



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

August 4, 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
05000352/2015002 AND 05000353/2015002**

Dear Mr. Hanson:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station (LGS), Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on July 10, 2015 with Mr. R. Libra, Site Vice President, and other members of your staff.

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

The inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the non-cited violation 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 Limerick Generating Station.

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

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000352/2015002
and 05000353/2015002
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000352/2015002
and 05000353/2015002
w/Attachment: Supplementary Information

DISTRIBUTION w/encl:
(via e-mail)

DDorman, RA
DLew, DRA
HNieh, DRP
MScott, DRP
RLorson, DRS

JTrapp, DRS
FBower, DRP
SBarber, DRP
BLin, DRP
ATurilin, DRP
PMeier, DRP
SRutenkroger, DRP, SRI

MFannon, DRP, RI
NEsch, DRP, Resident AA
KMorganButler, RI, OEDO
RidsNrrPMLimerick Res
RidsNrrDorlLp1-2 Res
ROPreports Res

DOCUMENT NAME: G:\DRP\BRANCH4\Inspection Reports\Limerick\2015\2Q\Limerick IR 2015002 Final.docx
ADAMS Accession No. **ML15216A194**

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP	RI/DRP		
NAME	SRutenkroger/SPR	SBarber/ FLB for via email	FBower/ FLB		
DATE	07/ 15 /	07/ /15	07/ /15		

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-352 and 50-353

License Nos.: NPF-39 and NPF-85

Report No.: 05000352/2015002 and 05000353/2015002

Licensee: Exelon Generation Company, LLC

Facility: Limerick Generating Station, Units 1 & 2

Location: Sanatoga, PA 19464

Dates: April 1, 2015 through June 30, 2015

Inspectors: S. Rutenkroger, PhD, Senior Resident Inspector
M. Fannon, Resident Inspector
B. Lin, Project Engineer
R. Nimitz, Senior Health Physicist
N. Floyd, Reactor Inspector

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

TABLE OF CONTENTS

SUMMARY	3
1. REACTOR SAFETY	4
1R01 Adverse Weather Protection	4
1R04 Equipment Alignment	5
1R05 Fire Protection	5
1R08 In-service Inspection	6
1R11 Licensed Operator Requalification Program and Licensed Operator Performance ...	8
1R12 Maintenance Effectiveness	9
1R13 Maintenance Risk Assessments and Emergent Work Control	9
1R15 Operability Determinations and Functionality Assessments	10
1R19 Post-Maintenance Testing	10
1R20 Refueling and Other Outage Activities	11
1R22 Surveillance Testing	12
2. RADIATION SAFETY	12
2RS1 Radiological Hazard Assessment and Exposure Controls	12
2RS2 Occupational ALARA Planning and Controls	14
2RS3 In-Plant Airborne Radioactivity Control and Mitigation	14
2RS4 Occupational Dose Assessment	15
2RS5 Radiation Monitoring Instrumentation	16
4. OTHER ACTIVITIES	17
4OA1 Performance Indicator Verification	17
4OA2 Problem Identification and Resolution	18
4OA3 Follow-Up of Events and Notices of Enforcement Discretion	20
4OA6 Meetings, Including Exit	22
ATTACHMENT: SUPPLEMENTARY INFORMATION	22
SUPPLEMENTARY INFORMATION	A-1
KEY POINTS OF CONTACT	A-1
LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED	A-1
LIST OF DOCUMENTS REVIEWED	A-2
LIST OF ACRONYMS	A-10

SUMMARY

IR 05000352/2015002 and 05000353/2015002; 4/01/2015 - 6/30/2015; Limerick Generating Station (LGS) Units 1 and 2; Follow-Up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified one non-cited violation (NCV) 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 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified because Exelon failed to control the proper design configuration of installed plant equipment in Unit 1. Specifically, a fitting used in the safety-related primary containment instrument gas (PCIG) tubing supplying the '1C' inboard main steam isolation valve (MSIV) was not installed in accordance with the specified quality standard and this deviation was not controlled. Subsequently, the fitting failed due to high cycle fatigue and caused a reactor trip. Exelon's corrective actions included initiating condition report IR 2458005, installing approved tubing and fittings on February 24, 2015, on the '1C' inboard MSIV which maintained wall thicknesses greater than original specifications, and verifying that current maintenance practice, training, and knowledge would preclude substitution of a different style fitting without further evaluation.

This finding is more than minor because it is associated with the design control attribute of the initiating events cornerstone and affected the objective to limit the likelihood of events that upset plant stability during power operations. Specifically, the inadvertent closure of the '1C' inboard MSIV resulted in a reactor trip. Using IMC 0609, "Significance Determination Process, Appendix A, Exhibit 1, "Initiating Events Screening Questions," the inspectors determined that this finding was of very low safety significance (Green) because the finding did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (e.g. loss of condenser, loss of feedwater). Specifically, the finding caused the loss of one steam line to the main condenser but three steam lines remained available. The inspectors determined that the finding did not have cross-cutting aspect because the installation of the fitting that failed did not occur within the last three years, and the inspectors did not conclude that the causal factors represented present Exelon performance. (Section 40A3)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On May 23, 2015, operators reduced power to 63 percent to clean the condenser water boxes. Operators returned the unit to 100 percent power on May 24, 2015. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period in end-of-cycle coastdown operations. On April 12, 2015, operators commenced a shutdown, from an initial power of 80 percent, for a planned refueling and maintenance outage (2R13). The station reached operational condition 5 (refueling) on April 14, 2015. Following the completion of refueling and maintenance activities, operators commenced a reactor startup on May 4, 2015. Operators returned the unit to 100 percent power on May 9, 2015. On May 15, 2015, operators reduced power to 55 percent to investigate and resolve reduced flow through the '2C' feedwater heater string. Operators returned the unit to 100 percent power on May 18, 2015. The unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of Exelon's readiness for the onset of seasonal high temperatures on June 12, 2015. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during this adverse weather condition. The inspectors walked down the emergency diesel generators and emergency service water system to ensure system availability. The inspectors verified that operator actions defined in Exelon's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel.

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed Exelon's procedures affecting these areas and the communications protocols between the transmission system operator and Exelon. This review focused on changes to the established program and material condition of the offsite and alternate AC power

equipment. The inspectors assessed whether Exelon established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system manager and reviewing condition reports and open work orders.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 2 'A' residual heat removal (RHR) while in shutdown cooling on April 15, 2015
- Unit 2 'B' RHR during Unit 2 'A' RHR planned maintenance on May 21, 2015
- D14 emergency diesel generator (EDG) during planned maintenance of the D12 EDG on June 2, 2015
- Reactor core isolation cooling (RCIC) during the high pressure coolant injection (HPCI) system planned maintenance on June 18, 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

Resident Inspector Quarterly Walkdowns (71111.05Q – 6 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 34, Unit 1 HPCI pump room, elevation 177', on April 28, 2015
- Fire area 54, Unit 2 'A' & 'C' RHR heat exchanger and pump rooms, elevations 177' and 201', on April 29, 2015
- Fire area 23, Unit 2 cable spreading room, elevation 254', on May 6, 2015
- Fire area 22, Unit 1 cable spreading room, elevation 254', on May 6, 2015
- Fire area 25, Unit 1 and 2 auxiliary equipment room and remote shutdown panel area, elevation 289', on May 18, 2015
- Fire areas 8 and 9, Unit 1 Class '1E' battery rooms, elevation 239', on June 24, 2015

b. Findings

No findings were identified.

1R08 In-service Inspection (71111.08 - 1 sample)

a. Inspection Scope

From April 20, 2015 to April 24, 2015, the inspectors conducted an inspection and review of Exelon staff's implementation of in-service inspection (ISI) program activities for monitoring degradation of the reactor coolant system boundary, risk significant piping and components, and containment systems during the LGS Unit 2 13th refueling outage (2R13). The sample selection for this inspection was based on the inspection procedure objectives and risk priority of those pressure retaining components in systems where degradation would result in a significant increase in risk. The inspectors observed in-process non-destructive examinations (NDE), reviewed documentation, and interviewed Exelon personnel to verify that the NDE activities performed as part of the third interval, third period, of the LGS Unit 2 ISI program were conducted in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2001 Edition with 2002 and 2003 Addenda.

Non-destructive Examination and Welding Activities (IMC Section 02.01)

The inspectors performed direct observation of NDE activities in process and reviewed documentation of completed examinations listed below. Activities included review of ultrasonic testing (UT), radiographic testing, and visual examination (VT).

The inspectors reviewed certifications of the NDE technicians performing the examinations and verified that the inspections were performed in accordance with approved NDE procedures and industry guidance. For UT activities, the inspectors also verified the calibration of equipment used to perform the examinations. The inspectors verified that the test results were reviewed and evaluated by certified Level III NDE personnel and that the parameters used in the test were in accordance with the limitations, precautions, and prerequisites specified in the test procedure.

ASME Code Required Examinations

- Direct observation of the manual UT of pipe-to-pipe weld (HBB-208-1 FW14), 20-inch diameter, in the high pressure coolant injection (HPCI) system.
- Direct observation of the manual UT of pipe-to-pipe weld (VRR-2RS-2A WA43), 28-inch diameter, in the reactor recirculation system.
- Direct observation of the automated UT of the reactor pressure vessel core shroud H1 weld.
- Documentation review of the radiographic testing of two pipe-to-valve welds (HBB-244-01 Weld-11 and Weld-12) performed as part of a repair/replacement activity, 4-inch diameter, in the HPCI system.
- The inspectors visually examined the condition of the containment liner surfaces, including both the drywell and suppression pool, at all floor elevations. Limited portions of the containment surfaces above and below each elevation were accessible for examination. The inspectors performed a documentation review of the containment VT records, and compared those to the inspector walkdowns. The inspectors also reviewed remote video of previously inaccessible suppression pool liner plates located behind the B and D core spray suction strainers that were examined as part of a license renewal commitment.

Other Augmented, License Renewal or Industry Initiative Examinations

The inspectors sampled the remote enhanced VT records of reactor vessel internals as done under water inside the reactor vessel during in-vessel visual inspection (IVVI) activities. The inspection scope included portions of the feedwater sparger brackets, steam dryers, and various jet pump components including the main wedges, slip joints, and set screw auxiliary wedges. The inspectors reviewed the applicable parts of the IVVI procedure, observation of a sample of digital video records, the analysis process for the observations, and documentation of indications. The inspectors verified that the activities were performed in accordance with applicable examination procedures and industry guidance.

Review of Previous Indications Accepted by Evaluation

The inspectors reviewed a sample of indications identified during IVVI activities from previous refueling outages. The inspectors verified there was no change in the size of these previous indications and that they were evaluated for continued service.

Repair/Replacement Activities Including Welding Activities

The inspectors reviewed the repair/replacement package associated with the replacement of a HPCI primary containment isolation valve. Specifically, the HPCI turbine exhaust line vacuum breaker primary containment isolation valve (Component No. HV-055-2F093) failed its local leak rate test and required replacement to meet design requirements. The inspectors performed a documentation review of the welding activities associated with the two pipe-to-valve welds to verify that welding and applicable NDE activities were performed in accordance with ASME Code requirements. The inspectors reviewed the weld procedure and welder qualifications, and also reviewed the radiography data sheets for final acceptance of the welds. The valve replacement was performed under work order C0249557.

Identification and Resolution of Problems (IMC Section 02.05)

The inspectors reviewed a sample of LGS Unit 2 corrective action reports, which identified NDE indications, deficiencies, and other non-conforming conditions since the previous refueling outage and during the current outage. The inspectors verified that non-conforming conditions were properly identified, characterized, and evaluated, and that corrective actions were identified and entered into the corrective action program for resolution.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed two licensed operator simulator training scenarios on May 26, 2015. The scenarios included the loss of stator water cooling, a non-isolable reactor coolant system leak, a fire in the reactor protection system uninterruptible power supply 1AY185, and an anticipated transient without scram (ATWS). The scenarios were complicated by a loss of the D11 EDG emergency bus, digital electro-hydraulic control transmitter failures, a HPCI inadvertent initiation, and main turbine high vibrations. 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 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.

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

a. Inspection Scope

The inspectors observed the LGS Unit 2 startup on May 4, 2015. The inspectors observed evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefings met the criteria specified in Exelon's procedures. Additionally, the inspectors observed operational performance in the main control room to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 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, and 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 D11, D12, D13, and D14 EDGs
- Unit 2 D21, D22, D23, and D24 EDGs

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 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 TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Units 1 and 2 'B' residual heat removal service water (RHRSW) loop unavailable for planned return piping replacement on April 16, 2015
- Unit 2 'A' RHR planned maintenance on May 21, 2015 and May 22, 2015
- Unit 1 RCIC flow transmitter venting planned maintenance on May 22, 2015

- Unit 2 'B' RHR planned maintenance on May 26, 2015 and May 27, 2015
- 201 safeguards offsite power source out of service on June 8, 2015 and June 9, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 3 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- IR 2485022, Unit 2 drywell inboard penetration seals have a three-quarter inch hole in the silicone foam and exposed Kaowool insulation on April 14, 2015
- IR 2488443, Unit 2 'B' RHR shutdown cooling return line when snubber DCA-204-H015 was determined to be mechanically bound when removed and tested as part of the regreasing program on April 21, 2015
- IR 2496668, Unit 2 HPCI discharge check valve leakby during the HPCI comprehensive test on May 11, 2015

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS 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.

1R19 Post-Maintenance Testing (71111.19 – 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 ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure 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.

- D11 EDG following copper tube shearing and replacement on April 1, 2015
- Unit 2 'A' inboard MSIV following repairs and gasket replacement on May 1, 2015
- Overspeed and backup overspeed trip testing following installation of the digital electro-hydraulic control system for the Unit 2 main turbine on May 7, 2015.
- Unit 2 'B' RHR following the maintenance outage on May 28, 2015
- 'B' control enclosure chiller following the maintenance outage on May 21, 2015
- D12 EDG following the cylinder liner replacements on June 12, 2015

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the 13th Unit 2 maintenance and refueling outage (2R13), which was conducted April 10 through May 5, 2015. The inspectors reviewed Exelon's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 samples)

a. Inspection Scope

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

- ST-4-LLR-031-2, Unit 2 'A' main steam isolation valve local leak rate testing on April 16, 2015
- ST-4-LLR-481-2, Unit 2 'D' RHR low pressure coolant injection valve local leak rate testing on April 18, 2015
- ST-6-049-320-2, Unit 2 RCIC operability test at 150 psig reactor pressure on May 5, 2015
- ST-6-055-231-2, Unit 2 HPCI comprehensive test on May 6, 2015

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

The inspectors reviewed Exelon performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR 20, TSs, applicable Regulatory Guides (RGs), and the procedures required by TSs as criteria for determining compliance.

Inspection Planning

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

Radiological Hazard Assessment

The inspectors reviewed recent plant radiation surveys and changes to plant operations since the last inspection to identify any new radiological hazards for onsite workers or members of the public. The inspectors walked down radiological controlled areas to evaluate material and radiological conditions and reviewed radiological risk significant work activities (e.g., diving, control rod drive replacement, refueling floor and drywell work activities). The inspectors reviewed the adequacy of radiological surveys for the work activities.

Instructions to Workers

The inspectors observed various containers of radioactive materials and assessed whether the containers were labeled and controlled in accordance with requirements. The inspectors reviewed occurrences where a worker's electronic personal dosimeter alarmed. The inspectors reviewed Exelon's evaluation of the incidents, documentation in the corrective action program, and whether compensatory dose evaluations were conducted when appropriate. The inspectors reviewed implementation of TS High Radiation Area (HRA) requirements including control of HRA keys.

Contamination and Radioactive Material Control

The inspectors observed the monitoring of potentially contaminated material leaving the radiological control area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material.

Radiological Hazards Control and Work Coverage

The inspectors evaluated in-plant radiological conditions and performed independent radiation measurements during facility walk-downs and observation of radiological work activities. The inspectors assessed whether posted surveys, radiation work permits, worker radiological briefings, and the use of continuous air monitoring and dosimetry monitoring were consistent with ambient and expected conditions. The inspectors examined the control of highly activated or contaminated materials stored within the spent fuel pools and the posting and physical controls for selected HRAs, locked high radiation areas and very high radiation areas (VHRA) to verify conformance with the occupational performance indicator.

Risk-Significant HRA and VHRA Controls

The inspectors reviewed the controls for HRAs, VHRAs, and radiological transient areas in the plant.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

The inspectors assessed Exelon's performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements contained in 10 CFR 20, applicable RGs, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed LGS collective dose history and trends; ongoing and planned radiological work activities; radiological source term history and trends; and ALARA dose estimating and tracking procedures.

Radiological Work Planning

The inspectors reviewed the following radiological work activities based on exposure significance: diving, control rod drive replacement, drywell valve work, and refueling floor work. With respect to these work activities, the inspectors reviewed: ALARA work activity evaluations; exposure estimates; exposure reduction requirements; results achieved (dose rate reductions, actual dose); person-hour estimates and results achieved; and post-job reviews.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed the current annual collective dose estimate; basis methodology; and measures to track, trend, and reduce occupational doses for ongoing work activities.

Source Term Reduction and Control

The inspectors reviewed the current plant radiological source term and historical trend, plans for plant source term reduction, and contingency plans for changes in the source term as the result of changes in plant fuel performance or changes in plant primary chemistry.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with ALARA planning and controls were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the control of in-plant airborne radioactivity and the use of respiratory protection devices in these areas. The inspectors used the requirements in

10 CFR 20, RG 8.15, RG 8.25, NUREG-0041, TS, and procedures required by TS as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the UFSAR to identify ventilation and radiation monitoring systems associated with airborne radioactivity controls and respiratory protection equipment staged for emergency use. The inspectors reviewed performance indicators for unintended internal exposure incidents.

Engineering Controls

The inspectors reviewed operability and use of both permanent and temporary ventilation systems, and the adequacy of airborne radioactivity radiation monitoring in the plant based on location, sensitivity, and alarm set-points.

Use of Respiratory Protection Devices

The inspectors reviewed the use of respiratory protection devices in the plant (grit blasting, under vessel work, and diving) to include applicable ALARA evaluations, respiratory protection device certification, respiratory equipment storage, and air quality testing records.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were identified at an appropriate threshold and addressed by Exelon's corrective action program.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

a. Inspection Scope

The inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR 20, Regulatory Guides, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed procedures associated with dosimetry operations, including issuance/use of external dosimetry and evaluation of and dose assessment for radiological incidents (effective dose equivalent, contamination, and discrete particles).

External Dosimetry

The inspectors reviewed electronic personal dosimeter results, dosimetry occurrence reports; and corrective action program documents for adverse trends related to external dosimetry.

Internal Dosimetry

The inspectors reviewed dose assessments based on air sample monitoring and the use of respiratory protection; and internal dose assessments for any actual internal exposure.

Special Dosimetric Situations

The inspectors reviewed external dose monitoring of workers in large dose rate gradient environments and dose assessments performed since the last inspection that used multi-badging.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with occupational dose assessment were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

The inspectors reviewed performance in assuring the accuracy and operability of radiation monitoring instruments used to protect occupational workers. The inspectors used the requirements in 10 CFR 20, RGs; applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the UFSAR; RP audits; records of in-service survey instrumentation; and selective procedures for instrument source checks and calibrations.

Walkdowns and Observations

The inspectors conducted walk-downs of plant area radiation monitors. The inspectors checked the calibration and source check status of various portable radiation survey instruments and contamination monitors for personnel and equipment.

Calibration and Check Sources

The inspectors reviewed the plant waste stream characterization to assess whether the calibration sources used were representative of the radiation encountered in the plant.

Problem Identification and Resolution

The inspectors verified that problems associated with radiation monitoring instrumentation were identified at an appropriate threshold and properly addressed in the corrective action program.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 4 samples)

.1 Safety System Functional Failures (2 samples)

a. Inspection Scope

The inspectors sampled Exelon's submittals for the Safety System Functional Failures performance indicator for both Unit 1 and Unit 2 for the period of April 1, 2014, through March 31, 2015. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Exelon's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, condition reports, 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 Exelon's submittal of the Mitigating Systems Performance Index for the following systems for the period of April 1, 2014, through March 31, 2015:

- Unit 1 Emergency AC Power System
- Unit 2 Emergency AC Power System

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

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 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 that Exelon entered issues into the corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program and periodically attended condition report screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Exelon performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, “Problem Identification and Resolution,” to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Exelon outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed Exelon’s corrective action program database for the first and second quarters of 2015 to assess condition reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily condition report review (Section 4OA2.1). The inspectors reviewed Exelon’s trending information conducted under PI-AA-1001 to verify that Exelon personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

The review did not reveal any new trends that could indicate a more significant safety issue. The inspectors determined that Exelon personnel were identifying issues at a low threshold and entering issues into the corrective action program for resolution and

appropriately prioritizing investigation reviews. The inspectors noted that the LGS Nuclear Oversight organization continued to identify negative trends at an appropriate level and elevated issues, when necessary. The inspectors specifically evaluated a declining trend in human performance identified by Exelon and reviewed the applicable condition reports. In addition, the inspectors observed reactor operators not fully complying with procedures and not recognizing abnormal conditions. For example, a reactor operator inappropriately marked a procedure section as not applicable during a surveillance test which resulted in the test not meeting acceptance criteria. The inspectors determined the issues in aggregate represented deficient operator knowledge and poor human performance tool use as well as a lack of procedure compliance. The inspectors determined that the issues were of minor safety significance and that Exelon's identification of a declining trend was appropriate.

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

.3 Annual Sample: D11 EDG Copper Tube Failures

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's apparent cause evaluation and corrective actions associated with condition reports IR 02456180, IR 02477966, and IR 02479001 which were written in response to failures of the copper tube connected to the aft main bearing booster pump of the D11 EDG.

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

a. Findings and Observations

No findings were identified.

Exelon determined the most probable cause was the aft main bearing booster copper tubing became flattened over time due to repeated contact with clamps, and the engine induced vibrations and tube to clamp contact resulted in weakening of the copper tube resulting in a shear. A similar event occurred with a swagelok to copper tube fitting connection that resulted in a shear. Additionally, Exelon determined the copper tubing is a soft material that is susceptible to cyclic fatigue if it is frequently manipulated during maintenance activities or resonant to equipment operating speed.

The inspectors reviewed Exelon's corrective actions to address the extent of condition of the previously identified EDG copper tubing issues. The inspectors determined Exelon conducted a thorough technical review of the copper tubing failures. Corrective actions

include replacing the EDG copper tubing with stainless steel tubing in upcoming EDG maintenance outages and installing softeners to eliminate tube to clamp contact and tube fatigue until the copper tubing can be upgraded to steel. The inspectors concluded that these actions were reasonable given that stainless steel will eliminate the soft copper material and vibration induced contact fatigue.

The inspectors concluded that Exelon's overall response to the EDG copper tubing failures was commensurate with the safety significance, was timely, and included appropriate compensatory measures.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 2 samples)

.1 Plant Events

a. Inspection Scope

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

- Unit 2 Alert declaration due to a fire in a Unit 2 Division 2 Safeguard DC Motor Control Center on April 5, 2015 (Event Number 50956).

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000352/2015-001-00: Valid Automatic Actuation of the Reactor Protection System with the Reactor Critical Due to Closure of One Main Steam Isolation Valve

a. Inspection Scope

On February 23, 2015 on LGS Unit 1, there was a valid automatic actuation of the reactor protection system (RPS) due to a high reactor pressure condition caused by the unexpected closure of the '1C' inboard MSIV. The '1C' inboard MSIV closed due to a fitting failure for the PCIG supply tubing at the valve. The valve is designed to fail closed on a loss of PCIG supply. The inspectors identified a finding during the review of the LER. This LER is closed.

a. Findings

Introduction. A self-revealing Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified because Exelon failed to control the proper design configuration of installed plant equipment in Unit 1. Specifically, a fitting used in the

safety-related PCIG tubing supplying the '1C' inboard MSIV was not installed in accordance with the specified quality standard and this deviation was not controlled. Subsequently, the fitting failed to high cycle fatigue and caused a reactor trip.

Description. On February 23, 2015, the LGS Unit 1 reactor tripped due to high reactor pressure caused by the closure of the '1C' inboard MSIV. Exelon identified that a reducing port connector in the PCIG supply line to the '1C' inboard MSIV pilot manifold was sheared. Exelon PowerLabs determined the fitting failed due to high cycle fatigue.

Exelon performed a root cause and concluded that the fitting was installed either during original construction or in the 1990s based on the model being manufactured pre-1996 and no documentation being found that related to this specific fitting being reviewed, procured, or installed. Exelon determined that design specification M-542, "Nuclear Boiler Instrument," classifies this section of PCIG tubing as safety-related. Exelon found that the original design documentation, per isometric drawing FJ-041-017, specified a different configuration and fitting than the actual as-found installation. Exelon also determined that M-0830, "Instrument Installation Details," allowed field installation of tubing and fittings to deviate from the specified design without further review, approval, and documentation only when the same or better overall effect was achieved. For this fitting, the substitution resulted in the wall thickness of the fitting and tubing to be decreased from nominal 0.0375" and 0.065", respectively, to nominal 0.028" which was not the same or better.

The inspectors reviewed the root cause evaluation, discussed the issue with plant staff, and searched and reviewed Exelon's work and corrective action program documents. The inspectors concluded that Exelon's determinations were reasonable and supported by the available records. The inspectors determined that the most probable time of installation of the deficient fitting was during original construction such that the fitting failed after approximately thirty years in service.

Exelon's corrective actions included initiating condition report IR 2458005, installing approved tubing and fittings on February 24, 2015, on the '1C' inboard MSIV which maintained wall thicknesses greater than original specifications, and verifying that current maintenance practice, training, and knowledge would preclude substitution of a different style fitting without further evaluation. Exelon also conducted immediate extent of condition walkdowns where practicable and scheduled further walkdowns to ensure no similar inappropriate fittings were installed.

Analysis. The inspectors determined that the failure to install safety-related PCIG tubing in accordance with the specified quality standard without a controlled deviation 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 is associated with the design control attribute of the initiating events cornerstone and affected the objective to limit the likelihood of events that upset plant stability during power operations. Specifically, the inadvertent closure of the '1C' inboard MSIV resulted in a reactor trip.

Using IMC 0609, "Significance Determination Process, Appendix A, Exhibit 1, "Initiating Events Screening Questions," the inspectors determined that this finding was of very low safety significance (Green) because the finding did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (e.g. loss of condenser, loss of feedwater). Specifically, the

finding caused the loss of one steam line to the main condenser but three steam lines remained available.

The inspectors determined that the finding did not have cross-cutting aspect because the installation of the fitting that failed did not occur within the last three years, and the inspectors did not conclude that the causal factors represented present Exelon performance.

Enforcement. 10 CFR 50, Appendix B, Criterion III, "Design Control," states, in part, that appropriate quality standards are specified in design documents and that deviations from such standards are controlled. M-542 classified the section of PCIG tubing to the '1C' inboard MSIV pilot manifold as safety-related. Isometric drawing FJ-041-017 specified a tubing and fitting configuration which had a fitting and tubing wall thickness of 0.0375" and 0.065", respectively. M-0830 required further review, approval, and documentation of deviations from the specified design when the same or better overall effect was not achieved. Contrary to the above, from August 8, 1985 (original issuance of operating license) to February 24, 2015, a reducing port connector was installed in the PCIG supply line to the '1C' inboard MSIV pilot manifold with a fitting and tubing wall thickness of 0.028", nominal, which was not the same or better overall effect, and this deviation from the specified design was not reviewed, approved, nor documented. Exelon's immediate corrective actions to restore compliance included installing approved tubing and fittings on February 24, 2015, on the '1C' inboard MSIV which maintained wall thicknesses greater than original specifications. Because this violation was of very low safety significance and was entered into the corrective action program (IR 2458005), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000352/2015002-01, Design Requirements Not Met for Installed Instrument Gas Tubing Fitting)**

4OA6 Meetings, Including Exit

On July 10, 2015, the inspectors presented the inspection results to Mr. R. Libra, Site Vice President, 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
 T. Dougherty, 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
 J. Karkoska, Manager, Nuclear Oversight
 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
 L. Emel, Lead Maintenance Tech
 M. Arnosky, Shift Manager
 K. McLaughlin, Engineering Manager
 M. Karasek, Engineer
 B. Tracy, Engineer
 K. Fischer, Site NDE Level III
 C. Hawkins, Exelon NDE Level III
 J. Kan, Authorized Nuclear In-service Inspector
 J. Kramer, Site Welding Administrator
 J. Newcomb, Exelon NDE Level III
 M. Weis, ISI Program Owner

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATEDOpened/Closed

05000352/2015002-01	NCV	Design Requirements Not Met for Installed Instrument Gas Tubing Fitting (Section 4OA3)
05000352/2015001-00	LER	Valid Automatic Actuation of the Reactor Protection System with the Reactor Critical Due to Closure of One Main Steam Isolation Valve (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

E-5, Grid Emergency, Revision 22
 GP-7.1, Summer Weather Preparation and Operation, Revision 34
 OP-AA-108-107, Switchyard Control, Revision 4
 OP-AA-108-107-1001, Station Response to Grid Capacity Conditions, Revision 6
 OP-AA-108-107-1002, Interface between COMED/PECO and Exelon Generation (Nuclear Power) for Transmission Operations, Revision 8
 OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 12
 WC-AA-107 Seasonal Readiness, Revision 15
 WC-AA-8000, Interface Procedure between COMED/PECO and Exelon Generation (Nuclear Power) for Construction and Maintenance, Revision 7

Condition Reports

2510383 2511847 2513887 2514045

Maintenance Orders/Work Orders

A1958908 R1292794

Miscellaneous

Certification letter of 2015 Summer Readiness to SVP of Operations
 Control Room Logs
 Maintenance tracking log for equipment issues affecting summer readiness preparations

Section 1R04: Equipment Alignment

Procedures

RT-6-051-603-2, A/C LPCI Valve Forward Flush, Revision 0
 S49.1.A, Normal RCIC Line-Up for Automatic Operation, Revision 25
 S51.1.A, Set Up of RHR System for Automatic Operation in LPCI Mode, Revision 52
 S51.5.C RHR Shutdown Cooling Piping Flushes, Revision 40
 S51.6.A Swapping RHR Pumps in RHR SDC Mode, Revision 14
 S51.8.B Shutdown Cooling/Reactor Coolant Circulation Operation Start-up and Shutdown, Revision 76
 1S49.1.A (COL), Valve Alignment to Assure Availability of the RCIC System, Revision 17
 1S51.1.A (COL-1) Equipment Alignment for Automatic Operation of the RHR System in the LPCI Mode – 'A' Subsystem, Revision 19
 1S92.1.N (COL-4), Equipment Alignment for 1D Diesel Generator Operation, Revision 29

Condition Reports

2504651 2504698 2504716 2504720

Miscellaneous

Control Room Logs

Section 1R05: Fire Protection**Procedures**

F-A-425, Pre-Fire Plan, Unit 1 Class 1E Battery Room 425, Revision 13
 F-A-436, Pre-Fire Plan, Common, Unit 1 Class 1E Battery Room, Revision 11
 F-A-449, Pre-Fire Plan Common, Unit 1 Cable Spreading Room (EL 254), Revision 14
 F-A-450, Pre-Fire Plan Common, Unit 2 Cable Spreading Room (El. 254), Revision 11
 F-A-540, Pre-Fire Plan Common, Remote Shutdown Room 540, Revision 10
 F-A-542, Pre-Fire Plan Common, Auxiliary Equipment Room 542, Revision 11
 F-R-109, Unit 1 HPCI Pump Room Pre-Fire Plan, Revision 10
 F-R-173, Unit 2 A and C RHR Heat Exchanger and Pump Rooms Pre-Fire Plan, Revision 7
 OP-AA-201-008, Pre-Fire Plan Manual, Revision 3

Section 1R08: In-Service Inspection**Procedures**

GEH-PDI-UT-1, PDI Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds, Revision 8
 GEH-UT-503, Procedure for Automated Ultrasonic Examination of the Shroud Assembly Welds, Revision 15
 GEH-UT-547, Procedure for Automated Ultrasonic Examination of Jet Pump Beams with Phased Array Technique in Boiling Water Reactors, Revision 05
 GEH-VT-204, Procedure for IVVI of BWR 4 RPV Internals, Revision 15
 MA-LG-793-001, Visual Examination of Containment Vessels and Internals, Revision 8
 QP.10.09B, Procedure for VT-1 and VT-3 Visual Examinations of Class MC Metallic Shell and Penetration Liners and Class CC Pressure Retaining Components and Their Integral Attachments, Revision 1
 100-RT-001, Radiographic Examination in Accordance with ASME Section V, Article 2, Revision 8

Condition Reports

2484984	2486892	2487130	2487294	2487618	2487672
2487876	2488812				

Maintenance Orders/Work Orders

C0249557	C0253933	C0257153
----------	----------	----------

Drawings

8031-ISI-M-52, Sheet 1, ASME Section XI Boundary P&ID Core Spray (Unit 1), Revision 10
 8031-M-55, P&ID High Pressure Coolant Injection (Unit 2), Revision 57
 HBB-244-1, Isometric - Reactor Building High Pressure Coolant Injection (Unit 2), Revision 9

Miscellaneous

Completed procedure MA-LG-793-001 with attached ASME IWE Visual Exam NDE Reports, dated April 2013

ER-LG-330-1001, Limerick Generating Station Units 1&2 ISI Program Plan, Revision 10

ER-LG-331, RPV & Internals Program Bases and Implementation Document, Revision 5

RT Data Sheet for HBB-244-01 Weld-11, dated April 23, 2015

RT Data Sheet for HBB-244-01 Weld-12, dated April 23, 2015

UT-15-020, UT Data Sheet for HBB-208-1 FW14, dated April 20, 2015

UT-15-024, UT Data Sheet for VRR-2RS-2A WA43, dated April 23, 2015

Weld Data Sheets and Field Weld Checklists for Weld HBB-244-01 FW-11 and FW-12, dated April 22, 2015

WPS 1-1-GTSM-PWHT, Welding Procedure Specification for Manual GTAW/SMAW of P1 Metals, Revision 2

Section 1R11: Licensed Operator Requalification ProgramProcedures

GP-2, Normal Plant Startup, Revision 155

Section 1R12: Maintenance EffectivenessCondition Reports

0438365	0445471	0445262	0499842	0737238	0999462
1109930	1109944	1470770	1512745	1551480	1601870
1602053	1610127	1611986	1612182	2385156	2421220
2456180	2474752	2477966	2479001	2479539	2430692
2456537					

Maintenance Orders/Work Orders

1921081	1971841
---------	---------

Miscellaneous

ECR 15-0136

Unit 1 EDG System Health Report

Unit 2 EDG System Health Report

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

OP-AA-108-117, Protected Equipment Program, Revision 4

RT-2-011-263-0, 'A' ESW Loop Flow Data Collection and Dual Loop Flow Verification with 1A, 2A and 1B ESW Loops Through 'A' RHRSW Return, Revision 1

SP-220, Replacement of 'B' Loop RHRSW Return Piping During 2R13, Revision 0

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

Condition Reports

2504612	2504629	2504637	2510383	2511847
---------	---------	---------	---------	---------

Section 1R15: Operability Determinations and Functionality AssessmentsProcedures

ER-AA-330-011, Snubber Service Life Monitoring, Revision 6
 ER-LG-330-1002, ISI Augmented Inspection Program, Revision 4
 ST-6-055-231-2, HPCI Pump Comprehensive Test, Revision 3

Condition Reports

2488443	2485666	2488637	2490394	2492362	2496518
2488637	2488443	2490098	2492167	2496668	

Drawings

A-13, Reactor Building Unit 2 Drywell Penetration Sealing Schedule & Details, Revision 5
 C-280, Reactor Building Unit 2 Liner Plate Requirements Penetration Schedule, Revision 21
 C-287, Reactor Building Units 1 & 2 Liner Plate Requirements Drywell Penetrations Sect's & Det's, Revision 23
 M-0055, P ID High Pressure Coolant Injection, Sheet 0001, Revision 058
 M-0056, P&ID HPCI Pump/Turbine, Sheet 0001, Revision 040
 SP-HCB-2SP-RJ2, Unit No. 2 Drywell Penetration Detail Assembly x 62, Revision 4
 8031-M-57, P&ID Containment Atmospheric Control (Unit 2), Revision 13

Miscellaneous

ECR LG 98-01239, Repair Penetration Seals, Revision 0
 ECR LG 98-01385, Inspection of Drywell Penetration Seals per NCR 98-01239, Revision 0
 LGS 1 & 2, IST Bases, 3rdTenYr Interval 2-18-10

Section 1R19: Post-Maintenance TestingProcedures

RT-6-031-310-2, Overspeed and Backup Overspeed Trip Test, Revision 22
 RT-6-092-312-1, D12 Diesel Generator Run-In, Revision 29
 RT-6-092-322-1, D12 Diesel Generator Overspeed Trip Test, Revision 26
 ST-2-041-466-2, RPS-Main Steam Isolation Valve-Closure; Division IA/IB, Channel A1/B1 Calibration/Functional Test (ZS-41-222A), Revision 9
 ST-4-051-306-2, 2B/2D RHR Auto Closure Seal-In Contact Test for HV-051-225B and HV-051-2F027B, Revision 5
 ST-6-011-232-0, B Loop ESW Pump, Valve and Flow Test, Revision 86
 ST-6-051-232-2, B RHR Pump, Valve and Flow Test, Revision 71
 ST-6-092-322-1, D12 Diesel Generator LOCA/Load Reject Testing and Fast Start Operability Test Run, Revision 28
 S90.1.A, Startup of the Control Enclosure Chilled Water System, Revision 55
 S90.9.A, Routine Inspection of the Control Enclosure Chilled Water System, Revision 44

Condition Reports

247796	2479001	2506370	2510716	2513057	2514085
2478216	2492061	2509777	2511323	2513203	

Maintenance Orders/Work Orders

C0256976	C0257552	R1233650	R1295709	R1312604	R1316379
----------	----------	----------	----------	----------	----------

Section 1R20: Refueling and Other Outage Activities

Procedures

GP-2, Normal Plant Startup, Revision 155
 LS-AA-119, Fatigue Management and Work Hour Limits, Revision 011
 NF-AA-330-1001, Core Verification Guidelines, Revision 10
 OU-AA-103, Shutdown Safety Management Program, Revision 15
 OP-AA-108-117, Protected Equipment Program, Revision 4
 OP-AA-108-117-1001, Spent Fuel Storage Pools Heat-Up Rate with Loss of Normal Cooling, Revision 0
 OP-MA-109-101, Clearance and Tagging, Revision 20
 S12.4.C, Drain, Fill and Vent the RHR Side of the 2B RHR Heat Exchanger, Revision 8
 S51.7.C, Defeating the RHR Pump/Suction Valve Interlock to Support RHR – Alternate Decay Heat Removal Operation, Revision 6
 S51.8.B, Shutdown Cooling/Reactor Coolant Circulation Operation Startup and Shutdown, Revision 76
 S51.8.L, RHR Alternate Decay Heat Removal Startup and Shutdown, Revision 18

Miscellaneous

Limerick Generating Station Shutdown Safety Plan, Revision 0

Section 1R22: Surveillance Testing

Procedures

ST-4-LLR-031-2, Main Steam Line 'A', Revision 10
 ST-4-LLR-041-2, Main Steam Line 'B', Revision 10
 ST-4-LLR-051-2, Main Steam Line 'C', Revision 10
 ST-4-LLR-061-2, Main Steam Line 'D', Revision 10
 ST-4-LLR-481-2, 'D' RHR LPCI, Revision 11
 ST-6-049-320-2, RCIC Operability Verification, Revision 24
 ST-6-055-231-2, HPCI Pump Comprehensive Test, Revision 3

Condition Reports

2487060	2496518	2496668	2497451
---------	---------	---------	---------

Section 2RS1: Access Control to Radiologically Significant Areas

Procedures

CY-AB-120, BWR Shutdown Chemistry, Revision 11
 CY-LG-120-1301, Outage Cobalt Limits, Revision 8
 RP-AA-350-1002, Managing Large Scale Contamination Events, Revision 0
 RP-AA-400-1007, Elevated Dose Rate Response Plan, Revision 2
 RP-AB-461, Access Controls During Irradiated Core Component Movement, Revision 0
 RP-AB-F-04, Access Controls During Irradiated Component Movement at Limerick, Revision 0

Miscellaneous

Corrective Action Documents (various)
 Performance Indicator Summary Data
 Source Term assessment

Section 2RS2: Occupational ALARA Planning and Controls

Miscellaneous

ALARA Contingency Plans
Corrective Action Documents (various ARs)
CRUD Burst Response Plan
Outage Chemistry Plan and Shutdown results
Radiation Protection Outage Checklist
Radiological Risk Management Matrix
Source Term Control Plans and Actions
Station ALARA Daily Updates (various)
Various ALARA Plans including control rod drive unlatching ALARA plans, estimates and decision analyses

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

Miscellaneous

Corrective Action Documents (various ARs)
NOVA 2000 User Manual
Recent Source Term Assessment

Section 2RS04: Occupational Dose Assessment

Miscellaneous

Corrective Action Documents (various ARs)
Personnel Contamination Events
Source Term Assessment

Section 2RS05: Radiation Monitoring Instrumentation

Procedures

RP-AA-700-1201, Operation of the MGP Instrument Telepole, Revision 1
RP-AA-700-1305, Operation and Calibration of the AMP 100/200, Revision 1

Miscellaneous

Corrective Action Documents (various ARs)
Instrument Calibration Records (various)
Source term Assessment

Section 4OA1: Performance Indicator Verification

Procedures

LS-AA-2200, Mitigating System Performance Index Data Acquisition and Reporting, Revision 5
LS-MA-1251, Reportability Reference Manual – Mid-Atlantic Plant Specific – LG (Limerick), Revision 18
OP-LG-108-104-1000, ST/RT Status Log (Short Duration Time Clock Log), Revision 1

Condition Reports

1553563

Miscellaneous

LER 2014-001-01 LER 2014-003-00 LER 2014-004-00 LER 2014-005-00
 LER 2014-006-00 LER 2014-007-00 LER 2015-001-00
 Operator Logs

Section 40A2: Problem Identification and ResolutionProcedures

PI-AA-125-1003, Apparent Cause Evaluation Manual, Revision 2

Condition Reports

445471	2485871	2490887	2503999	2509333	2516229
802822	2485951	2491022	2504018	2509348	2516273
1109930	2486090	2491801	2504345	2509356	2516599
1470770	2487365	2492061	2504491	2509489	2516721
1611986	2487413	2492167	2504496	2509493	2516968
2430417	2487876	2492362	2504498	2509630	2517351
2454913	2488443	2492785	2504612	2509850	2517538
2456180	2488637	2493784	2504629	2510180	2517552
2477224	2488780	2494653	2504651	2510244	2518312
2477966	2488857	2494862	2504698	2510383	2518459
2477966	2488858	2495343	2504910	2510799	2518484
2479001	2488859	2495518	2504953	2511027	2518567
2479001	2488862	2495976	2504968	2511386	2518883
2479539	2488864	2496121	2504969	2511847	2518886
2479539	2488865	2496397	2505741	2512925	2518895
2479594	2488868	2496518	2505860	2512938	2518991
2480166	2488870	2496668	2506575	2513517	2519480
2480263	2488871	2496830	2506655	2513519	2519532
2481081	2488872	2496857	2506719	2513738	2519542
2482168	2489079	2496864	2507360	2513855	2519566
2483062	2489224	2497105	2507593	2513892	2520107
2483175	2489337	2497688	2508465	2513898	2520108
2483373	2489357	2498057	2508470	2514045	2520239
2483972	2489606	2498282	2508615	2514244	2520545
2484136	2489668	2498352	2508733	2514382	2520732
2484558	2489907	2498569	2508752	2514835	2520946
2484975	2490098	2501655	2508823	2514877	2521169
2484977	2490394	2502323	2509185	2515246	2521172
2485022	2490558	2503292	2509190	2515373	2521493
2485556	2490625	2503596	2509218	2515581	
2485666	2490804	2503881	2509219	2515858	

Miscellaneous

EACE 02456180-03
 ECR 15-00136
 ECR 15-00210
 Unit 1 EDG System Health Report

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

Procedures

EP-AA-1008, Radiological Emergency Plan Annex for Limerick Generating Station, Revision 29

OP-AA-101-103-1004 Attachment 2, Event/Issues Report Format, Revision 29

SE-8 Appendix 1, Fire Hard Card, Revision 0

SE-8, Fire, Revision 50

Condition Reports

2480166

Drawings

M-1-E41-1040-E-017, Sheet 001, Revision 25

Miscellaneous

Event Notification #50956

Control Room Logs

LIST OF ACRONYMS

AC	alternating current
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
EDG	emergency diesel generator
HPCI	high pressure coolant injection
HRA	high radiation area
IMC	Inspection Manual Chapter
ISI	in-service inspection
IVVI	in-vessel visual inspection
LER	licensee event report
LGS	Limerick Generating Station
MSIV	main steam isolation valve
NCV	non-cited violation
NEI	Nuclear Energy Institute
NDE	non-destructive examination
NRC	Nuclear Regulatory Commission
PCIG	primary containment instrument gas
RCIC	reactor core isolation cooling
RHR	residual heat removal
RHRSW	residual heat removal service water
RP	radiation protection
TS	technical specifications
UFSAR	updated final safety analysis report
UT	ultrasonic testing
VHRA	very high radiation area
VT	visual examination