFLC) Readiness Assessment
Design Analysis, Analysis Nos: LISFSI-0026, 0027, 0028, 0029, 0030, 0032, 0033
Human Performance Issue Verbal Report for IR 2515229
Human Performance Alert Briefing for IR 2525512
Independent Spent Fuel Storage Installation Audit, NOSA-LIM-14-11 (AR 2390450)
Limerick Generating Station, 10 CFR 72.212 Evaluation Report, Revision 8
Magnetic Particle Examination, Report Nos: BOP-MT-14-088, 087, 086
Material Receiving Report No: 0406804, Dry Shielded Canister
NUHOMS System Overview, Course Code: MA-281.02

PCI Energy Services Nonconformance Report 907822-01, dated July 21, 2015
Registration of Use of Casks to Store Spent Fuel, dated July 23, 2015, ML 15204A008
Temporary Procedure Change, 15-0241-0, Refueling Platform Operation
White Paper, Response to NRC on DSC Drain Down Event, dated July 21, 2015
Work Order C0256246, 2015 ISFSI Campaign-Load 2nd Canister
Work Order R1268893, Demobilization from ISFSI Campaign

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
AR	action request
BWRT	backwash receiving tank
CFR	Code of Federal Regulations
CoC	certificate of compliance
CR	condition report
CRL	component record list
DC	direct current
DSC	dry shielded canister
DV	discharge valve
ED	electronic dosimeter
EDG	emergency diesel generator
EPD	electronic personal dosimeter
HPCI	high pressure coolant injection
HSM	horizontal storage module
IMC	Inspection Manual Chapter
IR	Issue Report
ISFSI	independent spent fuel storage installation
LER	licensee event report
LGS	Limerick Generating Station
MCC	motor control center
MSPI	mitigating system performance index
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NVLAP	National Laboratory Accreditation Program
ODCM	offsite dose calculation manual
PI	performance indicators
PM	preventive maintenance
RCE	root cause evaluation
RCIC	reactor core isolation cooling
REMP	radiological environmental monitoring program
RG	regulatory guide
RHR	residual heat removal
RHRSW	residual heat removal service water
RP	radiation protection
RWP	radiation work permit
RWCU	reactor water cleanup
TC	transfer cask
TS	Technical Specifications
UFSAR	updated final safety analysis report